

# **Appendix I.2**

## **Avifauna Biophysical Baseline Report**

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# Antrim Gypsum Project - Biophysical Baseline Report: Avifauna

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PREPARED FOR

**GHD Limited**

120 Western Parkway, Suite 110  
Bedford, Nova Scotia  
B4B 0V2

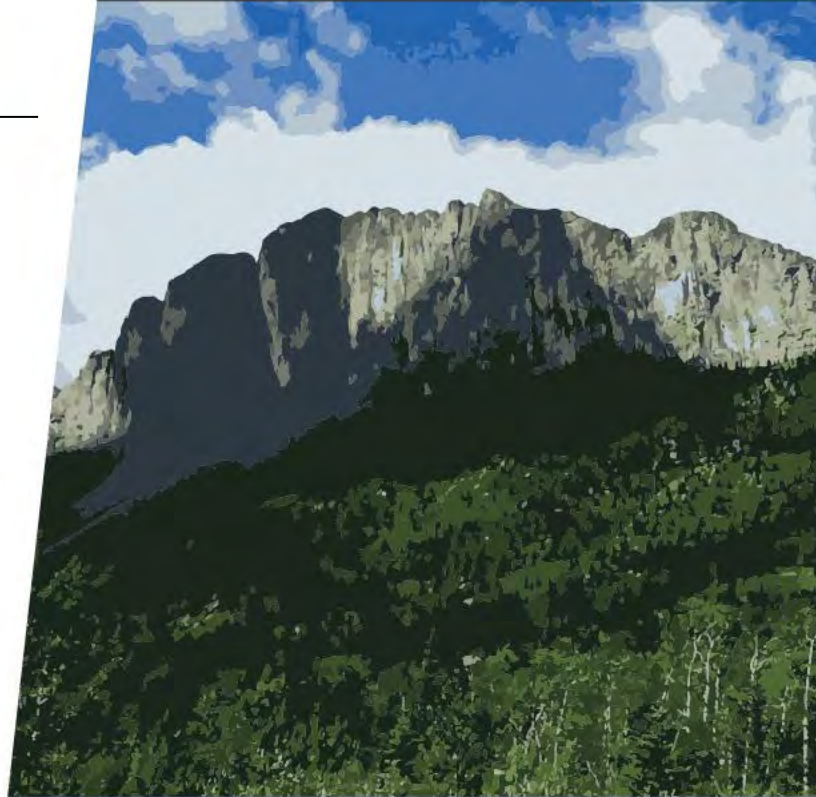
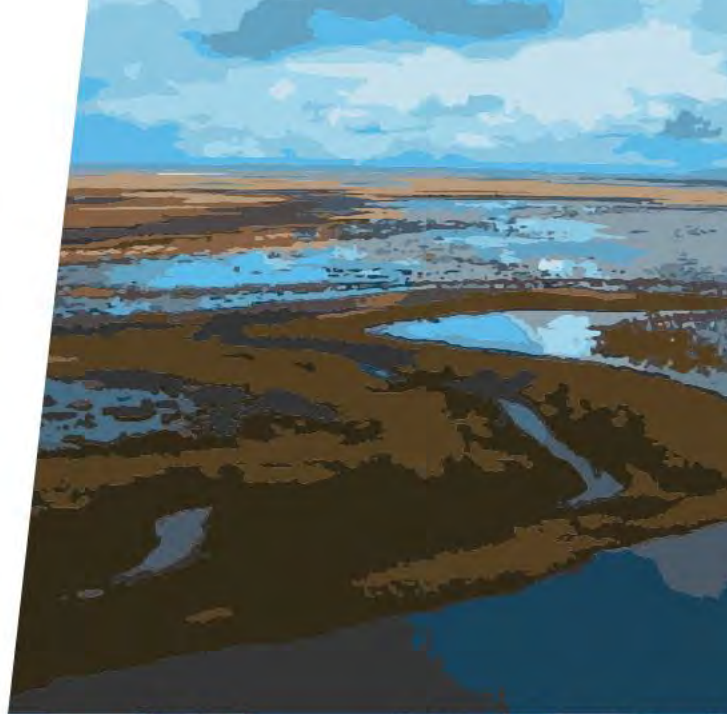
PREPARED BY

**McCallum Environmental Ltd.**  
2 Bluewater Road, Suite 115  
Bedford, Nova Scotia  
B4B 1G7

July 2024



McCallum Environmental Ltd.





## ANTRIM GYPSUM PROJECT

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## EXECUTIVE SUMMARY

The Antrim Gypsum Project (the Project) is located near Gays River, along Lake Egmont Road in Cooks Brook, Nova Scotia. CertainTeed Canada Inc. (CertainTeed) proposes to develop the Project as a conventional gypsum quarrying operation including an open pit quarry, till and organic stockpiles, overburden storage area, rock processing plant as well as water management infrastructure. The Project will produce crushed gypsum and anhydrate at an estimated average rate of production of 2.0 million tonnes per year, with a marketable production rate of 1.5 million tonnes per year. The gypsum and anhydrate products will be transported via trucks to a port facility for shipment to manufacturing facilities either in Canada or the United States. For the purposes of this environmental assessment, a Project Area (PA) was defined as the footprint of Project related infrastructure and includes the following parcels of land (PID 440228389, 40228371, 40212409, 40229676, 40959983, 40959975, 41517319, 41152893, 40767014, 40228009 and 40228017).

McCallum Environmental Ltd (MEL) was retained to complete avifauna surveys for the proposed Project. This assessment supports the preparation and submission of the provincial Environmental Assessment Registration Document (EARD).

The objective of the avifauna surveys was to:

- Identify species and habitat usage with a focus on Species at Risk (SAR) and Species of Conservation Interest (SOCI) within and surrounding the PA, and
- Determine trends in species composition and bird group usage throughout different seasons where possible.

The results of these surveys will be carried forward to the EARD and discussed in the effects assessment.

In May 2022, biophysical field surveys were initiated and continued through October 2023 and a total of 66.32 hours (3979 minutes) of surveys were completed by MEL biologists. The field studies were completed as follows:

- Spring migration surveys (May 2022/2023);
- Nocturnal owl surveys (May 2022);
- Breeding bird surveys (June – July 2022/2023);
- Nightjar surveys (June – July 2022), and
- Fall migration surveys (August – October 2023).

Avian biophysical surveys resulted in the observation of 4782 individuals, representing 98 bird species (not including incidentals or unknowns) within the PA.

The most abundant bird group observed (calculated by number of individuals per bird group) were passerines accounting for 81.28% of the species observed, followed by other landbirds (10.14%), waterfowl (6.88%), other waterbirds (0.65%), diurnal raptors (0.5%), shorebirds (0.33%), and nocturnal raptors (0.15%). These percentages include unknown individuals that were able to be identified to the level of bird group (e.g., passerines) and do not include unknown individuals that could not be identified



to the level of bird group (0.06%). These percentages represent species diversity within the PA. The most observed species was the American robin and black-capped chickadee.

In total, five avian SAR and eight avian SOCI were observed. The five avian SAR species observed were as follows:

- Barn swallow (*Hirundo rustica*);
- Canada warbler (*Cardellina canadensis*);
- Common nighthawk (*Chordeiles minor*);
- Eastern wood-pewee (*Contopus virens*); and
- Olive-sided flycatcher (*Contopus cooperi*).

No common nighthawk or Eastern whip-poor-will (*Antrostomus vociferus*) were observed during the nightjar surveys. Common nighthawks were only observed incidentally during wetland and watercourse delineation surveys.

Overall, survey locations with different forms of edge habitat (e.g., open wetland surrounded by forest) had the highest individual and species counts. The variety in habitat and variation in vegetation structure (e.g., height) would attract a higher number and variety of birds (e.g., all bird groups). Edge habitat and open areas can also serve as areas for species that tend to gather in groups (e.g., swallows and goldfinches) or staging areas for birds to gather and prepare for migration.

Several large groups of Canada geese (e.g., 60 to 70 individuals per group) were observed in the PA during the spring migration season. During the fall migration season, there were two occasions where large groups of birds (e.g., chickadees, goldfinches, flycatchers, vireos, and warblers) were observed showing signs of migration preparation. No other migratory behaviour or general migratory patterns were observed, such as specific direction or migratory areas/corridors.

The PA provides a range of habitats suitable for a variety of bird species with different habitat requirements. There are expansive areas of open and forested habitat that provide foraging and breeding habitat for certain species, such as for raptors and passerines. Forests and shrub-dominated areas with stand heterogeneity provide suitable habitat for foraging and breeding for many passerine species. Open habitat transitioning into forested habitat also provides edge habitat that various species use for foraging.



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## 1 INTRODUCTION

McCallum Environmental Ltd (MEL) was retained to complete baseline avifauna surveys for the proposed Antrim Gypsum Project (the Project), located in Cooks Brook, Nova Scotia. This assessment supports the preparation and submission of the provincial Environmental Assessment Registration Document (EARD) with Nova Scotia Environment and Climate Change (NSECC).

The objective of the avifauna species surveys was to identify species and habitat usage with a focus on Species at Risk (SAR) and Species of Conservation Interest (SOCI) within and surrounding the Project Area (PA), and to determine trends in species composition and bird group usage throughout different seasons.

The results of these surveys will be carried forward in the EARD to evaluate the Project's effect to avifauna.

### 1.1 Background

The Project is located near Gays River, along Lake Egmont Road in Cooks Brook, Nova Scotia (Figure 1, Appendix A). CertainTeed Canada Inc. (CertainTeed) proposes to develop the Project as a conventional gypsum quarrying operation including an open pit quarry, till and organic stockpiles, overburden storage area, rock processing plant as well as water management infrastructure. The Project will produce crushed gypsum and anhydrate at an estimated average rate of production of 2.0 million tonnes per year, with a marketable production rate of 1.5 million tonnes per year. The gypsum and anhydrate products will be transported via trucks to a port facility for shipment to manufacturing facilities either in Canada or the United States. The Project includes construction, operation, and closure activities.

### 1.2 Regulatory Context and Consultation

The Nova Scotia *Environment Act* and Environmental Assessment Regulations regulate provincial environmental assessments. The proposed Project is a facility that extracts or processes gypsum, therefore, requires a provincial environmental assessment registration as it is considered a *Class I* undertaking under Schedule A of the Nova Scotia Environmental Assessment Regulations.

The Project has potential to interact with avifauna species that are protected under several federal and provincial legislations, which the avifauna surveys explained herein were designed to detect. Legislation that may direct resource development and conservation of avifauna species and their habitat include:

- **Federal Legislation:**
  - *Species at Risk Act, and*
  - *Migratory Bird Convention Act.*
- **Provincial Legislation:**
  - *Nova Scotia Wildlife Act, and*
  - *Nova Scotia Endangered Species Act.*

The Project is also driven by policies, guidelines, and standards that provide guidance on the development of the Project and the survey design. These guidance documents and policies include:





- Environment and Climate Change Canada’s Canadian Wildlife Service (Atlantic Region) – Wind Energy & Birds Environmental Assessment Guidance Update (CWS 2022);
- Wind Turbines and Birds - Updated Guidance for Environmental Assessment and Monitoring Canadian Wildlife Service – Atlantic Region (CWS 2018);
- Wind Turbines and Birds - A Guidance Document for Environmental Assessment (EC-CWS 2007a);
- Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds (EC-CWS 2007b);
- Nova Scotia Wetland Conservation Policy (Nova Scotia Environment (NSE) 2019);
- The Guide to Addressing Wildlife Species and Habitat in an EA Registration Document (NSE 2009), and
- Various Nova Scotia Department of Natural Resources and Renewables (NSDNRR) Special Management Practices (SMP) and Environment and Climate Change Canada (ECCC) Species at Risk Management Plans.

Regulatory meetings and communications regarding the Project were completed. On May 26, 2022, NSDNRR was contacted regarding constraints and location sensitive species. On August 8 and 9, 2023, meetings were held with NSDNRR again to discuss methods and location sensitive species.

### **1.3 Assessment of Spatial Boundaries**

The Spatial boundaries of the baseline biophysical surveys in support of the EA are defined by the PA depicted in Figure 2 (Appendix A), located three kilometers north of the Town of Antrim, and two kilometers west of the town of Lake Egmont within the Halifax Regional Municipality (HRM). The PA is located on a mixture of private (PIDs 40228009, 40960858, 40228017, 40767014, 41152893, and 41517319) and Crown land (PIDs 40212409, 40959975, 40229676, 40212409, 40959983, 40228371, 40228389) and is 602 hectares in total size.

For the purposes of this environmental assessment, a PA was defined as the boundary of the terrestrial assessments related to the EARD.

## **2 BASELINE PROGRAM METHODOLOGY**

### **2.1 Desktop Review Methodology**

A review of the Canada Important Bird Areas database, Atlantic Canada Conservation Data Centre (ACDC) report, Maritime Breeding Bird Atlas (MBBA), old forest GIS database, and Canada Wildlife Service Migratory Bird Sanctuaries (MBS) was completed to support bird survey design.

The Nova Scotia Provincial Landscape Viewer (<https://nsgi.novascotia.ca/plv/>) was also reviewed to determine whether the PA is within, or adjacent to special features, such as protected areas. To ensure the PA is not located within any ecologically sensitive regions, the following databases were also reviewed:

- Nova Scotia Department of Natural Resources and Renewables (NSDNRR) Significant Habitats;
- Protected Areas/Parks and Wildlife Management Areas;
- Maritime Breeding Bird Atlas (MBBA);
- Canada Wildlife Service Migratory Bird Sanctuary (CWS-MBS);
- Canada Important Bird Area (IBA);



- *Species at Risk Act* (SARA) Critical Habitat GIS layers;
- SARA Recovery strategies, and
- Special Management Practice (SMPs) layers.

### 2.1.1 Priority Species List

A desktop priority species list was created in accordance with the *Guide to Addressing Wildlife Species and Habitat in an EA Registration Document* (NSE, 2009). This broad list (provided in Appendix B) helped to inform the avifauna field programs by identifying species that have the potential to be present within the PA. Priority species include Species of Conservation Interest (SOCI) that are not listed species under provincial or federal legislation (i.e., Committee on the Status of Endangered Wildlife in Canada [COSEWIC] species and/or Atlantic Canada Conservation Data Centre [ACCDC] S1, S2, and S3 species or any combination thereof (i.e., S3S4), and Species At Risk (SAR) which are listed on the Species at Risk Act (SARA) and/or the Nova Scotia Endangered Species Act (NSES).

Development of a priority species list for birds was completed based on a compilation of listed species from the following sources:

1. COSEWIC and SARA listed species: all species listed as Endangered, Threatened, or of Special Concern;
2. NSES: all species listed as Endangered, Threatened, or Vulnerable; and,
3. Conservation Rank: all Species designated as S1, S2, or S3 as defined by the ACCDC.

The priority list of species was first narrowed by broad geographic area in which individual species are known to occur, and then further narrowed by identifying specific habitat requirements for each species. For example, if a listed species on the NSES required marine coastal habitat, this species was not carried forward to the final list of priority species, since this habitat type does not exist within the PA. Because the priority species list is created prior to field work, it is quite an extensive list of species, with 326 in total (see Appendix B).

The compilation of a priority species list is habitat driven, rather than observation driven. This is based on the recognition that observation-based datasets are not comprehensive lists of species identified in any given area. Observation driven sources (e.g. the ACCDC dataset) are supplementary to the priority species list.

All field staff reviewed the desktop evaluation for priority species prior to commencing field work to ensure they were familiar with priority species identification and status ranks. The priority species list is referenced across the various biophysical assessments including avifauna surveys.

The final priority species list is included in Appendix B, the ACCDC report is included in Appendix C, and a list of birds recorded in the MBBA atlas that includes the PA (square 20MQ78) is provided in Appendix D.

## 2.2 **Survey Design Methodology**

Prior to conducting field surveys, a preliminary desktop survey design was developed to target suitable habitat for avifauna species or groups of interest (e.g., breeding birds, nightjar, owls, etc.). Survey methods were consistent with the guidelines stated in CWS (2022), CWS (2018), EC CWS (2007a), and EC CWS



(2007b). These documents provided instruction in the following areas: survey site selection, survey location spacing, number of point counts, survey duration, and season selection.

Based on desktop review, CWS guidelines (EC CWS 2007a, EC CWS 2007b, CWS 2018, and CWS 2022), *The Guide to Addressing Wildlife Species and Habitat in an EA Registration Document* (NSE 2009), and results from the priority species list and the ACCDC report, the following avifauna survey types were selected:

- Spring and fall migration point count (PC) surveys;
- Breeding bird PC surveys and area searches;
- Nocturnal owl surveys, and
- Nightjar surveys.

Winter surveys are not required or recommended by any guidelines or in regulatory meetings. Shorebird and waterfowl specific surveys were not completed since point count survey locations (PCs) during spring migration, breeding bird, and fall migration surveys included fields, wetlands, and watercourses within the PA where these bird groups would be detected if they were present. PC coverage within the PA adequately recorded raptor occurrences and negated the need for raptor-specific surveys in the avifauna baseline field program. In addition to this, surveyors incidentally report raptor and large stick nest observations during all field survey types (e.g., botany surveys, lichen surveys, etc.).

To determine suitable avifauna survey locations the following databases were used within GIS to encompass all habitat types and project infrastructure within the PA:

- Aerial imagery (provided by Google Earth);
- Nova Scotia Department of Natural Resources and Renewables (NSDNRR) Forest Inventory;
- Nova Scotia Environment and Climate Change Canada (NSECC) Depth-to-Water (DTW) Model;
- NSECC Wet Areas Mapping (WAM) and Flow Accumulation;
- NSECC Wetland Inventory;
- Nova Scotia Topographic Database (NSTDB) which includes road, watercourse, and topography layers, and
- Province of Nova Scotia Geographic Data Directory – Canopy Height Model (CHM).

These databases were used, and the major vegetation communities and habitat types listed below were delineated using a habitat model (referred to herein as the MEL habitat model) created in QGIS using the forestry, DTW, and CHM databases. Depending on the target avifauna species or species groups, a subset or all of the following habitat types were targeted for field surveys:

- Hardwood forests;
- Hardwood wet forests;
- Mixedwood forests;
- Mixedwood wet forests;
- Softwood forests;
- Softwood wet forests;
- Open areas/barrens;



- Shrubs/alders;
- Cutovers;
- Cutover Wetlands;
- Open Wetlands (i.e., open canopy swamps, fens, bogs, etc.);
- Anthropogenic (e.g., urban/developed - buildings, roads, quarries, etc.);
- Open waterbodies, and
- Areas with edge habitat.

### 2.2.1 Spring and Fall Migration and Breeding Bird Surveys

The following section outlines methodologies employed during spring, fall, and breeding season surveys.

Point count locations (PCs) were selected in representative habitats within the PA. These surveys are not species-specific, as avifauna species have different habitat requirements for breeding and migratory purposes, therefore a representative number of all major habitats listed in Section 2.2 were targeted. PC locations were spaced a minimum of 250 m depending on the complexity of habitat types and to reduce, and hopefully eliminate, the risk of double-counting individuals, as outlined in *Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds* (EC CWS 2007b).

PCs were selected as the preferred method for avian usage surveys due to the large extent of the PA and PCs provide identification of a broad range of species while minimizing the possibility of double-counting individuals. Attempts were made to establish PCs within and adjacent to the Project footprint, should post-construction avifauna monitoring be required. Survey design primarily focused on both habitat and area coverage (as well as areas that will be directly impacted by Project infrastructure). PC locations were selected based on the desktop habitat review and a MEL generated habitat model (discussed in Section 2.2) and were spread throughout and surrounding the PA to provide representative coverage for the diversity of habitats identified. It is MEL's understanding that PC locations provided representative sampling of avifauna habitats. A map of survey locations is provided in Appendix A (Figure 3, Appendix A). Based on this design, PCs were placed within the PA while maintaining the 250 m minimum distance apart with a maximum distance of one km apart.

Overall, PC layout focused on habitat coverage and the proposed infrastructure to understand the full extent of terrestrial effects relating to bird migration and breeding.

### 2.2.2 Nocturnal Owl Surveys

Four locations (Figure 4, Appendix A) were surveyed by vehicle during nocturnal owl surveys. Nocturnal owl PC stations are spaced at least 1.6 km apart to reduce the chances of detecting the same owl at multiple stations. Distance between locations ranged from approximately 1.87 – 3.89 km apart to cover area within and adjacent to the PA. Survey locations were within or on the edge of forested areas to represent suitable owl habitat in the area and all survey locations located outside of the PA were on public roads or forestry roads/ATV trails. PCs on roads also alleviates safety concerns for the surveyor during nocturnal surveys.

Nocturnal owl surveys started after sunset when it became dark. Two rounds of owl surveys were targeted to occur in May 2022 to encompass the breeding season for owls.



### 2.2.3 Nightjar Surveys

The common nighthawk (*Chordeiles minor*; ACCDC S3B) is listed as Special Concern by SARA/COSEWIC and Threatened by NSESA. The common nighthawk prefers to nest in gravelly substrates and is best detected while this species is foraging for insects shortly after sunset (MBBA 2008). Based on desktop analysis and reconnaissance surveys, the PA does contain suitable habitat for the common nighthawk, such as open wetlands, open forests, grasslands, barren areas with low shrub cover, rocky bluffs, open forests, developed areas (e.g., agricultural fields), clearcut areas, and other disturbed areas (Birds Canada 2022; COSEWIC 2018a).

The Eastern whip-poor-will (*Antrostomus vociferus*; ACCDC S1?B) is listed as Threatened by SARA/NSESA and Special Concern by COSEWIC. The Eastern whip-poor-will uses a mixture of open lands for foraging and wooded areas for nesting and perching (Birds Canada 2022). Examples of suitable habitat for Eastern whip-poor-will include shrubbed wetlands, clearcuts, agricultural fields, rock or sand barrens with scattered trees, savannahs, burned areas, conifer plantations, and various types of forests at early stages of succession or edges of dense forest with similar ground-level structure. This species is found in habitat with moderate tree, shrub, and herbaceous cover (ECCC 2018b). Based on desktop analysis and reconnaissance surveys, the PA does contain suitable habitat for the Eastern whip-poor-will.

Both the common nighthawk and Eastern whip-poor-will are included in the functional bird group 5 (nocturnal raptors; refer to Section 2.3 for the list of functional bird groups) and were targeted for the nightjar surveys.

Potential suitable breeding and foraging habitat for common nighthawk and Eastern whip-poor-will, such as roadside/gravel areas, clearcut and disturbed areas, wetland, and forested areas (Birds Canada 2022; ECCC 2018b; MBBA 2008), were selected as PC locations both within the PA and the area bordering the PA. A minimum of 1.6 km spacing was used to provide adequate coverage of the area while minimizing overlapping observations (i.e., hearing the same individual at multiple locations). Distance between locations ranged from approximately 1.82 – 4.87 km apart to cover area within and adjacent to the PA. Four PC locations were selected in the preliminary desktop review (Figure 5, Appendix A). All PC locations were on public roadsides or forestry roads/ATV trails in open areas (e.g., clearcuts or cultivated lands/agricultural fields) within and adjacent to the PA. PCs on roads and open areas with wide visibility also alleviates safety concerns for the surveyor during crepuscular and nocturnal surveys.

## 2.3 **Field Program Methods**

Survey locations determined in the desktop survey design were visited and adjusted if required (as described in Section 2.2). A breakdown of survey type, time of year, and survey rationale is described in Table 2-1. Survey dates were selected to provide representative coverage of important stages of avifauna ecology and to comply with the requirements for a *Class I* undertaking under Section 9(1) of the *Nova Scotia Environmental Assessment Regulations*. As an example, by spreading out survey dates the widest variety of migrating birds will be observed. Effort was made to spread rounds across survey periods (e.g., spring migration, breeding bird, and fall migration) to represent that entire period.

Biophysical surveys occurred during the spring and breeding 2022 seasons, and then halted at the request of the Proponent. Surveys continued in the 2023 field season and there was a northern expansion to the PA with more avian PCs added. As a result, PCs 1-38 were surveyed during the spring and breeding 2022



seasons, biophysical surveys were halted, and then PCs 1-38 were finished during the fall 2023 season. PCs 39-42 were later added due to the northern expansion of the PA (a small section on the northern side of Lake Egmont Road) and these four PCs were surveyed during the spring, breeding, and fall 2023 seasons. This only effected the dates of avian PC surveys. The nocturnal owl and nightjar surveys were completed during the spring and breeding 2022 seasons.

**Table 2-1: Avian Surveys Completed within the Project Area**

Survey Type	Survey Rounds	Survey Locations	Dates*	Rationale	Reference for Survey Dates and Methods
Spring migration	2	42 PCs	May 2022/2023 PCs 1 - 38: 2022 PCs 39 - 42: 2023	Bird species begin to migrate back to Canada to breed this time of year. Resident species may begin to breed on March 30. Surveying during this time period will detect any early nesters and the beginning of spring migration.	Nesting Periods – Government of Canada (ECCC 2018a)
Nocturnal owl	2	4 Owl PCs	May 2022	Different species breed on different schedules, therefore, spreading surveys out within allowed for greater chances to detect species.  Based on ACCDC, various species of owl have been detected within 100 km of the PA.	ACCDC (2023 Project report)
Breeding bird	2	42 PCs	June to early July 2022/2023 PCs 1 - 38: 2022 PCs 39 - 42: 2023	June is peak breeding season in Nova Scotia. Different species breed on different schedules, therefore, spreading surveys out within June allow for greater chances to detect species. Early July will likely catch late breeders.	Maritimes Breeding Bird Atlas (2023)
Fall migration	3	42 PCs	Late August to October 2023	Bird species begin to migrate south for the winter months from late August to September. Survey rounds began in late August and extended into late October to accommodate three survey rounds and potential early/late migrants.	Maritimes Breeding Bird Atlas (2023)
Nightjar	2	4 CONI PCs	June to early July 2022	To understand the use of the land within and surrounding the PA by common nighthawk and Eastern whip-poor-will.  Suitable habitat for both species is found within and adjacent to the PA. Based on ACCDC, common nighthawk have been observed 0.7 (± 7) km away from the PA and Eastern whip-poor-will have been observed 10.4 (± 7) km away from the PA.	Birds Canada (2022)  ACCDC (2023 Project report)

*\*Note that, at the request of the Proponent, biophysical surveys occurred during the spring and breeding 2022 seasons and then halted. Surveys continued in the 2023 field season and there was a northern expansion to the PA and more PCs added, hence the various dates for different PCs. This is further described in the methods section.*



Habitat descriptions at each PC were recorded and each PC location was georeferenced by a handheld Garmin GPS. General observations including temperature, visibility, wind speed, date, and start and end time were also recorded during each survey. Bearings were recorded for priority species observed during dedicated survey periods and incidentally.

Bird species were identified based on functional bird groups to understand how each group uses the PA. These functional groups include:

1. **Waterfowl:** Ducks, geese, or other large aquatic birds, especially when regarded as game;
2. **Shorebirds:** Waders, from the Order Charadriiformes;
3. **Other waterbirds:** Includes seabirds (i.e., marine birds), grebes (Order Podicipediformes), loons (Order Gaviiformes), Ciconiiformes (i.e., storks, herons, egrets, ibises, spoonbills, etc.), pelicans (Order Pelicaniformes), flamingos (Order Phoenicopteriformes), Gruiformes (i.e., cranes and rails), kingfishers, and dippers (the only family of passerines considered waterbirds);
4. **Diurnal Raptors:** Birds within the families Accipitridae (i.e., hawks, eagles, buzzards, harriers, kites, and old-world vultures), Pandionidae (i.e., osprey), Sagittariidae (i.e., secretary bird), Falconidae (i.e., falcons, caracaras, and forest falcons), Cathartidae (i.e., new world vultures), and one species from the Order Strigiformes (i.e., hawk owl);
5. **Nocturnal Raptors:** Birds of the Order Strigiformes (i.e., owls; with exception of the hawk owl, which is a diurnal species of owl);
6. **Passerines:** Any bird of the Order Passeriformes, which includes more than half of all bird species. This is with exception of the dippers, which are a passerine considered a waterbird, and
7. **Other Landbirds:** Birds within the Orders Galliformes (i.e., quail, pheasant, and grouse), Columbiformes (i.e., pigeons and doves), Cuculiformes (i.e., cuckoos), Caprimulgiformes (i.e., nighthawks and whip-poor-wills), Apodiformes (i.e., swifts and hummingbirds), and Piciformes (i.e., woodpeckers, flickers, and sapsuckers).

Survey methods varied for each survey type are described in detail below.

### 2.3.1 Spring and Fall Migration Surveys

Spring and fall migration surveys consisted of PC surveys as shown in Figure 3, Appendix A. Two rounds of spring migration surveys were completed from May 4 to 20, 2022, and on May 9 and 23, 2023. Three rounds of fall migration surveys were completed from August 22 to October 6, 2023. Survey rounds were separated by a minimum of ten days.

Forty-two PC locations were surveyed during spring and fall migration seasons (Figure 3, Appendix A). Total effort for spring and fall migration PC surveys was 840 minutes for spring migration and 1260 minutes for fall migration. Surveys began at, or within half an hour of, sunrise and effort was made to complete surveys by 10 am. Each PC was surveyed for a duration of 10 minutes. At each PC, a handheld Garmin GPS unit was used to geo-reference the location. During each survey, weather conditions (i.e., temperature, wind speed, precipitation, and visibility) were monitored and bird observations were recorded at three distance categories: within a 50 m radius, 50 to 100 m radius, and outside the 100 m radius.

All birds identified (auditory and/or visual) were recorded by species, including age and sex if known. Breeding behaviour and flyovers were also documented (e.g., altitude and flight direction). Surveys are not



conducted in wind speeds over three on the Beaufort scale (12-19 km/hr), when noise levels make it difficult to hear or distinguish bird calls, or in rain that is more than a light drizzle (EC CWS 2007b). Incidental observations, those observed outside PC locations or outside allocated survey time, were recorded for novel (e.g., not observed during any other survey) and priority species (SAR/SOCI) or species displaying breeding or other noteworthy behaviour(s).

During the dedicated bird surveys, habitat descriptions were recorded by surveyors for field verification of the desktop review and habitat model. Overall, the MEL habitat model had high accuracy for placing PCs in representative habitats during survey design. Refer to Table 2-2 for habitat field descriptions and the coordinates for each migration PC location. Survey round, date, and weather conditions are listed in

PC ID	Coordinates*		Surveyor Habitat Field Notes and Aerial Imagery Notes
	Easting	Northing	
1	473776.57	4982184.72	ATV trail crossing right of way of natural gas line, surrounded by mixedwood forest.
2	473553.00	4982296.94	ATV trail by watercourse, mixedwood forest.
3	473343.79	4982437.93	ATV trail, mixedwood forest.
4	473140.04	4982587.11	ATV trail, mixedwood forest by slow flowing water with riparian wetlands. Watercourse/wetland mix, very shrubby (lots of alders). Wetland with beaver activity.
5	472949.02	4982754.48	ATV trail, mixedwood forest. Wetland closeby.
6	472731.16	4982638.05	Mixedwood forest.
7	472914.00	4982460.67	Balsam fir thicket. Cut rather recently. Starting to turn to hardwood, close to wet area/wetlands.
8	473107.75	4982299.67	Young mixedwood forest, close to swamp and watercourse. Wetter area.
9	473311.50	4982157.77	Young mixedwood forest but mainly a balsam fir thicket. Cut recently.
10	473545.59	4982042.08	Right of way for natural gas line, mixedwood forest.
11	474653.82	4983470.08	Road, surrounded by mixedwood forest (mostly softwood dominant).
12	474492.87	4983279.78	Mixedwood forest with softwood undergrowth.
13	474335.50	4983083.31	Softwood dominant forest with quite a few hardwoods mixed in.
14	474168.13	4982895.01	Edge of wetland. Shrubby swamp with active beaver pond in centre. Surrounded by softwood dominant forest.
15	474200.88	4982644.87	Upland from wetland (active beaver pond and treed swamp), mixedwood and mixed canopy height forest (slightly more softwood) with lots of downed trees and wood debris. Wetter area.
16	473954.37	4982682.16	Mixedwood and mixed canopy height forest (slightly more softwood). Upland from active beaver pond. Some downed wood.
17	473918.90	4982922.30	Edge of pond (swampy part due to beaver activity) surrounded by softwood dominant and mixedwood forest. Edge of swamp downstream from active beaver pond.
18	474073.53	4983120.60	Edge of treed swamp. Softwood dominant forest.
19	474239.99	4983306.16	Softwood dominant forest (with quite a few hardwoods mixed in), upland close to alder/shrub swamp and close to a watercourse.
20	474404.63	4983496.27	Softwood dominant forest.
21	473878.56	4984222.30	Forestry/log road/trail. Softwood dominant forest (slightly more hardwood), somewhat clearcut. By watercourse and shrubby (alder) swamp.
22	473780.86	4983993.38	Edge of clearcut. Hardwood dominant forest with mixedwood forest surrounding clearcut. By watercourse.





PC ID	Coordinates*		Surveyor Habitat Field Notes and Aerial Imagery Notes
	Easting	Northing	
23	473687.17	4983752.33	Mixedwood forest, slightly more softwood dominant (patches of both). By wetland caused by selective cutting. Trees marked, plots/patches of forestry experiments/testing around this area.
24	473591.21	4983527.65	ATV trail. Mixedwood forest.
25	473822.25	4983422.14	Wet softwood dominant forest.
26	473915.94	4983651.36	Wet softwood dominant forest.
27	474011.45	4983884.22	Edge of clearcut. By hardwood dominant forest (hardwood canopy and softwood undergrowth).
28	474106.05	4984117.09	Edge of clearcut (old and regenerating). Mixedwood forest.
29	474200.65	4984346.31	By road, watercourse, and swampy area. Mixedwood forest, by clearcut.
30	474787.62	4984165.48	Forestry road. Mixedwood forest, clearcuts closeby (patchy).
31	474723.23	4984411.80	Clearcut area/field surrounded by mixedwood forest. Can see Lake Egmont Road with houses. Close to swampy wet cattail area (beside road).
32	474476.72	4984454.56	Mixedwood forest, hardwood dominant top canopy (softwood understory).
33	474423.96	4984214.42	Hardwood dominant and mixedwood forest, disturbed in parts.
34	474333.91	4983980.64	Clearcut area surrounded by mixedwood forest.
35	474226.58	4983749.60	Clearcut area surrounded by mixedwood forest.
36	474479.45	4983738.69	Mixedwood forest, hardwood dominant top canopy.
37	474730.50	4983724.13	Old clearcut area, surrounded by mixedwood forest.
38	474885.42	4983936.68	Mixedwood forest. By road and close to a watercourse.
39	474912.97	4985035.72	Side of Gays River with riparian fen wetland edge (grass/sedge and shrubby). Very mucky in this area. Close to fields on either side after riparian wetland zone ends. Mixedwood forest edge in distance. Close to road and bridge over brook/watercourse.
40	475024.61	4984669.24	Edge of grassy field. In shrubby mixedwood treeline with hardwood shrubs. Close to Gays River/watercourse and wetland/fen.
41	475139.86	4984439.06	Edge of Gays River. Fen, muddy and grassy riparian wetland area beside a small, ponded area (separate from Gays River) in the riparian wetland zone that borders the brook/watercourse. Mixedwood and shrubby treeline surrounding the location.
42	475082.11	4984018.14	Mixedwood forest, softwood dominant forest closeby. Close to road and a watercourse that goes outside of PA.

\*Coordinates are listed in NAD83 UTM Zone 20N.

\*Refer to the wetland and fish habitat Project biophysical baseline reports for figures and information on wetlands and watercourses within the PA.



Table 2-3.

**Table 2-2: Spring and Fall Migration Point Count (PC) Locations and Habitat Field Descriptions**

PC ID	Coordinates*		Surveyor Habitat Field Notes and Aerial Imagery Notes
	Easting	Northing	
1	473776.57	4982184.72	ATV trail crossing right of way of natural gas line, surrounded by mixedwood forest.
2	473553.00	4982296.94	ATV trail by watercourse, mixedwood forest.
3	473343.79	4982437.93	ATV trail, mixedwood forest.
4	473140.04	4982587.11	ATV trail, mixedwood forest by slow flowing water with riparian wetlands. Watercourse/wetland mix, very shrubby (lots of alders). Wetland with beaver activity.
5	472949.02	4982754.48	ATV trail, mixedwood forest. Wetland closeby.
6	472731.16	4982638.05	Mixedwood forest.
7	472914.00	4982460.67	Balsam fir thicket. Cut rather recently. Starting to turn to hardwood, close to wet area/wetlands.
8	473107.75	4982299.67	Young mixedwood forest, close to swamp and watercourse. Wetter area.
9	473311.50	4982157.77	Young mixedwood forest but mainly a balsam fir thicket. Cut recently.
10	473545.59	4982042.08	Right of way for natural gas line, mixedwood forest.
11	474653.82	4983470.08	Road, surrounded by mixedwood forest (mostly softwood dominant).
12	474492.87	4983279.78	Mixedwood forest with softwood undergrowth.
13	474335.50	4983083.31	Softwood dominant forest with quite a few hardwoods mixed in.
14	474168.13	4982895.01	Edge of wetland. Shrubby swamp with active beaver pond in centre. Surrounded by softwood dominant forest.
15	474200.88	4982644.87	Upland from wetland (active beaver pond and treed swamp), mixedwood and mixed canopy height forest (slightly more softwood) with lots of downed trees and wood debris. Wetter area.
16	473954.37	4982682.16	Mixedwood and mixed canopy height forest (slightly more softwood). Upland from active beaver pond. Some downed wood.
17	473918.90	4982922.30	Edge of pond (swampy part due to beaver activity) surrounded by softwood dominant and mixedwood forest. Edge of swamp downstream from active beaver pond.
18	474073.53	4983120.60	Edge of treed swamp. Softwood dominant forest.
19	474239.99	4983306.16	Softwood dominant forest (with quite a few hardwoods mixed in), upland close to alder/shrub swamp and close to a watercourse.
20	474404.63	4983496.27	Softwood dominant forest.
21	473878.56	4984222.30	Forestry/log road/trail. Softwood dominant forest (slightly more hardwood), somewhat clearcut. By watercourse and shrubby (alder) swamp.
22	473780.86	4983993.38	Edge of clearcut. Hardwood dominant forest with mixedwood forest surrounding clearcut. By watercourse.
23	473687.17	4983752.33	Mixedwood forest, slightly more softwood dominant (patches of both). By wetland caused by selective cutting. Trees marked, plots/patches of forestry experiments/testing around this area.
24	473591.21	4983527.65	ATV trail. Mixedwood forest.
25	473822.25	4983422.14	Wet softwood dominant forest.
26	473915.94	4983651.36	Wet softwood dominant forest.
27	474011.45	4983884.22	Edge of clearcut. By hardwood dominant forest (hardwood canopy and softwood undergrowth).



PC ID	Coordinates*		Surveyor Habitat Field Notes and Aerial Imagery Notes
	Easting	Northing	
28	474106.05	4984117.09	Edge of clearcut (old and regenerating). Mixedwood forest.
29	474200.65	4984346.31	By road, watercourse, and swampy area. Mixedwood forest, by clearcut.
30	474787.62	4984165.48	Forestry road. Mixedwood forest, clearcuts closeby (patchy).
31	474723.23	4984411.80	Clearcut area/field surrounded by mixedwood forest. Can see Lake Egmont Road with houses. Close to swampy wet cattail area (beside road).
32	474476.72	4984454.56	Mixedwood forest, hardwood dominant top canopy (softwood understory).
33	474423.96	4984214.42	Hardwood dominant and mixedwood forest, disturbed in parts.
34	474333.91	4983980.64	Clearcut area surrounded by mixedwood forest.
35	474226.58	4983749.60	Clearcut area surrounded by mixedwood forest.
36	474479.45	4983738.69	Mixedwood forest, hardwood dominant top canopy.
37	474730.50	4983724.13	Old clearcut area, surrounded by mixedwood forest.
38	474885.42	4983936.68	Mixedwood forest. By road and close to a watercourse.
39	474912.97	4985035.72	Side of Gays River with riparian fen wetland edge (grass/sedge and shrubby). Very mucky in this area. Close to fields on either side after riparian wetland zone ends. Mixedwood forest edge in distance. Close to road and bridge over brook/watercourse.
40	475024.61	4984669.24	Edge of grassy field. In shrubby mixedwood treeline with hardwood shrubs. Close to Gays River/watercourse and wetland/fen.
41	475139.86	4984439.06	Edge of Gays River. Fen, muddy and grassy riparian wetland area beside a small, ponded area (separate from Gays River) in the riparian wetland zone that borders the brook/watercourse. Mixedwood and shrubby treeline surrounding the location.
42	475082.11	4984018.14	Mixedwood forest, softwood dominant forest closeby. Close to road and a watercourse that goes outside of PA.

\*Coordinates are listed in NAD83 UTM Zone 20N.

\*Refer to the wetland and fish habitat Project biophysical baseline reports for figures and information on wetlands and watercourses within the PA.



**Table 2-3: Spring and Fall Migration Survey Dates and Weather Conditions**

Survey Round	Date*	Temperature (°C)	Wind (Beaufort Scale)	Precipitation
<b>Spring Migration</b>				
Round 1	May 4 and 6, 2022 (PCs 1 - 38)	0 - 8	0 - 1	0
	May 9, 2023 (PCs 39 - 42)	5 - 9	1 - 2	0
Round 2	May 19 and 20, 2022 (PCs 1 - 38)	4 - 17	0 - 1	0 - 1
	May 23, 2023 (PCs 39 - 42)	9 - 11	0 - 1	0
<b>Fall Migration</b>				
Round 1	August 22 and 23, 2023 (all PCs)	12 - 20	0 - 2	0
Round 2	September 11 and 12, 2023 (all PCs)	19 - 22	0 - 2	0 - 1 (with very light fog)
Round 3	October 5 and 6, 2023 (all PCs)	13 - 23	0 - 1	0

*Notes: weather conditions represent the entire survey (surveyors recorded weather conditions at the start and end of each survey). Precipitation scale is as follows: 0 = none, 1 = drizzle, and 2 = light/moderate. Wind scale (Beaufort scale) is as follows: 0 = <1 km/hr, 1 = 1-5 km/hr, 2 = 6-11 km/hr, and 3 = 12-19 km/hr. Survey rounds were completed and spread out as feasible based on travel and weather conditions.*

*\*Note that, at the request of the Proponent, biophysical surveys occurred during the spring and breeding 2022 seasons and then halted. Surveys continued in the 2023 field season and there was a northern expansion to the PA and more PCs added, hence the various dates for different PCs. This is further described in the methods section.*

### 2.3.2 Breeding Bird Surveys

Two rounds of breeding bird surveys were completed from June 22 to July 8, 2022, and on June 6 and 30, 2023 at PCs 1-42 (refer to Table 2-2 for locations and habitat field descriptions). The 42 PCs surveyed during this season occurred at the same locations for the spring and fall migration surveys. The total effort for both breeding bird PC survey rounds was 840 minutes. Rounds were separated by a minimum of 10 days. Survey round, date, location, and weather conditions are listed in Table 2-4.

The methods for breeding bird surveys mirror those described for spring and fall migration PC surveys (Section 2.3.1) in terms of suitable conditions and data recording. Area searches, that survey for breeding evidence within the PA, are recommended by CWS during the breeding season to visit more habitat types and/or search habitats more thoroughly for species use during the breeding season (EC CWS 2007b).

Qualified biologists conducted the area searches between PC locations during the morning breeding bird survey or after the morning survey in different areas. Meandering, non-standardized transects were completed, focusing on new habitats or habitat with notably high avian activity (within or adjacent to the PA). All bird observations were recorded in the same manner as the PC location method but with a focus on novel species, priority species, and breeding evidence. Area searches do not require standardized effort (EC CWS 2007b), but GPS tracks were recorded. Area searches were approximately 60 to 240 minutes in length. In total, approximately 915 minutes of area searches were completed during breeding bird surveys in 2022 and 2023 (Figure 3, Appendix A).



To understand breeding bird activity within and adjacent to the PA, the breeding status of all bird species observed during breeding bird surveys was also recorded. The surveyor documented bird behaviour observed, including distraction display, carrying food, and carrying nesting material. The MBBA has various breeding evidence codes that are used to determine the breeding status based on field observations (MBBA n.d.). The following are examples of the breeding status indicators described in *Atlassing for Species at Risk in the Maritime Provinces* (visit MBBA 2008 to view all breeding status indicators and definitions):

- **Observed** - species observed in its breeding season;
- **Possible** - species observed during breeding season in suitable nesting habitat or singing males or breeding calls heard, in suitable nesting habitat during breeding season;
- **Probable** – male and female pair observed in suitable nesting habitat during nesting season, agitated behaviour or anxiety calls of an adult, and
- **Confirmed** – copulation, nest building (including adult carrying nesting material), adult carrying food, distraction display, courtship display or territorial behaviour between two individuals, behaviour indicating active nest, nest containing eggs, recently fledged young (nidicolous species), or downy young (nidifugous species), including incapable of sustained flight.

**Table 2-4: Breeding Bird Survey Dates and Weather Conditions**

Survey Round	Date*	Temperature (°C)	Wind (Beaufort Scale)	Precipitation
Round 1	June 22 and 23, 2022 (PCs 1-38)	9 - 17	0 - 2	0
	June 6, 2023 (PCs 39 - 42)	8 - 10	1 - 2	0 - 2
Round 2	July 7 and 8, 2022 (PCs 1 - 38)	10 – 21	0 - 1	0
	June 30, 2023 (PCs 39 - 42)	16 - 17	0 - 1	0 (little fog)

*Notes: weather conditions represent the entire survey (surveyors recorded weather conditions at the start and end of each survey). Precipitation scale is as follows: 0 = none, 1 = drizzle, and 2 = light/moderate. Wind scale (Beaufort scale) is as follows: 0 = <1 km/hr, 1 = 1-5 km/hr, 2 = 6-11 km/hr, and 3 = 12-19 km/hr. Survey rounds were completed and spread out as feasible based on travel and weather conditions.*

*\*Note that, at the request of the Proponent, biophysical surveys occurred during the spring and breeding 2022 seasons and then halted. Surveys continued in the 2023 field season and there was a northern expansion to the PA and more PCs added, hence the various dates for different PCs. This is further described in the methods section.*

### 2.3.3 Nocturnal Owl Surveys

The methods for monitoring nocturnal owls follow the *Guideline for Nocturnal Owl Monitoring in North America* (Takats *et al.* 2001). Nocturnal owl surveys occurred when vocal activity of most owl species is greatest (typically between April and May), as identified by Takats *et al.* (2001). Nocturnal owl PC stations are spaced at least 1.6 km apart to reduce the chances of detecting the same owl at multiple stations. Surveys are conducted between half an hour after sunset and midnight (Takats *et al.* 2001). Two rounds of nocturnal owl surveys occurred at four survey locations (Table 2-5; Figure 4, Appendix A). Survey locations were surveyed by vehicle and the locations were selected for their ease of access and suitable habitat.

Moon phase and noise levels (traffic, wind, machinery, etc.) were recorded as was weather data for all surveys. Requirements for appropriate survey weather conditions followed those from breeding and



migration PC surveys. Nocturnal owl surveys started after dark. Total effort for the surveys was 76 minutes. Survey round, date, location, and weather/environmental conditions are listed in Table 2-6.

**Table 2-5: Nocturnal Owl Point Count (PC) Locations and Habitat Field Descriptions**

Owl PC ID	Coordinates (NAD 83 UTM 20)		Surveyor Habitat Field Notes
	Easting	Northing	
1	474445.07	4983654.48	End of forestry road. Forested.
2	471593.51	4983660.28	Road/ATV trail. Watercourse nearby. Forested.
3	472984.61	4981583.60	Road/ATV trail. Watercourse nearby. Forested.
4	474851.23	4981545.71	ATV trail. One side forested, other side old clearcut.

**Table 2-6: Nocturnal Owl Survey Dates and Weather Conditions**

Survey Round	Date	Temperature (°C)	Wind (Beaufort Scale)	Precipitation	Surveyor Notes
Round 1	May 6, 2022	0 - 5	0 - 1	0	None to moderate noise (e.g., traffic and airplane noise), moon visible (crescent, approximately 1/3 full), and 0 – 10% cloud over.
Round 2	May 19, 2022	10	0	0	No noise and 10% cloud cover.

*Notes: weather conditions represent the entire survey (surveyors recorded weather conditions at the start and end of each survey). Precipitation scale is as follows: 0 = none, 1 = drizzle, and 2 = light/moderate. Wind scale (Beaufort scale) is as follows: 0 = <1 km/hr, 1 = 1-5 km/hr, 2 = 6-11 km/hr, and 3 = 12-19 km/hr.*

Prior to commencing the survey, the broadcaster was tested to ensure that owl calls are audible and recognizable at 400 m. Ensuring that the broadcast could not be heard beyond 400 m minimized bias at the next survey station due to owls hearing the recording from the previous station (Takats *et al.* 2001). The broadcaster test was carried out under weather and noise conditions similar to those that are likely to be encountered during the survey.

The Bird Studies Canada (BSC) Nova Scotia Nocturnal Owl Survey program broadcast was used, which consists of a 9.5-minute track that follows the following format and owl data recording method (Bird Studies Canada – Atlantic Region 2019):

- Initiates with a beep to indicate the start of the first silent listening period, which lasts one minute. All owls heard or seen are recorded. Only if an owl is calling during this period, estimate a distance and bearing, then immediately proceed approximately 300 m along the road (toward the owl if possible) and record a second distance and bearing to permit triangulation of the owl and facilitate habitat association. Another beep marks the end of the first silent listening minute.
- A second silent listening minute will follow. All new owls seen or heard in the second minute are recorded, as well as any owls that continue to call from the first silent listening minute. As described above, if a new owl is heard during the second silent listening minute record a second distance and bearing will be taken to permit triangulation of the owl and facilitate habitat association.
- During each of the following 20-second broadcasts, rotate the speakers fully.



- A 20-second boreal owl broadcast begins, which is followed by a one-minute silent listening period. All owls heard or seen during this period are to be recorded separately and it is important to keep track of whether the owls heard in the first two-minutes continue to call as well as any new owls.
- The boreal owl broadcast is repeated, which is again followed by a one-minute silent listening period. All owls heard or seen during this period continue to be recorded separately.
- A 20-second barred owl broadcast begins, which is followed by a two-minute silent listening period. All owls heard or seen during this period continue to be recorded separately.
- The barred owl broadcast is repeated, which is again followed by another two-minute silent listening period. All owls heard or seen during this period continue to be recorded separately.
- A beep marks the end of the broadcast track.

Species vocalization (with timing of response if responding to track) and/or sightings were recorded along with any other significant information noted (distance/bearing, gender, age, habitat, and/or behaviour). Surveys were completed during periods of good or fair weather.

#### 2.3.4 Nightjar Surveys

Targeted surveys were selected for nightjars because these species are not reliably detected during the breeding bird PC surveys due to their crepuscular nature (Birds Canada 2022). Protocols were based on ECCC-CWS recommendations from a previous wind power project (Birds Canada 2022; May 5, 2022, pers. comm. with MEL, Mark McGarrigle, Species at Risk Biologist, NSDNRR; June 3, 2022, pers. comm. with MEL, Stephen Zwicker, Environmental Assessment Coordinator, ECCC-CWS) and, as a result, playback recordings were not used and the Canadian Nightjar Survey Protocol by Birds Canada (2022) was implemented into the field program. Nightjars are crepuscular and the best time to detect these species (particularly common nighthawk) is while they are foraging for insects shortly after sunset (MBBA 2008).

The 2022 protocol by Birds Canada recommends one survey round, however NSDNRR prefers two rounds (May 2022, pers. comm. with MEL, Mark McGarrigle, Species at Risk Biologist, NSDNRR). Two dedicated survey rounds for nightjars were conducted on June 22, 2022, and July 8, 2022 at four PC locations (Table 2-7; Figure 5, Appendix A). These dates were selected because common nighthawk and Eastern whip-poor-will tend to breed between early June and late July in the Maritimes (MBBA 2023). Survey timing started within seven days on either side of a full moon (due to potential for Eastern whip-poor-will observations; Birds Canada 2022) and surveys were completed between one hour before sunset and two hours after sunset when nightjars are most active (June 3, 2022, pers. comm. with MEL, Stephen Zwicker, Environmental Assessment Coordinator, ECCC-CWS). Combined nightjar surveys resulted in a total of 48 minutes of effort. Survey round, date, location, and weather conditions are listed in Table 2-8.

Nightjar surveys consisted of a six-minute passive surveying period at each nightjar PC location (hereafter CONI PC). This survey did not employ call playback or use of flashlights, as per survey protocol by Birds Canada (2022). CONI PCs were on roads or ATV trails in open areas (e.g., clearcuts or cultivated lands/agricultural fields) spread throughout and outside the PA. As per survey protocol, effort was made to choose PC locations with little noise and surveys were completed between June 15 and July 15 (Birds Canada 2022). Surveys were not conducted in wind speeds greater than Beaufort scale three, when rain was heavier than a light drizzle, or if noise levels were high enough to affect the surveyor's hearing. Site conditions and data recorded included weather conditions, cloud cover, time effort, number of cars passing



by, and if the moon was visible. All individual nightjar observations were recorded, including behaviours such as vocalizations or wing booms, as well as the sex, distance to surveyor, bearing, and time the observation occurred (e.g., what type of observation or behaviour was observed when; Birds Canada 2022). Any other bird species observed during the nightjar surveys were also recorded as incidentals.

Note that during the nightjar surveys, an opportunistic turtle survey was conducted along the survey route (between CONI PCs) in which roadsides and water crossings under roads were surveyed for turtles or turtle nesting activity while travelling between survey locations. No results were recorded from this effort. The survey track can be reviewed on the nightjar survey figure (Figure 5, Appendix A).

**Table 2-7: Nightjar Point Count (PC) Locations and Habitat Field Descriptions**

CONI PC ID	Coordinates (NAD 83 UTM 20)		Surveyor Habitat Field Notes
	Easting	Northing	
1	474446.32	4983653.88	End of forestry road. Forested.
2	475080.06	4985356.73	Lake Edmont Road. Farmland/fields on both sides of road. Forest and wetland nearby.
3	474851.06	4981546.08	ATV trail. One side forested, other side old clearcut.
4	470706.57	4984108.02	Macwilliams Road. Watercourse by road. Farmland/fields on both sides of road. Forest nearby.

**Table 2-8: Nightjar Survey Dates and Weather Conditions**

Survey Round	Date	Temperature (°C)	Wind (Beaufort Scale)	Precipitation	Surveyor Notes
Round 1	June 22, 2022	13 - 16	0 - 2	0	None to moderate noise (e.g., airplane and traffic noise), moon not visible, and 0% cloud cover.
Round 2	July 8, 2022	18	0 - 2	0	Moderate to high noise (e.g., airplane and traffic noise), moon visible, and 30 - 70% cloud cover. Seven cars passed surveyor at survey location CONI 3.

Notes: weather conditions represent the entire survey (surveyors recorded weather conditions at the start and end of each survey). Precipitation scale is as follows: 0 = none, 1 = drizzle, and 2 = light/moderate. Wind scale (Beaufort scale) is as follows: 0 = <1 km/hr, 1 = 1-5 km/hr, 2 = 6-11 km/hr, and 3 = 12-19 km/hr.

### 3 RESULTS

#### 3.1 Desktop Results

The ACCDC (Appendix C) identified 11 avian SAR and 21 avian SOCI within five km of the PA (Figure 6, Appendix A). The SAR birds observed by the ACCDC within five km are:

- Bank swallow (*Riparia riparia*; SARA/COSEWIC Threatened);
- Barn swallow (*Hirundo rustica*; SARA Threatened, COSEWIC Special Concern);
- Bobolink (*Dolichonyx oryzivorous*; SARA Threatened, COSEWIC Special Concern);
- Canada warbler (*Cardellina canadensis*; SARA Threatened, COSEWIC Special Concern);
- Chimney swift (*Chaetura pelagica*; SARA/COSEWIC Threatened);





- Common nighthawk (*Chordeiles minor*; SARA/COSEWIC Special Concern);
- Eastern wood-pewee (*Contopus virens*; SARA/COSEWIC Special Concern);
- Evening grosbeak (*Coccothraustes vespertinus*; SARA/COSEWIC Special Concern);
- Northern bobwhite (*Colinus virginianus*; SARA/COSEWIC Endangered);
- Olive-sided flycatcher (*Contopus cooperi*; SARA/COSEWIC Special Concern), and
- Rusty blackbird (*Euphagus carolinus*; SARA/COSEWIC Special Concern).

Barn swallow, Canada warbler, common nighthawk, eastern wood-pewee, and olive-sided flycatcher were observed during the biophysical surveys conducted within the PA and will be discussed in Section 3.3. The bobolink, chimney swift, and northern bobwhite ACCDC observations are likely due to the agricultural land, farm fields and associated anthropogenic structures, older regenerating developed land, and natural fields and meadows that surround northern and eastern sides of the PA. Only a small portion of this habitat is present in the northern part of the PA and none of these species were detected during the biophysical surveys. Evening grosbeak and rusty blackbird were also not observed during the biophysical surveys, despite appropriate habitat being present within the PA (e.g., softwood/mixedwood forest and wetland habitat). ACCDC also noted bank swallows within five km of the PA. No bank swallows were observed during the biophysical surveys due to lack of steep cliffs and banks.

Based on desktop analysis, there are no protected parks, wilderness areas, nature reserves, game sanctuaries, IBAs, or migratory bird sanctuaries within the PA. The Project is within the MBBA square 20MQ78. Significant habitat for the Nelson's sparrow (*Ammospiza nelson*; ranked by ACCDC as S3S4B) is located within the northern section of the PA as documented in 2001 by the NSDNRR Significant Species and Habitat Database; there were no Nelson's sparrow observations during the avifauna field surveys.

There is one nature reserve (the Lake Egmont Nature Reserve) approximately four km east of the PA. There is also the Lake Egmont Significant Ecological Area/International Biological Program candidate area (under NSECC) approximately 0.72 km east from the northwestern edge and 1.43 km east from the western side of the PA. This area is not legally protected. The closest Important Bird Area (IBA) to the PA is the Cobequid Bay IBA (NS019), which is approximately 30.44 km northwest from the PA (Figure 6, Appendix A). This section will continue with information regarding these areas as well as the results from the MBBA square.

The provincial park, Dollar Lake, is approximately four km south of the PA. This provincial park is used by the public for camping, hiking, and recreational water activities. Based on aerial imagery and GIS layers, this park would have similar forested habitat to the PA, including mature mixedwood and softwood, as well as wetland and watercourse/waterbody systems.

There are no national wildlife areas, wildlife management areas, or game sanctuaries, as well as no more protected areas within 6.5 km of the PA. There are also no migratory bird sanctuaries within 72 km of the PA.

Further desktop analysis revealed no significant information such as public avian data sources, research projects, or other significant ecological areas near the PA.



### 3.1.1 Lake Egmont Nature Reserve and Significant Ecological Area/International Biological Program Candidate

The Lake Egmont Nature Reserve is approximately 89.25 ha and represents a small site of mature hardwood and spruce trees growing in gypsum habitat (Figure 6, Appendix A). This provides unique habitat that has limited representation within Nova Scotia protected areas (e.g., gypsum sinkholes as well as vernal pools and talus slopes). This area also provides overwintering habitat for bats due to the presence of mature hardwood trees and sinkholes. Gypsum habitats are among the least protected and most threatened within the province (Lake Egmont Nature Reserve, NSECC n.d.).

The Lake Egmont Significant Ecological Area/International Biological Program candidate area (under NSECC) is approximately 189.62 ha; this area is not legally protected (Figure 6, Appendix A). Aerial imagery and GIS layers show a habitat that represents a complex of lakes, including Lake Egmont and Lower Lake Egmont, and open and forested wetlands that are downstream from Gays River, which runs along the northern border of the PA.

The PA likely contains similar habitat to the two areas described above, with the exception of lake habitat. As described in the introductory sections, the PA has habitat fragmentation due to newer and historic forestry activity, therefore large tracts of mature forest and interior forest are not as prevalent within the PA.

### 3.1.2 Cobequid Bay Important Bird Area (NS019)

The closest IBA to the PA is the Cobequid Bay IBA (NS019).

The Cobequid Bay IBA (IBA NS019) is approximately 47,768 ha in size and is situated in the Bay of Fundy near Truro, Nova Scotia (Figure 6, Appendix A). Cobequid Bay is approximately 40 km long, coming to a pointed bay on the eastern side and widening on the western end when it reaches the Minas Basin. Various habitat types, including beaches, tidal rivers/estuaries, saltmarshes, mudflats, and sandflats line the coastline depending on the tide level. Cobequid Bay is an important foraging spot for a variety of shorebirds and waterfowl during migration periods (e.g., geese, ducks, plovers, sandpipers, etc.). The high abundance of amphipods in the mud attracts one to two million shorebirds in the mudflats at the head of the Bay of Fundy within this and adjacent IBAs before fall migration. This high abundance of food is estimated to attract 50 to 95% of the world's population of semipalmated sandpipers (*Calidris pusilla*), as well as many other species of shorebirds. Thousands of shorebirds and waterfowl species are also observed using this bay as a stopover area during spring migration (IBA Canada n.d.).

The Cobequid Bay IBA is a proposed Hemispheric Shorebird Reserve, under the Western Hemisphere Shorebird Reserve Network. Concerns and threats for this site include anthropogenic use and disturbance on the beaches that line the coastline, as well as pollution and pesticide exposure due to developed and agricultural lands surrounding this IBA (IBA Canada n.d.). The PA is approximately 35 km away from any inlet, bay or coastline and does not represent the habitats within the Cobequid Bay IBA.

### 3.1.3 Maritime Breeding Bird Atlas

One MBBA square (20MQ78) encompasses the entirety of the PA (results are provided in Appendix D). Observations within this square are listed below:



- The first atlas has 44 possible, 17 probable, and 40 confirmed breeders.
- The second atlas has 20 possible, 22 probable, and 65 confirmed breeders.
  - Of these breeding species, there were 10 SAR (which were also identified by ACCDC within five km of the PA):
    - Bank swallow;
    - Barn swallow;
    - Bobolink;
    - Canada warbler;
    - Chimney swift;
    - Common nighthawk;
    - Eastern wood-pewee;
    - Evening grosbeak;
    - Olive-sided flycatcher, and
    - Rusty blackbird.
- SOCI observations within these MBBA squares (or SAR recorded with no breeding evidence) are presented in Appendix D.

Results for the ACCDC report and MBBA squares are provided in Appendices C and D.

### 3.2 Field Results

The following subsections outline the results of the spring migration, breeding season, fall migration, nocturnal owl surveys, and nightjar point count surveys, along with all incidental observations. Note that incidental observations will not be included in the dedicated bird survey sections and will be included in a separate section (Section 3.2.6).

ACCDC breeding bird status qualifiers were used to determine whether a species is a priority species, based on the time of year in which the species was observed. If a species has only one seasonal ranking, such as S3B, it was considered a SOCI regardless of the time of year it was observed. However, if the species had an alternate ranking, such as an SRank of S2S3B, S5N, the species was considered a priority species if observed during the breeding season. Outside of breeding season, this species was not considered a priority species.

#### 3.2.1 Spring Migration Surveys

During spring migration PC surveys, a total of 1832 individuals representing 66 species were observed, this number does not include unknown species.

Two avian species at risk (SAR; barn swallow and Canada warbler) and two avian species of conservation interest (SOCI; black-billed cuckoo and boreal chickadee) were observed during the 2022/2023 spring migration surveys (Figure 3, Appendix A; Table 3-1). Note that the turkey vulture (S2S3B, S4S5M) is not considered a priority species due to their ACCDC SRank during the migration season. All avian SAR and SOCI observations are discussed in Section 3.3.

Passerines comprised 67.58% of the species observed (calculated by number of individuals per bird group), followed by waterfowl (16.98%), other landbirds (13.48%), waterbirds (0.87%), diurnal raptors (0.71%),



nocturnal raptors (0.16%), and shorebirds (0.05%). These percentages do not include unknown individuals that could not be identified to the level of bird group (0.16%). Canada goose (n=299) and black-capped chickadee (n=132) were the most abundant species observed. All species and their abundances are presented in Table 3-1. Species and observed PC locations are presented in Appendix E.

All species identified are native species in this region of Nova Scotia with the exception of European starling. Typical and common habitat to support these species is present within the PA and surrounding landscape.

During spring migration, the PCs with the highest number of individuals were PCs 11 (108 individuals), 13 (112 individuals), 14 (116 individuals), and 39 (110 individuals). The PCs with the highest species diversity were PCs 11 (26 species), 39 (35 species), and 41 (32 species; Figure 3, Appendix A). PCs 11, 13, 14, and 39 all represent a form of edge habitat (i.e., PC 11 and 13 are on a road or close to a road and surrounded by older forest, PC 14 is on the edge of an open wetland surrounded by older forest, and PC 39 is in the riparian wetland edge of Gays River with older forest and field habitat to the west and south). The variety in habitat and variation in vegetation structure (e.g., height) would attract a higher number and variety of birds including passerines, other landbirds, and diurnal/nocturnal raptors; PC 39 would also attract species that tend to form in groups such as barn swallows and American goldfinches, along with shorebird and waterfowl species due to habitat availability. PCs 11 and 39 had two of the highest species diversity, including PC 41 which has similar habitat to PC 39 except for a ponded area nearby, less field habitat to the south, and more forested habitat surrounding the location. PC 41 is also an example of edge habitat.

Large groups of Canada geese - 60 to 70 individuals per group - were observed on four occasions during the spring migration surveys, which is evidence of migratory behaviour.

There was probable and confirmed breeding behaviour (MBBA n.d.) observed during the spring migration season, which includes:

- Black-and-white warbler: one male and female pair (probable).
- Canada warbler: competitive behaviour in the form of singing back and forth and males acting territorial and making agitated/alert chips and calls (probable).
- Magnolia warbler: competitive behaviour in the form of singing back and forth (probable).
- Mallard: two male and female pairs (probable).
- White-throated sparrow: competitive behaviour in the form of singing back and forth (probable).
- Yellow-rumped warbler: competitive behaviour in the form of singing back and forth (probable).
- American robin: observed two agitated American robins with an active nest with three eggs (confirmed).



Table 3-1: Individual Abundance and Species of Birds Observed During Spring Migration Surveys

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group
<b>BARS</b>	<b>Barn swallow</b>	<i>Hirundo rustica</i>	<u>T</u>	<u>E</u>	<b>S3B</b>	<u>2</u>	-	<u>6</u>
<b>CAWA</b>	<b>Canada warbler</b>	<i>Cardellina canadensis</i>	<u>T</u>	<u>E</u>	<b>S3B</b>	<u>4</u>	<u>2 males</u>	<u>6</u>
<b>BBCU</b>	<b>Black-billed cuckoo</b>	<i>Coccyzus erythrophthalmus</i>	-	-	<b>S3B</b>	<u>1</u>	-	<u>7</u>
<b>BOCH</b>	<b>Boreal chickadee</b>	<i>Poecile hudsonica</i>	-	-	<b>S3</b>	<u>1</u>	-	<u>6</u>
ALFL	Alder flycatcher	<i>Empidonax alnorum</i>	-	-	S5B	1	-	6
ABDU	American black duck	<i>Anas rubripes</i>	-	-	S5B, S5N	2	-	1
AMCR	American crow	<i>Corvus brachyrhynchos</i>	-	-	S5	67	-	6
AMGO	American goldfinch	<i>Carduelis tristis</i>	-	-	S5	43	-	6
AMRE	American redstart	<i>Setophaga ruticilla</i>	-	-	S5B	11	-	6
AMRO	American robin	<i>Turdus migratorius</i>	-	-	S5B, S3N	102	-	6
BDOW	Barred owl	<i>Strix varia</i>	-	-	S5	3	-	5
BAEA	Bald eagle	<i>Haliaeetus leucocephalus</i>	-	-	S5	11	5 juveniles	4
BLBW	Blackburnian warbler	<i>Setophaga fusca</i>	-	-	S4B, S5M	3	-	6
BAWW	Black-and-white warbler	<i>Mniotilta varia</i>	-	-	S5B	40	1 male, 1 female	6
BCCH	Black-capped chickadee	<i>Poecile atricapilla</i>	-	-	S5	132	-	6
BTBW	Black-throated blue warbler	<i>Setophaga caerulescens</i>	-	-	S5B	3	-	6
BTNW	Black-throated green warbler	<i>Dendroica virens</i>	-	-	S5B	54	1 female	6
BLJA	Blue jay	<i>Cyanocitta cristata</i>	-	-	S5	95	-	6
BHVI	Blue-headed vireo	<i>Vireo solitarius</i>	-	-	S5B	12	-	6
CAGO	Canada goose	<i>Branta canadensis</i>	-	-	SUB, S4N, S5M	299	-	1
CSWA	Chestnut-sided warbler	<i>Setophaga pensylvanica</i>	-	-	S5B	4	-	6
CHSP	Chipping sparrow	<i>Spizella passerina</i>	-	-	S4B, S5M	1	-	6
COGR	Common grackle	<i>Quiscalus quiscula</i>	-	-	S5B	5	-	6
COLO	Common loon	<i>Gavia immer</i>	-	-	S4B	16	-	3
CORA	Common raven	<i>Corvus corax</i>	-	-	S5	19	-	6



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Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group
COYE	Common yellowthroat	<i>Geothlypis trichas</i>	-	-	S5B	33	-	6
DEJU	Dark-eyed junco	<i>Junco hyemalis</i>	-	-	S4S5	43	-	6
DOWO	Downy woodpecker	<i>Dryobates pubescens</i>	-	-	S5	4	-	7
EUST	European starling	<i>Sturnus vulgaris</i>	-	-	SNA	13	-	6
GCKI	Golden-crowned kinglet	<i>Regulus satrapa</i>	-	-	S5	13	-	6
GWTE	Green-winged teal	<i>Anas crecca</i>	-	-	S4S5B, S5M	1	-	1
HAWO	Hairy woodpecker	<i>Picoides villosus</i>	-	-	S5	6	-	7
HETH	Hermit thrush	<i>Catharus guttatus</i>	-	-	S5B	88	-	6
HERG	Herring gull	<i>Larus argentatus</i>	-	-	S5	1	-	2
LEFL	Least flycatcher	<i>Empidonax minimus</i>	-	-	S4S5B, S5M	7	-	6
MAWA	Magnolia warbler	<i>Dendroica magnolia</i>	-	-	S5B	19	-	6
MALL	Mallard	<i>Anas platyrhynchos</i>	-	-	S5B, S5N	5	2 males, 2 females	1
MODO	Mourning dove	<i>Zenaida macroura</i>	-	-	S5	22	-	7
NAWA	Nashville warbler	<i>Vermivora ruficapilla</i>	-	-	S4B, S5M	3	-	6
NOFL	Northern flicker	<i>Colaptes auratus</i>	-	-	S5B	107	-	7
NOPA	Northern parula	<i>Parula americana</i>	-	-	S5B	22	-	6
NOWA	Northern waterthrush	<i>Parkesia noveboracensis</i>	-	-	S4B, S5M	7	-	6
OVEN	Ovenbird	<i>Seiurus aurocapilla</i>	-	-	S5B	67	-	6
PAWA	Palm warbler	<i>Dendroica palmarum</i>	-	-	S5B	8	-	6
PIWO	Pileated woodpecker	<i>Dryocopus pileatus</i>	-	-	S5	6	-	7
PUFI	Purple finch	<i>Carpodacus purpureus</i>	-	-	S4S5B, S3S4N, S5M	34	-	6
RBNU	Red-breasted nuthatch	<i>Sitta canadensis</i>	-	-	S4S5	37	-	6
REVI	Red-eyed vireo	<i>Vireo olivaceus</i>	-	-	S5B	15	-	6
RTHA	Red-tailed hawk	<i>Buteo jamaicensis</i>	-	-	S5	1	-	4
RWBL	Red-winged blackbird	<i>Agelaius phoeniceus</i>	-	-	S4B	11	-	6
RNDU	Ring-necked duck	<i>Aythya collaris</i>	-	-	S5B	1	-	1



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Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group	
RIPH	Ring-necked pheasant	<i>Phasianus colchicus</i>	-	-	SNA	9	-	7	
ROPI	Rock pigeon	<i>Columba livia</i>	-	-	SNA	2	-	7	
RCKI	Ruby-crowned kinglet	<i>Regulus calendula</i>	-	-	S4B, S5M	30	-	6	
RUGR	Ruffed grouse	<i>Bonasa umbellus</i>	-	-	S5	37	-	7	
SOSP	Song sparrow	<i>Melospiza melodia</i>	-	-	S5B	28	-	6	
SWTH	Swainson's thrush	<i>Catharus ustulatus</i>	-	-	S4B, S5M	1	-	6	
SWSP	Swamp sparrow	<i>Melospiza georgiana</i>	-	-	S5B	23	-	6	
TRES	Tree swallow	<i>Tachycineta bicolor</i>	-	-	S4B	8	-	6	
TUVU	Turkey vulture	<i>Cathartes aura</i>	-	-	S2S3B, S4S5M	1	-	4	
WBNU	White-breasted nuthatch	<i>Sitta carolinensis</i>	-	-	S4	4	-	6	
WTSP	White-throated sparrow	<i>Zonotrichia albicollis</i>	-	-	S4S5B, S5M	36	-	6	
WIWR	Winter wren	<i>Troglodytes troglodytes</i>	-	-	S5B	29	-	6	
YBFL	Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>	-	-	S4B, S5M	3	-	6	
YBSA	Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	-	-	S5B	51	-	7	
YRWA	Yellow-rumped warbler	<i>Dendroica coronata</i>	-	-	S5B	56	-	6	
-	Unknown bird	-	-	-	-	3	-	-	
-	Unknown duck	-	-	-	-	3	-	1	
-	Unknown warbler	-	-	-	-	1	-	6	
-	Unknown woodpecker (hairy or downy woodpecker)	-	-	-	-	2	-	7	
<b>Total Number of Individuals</b>		<b>1832</b>	<b>Total Number of Species (does not include unknowns)</b>				<b>66</b>		

Notes: incidental observations not included (those observed outside of point count locations). Bird group is coded as: 1 = waterfowl; 2 = shorebirds; 3 = other waterbirds (i.e., that are not waterfowl or shorebirds); 4 = diurnal raptors; 5 = nocturnal raptors; 6 = passerines (excluding dippers), and 7 = other landbirds. Bolded species are priority species. Bolded and underlined species are SAR. ACCDC rankings retrieved from: <http://www.accdc.com/webranks/NSvert.htm> (January 2024). "-" represents no federal designation



### 3.2.2 Breeding Bird Surveys

During breeding bird PC surveys, a total of 1292 individuals representing 75 species (this number does not include unknowns) were observed.

Four avian SAR (barn swallow, Canada warbler, eastern wood-pewee, and olive-sided flycatcher) and four avian SOCI (blackpoll warbler, red crossbill, spotted sandpiper, and Wilson's snipe; Figure 3, Appendix A; Table 3-2) were observed during the 2022/2023 breeding bird surveys. All avian SAR and SOCI observations are discussed in Section 3.3.

Passerines comprised 87.69% of the species observed (calculated by number of individuals per bird group), followed by other landbirds (9.98%), other waterbirds (0.7%), shorebirds (0.7%), waterfowl (0.54%), diurnal raptors (0.3%), and nocturnal raptors (0.08%). These percentages include unknown individuals that were able to be identified to the level of bird group (e.g., waterfowl). American robin (n=101), hermit thrush (n=71), and common yellowthroat (n=68) were the most abundant species observed. All species and their abundances are presented in Table 3-2. Species and observed PC locations are presented in Appendix E.

All species identified are native species in this region of Nova Scotia (with the exception of European starling). Typical and common habitat to support these species is present within the PA and surrounding landscape.

During the breeding season, the PCs with the highest number of individuals were PCs 39 (135 individuals) and 40 (65 individuals). The PCs with the highest species diversity were PCs 17 (28 species), 40 (28 species), and 39 (44 species; Figure 3, Appendix A). PCs 17, 39, and 40 all represent a form of edge habitat (i.e., PC 17 is on the edge of an open wetland surrounded by older forest, PC 39 is in the riparian wetland edge of Gays River with older forest and field habitat to the west and south, and PC 40 is close to the riparian wetland edge of Gays River and surrounded by older forest to the north and east and field habitat to the west and south). PC 39 would also attract species that tend to form in groups such as barn swallows and American goldfinches. The variety in habitat and variation in vegetation structure (e.g., height) would attract a higher number and variety of birds (e.g., all bird groups – passerines, waterfowl, shorebirds, other landbirds, other waterbirds, and diurnal/nocturnal raptors).

There was probable and confirmed breeding behaviour (MBBA n.d.) observed during the breeding bird season, which includes:

- American goldfinch: one male and female pair (probable).
- American redstart: two males were physically fighting/chasing each other, evidence of territorial behaviour (probable).
- Black-and-white warbler: competitive behaviour in the form of singing back and forth (probable).
- Canada warbler: competitive behaviour in the form of singing back and forth (probable).
- Common yellowthroat: competitive behaviour in the form of singing back and forth and one male and female pair (probable).
- Downy woodpecker: one male and female pair (probable).
- Ring-necked duck: one male and female pair (probable).
- Wilson's snipe: conducting a breeding display (territorial behaviour) and winnowing over a wetland (WL 51), evidence of competing with another individual in the area (probable).





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- Yellow-rumped warbler: male and female displaying courtship behaviour (probable).
- American robin: observed an active nest (could not observe number of eggs due to height of nest and to avoid disturbance) with distressed and agitated American robins in the area (confirmed).
- American woodcock: female observed with three young chicks (confirmed).
- Black-throated green warbler: competitive behaviour in the form of singing back and forth (probable) and agitated female was observed protecting a young chick that was spotted on the ground (confirmed).
- Blue jay: group of agitated/alert adults flying close to surveyor and chasing a hawk away from an area, evidence they were protecting young fledglings on the ground (confirmed).
- Common grackle: carrying food (confirmed).
- Common raven: observed defending an area with young/juvenile chicks (confirmed).
- Ovenbird: carrying food (confirmed).
- Red-eyed vireo: observed fighting off four blue jays from top of a tree, strong evidence there was a nest (confirmed).

All other species observed during the breeding bird surveys are considered possible breeders due to observing them in suitable nesting habitat during the breeding season (Table 3-2; MBBA n.d.).



**Table 3-2: Individual Abundance and Species of Birds Observed During Breeding Bird Surveys**

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group
<b><u>BARS</u></b>	<b><u>Barn swallow</u></b>	<b><u><i>Hirundo rustica</i></u></b>	<b><u>T</u></b>	<b><u>E</u></b>	<b><u>S3B</u></b>	<b><u>9</u></b>	-	<b><u>6</u></b>
<b><u>CAWA</u></b>	<b><u>Canada warbler</u></b>	<b><u><i>Cardellina canadensis</i></u></b>	<b><u>T</u></b>	<b><u>E</u></b>	<b><u>S3B</u></b>	<b><u>7</u></b>	-	<b><u>6</u></b>
<b><u>EAWP</u></b>	<b><u>Eastern wood-pewee</u></b>	<b><u><i>Contopus virens</i></u></b>	<b><u>SC</u></b>	<b><u>V</u></b>	<b><u>S3S4B</u></b>	<b><u>11</u></b>	-	<b><u>6</u></b>
<b><u>OSFL</u></b>	<b><u>Olive-sided flycatcher</u></b>	<b><u><i>Contopus cooperi</i></u></b>	<b><u>SC</u></b>	<b><u>T</u></b>	<b><u>S3B</u></b>	<b><u>6</u></b>	-	<b><u>6</u></b>
<b><u>BLPW</u></b>	<b><u>Blackpoll warbler</u></b>	<b><u><i>Setophaga striata</i></u></b>	-	-	<b><u>S3B, S5M</u></b>	<b><u>2</u></b>	-	<b><u>6</u></b>
<b><u>RECR</u></b>	<b><u>Red crossbill</u></b>	<b><u><i>Loxia curvirostra</i></u></b>	-	-	<b><u>S3S4</u></b>	<b><u>1</u></b>	-	<b><u>6</u></b>
<b><u>SPSA</u></b>	<b><u>Spotted sandpiper</u></b>	<b><u><i>Actitis macularius</i></u></b>	-	-	<b><u>S3S4B, S5M</u></b>	<b><u>1</u></b>	-	<b><u>2</u></b>
<b><u>WISN</u></b>	<b><u>Wilson’s snipe</u></b>	<b><u><i>Gallinago delicata</i></u></b>	-	-	<b><u>S3B, S5M</u></b>	<b><u>4</u></b>	-	<b><u>2</u></b>
ALFL	Alder flycatcher	<i>Empidonax alnorum</i>	-	-	S5B	14	-	6
AMCR	American crow	<i>Corvus brachyrhynchos</i>	-	-	S5	33	-	6
AMGO	American goldfinch	<i>Carduelis tristis</i>	-	-	S5	18	3 males, 2 females	6
AMRE	American redstart	<i>Setophaga ruticilla</i>	-	-	S5B	20	2 males	6
AMRO	American robin	<i>Turdus migratorius</i>	-	-	S5B, S3N	101	-	6
AMWO	American woodcock	<i>Scolopax minor</i>	-	-	S5B	4	1 female & 3 juveniles	2
BDOW	Barred owl	<i>Strix varia</i>	-	-	S5	1	-	5
BAEA	Bald eagle	<i>Haliaeetus leucocephalus</i>	-	-	S5	2	-	4
BEKI	Belted kingfisher	<i>Megaceryle alcyon</i>	-	-	S4S5B	4	-	3
BLBW	Blackburnian warbler	<i>Setophaga fusca</i>	-	-	S4B, S5M	4	-	6
BAWW	Black-and-white warbler	<i>Mniotilta varia</i>	-	-	S5B	48	1 female	6
BCCH	Black-capped chickadee	<i>Poecile atricapilla</i>	-	-	S5	62	-	6
BTBW	Black-throated blue warbler	<i>Setophaga caerulea</i>	-	-	S5B	2	-	6
BTNW	Black-throated green warbler	<i>Dendroica virens</i>	-	-	S5B	41	1 female & 1 juvenile	6
BLJA	Blue jay	<i>Cyanocitta cristata</i>	-	-	S5	36	-	6
BHVI	Blue-headed vireo	<i>Vireo solitarius</i>	-	-	S5B	28	-	6
BWHA	Broad-winged hawk	<i>Buteo platypterus</i>	-	-	S5B	1	-	4
BRCR	Brown creeper	<i>Certhia americana</i>	-	-	S5	1	-	6
CAGO	Canada goose	<i>Branta canadensis</i>	-	-	SUB, S4N, S5M	4	-	1



ANTRIM GYPSUM PROJECT

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group
CEDW	Cedar waxwing	<i>Bombycilla cedrorum</i>	-	-	S5B	7	-	6
CSWA	Chestnut-sided warbler	<i>Setophaga pensylvanica</i>	-	-	S5B	4	-	6
CHSP	Chipping sparrow	<i>Spizella passerina</i>	-	-	S4B, S5M	1	-	6
COGR	Common grackle	<i>Quiscalus quiscula</i>	-	-	S5B	18	-	6
COLO	Common loon	<i>Gavia immer</i>	-	-	S4B	5	-	3
CORA	Common raven	<i>Corvus corax</i>	-	-	S5	26	Juveniles (unknown)	6
COYE	Common yellowthroat	<i>Geothlypis trichas</i>	-	-	S5B	68	1 male, 1 female	6
DEJU	Dark-eyed junco	<i>Junco hyemalis</i>	-	-	S4S5	32	-	6
DOWO	Downy woodpecker	<i>Dryobates pubescens</i>	-	-	S5	9	1 male, 1 female	7
EAPH	Eastern phoebe	<i>Sayornis phoebe</i>	-	-	S4S5B, S4M	3	-	6
EUST	European starling	<i>Sturnus vulgaris</i>	-	-	SNA	17	-	6
GCKI	Golden-crowned kinglet	<i>Regulus satrapa</i>	-	-	S5	15	-	6
HAWO	Hairy woodpecker	<i>Picoides villosus</i>	-	-	S5	7	1 male	7
HETH	Hermit thrush	<i>Catharus guttatus</i>	-	-	S5B	71	-	6
LEFL	Least flycatcher	<i>Empidonax minimus</i>	-	-	S4S5B, S5M	10	-	6
MAWA	Magnolia warbler	<i>Dendroica magnolia</i>	-	-	S5B	26	-	6
MODO	Mourning dove	<i>Zenaida macroura</i>	-	-	S5	9	-	7
MOWA	Mourning warbler	<i>Geothlypis philadelphia</i>	-	-	S4B, S5M	1	-	6
NAWA	Nashville warbler	<i>Vermivora ruficapilla</i>	-	-	S4B, S5M	11	-	6
NOCA	Northern cardinal	<i>Cardinalis cardinalis</i>	-	-	S4	4	-	6
NOFL	Northern flicker	<i>Colaptes auratus</i>	-	-	S5B	60	-	7
NOPA	Northern parula	<i>Parula americana</i>	-	-	S5B	33	-	6
NOWA	Northern waterthrush	<i>Parkesia noveboracensis</i>	-	-	S4B, S5M	2	-	6
OVEN	Ovenbird	<i>Seiurus aurocapilla</i>	-	-	S5B	59	-	6
PAWA	Palm warbler	<i>Dendroica palmarum</i>	-	-	S5B	11	-	6
PIWO	Pileated woodpecker	<i>Dryocopus pileatus</i>	-	-	S5	16	-	7
PUFI	Purple finch	<i>Carpodacus purpureus</i>	-	-	S4S5B, S3S4N,	6	-	6
RBNU	Red-breasted nuthatch	<i>Sitta canadensis</i>	-	-	S4S5	28	-	6



ANTRIM GYPSUM PROJECT

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group	
REVI	Red-eyed vireo	<i>Vireo olivaceus</i>	-	-	S5B	51	-	6	
RWBL	Red-winged blackbird	<i>Agelaius phoeniceus</i>	-	-	S4B	8	-	6	
RNDU	Ring-necked duck	<i>Aythya collaris</i>	-	-	S5B	2	1 male, 1 female	1	
RIPH	Ring-necked pheasant	<i>Phasianus colchicus</i>	-	-	SNA	1	-	7	
ROPI	Rock pigeon	<i>Columba livia</i>	-	-	SNA	4	-	7	
RCKI	Ruby-crowned kinglet	<i>Regulus calendula</i>	-	-	S4B, S5M	15	-	6	
RTHU	Ruby-throated hummingbird	<i>Archilochus colubris</i>	-	-	S5B	2	1 female	6	
RUGR	Ruffed grouse	<i>Bonasa umbellus</i>	-	-	S5	7	-	7	
SAVS	Savannah sparrow	<i>Passerculus sandwichensis</i>	-	-	S4S5B, S5M	1	-	6	
SOSP	Song sparrow	<i>Melospiza melodia</i>	-	-	S5B	27	-	6	
SWTH	Swainson’s thrush	<i>Catharus ustulatus</i>	-	-	S4B, S5M	2	-	6	
SWSP	Swamp sparrow	<i>Melospiza georgiana</i>	-	-	S5B	18	-	6	
TRES	Tree swallow	<i>Tachycineta bicolor</i>	-	-	S4B	22	-	6	
WBNU	White-breasted nuthatch	<i>Sitta carolinensis</i>	-	-	S4	1	-	6	
WTSP	White-throated sparrow	<i>Zonotrichia albicollis</i>	-	-	S4S5B, S5M	20	-	6	
WIWR	Winter wren	<i>Troglodytes troglodytes</i>	-	-	S5B	25	-	6	
YBFL	Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>	-	-	S4B, S5M	5	-	6	
YBSA	Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	-	-	S5B	16	-	7	
YWAR	Yellow warbler	<i>Dendroica petechia</i>	-	-	S5B	4	-	6	
YRWA	Yellow-rumped warbler	<i>Dendroica coronata</i>	-	-	S5B	35	1 male, 1 female	6	
-	Unknown duck	-	-	-	-	1	-	1	
-	Unknown hawk	-	-	-	-	1	-	4	
<b>Total Number of Individuals</b>		<b>1292</b>	<b>Total Number of Species (does not include unknowns)</b>				<b>75</b>		

Notes: incidental observations not included (those observed outside of point count locations). Bird group is coded as: 1 = waterfowl; 2 = shorebirds; 3 = other waterbirds (i.e., that are not waterfowl or shorebirds); 4 = diurnal raptors; 5 = nocturnal raptors; 6 = passerines (excluding dippers), and 7 = other landbirds. Bolded species are priority species. Bolded and underlined species are SAR. ACCDC rankings retrieved from: <http://www.accdc.com/webranks/NSvert.htm> (January 2024). “-” represents no federal designation.



### 3.2.3 Fall Migration Surveys

During fall migration PC surveys, a total of 1620 individuals representing 74 species were observed.

Two avian SAR (Canada warbler and eastern wood-peewee) and four avian SOCI (boreal chickadee, Canada jay, pine siskin, and red crossbill; Figure 3, Appendix A; Table 3-3) were observed during the 2023 fall migration surveys. Note that the bay-breasted warbler (S3S4B, S4S5M), pine warbler (S2S3B, S4S5M), and Wilson's warbler (S3B, S5M) are not considered priority species due to their ACCDC SRanks during the migration season. All avian SAR and SOCI observations are discussed in Section 3.3.

Passerines comprised 92.04% of the species observed (calculated by number of individuals per bird group), followed by other landbirds (6.48%), waterfowl (0.68%), diurnal raptors (0.37%), other waterbirds (0.19%), shorebirds (0.19%), and nocturnal raptors (0.06%). These percentages include unknown individuals that were able to be identified to the level of bird group (e.g., other landbirds). Blue jay (n=191), black-capped chickadee (n=173), American goldfinch (n=169), and American robin (n=150) were most abundant species observed. All species and their abundances are presented in Table 3-3. Species and observed PC locations are presented in Appendix E.

All species identified are native species in this region of Nova Scotia (with the exception of European starling). Typical and common habitat to support these species is present within the PA and surrounding landscape.

During fall migration, the PCs with the highest number of individuals were PCs 30 (98 individuals) and 37 (98 individuals). The PCs with the highest species diversity were PCs 8 (30 species) and 37 (36 species; Figure 3, Appendix A). PCs 8, 30, and 37 all represent a form of edge habitat: PC 8 is in between an area disturbed by previous clearcutting activities and wetlands, and PCs 30 and 37 are all close to forestry roads and surrounded by forest fragmented by older and recent clearcutting activity. The variety in habitat and variation in vegetation structure (e.g., height) would attract a higher number and variety of birds such as passerines, other landbirds, and diurnal/nocturnal raptors. Clearcut areas can also serve as a staging area for birds to gather and prepare for migration.

During the fall migration season, there were two occurrences where a large group of birds showing signs of migration activity were observed:

- A Canada warbler was observed within a large group of birds - primarily vireos, warblers, American goldfinches, and black-capped chickadees - in a clearcut area that were showing signs of migration preparation.
- A female or juvenile Canada warbler was observed within a large group of birds, primarily black-capped chickadees, flycatchers, vireos, and warblers, in a wet, older clearcut area that were showing signs of migration preparation.

There was one observation of breeding behaviour observed during the fall migration season, which included a common yellow-throat male and female pair. This is considered probable breeding behaviour (MBBA n.d.).



Table 3-3: Individual Abundance and Species of Birds Observed During Fall Migration Surveys

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group
<b>CAWA</b>	<b>Canada warbler</b>	<b><i>Cardellina canadensis</i></b>	<b><u>T</u></b>	<b><u>E</u></b>	<b><u>S3B</u></b>	<b><u>7</u></b>	<b><u>1 female or juvenile</u></b>	<b><u>6</u></b>
<b>EAWP</b>	<b>Eastern wood-pewee</b>	<b><i>Contopus virens</i></b>	<b><u>SC</u></b>	<b><u>V</u></b>	<b><u>S3S4B</u></b>	<b><u>14</u></b>	-	<b><u>6</u></b>
<b>BOCH</b>	<b>Boreal chickadee</b>	<b><i>Poecile hudsonica</i></b>	-	-	<b>S3</b>	<b>2</b>	-	<b>6</b>
<b>CAJA</b>	<b>Canada jay</b>	<b><i>Perisoreus canadensis</i></b>	-	-	<b>S3</b>	<b>1</b>	-	<b>6</b>
<b>PISI</b>	<b>Pine siskin</b>	<b><i>Spinus pinus</i></b>	-	-	<b>S3</b>	<b>7</b>	-	<b>6</b>
<b>RECR</b>	<b>Red crossbill</b>	<b><i>Loxia curvirostra</i></b>	-	-	<b>S3S4</b>	<b>2</b>	-	<b>6</b>
ALFL	Alder flycatcher	<i>Empidonax alnorum</i>	-	-	S5B	8	-	6
AMCR	American crow	<i>Corvus brachyrhynchos</i>	-	-	S5	55	-	6
AMGO	American goldfinch	<i>Carduelis tristis</i>	-	-	S5	169	-	6
AMRE	American redstart	<i>Setophaga ruticilla</i>	-	-	S5B	28	6 females & 3 juveniles & 1 juvenile male	6
AMRO	American robin	<i>Turdus migratorius</i>	-	-	S5B, S3N	150	-	6
AMWO	American woodcock	<i>Scolopax minor</i>	-	-	S5B	2	-	2
BAEA	Bald eagle	<i>Haliaeetus leucocephalus</i>	-	-	S5	2	1 juvenile	4
BBWA	Bay-breasted warbler	<i>Setophaga castanea</i>	-	-	S3S4B, S4S5M	1	-	6
BEKI	Belted kingfisher	<i>Megaceryle alcyon</i>	-	-	S4S5B	1	-	3
BLBW	Blackburnian warbler	<i>Setophaga fusca</i>	-	-	S4B, S5M	2	1 female or juvenile male	6
BAWW	Black-and-white warbler	<i>Mniotilta varia</i>	-	-	S5B	26	1 male, 3 females	6
BCCH	Black-capped chickadee	<i>Poecile atricapilla</i>	-	-	S5	173	-	6
BTNW	Black-throated green warbler	<i>Dendroica virens</i>	-	-	S5B	12	2 males, 1 female & 1 juvenile & 3 females or juveniles	6
BLJA	Blue jay	<i>Cyanocitta cristata</i>	-	-	S5	191	-	6
BHVI	Blue-headed vireo	<i>Vireo solitarius</i>	-	-	S5B	35	1 juvenile	6
BRCR	Brown creeper	<i>Certhia americana</i>	-	-	S5	25	-	6
CAGO	Canada goose	<i>Branta canadensis</i>	-	-	SUB, S4N, S5M	9	-	1
CEDW	Cedar waxwing	<i>Bombycilla cedrorum</i>	-	-	S5B	20	-	6



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Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group
COGR	Common grackle	<i>Quiscalus quiscula</i>	-	-	S5B	19	-	6
COLO	Common loon	<i>Gavia immer</i>	-	-	S4B	2	-	3
CORA	Common raven	<i>Corvus corax</i>	-	-	S5	34	-	6
COYE	Common yellowthroat	<i>Geothlypis trichas</i>	-	-	S5B	27	2 males, 5 females & 3 juveniles & 2 females or juveniles	6
DEJU	Dark-eyed junco	<i>Junco hyemalis</i>	-	-	S4S5	69	-	6
DOWO	Downy woodpecker	<i>Dryobates pubescens</i>	-	-	S5	3	1 juvenile male	7
EAPH	Eastern phoebe	<i>Sayornis phoebe</i>	-	-	S4S5B, S4M	2	-	6
EUST	European starling	<i>Sturnus vulgaris</i>	-	-	SNA	6	-	6
GCKI	Golden-crowned kinglet	<i>Regulus satrapa</i>	-	-	S5	94	-	6
GHOW	Great horned owl	<i>Bubo virginianus</i>	-	-	S4	1	-	5
HAWO	Hairy woodpecker	<i>Picoides villosus</i>	-	-	S5	14	-	7
HETH	Hermit thrush	<i>Catharus guttatus</i>	-	-	S5B	30	-	6
HERG	Herring gull	<i>Larus argentatus</i>	-	-	S5	1	-	2
LEFL	Least flycatcher	<i>Empidonax minimus</i>	-	-	S4S5B, S5M	1	-	6
LISP	Lincoln's sparrow	<i>Melospiza lincolnii</i>	-	-	S4B, S5M	1	-	6
MAWA	Magnolia warbler	<i>Dendroica magnolia</i>	-	-	S5B	4	1 female & 2 females or juveniles	6
MALL	Mallard	<i>Anas platyrhynchos</i>	-	-	S5B, S5N	1	-	1
MERL	Merlin	<i>Falco columbarius</i>	-	-	S5B	1	-	4
MODO	Mourning dove	<i>Zenaida macroura</i>	-	-	S5	5	-	7
NAWA	Nashville warbler	<i>Vermivora ruficapilla</i>	-	-	S4B, S5M	6	-	6
NOCA	Northern cardinal	<i>Cardinalis cardinalis</i>	-	-	S4	4	-	6
NOFL	Northern flicker	<i>Colaptes auratus</i>	-	-	S5B	53	-	7
NOHA	Northern harrier	<i>Circus hudsonius</i>	-	-	S4B, S4S5M	1	-	4
NOPA	Northern parula	<i>Parula americana</i>	-	-	S5B	4	1 female	6
OVEN	Ovenbird	<i>Seiurus aurocapilla</i>	-	-	S5B	10	-	6



## ANTRIM GYPSUM PROJECT

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group
PAWA	Palm warbler	<i>Dendroica palmarum</i>	-	-	S5B	3	-	6
PIWO	Pileated woodpecker	<i>Dryocopus pileatus</i>	-	-	S5	7	-	7
PIWA	Pine warbler	<i>Setophaga pinus</i>	-	-	S2S3B, S4S5M	1	-	6
PUFI	Purple finch	<i>Carpodacus purpureus</i>	-	-	S4S5B, S3S4N, S5M	2	-	6
RBNU	Red-breasted nuthatch	<i>Sitta canadensis</i>	-	-	S4S5	33	-	6
REVI	Red-eyed vireo	<i>Vireo olivaceus</i>	-	-	S5B	88	-	6
RTHA	Red-tailed hawk	<i>Buteo jamaicensis</i>	-	-	S5	1	-	4
RCKI	Ruby-crowned kinglet	<i>Regulus calendula</i>	-	-	S4B, S5M	6	-	6
RTHU	Ruby-throated hummingbird	<i>Archilochus colubris</i>	-	-	S5B	2	-	6
RUGR	Ruffed grouse	<i>Bonasa umbellus</i>	-	-	S5	15	-	7
SSHA	Sharp-shinned hawk	<i>Accipiter striatus</i>	-	-	S5	1	-	4
SOSP	Song sparrow	<i>Melospiza melodia</i>	-	-	S5B	40	-	6
SWSP	Swamp sparrow	<i>Melospiza georgiana</i>	-	-	S5B	9	-	6
TRES	Tree swallow	<i>Tachycineta bicolor</i>	-	-	S4B	2	-	6
VEER	Veery	<i>Catharus fuscescens</i>	-	-	S4B	1	-	6
WBNU	White-breasted nuthatch	<i>Sitta carolinensis</i>	-	-	S4	4	-	6
WTSP	White-throated sparrow	<i>Zonotrichia albicollis</i>	-	-	S4S5B, S5M	24	-	6
WWCR	White-winged crossbill	<i>Loxia leucoptera</i>	-	-	S4S5	3	-	6
WIWA	Wilson's warbler	<i>Cardellina pusilla</i>	-	-	S3B, S5M	1	1 female or juvenile	6
WIWR	Winter wren	<i>Troglodytes troglodytes</i>	-	-	S5B	7	-	6
WODU	Wood duck	<i>Aix sponsa</i>	-	-	S5B	1	1 female or juvenile	1
YBSA	Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	-	-	S5B	7	-	7
YWAR	Yellow warbler	<i>Dendroica petechia</i>	-	-	S5B	1	-	6
YRWA	Yellow-rumped warbler	<i>Dendroica coronata</i>	-	-	S5B	24	1 female & 1 female or juvenile	6





## ANTRIM GYPSUM PROJECT

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	Group
YTVI	Yellow-throated vireo	<i>Vireo flavifrons</i>	-	-	SNA	1	-	6
-	Unknown woodpecker (hairy or downy woodpecker)	-	-	-	-	1	-	7
<b>Total Number of Individuals</b>		<b>1620</b>	<b>Total Number of Species</b>					<b>74</b>

Notes: incidental observations not included (those observed outside of point count locations). Bird group is coded as: 1 = waterfowl; 2 = shorebirds; 3 = other waterbirds (i.e., that are not waterfowl or shorebirds); 4 = diurnal raptors; 5 = nocturnal raptors; 6 = passerines (excluding dippers), and 7 = other landbirds. Bolded species are priority species. Bolded and underlined species are SAR. ACCDC rankings retrieved from: <http://www.accdc.com/webranks/NSvert.htm> (January 2024). "-" represents no federal designation



### 3.2.4 Nocturnal Owl Surveys

There were no owls observed during round one of nocturnal owl surveys.

Two owls were observed during the second round of nocturnal owl surveys: one barred owl was heard at survey location Owl 1 and one northern saw-whet owl (*Aegolius acadicus*; ranked by ACCDC as S4B, SUM) was heard at survey location Owl 3. The barred owl was heard before the owl track was played and the northern saw-whet owl was heard during the last minute of the owl track.

Other avian species observed (seen or heard) during the nocturnal owl surveys (2022) include:

- Two American robins;
- Three American woodcocks (one was conducting a breeding display, which is considered probable breeding behaviour; MBBA n.d.);
- Three common loons;
- One hermit thrush;
- One sharp-shinned hawk, and
- Two yellow-bellied sapsuckers.

When compared to the spring/fall migration and breeding bird surveys, the only novel species observed during the nocturnal owl surveys was the northern saw-whet owl.

### 3.2.5 Nightjar Surveys

As discussed in Section 2.2.3, the PA does contain suitable habitat for the common nighthawk and the eastern whip-poor-will. Examples of suitable habitat for common nighthawk include open bogs/wetlands, open forests, grasslands, barren areas with low shrub cover, clearcut areas, quarries, or other disturbed areas (COSEWIC 2018a). Examples of suitable habitat for eastern whip-poor-will include shrubbed wetlands, clearcuts, agricultural fields, rock or sand barrens with scattered trees, savannahs, burned areas, conifer plantations, and various types of forests at early stages of succession or edges of dense forest with similar ground-level structure. This species is found in habitat with moderate tree, shrub, and herbaceous cover (ECCC 2018b).

There were no nightjars (eastern whip-poor-will or common nighthawk) observed during either nightjar survey round.

There were other avian species observed during the second round of nightjar surveys, which include:

- One American crow;
- One American goldfinch;
- Two American robins;
- Two common yellowthroats;
- Three hermit thrushes;
- Two Northern flickers;
- One ovenbird;
- One purple finch;
- One red-eyed vireo;



- Five song sparrows;
- One white-throated sparrow;
- Two winter wrens, and
- Two yellow-rumped warblers (a male and female pair, which is considered probable breeding behaviour; MBBA n.d.).

There were no novel species observed during the nightjar surveys compared to the spring/fall migration and breeding bird surveys.

### 3.2.6 Incidentals

Incidental observations include those made during dedicated bird surveys (i.e., observation outside of point count time or survey location) and those made during non-bird related surveys (e.g., wetland delineation, botany, etc.).

There were no avian incidental observations during the dedicated avian survey program. There were incidental bird species recorded during other biophysical baseline survey types and will be listed below. The only novel species observed incidentally was the common nighthawk. All incidental birds were also observed during the dedicated bird surveys.

Four avian SAR species were incidentally observed during various biophysical survey types and include (see Section 3.3.1 for more details):

- Turtle surveys (2022): one Canada warbler and one olive-sided flycatcher;
- Fish habitat surveys (2023): one eastern-wood pewee, and
- Wetland/watercourse delineation surveys (2022/2023): nine Canada warblers, two common nighthawks, seven eastern wood-pewees, and three olive-sided flycatchers.

Note that all avian SAR observation locations can be viewed in Figure 7, Appendix A. All avian SAR observations are discussed in detail in Section 3.3.

Non-SAR/SOCI avian incidental observations were also made during turtle and wetland/watercourse delineation surveys. One barred owl was observed during turtle surveys (2022). Incidental avian observations during wetland/watercourse delineation surveys (2022/2023):

- One alder flycatcher;
- One barred owl;
- One Blackburnian warbler;
- One black-and-white warbler;
- One black-throated green warbler;
- One blue-headed vireo;
- One chestnut-sided warbler;
- One common yellowthroat;
- One hermit thrush;
- One northern cardinal;
- One pileated woodpecker;



- One red-breasted nuthatch;
- Three ruby-crowned kinglets;
- One ruffed grouse;
- One song sparrow, and
- One winter wren.

Breeding behaviour was also observed incidentally during wetland delineation surveys: one American woodcock nest and one grouse nest (species not recorded) was observed.

All species identified are native species in this region of Nova Scotia. Typical and common habitat to support these species is present within the PA and surrounding landscape.

### 3.3 Priority Species

ACCDC breeding bird status qualifiers were used to determine whether a species is a priority species, based on the time of year in which the species was observed. If a species has only one seasonal ranking, such as S3B, it was considered a SOCI regardless of the time of year it was observed. However, if the species had an alternate ranking, such as an SRank of S2S3B, S5N, the species was considered a priority species if observed during the breeding season. Outside of breeding season, this species was not considered a priority species.

Refer to Figure 7, Appendix A for all avian SAR observations. Note that the PC survey data above reflects the PC(s) at which each avian SAR or SOCI were observed and Figure 7 presents where the observation is precisely located based on surveyor data (i.e., distance and direction recorded).

#### 3.3.1 Species at Risk

Five avian SAR were observed during surveys throughout the dedicated biophysical survey period in 2022 and 2023. The SAR, its habitat requirements, the habitat present within the PA, and SAR observation information are described below.

The avian SAR observed within the PA included barn swallow, Canada warbler, common nighthawk, eastern wood-pewee, and olive-sided flycatcher; all observations were associated with edge habitat, open areas, or wetlands. Barn swallows were only observed during dedicated avifauna surveys and common nighthawk were only observed incidentally during wetland/watercourse delineation surveys. All other SAR were observed during avifauna surveys and incidentally during other biophysical survey types as well.

Refer to Figure 7, Appendix A for all avian SAR observations and refer to the Project Wetland Biophysical Baseline Report for a figure of mapped wetlands and further information on wetland protection based on avian SAR observations (e.g., wetlands of special significance).

##### 3.3.1.1 Barn swallow

The barn swallow (listed as Threatened by SARA, Special Concern by COSEWIC, Endangered by NSESA, and ranked by ACCDC as S3B) is a small-sized bird belonging to the passerine group. Although breeding habitat for this species is not prevalent within the PA, there is suitable foraging habitat for this species. Nesting habitat for this species includes horizontal and vertical structures that are either natural (e.g., cliffs,



rock overhangs, and caves) or anthropogenic structures (e.g., bridges, abandoned barns/houses/sheds, boats, wells, mine shafts, and culverts). Barn swallows forage over open and semi-open habitats such as grasslands, meadows, agricultural lands, open wetlands/waterbodies, shorelines, tundra, sand dunes, wooded clearings, parks, roads, and cleared right-of-ways (e.g., highways and transmission lines; COSEWIC 2021). Nesting sites are selected with foraging habitat nearby as well as a source of water and/or mud for nest construction. Barn swallows avoid heavily forested areas as well as high mountainous areas. Despite the barn swallow being known to adapt and nest within anthropogenic structures and activities, the most significant threat to this species is the loss and/or degradation of habitat and the decrease in insect populations (COSEWIC 2021).

Barn swallows were observed during spring migration 2023 and breeding bird 2023 surveys.

Eleven barn swallows were observed foraging around wetland (WL) 51 which was a complex wetland of swamp and fen. The barn swallows were foraging over this wetland and the Gays River, as well as a field/meadow on the adjacent property that borders this wetland. There was also a barn on this property that the barn swallows were observed flying into and leaving. This barn could be potential nesting habitat. Barn swallow observations were only in the small portion of PA on the northern side of Lake Egmont Road. The rest of the PA would contain suitable foraging habitat for barn swallow (e.g., open wetlands) but the northern side of Lake Egmont Road was the only area where potential barn swallow nesting habitat was observed.

### 3.3.1.2 *Canada warbler*

The Canada warbler (listed as Threatened by SARA, Special Concern by COSEWIC, Endangered by NSESA, and ranked by ACCDC as S3B) is a small-sized bird belonging to the passerine group. There is suitable foraging and breeding habitat for this species within the PA. The Canada warbler prefers wet, coniferous, and mixedwood forests with a thick shrub layer. Canada warblers are typically found in treed and shrub swamps (COSEWIC 2020). This species can also be found in woody thickets and shrubby riparian areas within forests on the edges of watercourses and ravines, and in regenerative growth within natural and anthropogenic disturbed areas. Nests are built on or close to the ground for cover. The most significant threat to this species is the loss and/or degradation of habitat (COSWIC 2020).

Canada warblers were observed during spring migration 2022, breeding bird 2022/2023, and fall migration 2023 surveys as well as incidentally during turtle 2022 surveys and wetland/watercourse delineation 2022/2023 surveys.

Twenty-eight Canada warblers were observed within various wetland habitats (primarily swamps) or wetter areas with wetlands nearby within the PA.

Wetlands that Canada warbler were observed in include:

- WL 6 (complex of swamp and fen with discontinuous throughflow of watercourses);
- WL 34 (swamp);
- WL 35 (swamp);
- WL 41 (complex of swamp and fen);
- WL 44 (swamp);



- WL 47 (swamp);
- WL 51 (complex of swamp and fen), and
- WL 67 (swamp).

#### 3.3.1.3 *Common nighthawk*

The common nighthawk is a medium-sized bird belonging to the nocturnal raptor group (specifically the nightjar family). As described in Section 2.2.3, there is suitable foraging and breeding habitat for this species within the PA (e.g., open wetlands and clearcuts). The rankings and habitat description for the common nighthawk are described in that section as well.

Despite the common nighthawk being known to adapt to anthropogenic structures activities, the most significant threat to this species is the loss and/or degradation of habitat and the decrease in insect populations (COSEWIC 2018a).

Common nighthawks were observed incidentally during wetland/watercourse delineation 2022 surveys.

Two common nighthawks were observed incidentally during wetland/watercourse delineation surveys. The common nighthawks were observed foraging over open areas, which include WL 23 (fen).

#### 3.3.1.4 *Eastern wood-pewee*

The eastern wood-pewee (listed as Special Concern by SARA/COSEWIC, Vulnerable by NSESA, and ranked by ACCDC as S3S4B) is a small-sized bird belonging to the passerine group. There is suitable foraging and breeding habitat for this species within the PA. The species is known to nest and forage at high canopy level in areas associated with clearings and forest edges. Eastern wood-pewees are mostly associated with mid-canopy layer of forest clearings and edges of wetlands and deciduous and mixed forests. They are most abundant in intermediate age and mature forest stands (COSEWIC 2012). Preferred habitats include riparian areas by rivers, open/semi-open mature forest, treed swamps, bogs, meadows, cutblocks, quarries, transmission lines, barrens, and burned forests. The preference of edge habitat is strongly associated with their foraging needs and behaviour. The most significant threat to this species is the loss and/or degradation of habitat (COSEWIC 2012).

Eastern wood-pewees were observed during breeding bird 2022 and fall migration 2023 surveys, as well as incidentally during wetland/watercourse delineation 2022/2023 and fish habitat 2023 surveys.

Thirty-three eastern-wood pewee were observed, all of which were associated with forested edge habitat like open wetlands, clearcuts, and the right-of-way for the natural gas line.

Wetlands that eastern wood-pewee were observed in include:

- WL 6 (complex of swamp and fen with discontinuous throughflow watercourses);
- WL 28 (swamp);
- WL 34 (swamp);
- WL 35 (swamp), and
- WL 41 (complex of swamp and fen).



### 3.3.1.5 *Olive-sided flycatcher*

The olive-sided flycatcher (listed as Special Concern by SARA/COSEWIC, Threatened by NSESA, and ranked by ACCDC as S3B) is small to medium-sized bird belonging to the passerine group. There is suitable foraging and breeding habitat for this species within the PA. The olive-sided flycatcher is typically found in edge habitat within softwood and mixedwood forests for breeding habitat. This species inhabits open forest, often near water or wetlands that contain tall snags or trees (COSEWIC 2018b). This species prefers areas with tall trees or snags adjacent to or within open areas to perch on for foraging. Preferred habitats include riparian areas by rivers, open/semi-open mature forest, treed swamps, bogs, cutblocks, barrens, meadows, and burned forests. The most significant threat to this species is the loss and/or degradation of habitat (COSEWIC 2018b).

Olive-sided flycatchers were observed during breeding bird 2022/2023 surveys, as well as incidentally during turtle 2022 surveys and wetland/watercourse delineation 2022 surveys.

Ten olive-sided flycatchers were observed, all of which were associated with forested edge habitat of open wetlands. Wetlands that olive-sided flycatcher were observed in include:

- WL 6 (complex of swamp and fen with discontinuous throughflow of watercourses);
- WL 41 (complex of swamp and fen),
- and WL 51 (complex of swamp and fen).

### 3.3.2 Species of Conservation Interest Observed

Across all survey seasons, a total of eight avian SOCI were observed (Figure 7, Appendix A). Note that certain bird species are considered SOCI during certain seasons due to their ACCDC SRank, as explained throughout field results in Section 3.2 (e.g., bay-breasted warbler). The species, the number of individuals, and the survey season/type when they were observed are as follows:

- Black-billed cuckoo (one individual; spring migration 2022);
- Blackpoll warbler (two individuals; breeding bird 2023);
- Boreal chickadee (three individuals; spring migration 2022 and fall migration 2023);
- Canada jay (one individual; fall migration 2023);
- Pine siskin (seven individuals; fall migration 2023);
- Red crossbill (three individuals; breeding bird 2022 and fall migration 2023);
- Spotted sandpiper (one individual; breeding bird 2023), and
- Wilson's snipe (four individuals; breeding bird 2023).

## 4 AVIFAUNA SUMMARY

This Avifauna Report was prepared in anticipation of the submission of an EARD for the Antrim Gypsum Project. The purpose of this report was to describe baseline conditions of avifauna within the PA. The report presents details of desktop and field studies conducted and analyses of the resulting data collected. It is anticipated that this information will support the registering of a provincial EARD by understanding the potential project interactions with avifauna.



The avifauna survey program occurred within the PA, which consists of a variety of forest types (i.e., softwood, mixedwood, and hardwood), with the majority being softwood and mixedwood, that vary in hydrology and age. The southern half of the PA contains larger tracts of undisturbed forest while the northern half of the PA has more recent and historic clear-cutting activity. The entirety of the PA contains ATV trails spread throughout as well as a natural gas pipeline that cuts through the southern half of the PA from southwest to northeast. The PA contains watercourses and a variety of wetlands such as treed swamps, shrub swamps, fens, and open swamps/ponds or marshes. There is a small portion of the PA on the northern side of Lake Egmont Road, which contains a property with a field/meadow that ends at the edge of Gays River and a riparian wetland. Based on field observations, it is evident that the PA is used by the public for activities such as hunting and camping.

The PA provides a range of habitats suitable for a variety of bird species with different habitat requirements. There are expansive areas of open and forested habitat that provide foraging and breeding habitat for certain species (e.g., raptors and passerines). Forests and shrub-dominated areas with stand height heterogeneity provide suitable habitat for foraging and breeding for many passerine species. Open habitat transitioning into forested habitat also provides edge habitat that various species use for foraging, such as swallows and flycatchers.

The objective of the avifauna species surveys was to:

- Identify species and habitat usage with a focus on SAR and SOCI within and surrounding the PA, and
- Determine trends in species composition and bird group usage throughout different seasons where possible.

The results of these surveys will be carried forward to the EARD and discussed in the effects assessment.

In May 2022, biophysical field surveys were initiated and continued through October 2023 and a total of 66.32 hours (3979 minutes) of surveys were completed by MEL biologists. The field studies were completed as follows:

- Spring migration surveys (May 2022/2023);
- Nocturnal owl surveys (May 2022);
- Breeding bird surveys (June – July 2022/2023);
- Nightjar surveys (June – July 2022), and
- Fall migration surveys (August – October 2023).

Avian biophysical surveys resulted in the observation of 4782 individuals, representing 98 bird species (not including incidentals or unknowns) within the PA.

The most abundant bird group observed (calculated by number of individuals per bird group) were passerines accounting for 81.28% of the species observed, followed by other landbirds (10.14%), waterfowl (6.88%), other waterbirds (0.65%), diurnal raptors (0.5%), shorebirds (0.33%), and nocturnal raptors (0.15%). These percentages include unknown individuals that were able to be identified to the level of bird group (e.g., passerines) and do not include unknown individuals that could not be identified to the level of





bird group (0.06%). These percentages represent species diversity within the PA. The most observed species was the American robin and black-capped chickadee.

Based on other data sources (e.g., ACCDC, MBBA, eBird, Christmas Bird Count, etc.), the bird species observed during the biophysical studies for this EARD were normal for this area throughout the spring migration, breeding, and fall migration seasons.

Through desktop analysis and field observations, it is apparent that the general area supports various life stages for migratory birds due to the variety of habitats (e.g., various wetland types, watercourses, forested areas, open habitat (clearcut areas), etc.).

In total, five avian SAR and eight avian SOCI were observed across all survey seasons (Section 3.3). The five avian SAR species observed were as follows:

- Barn swallow;
- Canada warbler;
- Common nighthawk;
- Eastern wood-pewee, and
- Olive-sided flycatcher.

No common nighthawk or Eastern whip-poor-will were observed during the nightjar surveys. Common nighthawks were only observed incidentally during wetland and watercourse delineation surveys.

The eight avian SOCI species observed were as follows:

- Black-billed cuckoo;
- Blackpoll warbler;
- Boreal chickadee;
- Canada jay;
- Pine siskin;
- Red crossbill;
- Spotted sandpiper, and
- Wilson's snipe.

Overall, survey locations with edge habitat had the highest individual and species counts. The variety in habitat and variation in vegetation structure would attract a higher number and variety of birds. Edge habitat and open areas can also serve as areas for species that tend to gather in groups (e.g., swallows and goldfinches) or staging areas for birds to gather and prepare for migration.

Several large groups of Canada geese (e.g., 60 to 70 individuals per group) were observed in the PA during the spring migration season. During the fall migration season, there were two occasions where large groups of birds were observed showing signs of migration preparation. No other migratory behaviour or general migratory patterns were observed, this includes specific direction or migratory areas/corridors.



## 5 LIMITATIONS

Limitations incurred at the time of the assessment include:

- MEL has relied in good faith upon the evaluation and conclusions in all third-party assessments. MEL relies upon these representations and information provided but can make no warranty of their accuracy.
- MEL has relied in good faith upon regulators in the various regulatory agencies and methodologies used in the design of this assessment may have been based upon regulatory guidance.
- There are a potentially infinite number of methods in which human activity can influence wildlife behaviours and populations and merely demonstrating that one factor is not operative does not negate the influence of the remainder of possible factors.
- A limitation with field surveys is that if no migration patterns are observed, it does not mean they do not exist in the area.
- All reasonable assessment programs will involve an inherent risk that some conditions will not be detected and all reports summarizing such investigations will be based on assumptions of what characteristics may exist between the sample points.
- Bird detectability depends on (i) species biology and behaviour (abundance, activity, species body size and conspicuousness, and ecological traits), (ii) individual characteristics within the species (sex and age), (iii) environmental factors (habitat, weather, phase of season, and time of day), and (iv) methodology of counts and skills of observers.
- An essential assumption of distance sampling methods is that distances to individuals are accurately estimated, a task not easy to accomplish under normal field conditions and are based on the perspective of the observer.

## 6 CLOSING

This Report has considered relevant factors and influences pertinent within the scope of the assessment and has completed and provided relevant information in accordance with the methodologies described.

The undersigned has considered the above statement to write, combine, and reference the report accordingly.

Jessica Lohnes, B.Sc.H.  
Environmental Scientist  
McCallum Environmental Ltd.  
[jessica@mccallumenvironmental.com](mailto:jessica@mccallumenvironmental.com)

Emma Posluns, M.Sc.  
Project Coordinator  
McCallum Environmental Ltd.  
[emma@mccallumenvironmental.com](mailto:emma@mccallumenvironmental.com)



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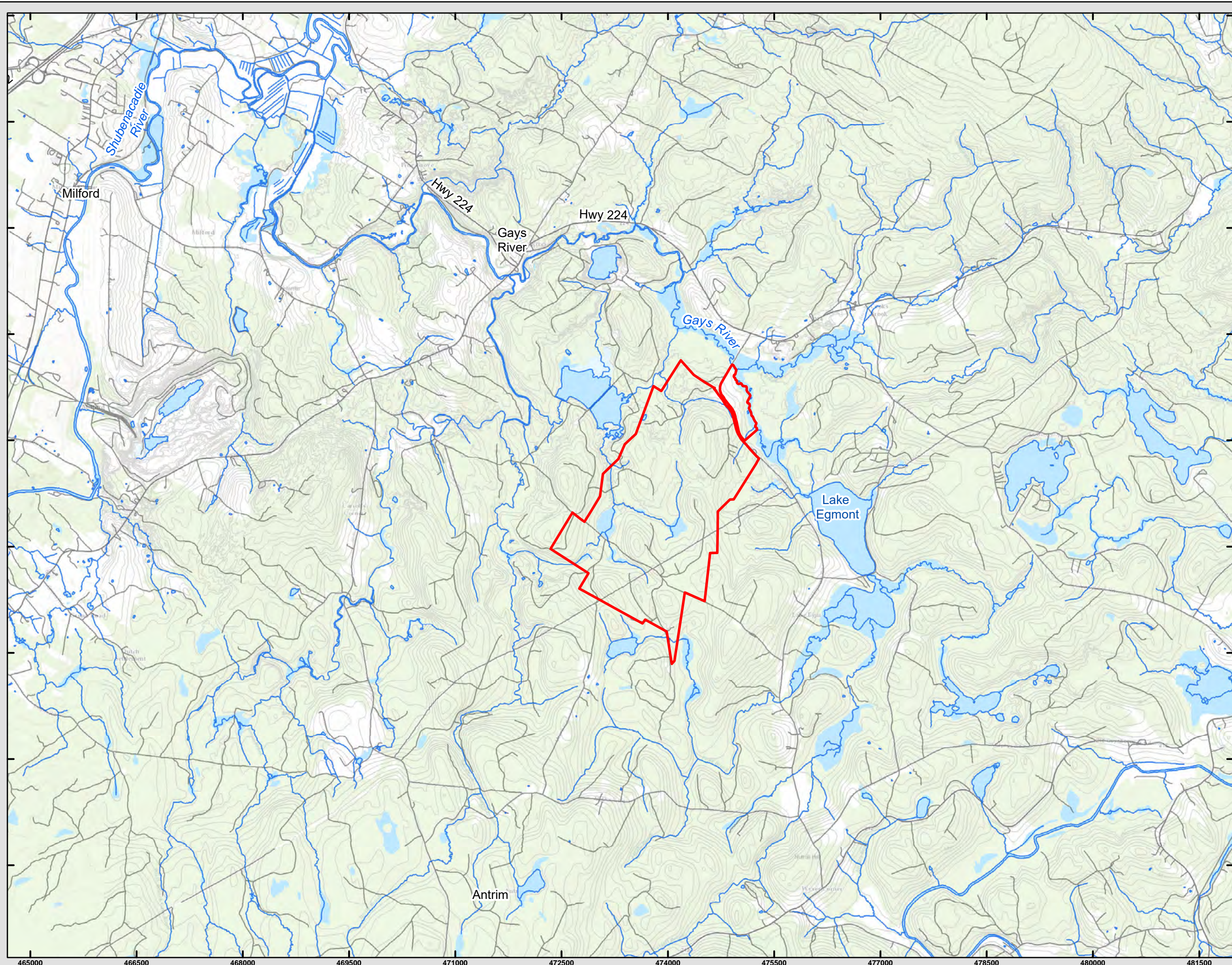
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**APPENDIX A: FIGURES**



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



**FIGURE 1**

**Antrim Gypsum Project**

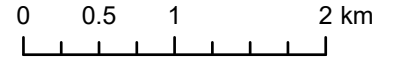
**Project Location**

**Antrim, NS**

-  Project Location
-  Roads
-  Mapped Watercourse (NSTDB)
-  Mapped Waterbody (NSTDB)
-  Project Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N  
 Projection: Transverse Mercator  
 Datum: North American 1983 CSRS  
 Units: Meter

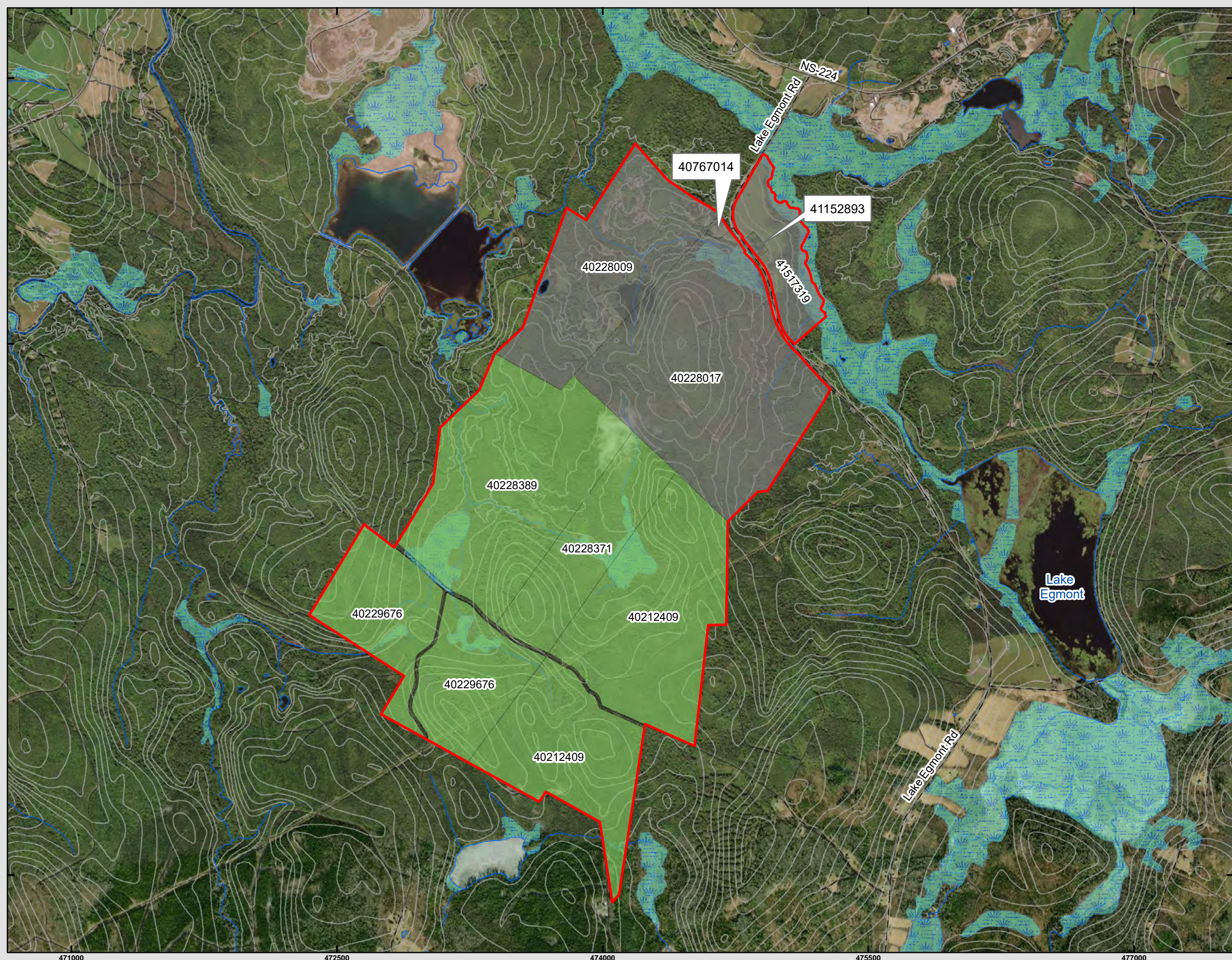


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Drawn By: MD Project #: 22-630  
 Reviewed By: Date: 2024-01-22



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**FIGURE 2**

**Antrim Gypsum Project**

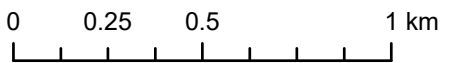
**Study Areas**

**Antrim, NS**

- ★ Project Location
- Mapped Watercourse (NSTDB)
- Roads
- Crown Land
- Private Land
- NSECC Wetland Inventory
- Project Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N  
 Projection: Transverse Mercator  
 Datum: North American 1983 CSRS  
 Units: Meter



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Figure 3

Antrim Gypsum Mine

Spring/Fall Migration and Breeding Bird Surveys: Avian Point Count (PC) Locations & Breeding Bird Area Search Tracks

Antrim, NS

- Avian Point Count
- Breeding Bird Area Search Tracks
- Mapped Watercourse (NSTDB)
- Roads
- Field Delineated Watercourse
- Open Water
- Wetland Mosaic
- Field Delineated Wetland
- NESCC Wetland Inventory
- Project Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N  
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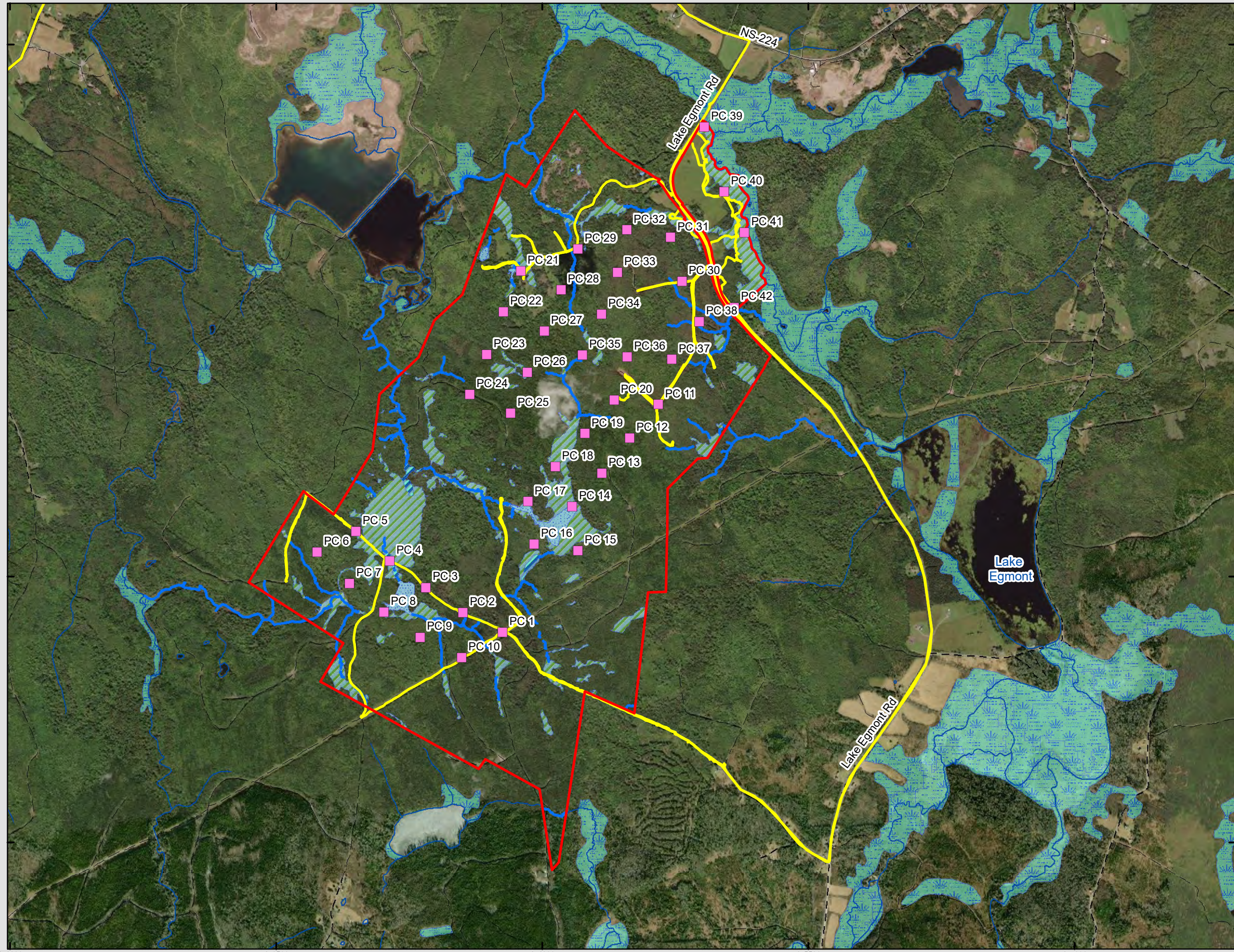
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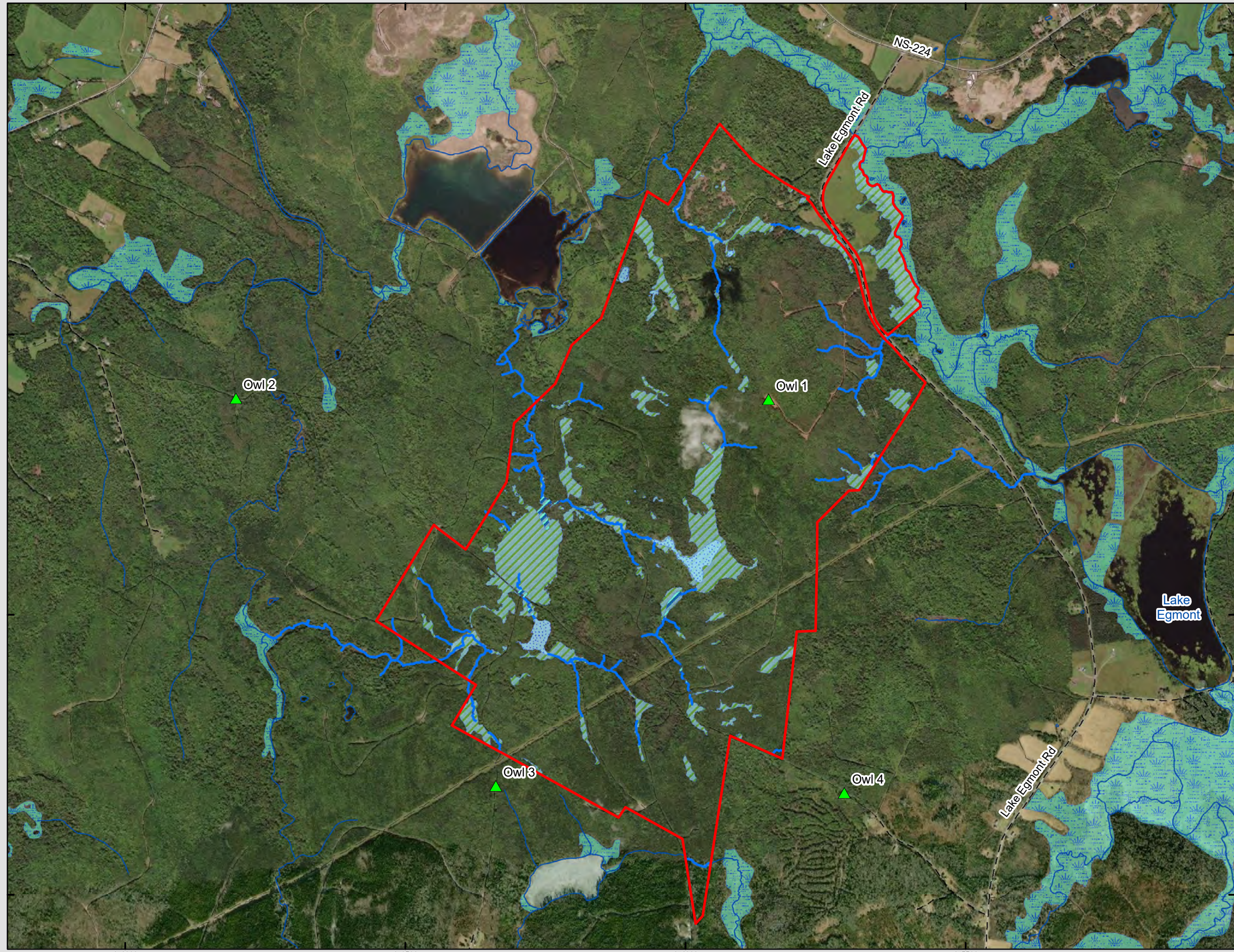


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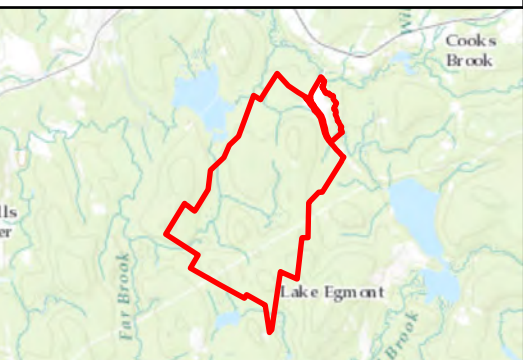
**Figure 4**

**Antrim Gypsum Mine**

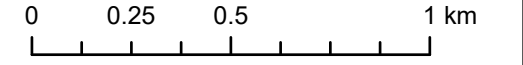
**Nocturnal Owl Point Count (PC) Locations**

**Antrim, NS**

- Owl Survey Point Count
- Roads
- Mapped Watercourse (NSTDB)
- Field Delineated Watercourse
- Open Water
- Wetland Mosaic
- Field Delineated Wetland
- NESCC Wetland Inventory
- Project Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N  
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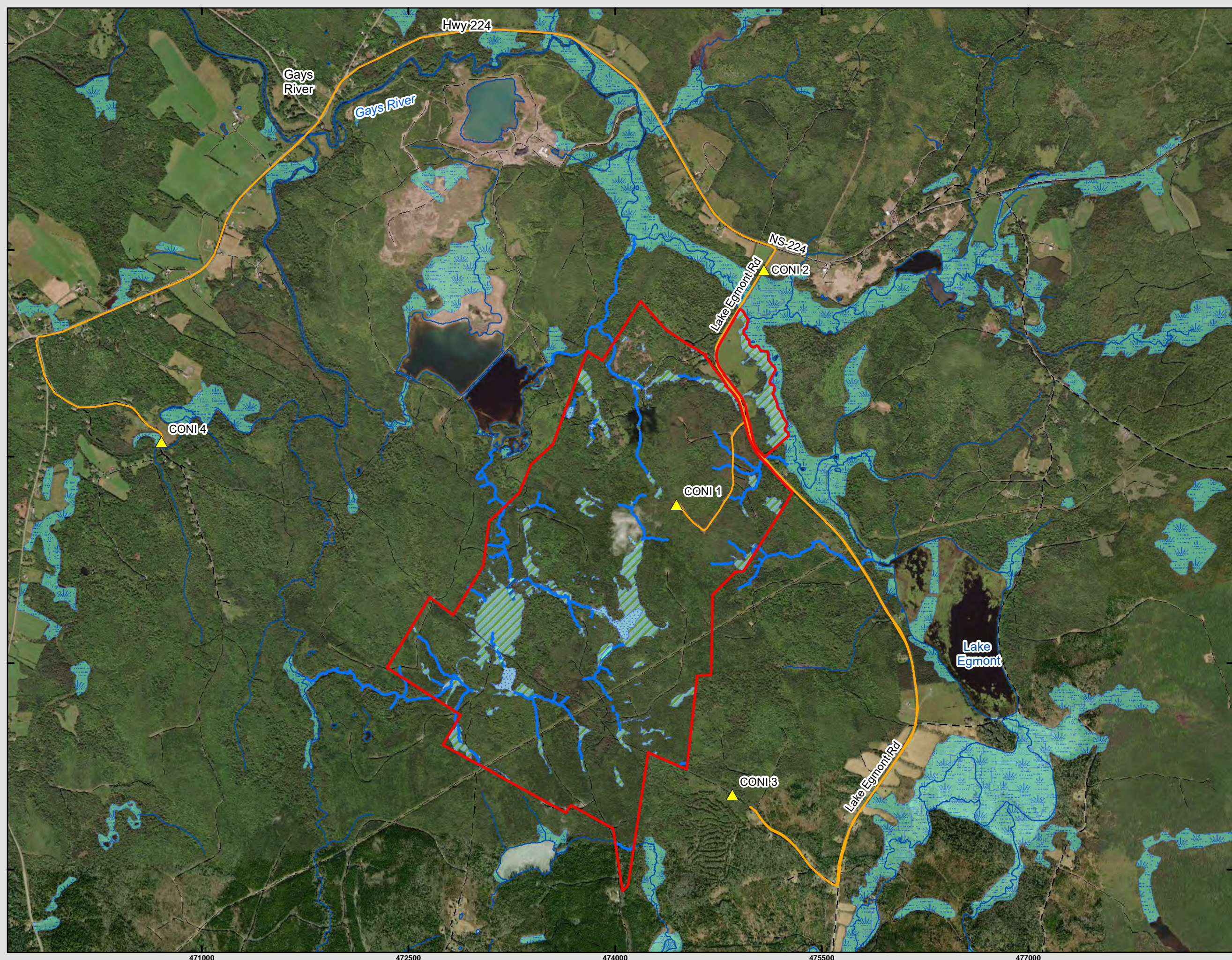


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 Reviewed By: EP Date: 2024-01-18



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**Figure 5**

**Antrim Gypsum Mine**

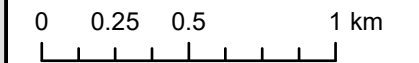
**Nightjar Point Count (CONI PC)  
Locations & Opportunistic Turtle  
Survey Tracks**

**Antrim, NS**

- Common Nighthawk Survey Point Count
- Opportunistic Turtle Survey Track
- Roads
- Mapped Watercourse (NSTDB)
- Field Delineated Watercourse
- Open Water
- Wetland Mosaic
- Field Delineated Wetland
- NESCC Wetland Inventory
- Project Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N  
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Drawn By: MD  
 Reviewed By: MJ

Project #: 22-630  
 Date: 2024-03-06



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





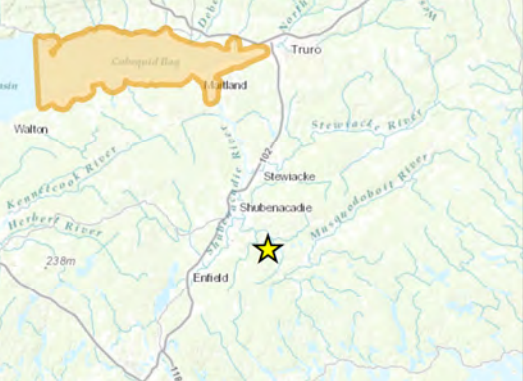
**Figure 6**

**Antrim Gypsum Mine**

**Project Area and Desktop Review**

**Antrim, NS**

-  Project Location
-  ACCDC Observation
-  Roads
-  Mapped Watercourse (NSTDB)
-  Mapped Waterbody (NSTDB)
-  NSECC Wetland Inventory
-  Cobequid Bay Important Bird Area (NS019)
-  Lake Egmont Nature Reserve
-  Lake Egmont SES / IBP candidate
-  Project Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N  
 Projection: Transverse Mercator  
 Datum: North American 1983 CSRS  
 Units: Meter



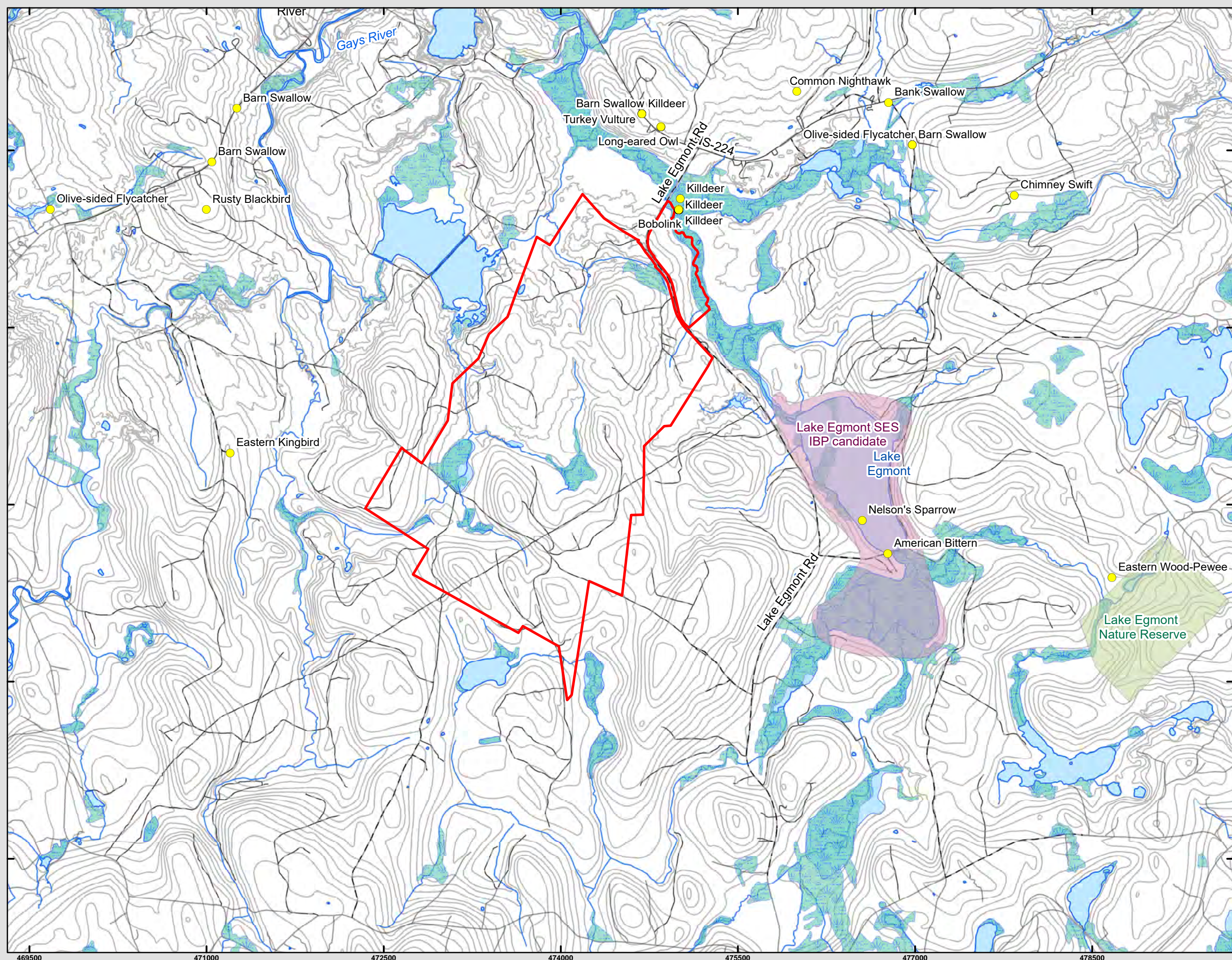
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 Reviewed By: MJ Date: 2024-01-17



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Figure 7

Antrim Gypsum Mine

Avian Priority Species (Species at Risk (SAR) & Species of Conservation Interest (SOCl)) Field Observations

Antrim, NS

Priority Species (SAR & SOCl)

- Barn swallow
- Black-billed cuckoo
- Blackpoll warbler
- Boreal chickadee
- Canada jay
- Canada warbler
- Common nighthawk
- Eastern wood-pewee
- Olive-sided flycatcher
- Pine siskin
- Red crossbill
- Spotted sandpiper
- Wilson's snipe
- Roads
- Mapped Watercourse (NSTDB)
- Field Delineated Watercourse
- Open Water
- Wetland Mosaic
- Field Delineated Wetland
- NESCC Wetland Inventory
- Project Area



Coordinate System: NAD 1983 CSRS UTM Zone 20N  
Projection: Transverse Mercator  
Datum: North American 1983 CSRS  
Units: Meter



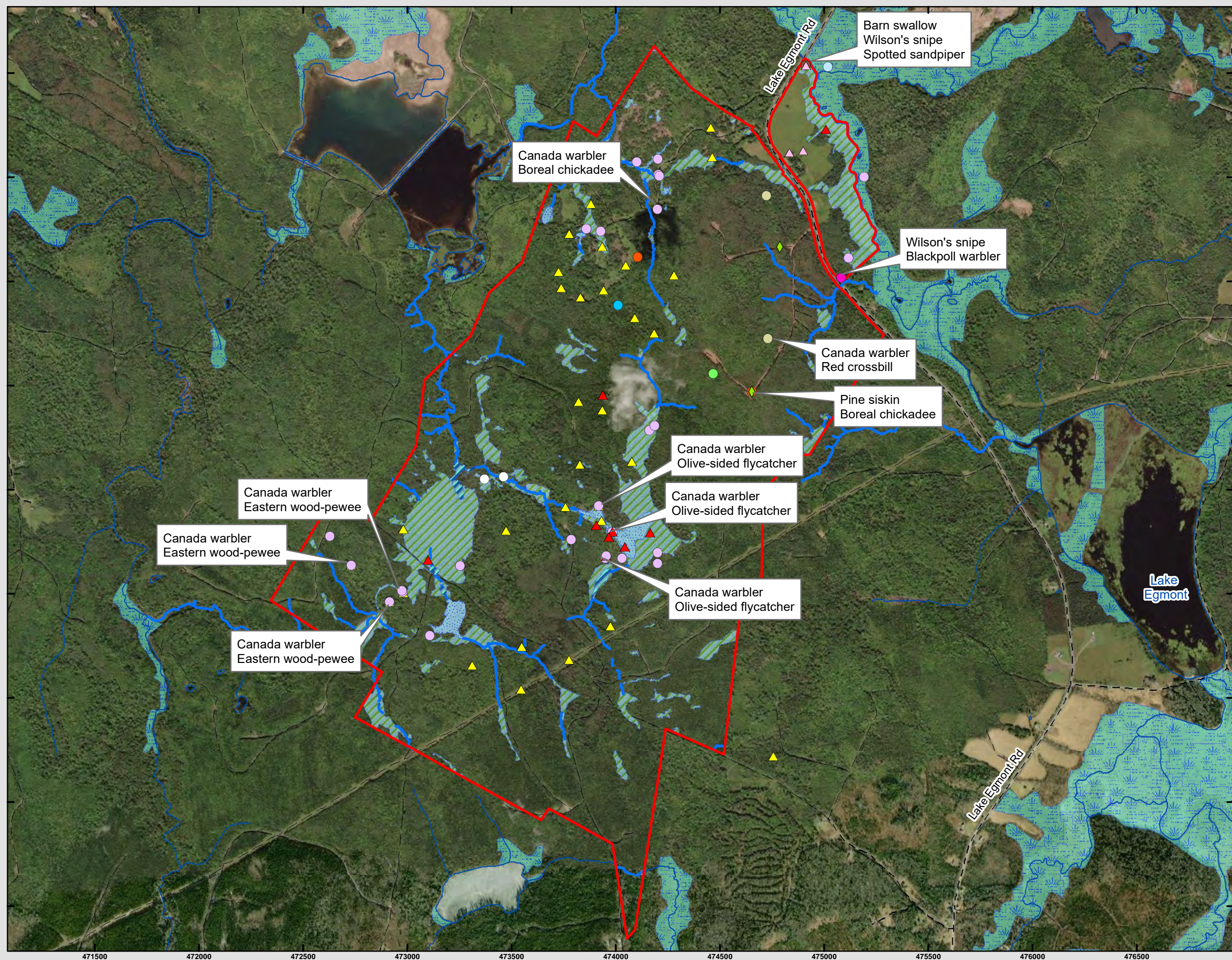
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1:17,000 Scale when printed @ 11" x 17"

Drawn By: MD Project #: 22-630  
Reviewed By: MJ Date: 2024-03-07



McCallum Environmental Ltd.



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**APPENDIX B: PRIORITY SPECIES LIST**

Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<b>Mammals</b>						
<i>Alces alces americana</i>	Moose	S1	0	0	Endangered	Moose are herbivores who live in boreal and mixed-wood forests. They are often found where there is an abundance of food (twigs, stems, and foliage of young deciduous trees and shrubs). In spring, islands and peninsulas are often used by cows when giving birth. In summer, access to wetlands (and aquatic vegetation) is important.
<i>Glaucomys volans</i>	Southern Flying Squirrel	S3S4	Not at Risk	No Status	0	Southern Flying Squirrel occurs in southern Nova Scotia in an area roughly bounded by the South Mountains in the north, the Gaspereau Valley (Kentville) to the west, the New Ross area in north-east Lunenburg County to the south and Kejimikujik National Park in the west. Southern Flying Squirrel selected forests with American beech, eastern hemlock, red oak, white ash and white pine. Nest trees (dead or alive) also tend to be larger in diameter than trees without nests (COSEWIC Assessment and Status Report).
<i>Myotis lucifugus</i>	Little Brown Myotis	S1	Endangered	Endangered	Endangered	Little Brown Myotis is one of the few bat species that uses buildings and other anthropogenic structures (e.g., bat boxes, bridges, and barns) to roost (particularly for maternity roosting), but it will also use cavities of canopy trees, foliage, tree bark, crevices on cliffs, and other structures.
<i>Myotis septentrionalis</i>	Northern Myotis	S1	Endangered	Endangered	Endangered	Northern Myotis may hibernate in cooler sections of a cave. Northern Myotis will generally return to the same hibernaculum, but not always in consecutive years. Northern Myotis roost singly or in small groups and favour tree roosts (under raised bark and in tree cavities and crevices), but they can also be found in anthropogenic structures (e.g., under shingles). Northern Myotis' maternity roosts are strongly associated with forest cover, streams, and tree characteristics (e.g., species, height, diameter, age, and decay). Females prefer to roost in tall, large diameter trees in early- to mid-stages of decay. Maternity colonies in Nova Scotia were generally in larger-than-average trees. Males generally roost alone under raised bark or within cavities of trees in mid-stages of decay.
<i>Pekania pennanti</i>	Fisher	S3	0	0	0	They are often found in deciduous and mixedwood forest stands in the forested region. They can also be found in wetland vegetation types including shrubby swamps, shrubby bogs, and marshes. There is a higher likelihood to find them in harvested stands compared to naturally regenerating stands of similar age.

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Perimyotis subflavus</i>	Tricolored Bat	S1	Endangered	Endangered	Endangered	Tri-colored Bat often select the deepest part of caves or mines where temperature is the least variable, have strong humidity level preferences, and use warmer walls than other species. They have been recorded within any one hibernacula, possibly because they tend to hibernate solitarily (i.e., not in clusters) in the deepest sections of the caves/mines. Tri-colored Bats exhibit high fidelity to hibernacula. Roosts provide thermal regulation, shelter from weather and predation, and can be sites for social interaction. Individuals may switch roosts regularly and therefore, may use a network of roosts in a roosting area. The tendency to switch roosts may depend on species, sex, age, reproductive status, and roost type.
<i>Sorex maritimensis</i>	Maritime Shrew	S3				Often found in marshes and wet meadows The most favoured habitat is the edges of freshwater swamps and marshes which have become overgrown with tangled grass and rushes.
<i>Sorex palustris</i>	American Water Shrew	S3S4				Mostly aquatic, the water shrew lives beneath the overhanging banks and in rock crevices along the edges of swiftly flowing mountain streams. Rhododendron and yellow birch are usually the dominant vegetation in these areas.
<i>Synaptomys cooperi</i>	Southern Bog Lemming	S3				They are often found in sphagnum bogs and low moist places, but they are also found in grasslands, mixed deciduous/coniferous forests, spruce-fir forests, freshwater wetlands, marshes, and meadows. They prefer areas with a thick mat of herbaceous and shrubby vegetation.
<b>Avifauna</b>						
<i>Bucephala clangula</i>	Common Goldeneye	S1?B,S UN,SU M	0	0	0	Winters in Nova Scotia along the coast. Generally migrates late in fall and early in spring. Males tend to winter farther north than females. Found in shallow coastal bays, estuaries that offer good foraging sites: sand, gravel, rock and boulder substrates supporting mollusks and crustaceans. In the interior, wintering flocks gather on large lakes and rivers as far north as open water occurs. Breeds between April and July (Audubon and The Cornell Lab)
<i>Buteo lagopus</i>	Rough-legged Hawk	S3S4	0	0	0	Common across Nova Scotia during nonbreeding (winter). Spends the winter in open country, including grasslands, coastal prairies, marshes, farmland and dunes. In tree-covered areas they hunt over open bogs and other clearings. Breeds mostly on tundra, in areas having cliffs for nest sites; some breed along northern edge of coniferous forest zone. Rough-legged Hawks breed in open country of the arctic, both in North America and Eurasia. Breeds between April and July. May mate for life (Audubon and The Cornell Lab).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Calcarius lapponicus</i>	Lapland Longspur	S3S4B, S5M	0	0	0	They winter in vast agricultural fields that are often devoid of other birdlife in that season in southern area, and head up to the tundra to breed in the summer. Breeds between April and July (Cornell Lab, Audubon).
<i>Calidris canutus</i>	Red Knot	S2?B,S UM	Special Concern/ Endangered/ Endangered	Not on Schedule 1/Not on Schedule 1/Not on Schedule 1	Endangered	Red Knots migrate through Nova Scotia along the coast in the summer and fall. Adults in faded breeding plumage are observed in July and August, while juveniles are mainly seen from August to October. Red Knots use different habitats during the breeding, wintering, and migration seasons. In the Arctic, they nest in extremely barren habitats, such as windswept ridges, slopes, or plateaus. Nesting sites are usually located in dry, south-facing locations, near wetlands or lakes, where the young are led after hatching. Red Knots generally feed in damp or barren areas that can be as far as 10 km from the nest. Migratory stopovers and wintering grounds are vast coastal zones swept by tides twice a day, usually sandflats but sometimes mudflats. In these areas, the birds feed on molluscs, crustaceans, and other invertebrates. The species also frequents peat-rich banks, salt marshes, brackish lagoons, mangrove areas, and mussel beds.
<i>Calidris minutilla</i>	Least Sandpiper	S3S4B	0	0	0	Common migrant (generally in flocks) in Nova Scotia. In Nova Scotia, Least Sandpipers are known to nest in sand dunes. During migration they stop on coastal mudflats, rocky shorelines and inland habitats including wet meadows, flooded fields, and muddy edges of lakes, ponds and ditches. On the coast they usually avoid sandy beaches and wide-open tidal flats, preferring narrow tidal creeks and the edges of salt marshes. Breeds between April and July (Audubon and The Cornell Lab).
<i>Calidris pusilla</i>	Semipalmated Sandpiper	S1B,S UM	0	0	0	Common migrant in Nova Scotia. Migrates in flocks (adults before juveniles). May make very long nonstop flights between major feeding areas on migration. Semipalmated Sandpipers nest in low tundra, usually not far from marshes or ponds (both dry upland habitats with sufficient vegetation cover). In preparation for migration, they gather into flocks in shallow-water mudflats or lakeshores. Migrating birds stop over at sewage ponds, ephemeral wetlands (rain pools), beaches, inlets, estuaries, tidal mudflat, sandbars and freshwater impoundments with shallow margins (edges of lakes and marshes). Breeds between April and July (Audubon and The Cornell Lab).
<i>Cardellina canadensis</i>	Canada Warbler	S1B	Special Concern	Threatened	Endangered	Forest undergrowth, shady thickets. Breeds in mature mixed hardwoods of extensive forests and streamside thickets. Prefers to nest in moist habitat: in luxuriant undergrowth, near swamps, on stream banks, in rhododendron thickets, in deep, rocky ravines and in moist deciduous second-growth.



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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Cardellina pusilla</i>	Wilson's Warbler	S2S3	0	0	0	Found in thickets along wooded streams, moist tangles, low shrubs, willows, alders. Breeds in thickets, second-growth, bogs, or in alder and willow groves near streams and ponds. In migration and winter, occurs from hot lowland thickets up to cool mountain woods; always in scrubby overgrown clearings and thin woods, not in the interior of dense forest. Breeds between April and July (Cornell Lab, Audubon).
<i>Cathartes aura</i>	Turkey Vulture	S3S4B, S4S5M	0	0	0	In past was not surveyed/very rare to see Turkey Vultures in Nova Scotia, but as the climate warms they are now sighted across the province (MBBA and Nova Scotia Bird Society). Look for Turkey Vultures as they soar high over open areas. They are particularly noticeable along roadsides and at landfills. At night, they roost in trees, on rocks and other high secluded spots. Most common over open or semi-open country (including mixed farmland, forest, rangeland and even small offshore islands), especially within a few miles of rocky or wooded areas providing secure nesting sites. Generally avoids densely forested regions. Breeds between April and July (Audubon and The Cornell Lab)
<i>Charadrius vociferus</i>	Killdeer	S2S3B, S5N,S5 M	0	0	0	Favours fields, sandbars, lawns, river banks, coastal estuaries, mudflats and shores. Often found on open ground, such as pastures, plowed fields and large lawns, even at a great distance from water. This species does well in areas disturbed by humans and is commonly spotted on roads, lawns, airports, parking lots, golf courses, fields and in gravel areas. Most successful nesting areas have some shallow water closeby or other good feeding area for the chicks. Generally the vegetation in fields inhabited by Killdeer is no taller than one inch. You can find Killdeer near water, but unlike many other shorebirds, they are also common in dry areas. Spring migration is very early, returning to some northern areas in February or March. Breeds between March and July (Audubon and The Cornell Lab).
<i>Chlidonias niger</i>	Black Tern	S3N	0	0	0	Uncommon migrant and breeder in Nova Scotia; has mainly been seen in Cumberland County. Migrants turn up in many sorts of wetland habitats: sewage lagoons, river edges, lakes, marshes, lagoons, beaches and over open ocean waters, even far out to sea. Black Terns nest in large freshwater wetlands, usually in dense marshes on the edges of shallow lakes associated with open prairies or northern forests (sometimes in rice fields or on river islands). Breeds in scattered colonies between April and July (Audubon and The Cornell Lab).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Chordeiles minor</i>	Common Nighthawk	S3?N,S UM	Special Concern	Threatened	Threatened	Common Nighthawk breeds in a range of open and partially open habitats, including forest openings and post-fire habitats, prairies, bogs, and rocky or sandy natural habitats, as well as disturbed areas. It is also found in settled areas that meet its habitat needs, those with open areas for foraging and bare or short-cropped surfaces for nesting. The species use of a wide range of habitats makes it difficult to estimate trends in habitat availability, except in urban habitats, where their main nesting sites – flat graveled roofs – are disappearing.
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	S2M	0	0	0	Most of this species in Nova Scotia likely comes from Iceland (followed by a sudden growth of the Icelandic nesting population in the 1930s). In winter, found primarily along seacoasts, estuaries and protected bays (generally rare on fresh waters well inland). Breeds along lakes, rivers, bogs, moors, grasslands, swamps and coastal marshes. Usually nests in colonies, sometimes in isolated pairs. Breeds in scattered colonies between April and July (Audubon and The Cornell Lab).
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	S1B, S4M	Special Concern	Special Concern	Vulnerable	Evening Grosbeak breeding habitat generally includes open, mature mixedwood forests, where fir species and/or White Spruce are dominant, and Spruce Budworm is abundant. Outside the breeding season, the species seems to depend largely on seed crops from various trees such as firs and spruces in the boreal forest, but is also attracted to ornamental trees that produce seeds or fruit, and bird feeders stocked with sunflower seeds.
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S3M	0	0	0	Black-billed Cuckoos are birds of woodlands and thickets, including aspen, poplar, birch, sugar maple, hickory, hawthorn and willow. They tend to occur more frequently in larger and denser woodlands than the Yellow-billed Cuckoo. On their wintering grounds, they live in forest, woodlands and scrub. A long-distance migrant, going to South America for the winter. Migrates at night; sometimes heard calling in flight overhead at night during the spring. During migration, they seek any kind of dense vegetation cover (e.g. young trees or tall shrubs). Common breeder in Nova Scotia. Breeds mostly in deciduous thickets and shrubby places, often on the edges of woodland or around marshes. Also in second growth of mixed deciduous-coniferous woods, or along their brushy edges. Breeds between April and July (Audubon and The Cornell Lab).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Contopus cooperi</i>	Olive-sided Flycatcher	S3B	Special Concern	Threatened	Threatened	Olive-sided Flycatcher has been widely observed in open coniferous or mixed coniferous forests, often located near water or wetlands with the presence of tall snags or trees from which the species sallies for prey and advertises its territory. Mature conifer stands within patchy landscapes influenced by natural disturbance (e.g., recent burns) support the highest densities of Olive-sided Flycatcher. Nests are generally placed toward the tip of coniferous branches (although other tree types have been used).
<i>Contopus virens</i>	Eastern Wood-Pewee	S3B, S5M	Special Concern	Special Concern	Vulnerable	The Eastern Wood-pewee is mostly associated with the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in forest stands of intermediate age and in mature stands with little understory vegetation. During migration, a variety of habitats are used, including forest edges, early and successional clearings.
<i>Coturnicops noveboracensis</i>	Yellow Rail	S2S3B, S4S5M	Special Concern	Special Concern	0	Yellow rail is distributed along northern Nova Scotia. Nesting Yellow Rails are typically found in marshes dominated by sedges, true grasses, and rushes, where there is little or no standing water (generally 0-12 cm water dept), and where the substrate remains saturated throughout the summer. They can be found in damp fields and meadows, on the floodplains of rivers and streams, in the herbaceous vegetation of bogs, and at the upper levels (drier margins) of estuarine and salt marshes. Nesting habitats usually have a dry mat of dead vegetation from previous growing seasons. A greater diversity of habitat types is used during migration and winter than during the breeding season. In winter, the rails are known to use coastal wetlands and rice fields. (COSEWIC Assessment and Status Report).
<i>Dolichonyx oryzivorus</i>	Bobolink	S3B	Special Concern	Threatened	Vulnerable	Bobolink has nested in forage crops (e.g., hayfields and pastures dominated by a variety of species, such as clover, Timothy, Kentucky Bluegrass, and broadleaved plants). The Bobolink occurs in various grassland habitats including wet prairie, graminoid peatlands and abandoned fields dominated by tall grasses, remnants of uncultivated virgin prairie (tall-grass prairie), no-till cropland, small-grain fields, restored surface mining sites and irrigated fields in arid regions. It is generally not abundant in short-grass prairie, Alfalfa fields, or in row crop monocultures (e.g., corn, soybean, wheat), although its use of Alfalfa may vary by region.

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Empidonax traillii</i>	Willow Flycatcher	S1B	0	0	0	Uncommon breeder throughout mainland Nova Scotia, not Cape Breton (MBBA, as of July 2021). In winter, they use shrubby clearings, pastures and woodland edges often near water. Migrates relatively late in spring and early in fall. Breeds in thickets of deciduous trees and shrubs, especially willows, or along woodland edges. Often near streams or marshes and may be found in drier habitats than the Alder Flycatcher. Breeds between April and July (Audubon and The Cornell Lab).
<i>Euphagus carolinus</i>	Rusty Blackbird	S3B	Special Concern	Special Concern	Endangered	Breeding habitat is characterized by coniferous-dominated forests adjacent to wetlands, such as slow-moving streams, peat bogs, sedge meadows, marshes, swamps and beaver ponds. On migration, the Rusty Blackbird is primarily associated with wooded wetlands. In winter, it occurs primarily in lowland forested wetlands, cultivated fields and pecan groves. Suitable habitat for the species appears to be decreasing on its breeding range and wintering grounds, due mainly to the loss and degradation of wetlands by human activities.
<i>Falco sparverius</i>	American Kestrel	S3N	0	0	0	Breeds in Nova Scotia but also can be a permanent resident. American Kestrels favor open areas with short ground vegetation and sparse trees (e.g. meadows, wood edges, grasslands, deserts, parks, farm fields, cities and suburbs). When breeding, kestrels need access to at least a few trees or structures that provide appropriate nesting cavities. American Kestrels are attracted to many habitats modified by humans, including pastures and parkland, and are often found near areas of human activity including towns and cities. In winter, females may occupy open habitats more so than males. Breeds between April and July (Audubon and The Cornell Lab).
<i>Gallinago delicata</i>	Wilson's Snipe	S3B,S3N,S3M	0	0	0	Common across Nova Scotia during breeding and also known as a permanent resident in the southern areas of the province. Wilson's Snipes can be found in all types of wet, marshy settings, including wet fields, bogs, fens, swamps, wet meadows and along muddy edges of rivers and ponds. They avoid areas with tall, dense vegetation, but need patches of cover to hide in and to provide a safe lookout for predators. During the breeding season they are mainly found around fresh marshes and bogs, shrubby streambanks and northern tundra. Breeds between April and July (Audubon and The Cornell Lab).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Hirundo rustica</i>	Barn Swallow	S3B	Special Concern	Threatened	Endangered	Barn Swallows forage over a wide range of open and semi-open habitats including natural and anthropogenic grasslands, other farmland, open wetlands, open water, savannah, tundra, highways and other cleared right-of-ways, and cities and towns. They avoid forested regions and high mountains. Barn Swallows throughout the world have adapted to nesting in or on human structures, including buildings, barns, bridges, culverts, wells and mine shafts. Use of natural nest sites such as caves or rock cliffs with crevices or ledges protected by overhangs is rarely reported. Nocturnal roosts are typically in reed or cane beds or other dense vegetation, usually in or near water.
<i>Icterus galbula</i>	Baltimore Oriole	S3B	0	0	0	Baltimore Orioles are often very common in open woods and groves in summer. Found in open woods, riverside groves, elms, shade trees. Breeds in deciduous or mixed woodland, generally in open woods or edges rather than interior of dense forest. May be common in trees in towns (Audubon). Breeds between April and July (Audubon and The Cornell Lab).
<i>Ixobrychus exilis</i>	Least Bittern	S3S4B	Threatened	Threatened	0	The Least bittern has been observed in every Province in Canada. However, it is only probable to be located in Nova Scotia. The Least Bittern breeds strictly in marshes dominated by emergent vegetation surrounded by areas of open water. Most breeding grounds in Canada are dominated by cattails, but breeding also occurs in areas with other robust emergent plants and in shrubby swamps. The presence of stands of dense vegetation is essential for nesting because the nests of Least Bittern sit on platforms of stiff stems. The nests are almost always within 10 m of open water. This small heron prefers large marshes that have relatively stable water levels throughout the nesting period. Needs for wintering habitat are less specific, and appear to be met by a wide variety of wetlands—not only emergent marshes like those used for breeding, but also brackish and saline swamps (Environment Canada Recovery Strategy)
<i>Lanius borealis</i>	Northern Shrike	SUB	0	0	0	They occur in open but brushy habitats, and on calm, sunny days they may sit up on utility wires, bushes, and trees (Cornell Lab). Nests are usually placed in a low tree or large shrub, often in spruce or willow, usually 6-15' above the ground. Breeds between April and July (Audubon and The Cornell Lab).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Limnodromus griseus</i>	Short-billed Dowitcher	S3B	0	0	0	Common migrant in Nova Scotia that prefers coastal habitats. Migrants are opportunistic in their choice of habitat, turning up in man-made environments such as impoundments, sewage ponds and flooded farm fields as well as in muddy margins of rivers, lakes and bays. Migrants also rest on rocky and sandy shorelines (beaches) and occasionally feed in such places, but they forage mostly where there is a fine muddy bottom covered by a few inches of water (pond edges, mudflats and tidal marshes). Breeds far north, mostly in open bogs, marshes and edges of lakes within coniferous forest zone. Breeds between April and July (Audubon and The Cornell Lab).
<i>Limosa haemastica</i>	Hudsonian Godwit	S2B	Threatened	Not on Schedule 1	0	Hudsonian Godwit occurs regularly during breeding or migration in all three territories and in provinces from British Columbia to Québec, as well as occasionally in the fall in all of the Atlantic provinces. Hudsonian Godwit breeds in wetland habitats (sedge meadows and muskeg) in sub-Arctic and Boreal regions. It uses a wide variety of habitats on migration, including freshwater marshes, saline lakes, flooded fields, shallow ponds, coastal wetlands and mudflats (COSEWIC Assessment and Status Report).
<i>Loxia curvirostra</i>	Red Crossbill	S2B	0	0	0	Found throughout the entire province year-round. Red Crossbills can be found in conifer forests and groves, and breeds in pines (predominately), spruce, hemlock, Douglas-fir, or other evergreens. Breeding occurs from April to July (The Cornell Lab, Audubon)
<i>Mareca strepera</i>	Gadwall	S3B,S4 S5M	0	0	0	Not common in Nova Scotia but there have been recent confirmed sightings, based on the distribution list by county in this file (MBBA, as of July 2021) - Found in lakes, ponds and marshes. They choose well-vegetated wetlands for foraging and concealing themselves. Gadwall breed mainly in prairie potholes (small ponds scattered throughout the Great Plains and Canadian prairies, hence why they are uncommon in Nova Scotia). Will also breed on tundra, deltas and wetlands in boreal forests farther north. Equally important for breeding are adjacent uplands with vegetation to conceal nests and ducklings. Breeds between April and July (but compared to most ducks, nesting begins rather late) (Audubon and The Cornell Lab)

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Mimus polyglottos</i>	Northern Mockingbird	S3B,S5 M	0	0	0	Year-round resident throughout Nova Scotia, less common in Cape Breton. Found year-round in areas with open ground and shrubby vegetation (e.g. dense, low shrubs - hedges, fruiting bushes and thickets). When foraging on the ground, it prefers grassy areas, rather than bare spots. Common places include roadsides, parkland, cultivated land, suburban areas, woodland edges and in second-growth habitat at low elevations. Breeds between April and July (Audubon and The Cornell Lab).
<i>Molothrus ater</i>	Brown-headed Cowbird	S3B	0	0	0	Found in farms, fields, prairies, wood edges, river groves. Favors open or semi-open country at all seasons. In winter often concentrates in farmland, pastures, or cattle feedlots. More widespread in breeding season, in grassland, brushy country, forest edges, even desert, but tends to avoid dense unbroken forest. Breeds between April and July, and lays eggs in nests of other birds (Audubon and The Cornell Lab).
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S2S3B, SUM	0	0	0	Uncommon breeder throughout mainland Nova Scotia, not Cape Breton (MBBA, as of July 2021). Migrates mostly at night. Breeds mainly in deciduous forest or mixed forest, but avoids pure stands of conifers. May be found in either continuous deep forest or in more open wooded areas, around edges of clearings or abandoned orchards. Dead snags and dying trees are important sources of the cavities they need for nesting (will even search out cavities in old orchards and in woody urban areas like parks, cemeteries and golf courses). If there are enough trees, they will claim territories in pastures, along streams and rivers, and in swamps and wetlands. Breeds between April and July (Audubon and The Cornell Lab).
<i>Numenius borealis</i>	Eskimo Curlew	SUB	Endangered	Endangered	0	This species have not been recorded in Nova Scotia since 2007. On spring and fall migration, a wide variety of habitats was used historically, including both inter-tidal and terrestrial habitats, the latter including anthropogenic landscapes. As on the breeding areas, the Eskimo Curlew commonly used ericaceous heathland on fall migration in southern Quebec, Labrador, Newfoundland and the Maritime Provinces. On spring migration, they were found in tallgrass and eastern mixed grass prairies, often in areas that had been recently burned or disturbed by grazing bison, and in cultivated fields. (COSEWIC Assessment and Status Report).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Numenius phaeopus hudsonicus</i>	Whimbrel	S3S4N	0	0	0	Common migrant in Nova Scotia. Migrating whimbrels feed mostly on tidal mudflats and sandflats; they also forage in saltmarshes, lagoons, estuaries and on reefs and rocky shorelines where small crabs are available. When not feeding, Whimbrels roost in flocks in marshes, meadows, fields, dunes and oyster beds, as well as on small islands and even in mangrove trees. Migrating Whimbrels are known to also use coastal tundra and heath in Alaska and Canada. North American Whimbrels breed in subarctic and alpine tundra and taiga, nesting in drier upland environments (heath) or (mainly) wetter lowlands with grasses, sedges, mosses, lichens, small shrubs and stunted trees. Breeds between April and July (The Cornell Lab and eBird).
<i>Oxyura jamaicensis</i>	Ruddy Duck	S3M	0	0	0	Uncommon in Nova Scotia during migration. Only a few confirmed sightings in Cumberland and Antigonish county (MBBA, as of July 2021) - Migration extends over a considerable period in both spring and fall. Migrating Ruddy Ducks stop in a variety of habitats, mainly on large, permanent wetlands, ponds, marshes, lakes and reservoirs. About 86 percent of the breeding population is concentrated in the prairie pothole region of south-central Canada, hence why they are uncommon in Nova Scotia. Breeds between April and July (Audubon and The Cornell Lab)
<i>Passerella iliaca</i>	Fox Sparrow	S2S3M	0	0	0	Found year round in Cape Breton, and throughout the migration season (late March and early November) in the rest of the province. Migrates at night. Found in wooded areas, undergrowth, brush. Breeds in brushy areas including woodland edges and clearings, streamside thickets, scrubby second growth, stunted coastal forest. Winters in similar habitats, also in brushy fields, chaparral, well-vegetated suburbs and parks. Breeds from April to July (The Cornell Lab, Audubon)
<i>Passerina cyanea</i>	Indigo Bunting	S3S4	0	0	0	This species favors brushy edges rather than unbroken forest. Indigo Buntings breed in brushy and weedy areas. They're common on the edges of woods and fields; along roads, streams, rivers, and powerline cuts; in logged forest plots, brushy canyons, and abandoned fields where shrubby growth is returning. They are also in clearings within deciduous woods, edges of swamps. Breeds between April and July (Audubon and The Cornell Lab).



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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Perisoreus canadensis</i>	Canada Jay	S2B, SUM	0	0	0	Year-round resident throughout Nova Scotia and commonly referred to as the Gray Jay. No regular migration. On rare occasions, small invasions of Canada Jays will move a short distance out of boreal forest in winter. Prefers boreal and subalpine forests across northern North America, usually where black or white spruce trees are common (also aspen, white birch, balsam fir, sugar maple, jack pine, red spruce, eastern white cedar, etc.). Found in various kinds of coniferous and mixed forest, but rarely occurs where there are no spruce trees. Mated pairs stay together all year and defend permanent territories. Breeding and nesting for this species begins very early, during late winter, with breeding grounds still snow-covered. Breeds until, approximately, July (Audubon and The Cornell Lab).
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S1B	0	0	0	Breeds throughout Nova Scotia. A long-distance migrant that migrates in flocks, traveling by day. Typically nests in colonies, sometimes with hundreds of nests crowded close together. These colonies are close to a water source, open fields or pastures for foraging, and a source of mud for nest building. Nest site is usually on vertical surface with some overhead shelter. Natural sites were on cliffs. Most sites today are on the sides of buildings, under bridges, in culverts or similar places. They now live in grasslands, towns, broken forest and river edges, but avoid heavy forest and deserts (e.g. open to semi-open land, farms, river bluffs and lakes). Still unaccountably scarce or missing in some seemingly suitable areas. Breeds between April and July (Audubon and The Cornell Lab).
<i>Phalacrocorax carbo</i>	Great Cormorant	S2B				Habitat is mainly over shallow waters close to shore, especially in sheltered bay areas. Nests on rocky sea cliffs of coasts and islands. In recent years, as population has increased, has been found in winter on large rivers inland. Breeds throughout the year, but mostly spring to late summer (April to August) (Audubon and The Cornell Lab)
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S1B				Look for these birds in forest edges and woodlands. Rose-breasted Grosbeaks breed in moist deciduous forests, deciduous-coniferous forests, thickets, and semiopen habitats. They gravitate toward second-growth woods, suburban areas, parks, gardens, and orchards, as well as shrubby forest edges next to streams, ponds, marshes, roads, or pastures. They favor edges or openings with combination of shrubs and tall trees, rather than unbroken forest. Breeds from April to July (The Cornell Lab, Audubon)

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Picoides arcticus</i>	Black-backed Woodpecker	SXM				Known throughout Nova Scotia year-round. Not strictly migratory, but may move around in response to changing conditions (e.g. destruction of habitat). Eastern birds occasionally stage southward irruptions in winter, with scattered individuals showing up well south of breeding range. Habitat includes boreal forests of firs and spruces (pine, Douglas-fir, hemlock, tamarack and spruce, especially spruce bogs). Favours areas of dead or dying trees (coniferous and deciduous), and may concentrate at burned or flooded areas with many standing dead trees. Frequents lowlands in the North and mountains in the West. Breeds between April and July (Audubon and The Cornell Lab).
<i>Pinicola enucleator</i>	Pine Grosbeak	S2S3M				Found throughout the province year-round. Pine grosbeaks can be found in conifers; in winter, other trees. Breeds in open coniferous forest, especially of spruce and fir. In winter often found in deciduous trees (especially fruiting trees), also in groves of pines and other conifers. Breeding occurs from April to July (The Cornell Lab, Audubon).
<i>Piranga olivacea</i>	Scarlet Tanager	S1B				These birds can be found in oak forests in summer, but they often remain out of sight as they forage in the leafy upper branches. Nest site is in tree (usually deciduous), typically 20-30' above ground. Found in forests and shade trees (especially oaks). Breeds mostly in deciduous forest, predominately oaks but also in maple, beech, mixed pine-oak woods, and coniferous woods dominated by pine or hemlock. Breeding Scarlet Tanagers prefer large forest tracts with large trees. During spring and fall they use similar forest habitats as well as open spaces such as parks and gardens. Breeds between April and July (The Cornell Lab, Audubon)
<i>Pluvialis dominica</i>	American Golden-Plover	S3S4B, S5M				Uncommon migrant across Nova Scotia. Found in prairies, mudflats and shores (tundra in the summer). During migration, usually found on short-grass prairies, flooded pastures, plowed fields and, less often, on shorelines, mudflats and beaches (also found in disturbed areas - airports, golf courses and tilled farmland for example). Breeds on Arctic tundra, especially in low vegetation on rocky slopes. Breeds between April and July (Audubon and The Cornell Lab).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Pluvialis squatarola</i>	Black-bellied Plover	S1?B,SUM				Migrates through Nova Scotia. Found in mudflats, open marshes and beaches (tundra in the summer). Nesting occurs in drier tundra, often more barren ridges above lowland lakes and rivers (sometimes in lower wet tundra near coast). In winter, found mostly on open sand beaches and tidal flats. During migration will often stop in short-grass prairie or plowed fields, especially during high tides, when mudflats are underwater. In some places, they forage on rocky shorelines. Black-bellied Plovers roost together at high tide and overnight on beaches, saltmarshes and sometimes upland habitats such as farm fields. Most migrate along coast or over sea, but numbers stop over regularly at some inland sites. Breeds between April and July (Audubon and The Cornell Lab).
<i>Podiceps auritus</i> pop. 2	Horned Grebe - Western population	S3				The Horned Grebe winters on the coast of Nova Scotia. It has been observed on lakes, rivers and marshes. Some birds follow coastlines as part of their migration. Horned Grebes generally winter in marine habitats, mainly estuaries and bays. Birds are found in greatest numbers in coastal habitats, including areas that offer some degree of protection. Some birds winter on inland lakes and rivers in areas where the minimum temperature in January is higher than -1°C (Species at Risk Public Registry)
<i>Poecile hudsonicus</i>	Boreal Chickadee	S2S3B				Year-round resident throughout Nova Scotia. Occasional small southward invasions in fall, with a few appearing south of breeding range (similar to Black-capped Chickadees invasions). Boreal Chickadees inhabit mostly mature coniferous forests (sometimes mixed forests), usually spruce and balsam fir, often near water. During late fall and winter irruptions, they tend to be found mostly in areas dominated by coniferous trees. Occurs in low stunted spruces as far North as treeline (e.g. spruce bogs). May mate for life, the birds remaining together all year. Nests in a hole in a tree, either a natural cavity or one they created (or from another species). Breeds between April and July (Audubon and The Cornell Lab).
<i>Poocetes gramineus</i>	Vesper Sparrow	S2S3B, S2S3N				Vesper Sparrows breed in open areas with short, sparse grass, areas where there are a few taller plants for use as song perches, and scattered shrubs including, old fields, pastures, weedy fencelines and roadsides, hayfields, and native grasslands. Can be found in meadows, fields, prairies, roadsides, open grassy or weedy fields. May be in weedy roadsides, gravel pits, stubble fields, grassy areas just above sandy beaches. Breeds from April to July (The Cornell Lab, Audubon).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Rallus limicola</i>	Virginia Rail	S3B				Breeds across Nova Scotia, but more common in the northern region. Nests in a variety of marshy situations, mostly fresh, but also brackish marshes near the coast. Where this species and Sora breed in same marshes, Virginia Rail typically nests in drier spots. Often moves into salt marshes in winter. During migration, sometimes found in odd spots, even city streets. Virginia Rails occupy shallow (sometimes deeper) freshwater wetlands with tall stands of cattails and rushes (need areas with standing water typically less than 6 inches deep with a muddy bottom). They are most common in wetlands with 40–70% coverage of tall emergent vegetation, mixed with open water, mudflats and areas with matted vegetation. During the nonbreeding season, Virginia Rails use similar habitat, but may venture into more open areas. Breeds between April and July (Audubon and The Cornell Lab).
<i>Riparia riparia</i>	Bank Swallow	S3S4				As with other swallow species, migratory stopover points are usually centred on large marshes where birds roost at night and disperse to forage throughout the day. There is little information available for Bank Swallows in terms of the importance of area requirements of these disparate habitats and their proximity to each other.
<i>Setophaga castanea</i>	Bay-breasted Warbler	S3B, S5N, S5M				Bay-breasted warblers are found in woodlands, conifers in summer. Usually breeds in northern coniferous forest, in thick stands of spruce and fir. They are predators of spruce budworm, and are abundant in spruce forests during outbreaks. Where spruce is not found, will nest in deciduous or mixed second-growth woods of birches, maples, firs, and pines. Breed from April to July, typically in the latter half of the breeding window (The Cornell Lab, Audubon)
<i>Setophaga pinus</i>	Pine Warbler	S2B, SUM				Pine Warblers live in pine or mixed pine-deciduous forest. Also sometimes in cedar or cypress. Various spottings throughout Nova Scotia, generally in the southern portion of the province. Breeds April to July (The Cornell Lab, Audubon)
<i>Setophaga striata</i>	Blackpoll Warbler	S2S3M				The blackpoll warbler can be found in conifers; broadleaf trees in migration. Breeds in low northern spruce forest. In migration, moves through forests, parks and gardens, they stop over in scrubby thickets and mature evergreen and deciduous forests. Found in the southern half of Nova Scotia during migration and the northern half during the breeding season. Breeding occurs from April to July (The Cornell Lab, Audubon).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Setophaga tigrina</i>	Cape May Warbler	S3M				The Cape May Warbler can be found in spruce forest; other trees in migration. Breeds in spruce forest, especially during spruce budworm outbreaks, either in pure stands or mixed with firs or other trees, generally in more open woods or near the forest edge. During migration often favors conifers, but also forages in deciduous trees and thickets. Breeding occurs from April to July (The Cornell Lab, Audubon)
<i>Sialia sialis</i>	Eastern Bluebird	S3N, SUM				Uncommon breeder throughout Nova Scotia. In the north, arrives quite early in spring, and lingers late in fall. These birds live in semi-open country with scattered trees, but with little understory and sparse ground cover. Original habitats probably included open, frequently burned pine savannas, beaver ponds, mature (but open) woods and forest clearings/openings. Today, they are most common along pastures, roadsides, agricultural fields, suburban parks, backyards and golf courses. Breeds between April and July (Audubon and The Cornell Lab).
<i>Spatula clypeata</i>	Northern Shoveler	S3				Migrates through all parts of Nova Scotia, except Cape Breton (uncommon for this species to breed in Nova Scotia). Migratory period is quite prolonged in both spring and fall, with many birds moving late in spring and early in fall. Northern Shovelers use shallow wetlands with submerged vegetation during the breeding season, nesting along the margins and in the neighboring grassy fields. Outside of the breeding season they forage in saltmarshes, estuaries, lakes, flooded fields, wetlands, agricultural ponds and wastewater ponds (and fields in vicinity of shallow water) with extensive muddy margins, including stagnant or polluted waters not much favored by other ducks. Pair formation begins in winter and continues during spring migration. Breeds between April and July (Audubon and The Cornell Lab)
<i>Spatula discord</i>	Blue-winged Teal	S1S2B, SUM				Found mainly in fresh ponds and marshes. In summer they use shallow freshwater marshes and ponds in open country, as well as brackish marshes near coast. In migration and winter they forage and stop in any kind of shallow waters, whether inland or coastal. Flocks in migration are sometimes seen over ocean, many miles offshore. They are flightless during their late summer molt, and they spend this time in prairie potholes or large marshes. Blue-winged Teal nest among grasses or herbaceous vegetation. Pair formation begins in early winter and continues during spring migration. Breeds between April and July (Audubon and The Cornell Lab)

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Spinus pinus</i>	Pine Siskin	S2S3B				Found throughout the province year-round. Pine Siskins can be found in conifers, mixed woods, alders, weedy areas. Breeds mostly in coniferous and mixed woods, often around edges or clearings; sometimes in deciduous woods, isolated conifer groves. In migration and winter occurs in many kinds of semi-open areas, woodland edges, weedy fields. Breeding occurs from April to July (The Cornell Lab, Audubon)
<i>Sterna paradisaea</i>	Arctic Tern	S2B				Common on-shore in Nova Scotia for the breeding season and common off-shore during migration. At sea for most of year, in wide variety of situations, but seems to spend most time over cold waters and well offshore. Rarely found inland. They tend to migrate offshore although some individuals may migrate overland. They forage over streams, ponds, lakes, estuaries and the open ocean. Nests in colonies (sometimes with other tern species), sometimes in isolated pairs (in treeless areas with little to no ground cover (coastal tundra), in open boreal forests and on undisturbed small islands and barrier beaches). Breeds between April and July (Audubon and The Cornell Lab).
<i>Toxostoma rufum</i>	Brown Thrasher	S3S4B, S4S5M				Not common and rarely seen in Nova Scotia, with no recorded sightings in Cape Breton (MBBA, as of July 2021). In eastern North America, Brown Thrashers nest in thickets, brush, shubbery, hedgerows, forest edges and overgrown clearings in deciduous forest. On rare occasions they breed in backyards and gardens with shrubs and hedges (but in general - areas of dense low growth, especially thickets around edges of deciduous or mixed woods, shrubby edges of swamps or undergrowth in open pine woods). Breeds between April and July (Audubon and The Cornell Lab).
<i>Tringa flavipes</i>	Lesser Yellowlegs	S2S3B, S4S5M				Common migrant throughout Nova Scotia. Occurs widely in migration, including coastal estuaries, salt and fresh marshes, mudflats, shores/edges of lakes and ponds; typically more common on freshwater habitats. Often in same places as Greater Yellowlegs, but may be less frequent on tidal flats. Wetland habitats ranging from tidal flats to sewage ponds to flooded fields; often in the company of other shorebird species. Breeds in open boreal forests and meadows interspersed with marshes and bogs. Breeds between April and July (Audubon and The Cornell Lab).
<i>Tringa melanoleuca</i>	Greater Yellowlegs	S3B, S5M				Common migrant in Nova Scotia (migrates in flocks). During migration and throughout the winter, Greater Yellowlegs use a wide variety of fresh and brackish wetlands, including mudflats, estuaries, beaches, marshes, lake and pond edges, wet meadows, sewage ponds and flooded agricultural fields. Breeds in boggy and marshes places within northern coniferous forest. Breeds between April and July (Audubon and The Cornell Lab).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S3B, SUM				Common breeder throughout Nova Scotia. A long-distance migrant that uses many habitats and migrates in flocks. Unlike many of the migratory songbirds, kingbirds may travel mostly by day. The Eastern Kingbird usually breeds in fields with scattered shrubs and trees, in orchards and along forest edges (also clearings, roadsides, parks, newly burned forest, beaver ponds, golf courses and urban environments with tall trees and scattered open spaces). It is drawn to water, often nesting densely in trees that overhang rivers or lakes. In summer, requires open space for hunting. Often common around edges of marshes, farmland and native tallgrass prairie. Breeds between April and July (Audubon and The Cornell Lab).
<i>Vireo gilvus</i>	Warbling Vireo	S3B				Occurs in deciduous and mixed woods, aspen groves, poplars, shade trees. Breeds in open deciduous or mixed woodland; also in orchards, shade trees of towns (Audubon). They stay high in deciduous treetsos (Cornell Lab). Breeds between April and July (Audubon and The Cornell Lab).
<i>Vireo philadelphicus</i>	Philadelphia Vireo	S2B, SUM				Occurs in second growth; poplars, willows, alders. Breeds in deciduous and mixed woodlands, especially near their edges, or in the young growth of overgrown pastures. Also nests in willows and alders along streams, lakes, and ponds. Breeds between April and July (Audubon).
<b>Herpetofauna</b>						
<i>Chelydra serpentina</i>	Snapping Turtle	S3	Special Concern	Special Concern	Vulnerable	They are common in southwestern Nova Scotia and less common on the northeastern mainland. Although Snapping Turtles occupy a wide variety of habitats, the preferred habitat for this species is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often found in ponds, marshes, swamps, peat bogs, shallow bays, river and lake edges, and slow-moving streams. turtles appear to prefer the following characteristics for their hibernacula: water shallow enough to let the turtle reach the surface to breathe, but deep enough so the water will not freeze to the bottom; a location that is likely to freeze over later in the season and thaw earlier in the spring; a thick layer of mud in which the turtle can bury itself; and additional submerged cover, such as a floating mat of vegetation, roots, stumps, branches or logs, a muskrat dwelling or an overhanging bank.

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Chrysemys picta picta</i>	Eastern Painted Turtle	S4	Special Concern	Special Concern	0	Eastern Painted Turtle is found in New Brunswick, Nova Scotia, and the Atlantic coastal states east of the Appalachian Mountains. Painted Turtles occupy slow moving, relatively shallow and well-vegetated wetlands (e.g., swamps, marshes, ponds, fens, bogs, and oxbows) and water bodies (e.g., lakes, rivers, creeks, and streams) with abundant basking sites and organic substrate. These turtles are found in association with submergent aquatic plants, which are used for cover and feeding. The species is semi-tolerant of human-altered landscapes and may occasionally be found occupying urban ponds and lands subject to anthropogenic disturbance (e.g., farm ponds, impoundments, water treatment facilities). Suitable nesting habitat includes open, often south-facing, and sloped areas with sandy-loamy and/or gravel substrate usually within 1200 m of aquatic active season habitats. Painted Turtles overwinter in shallow water with deep sediment (COSEWIC Assessment and Status Report).
<i>Glyptemys insculpta</i>	Wood Turtle	S2	Threatened	Threatened	Threatened	Wood Turtles are strongly associated with meandering, shallow rivers with sand, gravel, and/or cobble bottoms; these rivers are typically clear, with moderate current and frequent oxbows. Wood Turtles hibernate aquatically in streams and rivers (October to April, depending on location). Overwintering sites are usually on the bottom of deep pools, often with fallen debris that provides structure and prevents dislodging during high flow events. Found throughout the Province with concentrations in Guysborough and Annapolis Counties. Local plants include alders, chokecherry, hawthorn and mixed wood stands of deciduous and coniferous trees. Females lay their eggs in sandy bars along rivers and other gravel areas (driveways, roadsides, borrow pits) in June.
<i>Hemidactylium scutatum</i>	Four-toed Salamander	S3	0	0	0	Four-toed salamanders have specialized habitat requirements which require suitable breeding wetlands within or adjacent to mature forests. They prefer mature, mesic forests with dense canopy cover to preserve body moisture, an abundance of downed woody debris for cover and foraging opportunities, and vernal pools, ponds, bogs, shallow marshes, or other fishless bodies of water for nesting and larval success. Wooded wetlands such as seepage swamps or cedar swamps with many moss mats are ideal. Male adults can be located under leaves, bark, and logs in the upland forest, while females are most often found during the breeding season nesting in moss mats which overhang pools of water. (Harding 1997).



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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Anguilla rostrata</i>	American Eel	S3B	Threatened	Not on Schedule 1	0	During their oceanic migrations, eels occupy salt water and in their continental phase (growth in continental waters), they use all salinity zones. In freshwater habitats, preferred habitat can be found in both lentic and lotic waters including all waters extending from the high-water mark down to at least 10 m depth for all reaches currently or formerly used by the American Eel (COSEWIC Assessment and Status Report).
<i>Alosa pseudoharengus</i>	Alewife	S3N	0	0	0	A marine fish that uses freshwater streams for spawning, and is now landlocked in many inland lakes. They have been known to enter Grand, Shubenacadie Lake, as well as Fletcher Run and Rawdon rivers. In the Maritime provinces, spawning commences in May and continues until late in June (Scott and Crossman, 1973).
<i>Culaea inconstans</i>	Brook Stickleback	S5	0	0	0	Inhabits clear, cold, densely vegetated waters of small streams and spring-fed ponds, and is found along the swampy margins of beach ponds of larger lakes. They are tolerant of salt water for short periods of time. Spawning occurs in shallow water from late April to July, depending on the water temperature (Scott and Crossman, 1973)
<i>Margariscus nachtriebi</i>	Northern Pearl Dace	S3	0	0	0	Cool, clear headwater streams in the south, bog drainage streams, ponds and small lakes in the north, and in stained, peaty waters of beaver ponds.. Spawning occurs in clear water over sand or gravel in weak or moderate current (Scott and Crossman 1973).
<i>Morone saxatilis</i>	Striped Bass	S3	Endangered	Not on Schedule 1	0	The natural range of Striped Bass covers the Atlantic coast of North America. The southern Gulf of St. Lawrence DU occurs in the southern Gulf of St. Lawrence, primarily on the east coast of New Brunswick, but also part of the coast of Nova Scotia. The Bay of Fundy DU occurs in the Bay of Fundy. There is one confirmed spawning population in the Shubenacadie River, NS, and one has been extirpated from the Annapolis River, NS (COSEWIC Assessment and Status Report).

Scientific Name	Common Name	SRank	COSEWIC	SARA	NSEA	Habitat Description
<i>Morone saxatilis</i> <i>pop. 2</i>	Striped Bass - Bay of Fundy population	S2S3B, S2S3N	Endangered	Not on Schedule 1	0	Shubenacadie River, Saint John River (historically), and Annapolis River (historically). In most Striped Bass populations, spawning, incubation and early larval development occur in fresh or slightly brackish waters. The Shubenacadie River population, however, spawns in a section of its major tributary, the Stewiacke River, affected by a tidal bore. At the juvenile and adult stages, Striped Bass use coastal and estuarine habitats and saltwater systems. Eelgrass plays an important role for several species of fish at different stages of their life cycle, including the Striped Bass for rearing, feeding and sheltering. Young and adult Striped Bass populations undertake a fall migration to estuaries or freshwater habitats to overwinter (see Dispersal and Migration section). This behaviour is considered to enable them to avoid the low winter ocean temperatures. Wintering and spawning sites do not necessarily overlap in distribution or occur in the same drainage (COSEWIC Assessment and Status Report).
<i>Salmo salar</i> <i>(landlocked)</i>	Atlantic Salmon (landlocked)	S2S3B, S2S3N				Found in Grand Lake and Lake Charlotte, Halifax Co. In the autumn they move into rocky shallows to prepare for spawning, in the winter they can be found throughout the lake, and in the spring they often occur in surface waters. As water warms up, salmon will retire to the cooler waters. Spawning occurs in the fall (Scott and Crossman, 1973).
<i>Salmo salar</i> <i>pop.</i> 6	Atlantic Salmon - Nova Scotia Southern Upland population	S1S2				Southern Upland Atlantic Salmon typically spend two to four years in freshwater as juveniles before migrating to the north Atlantic Ocean. After staying at sea for one to three years, adults return to freshwater to spawn. Rivers that support Atlantic Salmon are generally clear, cool and well-oxygenated, with gravel, cobble and boulder substrates.
<i>Salvelinus</i> <i>fontinalis</i>	Brook Trout	S1				Most common in cool well-oxygenated waters of lakes and streams. In autumn, brook trout move into smaller, shallower streams and require free passage along streams to move between areas of use. Spawning occurs from October - early December (Gilhen, 1974)
<b>Invertebrates</b>						
<i>Bombus</i> <i>bohemicus</i>	Ashton Cuckoo Bumble Bee	S1	Endangered	Endangered	Endangered	Currently, nothing is known about the mating and overwintering habitat requirements for the Gypsy Cuckoo Bumble Bee. Overwintering habitat for bumble bees in Ontario may include rotting logs, leaf litter and mulch, burrows in soil, and garden compost. Forage habitat includes the plant species mentioned below as well as other flowering plants which bloom early spring (e.g. Willow) to late autumn (e.g. Goldenrod). Forage habitat occurs in old fields, grasslands, dunes, alvars, woodlands (especially in the spring) and road sides.

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<i>Bombus suckleyi</i>	Suckley's Cuckoo Bumble Bee	SH	Threatened	Not on Schedule 1	0	Suckley's Cuckoo Bumble Bee occurs in most Canadian ecozone including the Atlantic Maritimes. Suckley's Cuckoo Bumble Bee occurs in diverse habitats including open meadows and prairies, farms and croplands, urban areas, boreal forest, and montane meadows. Records are from sea level to 1200 m although the species could potentially occur at higher elevations where its host(s) occur. In the early spring, hosts typically establish nests in abandoned underground rodent burrows or other dry natural hollows; because Suckley's Cuckoo Bumble Bee is a nest parasite these same host residence sites also serve as its habitat. Adults have been recorded feeding on pollen and nectar from many flowers (COSEWIC Assessment and Status Report).
<i>Bombus terricola</i>	Yellow-banded Bumble Bee	S3	Special Concern	Special Concern	Vulnerable	Habitat generalist within open coniferous, deciduous and mixed-wood forests, wet and dry meadows and prairie grasslands, meadows bordering riparian zones, and along roadsides, urban parks, gardens and agricultural areas, subalpine habitats and more isolated natural areas.
<i>Coccinella transversoguttata</i>	Transverse Lady Beetle	SH	Special Concern	Special Concern	Endangered	The Transverse Lady Beetle is reported to be a habitat generalist occurring within agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, sand dune edges and riparian areas.
<i>Coccinella transversoguttata richardsoni</i>	Transverse Lady Beetle	SH	Special Concern	Special Concern	0	The Canadian range of the Transverse Lady Beetle stretches from St. John's, Newfoundland and Labrador, west to Vancouver Island. The Transverse Lady Beetle is a habitat generalist and known to occur within agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, and riparian areas. The Transverse Lady Beetle can also be found in a wide variety of non-agricultural vegetation including birch, pine, spruce, maple, mountain ash, poplar, willow, sage, cherry, alder, thistles, grasslands, and scruff pea plants along the edge of sand dunes. Overwintering adults tend to aggregate in well ventilated microhabitats such as under stones, rock crevices, in grass tussocks, in leaf litter, or in tree bark (COSEWIC Assessment and Status Report).

Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Danaus plexippus</i>	Monarch	S2?B, S3M	Endangered	Special Concern	Endangered	The breeding habitat of the Eastern and Western populations in Canada is confined to where milkweeds grow, since leaves of these plants are the sole food of the caterpillars. The different species of milkweeds grow in a variety of environments, including meadows in farmlands, along roadsides and in ditches, open wetlands, dry sandy areas, short and tall grass prairie, river banks, irrigation ditches, arid valleys, and south-facing hillsides. Milkweeds are also often planted in gardens. The Monarch is known to breed on native milkweeds within their natural ranges. The most commonly used other sources of nectar are goldenrods ( <i>Solidago</i> spp.), asters ( <i>Doellingeria</i> , <i>Eurybia</i> , <i>Oclemena</i> , <i>Symphotrichum</i> and <i>Virgulus</i> ), the introduced Purple Loosestrife ( <i>Lythrum salicaria</i> ), and various clovers ( <i>Trifolium</i> spp. and <i>Melilotus</i> spp.)
<b>Molluscs</b>						
<i>Alasmidonta undulata</i>	Triangle Floater	S2S3	0	0	0	They prefer small, steady-flowing streams close to headwaters. It is sometimes found in lakes or ponds, and most often found in gravelly sand, mud, or between large stones. (Vermont Atlas, 2021a)
<i>Alasmidonta varicosa</i>	Brook Floater	S3	Special Concern	Special Concern	Threatened	Found in rivers, streams, and lakes. They prefer watercourses with a moderate to high water flow with rocks, cobble and sand-pocket areas and may also be found in certain lakes in Nova Scotia. They are typically found clustered in sand-pocket areas behind boulders and stream banks, likely as a means of protection in high-flow velocity. The Brook Floater occurs in a relatively small number of rivers, including the Annapolis, LaHave, Gays, Wallace, East St. Marys and Salmon Rivers in Nova Scotia.
<i>Margaritifera margaritifera</i>	Eastern Pearlshell	S2	0	0	0	The mussels live buried or partly buried in coarse sand and fine gravel in clean, oligotrophic, fast-flowing and unpolluted rivers and streams (Skinner et al., 2003).
<i>Strophitus undulatus</i>	Creeper	S3				Shallow freshwater. Riffles, moderate-low gradient, creek, pool (Nature Serve Explorer, 2021).
<b>Vascular Plants</b>						
<i>Acer saccharinum</i>	Silver Maple	S1	0	0	0	Generally found near flowing water and in wetlands. In Nova Scotia, it has been found along the Cornwallis River, Kings Co. (Munro, Newell & Hill, 2014).
<i>Agalinis purpurea</i>	Purple False-Foxglove	S2S3	0	0	0	Bogs, calcareous and mafic fens, open floodplain swamps, depression ponds, interdune swales, tidal freshwater marshes and swamps; more numerous in a variety of wet to mesic, open, disturbed habitats, including old fields, clearings, and roadsides. Flowers in late summer to early fall (Digital Atlas of Virginia Forest, nd).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Agalinis purpurea</i> var. <i>parviflora</i>	Small-flowered Purple False Foxglove	S2S3	0	0	0	Sandy soils of stream and lake margins, bogs, and barren (NatureServe, 2021)
<i>Agalinis tenuifolia</i>	Slender Agalinis	S1	0	0	0	Anthropogenic (man-made or disturbed habitats), brackish or salt marshes and flats, fresh tidal marshes or flats, meadows and fields, woodlands <a href="https://gobotany.nativeplanttrust.org/species/agalinis/tenuifolia/">https://gobotany.nativeplanttrust.org/species/agalinis/tenuifolia/</a> ; Exotic to Nova Scotia, <a href="http://www.accdc.com/webranks/NSall.htm">http://www.accdc.com/webranks/NSall.htm</a> .
<i>Ageratina altissima</i>	White Snakeroot	S1S2	0	0	0	Grows in moist soils at the edge of fields and forests. Flowers late summer, August and September. Known from Mill Brook, McGahey Brook and a brook near Refugee Cove, all in Cape Chignecto Provincial Park; older collection from Antigonish County. (Munro, Newell and Hill, 2014)
<i>Ageratina altissima</i> var. <i>altissima</i>	White Snakeroot	S1S2	0	0	0	Grows in moist soils at the edge of fields and forests. Flowers late summer, August and September. Known from Mill Brook, McGahey Brook and a brook near Refugee Cove, all in Cape Chignecto Provincial Park; older collection from Antigonish County. (Munro, Newell and Hill, 2014)
<i>Allium schoenoprasum</i>	Wild Chives	S1?	0	0	0	Wet meadows, rocky or gravelly stream banks and lake shores. Flowering June to August (Flora North America).
<i>Allium schoenoprasum</i> var. <i>sibiricum</i>	Wild Chives	S1?	0	0	0	Wet meadows, rocky or gravelly stream banks and lake shores. Flowering June to August (Flora North America).
<i>Allium tricoccum</i> var. <i>burdickii</i>	Narrow-leaved Wild Leek	S1?	0	0	0	DISTRIBUTION NOT KNOWN IN NS. Dry soil in upland woods. Flowering early June (Flora North America).
<i>Amelanchier fernaldii</i>	Fernald's Serviceberry	S2S3	0	0	0	Thickets, open barrens, shores, and ravines. Occurs mostly in calcareous areas. Grows in riparian and shrub wetlands (Nature Serve Explorer, nd). Flowers June - August (Munro, Newell & Hill, 2014).
<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry	S1	0	0	0	Found in disturbed habitats such as roadsides, fields, sand plains, riparian meadows and barrens (Munro, Newell & Hill, 2014). Bloom time April to May (Missouri Botanical Garden, nd)
<i>Amelanchier spicata</i>	Running Serviceberry	S3S4	0	0	0	Man-made or disturbed habitats, cliffs, balds, ledges, forest edges, grassland, meadows and fields, woodlands (GoBotany, nd). Flowers in the spring (NC State Extension, nd)

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Andersonglossum boreale</i>	Northern Wild Comfrey	S1	0	0	0	A generalist. along the borders of woods and thickets, along trails and pathways through woods, and within upland deciduous woods. It appears to prefer circumneutral or even calcareous areas. The soils are usually sandy or rocky (New York Natural Heritage Program 2005). Rare in open woods and roadsides (Rhoads and Block 2000). Borders, openings, and clearings or under dense shade in coniferous or mixed woods (fir, cedar, spruce, pine, birch, aspen, and occasionally beech and maple), especially in sandy or rocky soil (Voss 1996). Uplands woods (Gleason & Cronquist 1991). Rich woods and thickets (Fernald 1970). flowers of this plant begin to appear mid-May and persist into early July
<i>Angelica atropurpurea</i>	Purple-stemmed Angelica	S3	0	0	0	Grows in swamps, meadows, in ditches and along streams. Flowers late May until September. Very abundant in northern Cape Breton (Munro, Newell & Hill, 2014)
<i>Antennaria parlinii</i>	Parlin's Pussytoes	S2	0	0	0	Found in dry soils of pine and oak forests, pastures, oldfields, and rocky banks. Flowers in June or July. Only known from along the LaHave River (Bridgewater), the Halfway River (Hants County) and from several Kings County locations. More recently found along the Kennetcook River, Hants County and East Branch River John, Pictou County (Munro, Newell and Hill, 2014).
<i>Antennaria parlinii ssp. fallax</i>	Parlin's Pussytoes	S2	0	0	0	Found in dry soils of pine and oak forests, pastures, oldfields, and rocky banks. Flowers in June or July. Only known from along the LaHave River (Bridgewater), the Halfway River (Hants County) and from several Kings County locations. More recently found along the Kennetcook River, Hants County and East Branch River John, Pictou County (Munro, Newell and Hill, 2014).
<i>Antennaria rosea</i>	Rosy Pussytoes	S1	0	0	0	The rosy-coloured flowers are distinctive and like no others of the genus in NS. It has very recently been confirmed at Cape d'Or (Munro, Newell and Hill, 2014).
<i>Antennaria rosea ssp. arida</i>	Rosy Pussytoes	S1	0	0	0	The rosy-coloured flowers are distinctive and like no others of the genus in NS. It has very recently been confirmed at Cape d'Or (Munro, Newell and Hill, 2014)
<i>Asplenium viride</i>	Green Spleenwort	S3	0	0	0	Limestone and other basic rocks (Flora of North America).
<i>Barbarea orthoceras</i>	American Yellow Rocket	S1	0	0	0	It inhabits ice-scoured river shores on high-pH bedrock or till, and on wet talus in the subalpine zone.

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<i>Bartonia virginica</i>	Yellow Bartonia	S3S4	0	0	0	Flowers July to September. Dry barrens, sandy or peaty soils, bogs, lakeshores. Common in the southwestern counties becoming scarcer east to Annapolis and Halifax; St. Peter's area of Cape Breton.
<i>Betula michauxii</i>	Michaux's Dwarf Birch	S3	0	0	0	Limited to peat bogs. It flowers later than many, in July and August. Scattered localities from Brier Island, Digby Co., east to Guysborough, Cape Breton and Inverness counties (Munro, Newell & Hill, 2014).
<i>Bidens beckii</i>	Water Beggarticks	S3S4	0	0	0	Found in shallows of sluggish streams and ponds. Flowers during August and September. Scattered throughout but more abundant from Pictou northward. (Munro, Newell and Hill, 2014).
<i>Bidens hyperborea</i>	Estuary Beggarticks	S2S3	0	0	0	Its habitat is limited to estuarine conditions. Flowers in August. Reported from River Philip and known from Antigonish and Inverness counties (Munro, Newell and Hill, 2014).
<i>Boehmeria cylindrica</i>	Small-spike False-nettle	S2S3	0	0	0	Understory herb of moist deciduous forests in Nova Scotia. Flowers from July - September. Elsewhere found in swamps. locally very abundant on the LaHave R from New Germany to Bridgewater, local on the Annapolis R at Kingston and there's one record from the Shubenacadie Wildlife Park (Munro, Newell & Hill, 2014)
<i>Botrychium lanceolatum</i>	Triangle Moonwort	S2S3	0	0	0	Kentville Ravine (Kings County); Colchester, Cumberland and a few sites in western Cape Breton. Rare where found and of limited distribution in the Northern counties. Found where there are fertile soils on wooded hillsides. Bogs, fens, forests, meadows, fields, swamps and edges of wetlands. This species releases its spores later than most moonworts (July to August) (Minnesota Environment and Natural Resources Trust Fund, Go Botany and Munro et al., 2014).
<i>Botrychium lanceolatum ssp. angustisegmentum</i>	Narrow Triangle Moonwort	S2S3	0	0	0	Kentville Ravine (Kings County); Colchester, Cumberland and a few sites in western Cape Breton. Rare where found and of limited distribution in the Northern counties. Found where there are fertile soils on wooded hillsides. Bogs, fens, forests, meadows, fields, swamps and edges of wetlands. This species releases its spores later than most moonworts (July to August) (Minnesota Environment and Natural Resources Trust Fund, Go Botany and Munro et al., 2014).

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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Botrychium lunaria</i>	Common Moonwort	S1	0	0	0	Known from Conrad's Beach, Halifax County and from New Campbellton and Indian Brook in northern Cape Breton. Found on open slopes, sand or gravel; shores and meadows. Basic soils. Anthropogenic habitats (man-made or disturbed habitats), fields and edges of wetlands. Spores are produced throughout the summer (Go Botany and Munro et al., 2014).
<i>Botrychium lunaria</i> var. <i>lunaria</i>	Moonwort Grapefern	S1	0	0	0	Known from Conrad's Beach, Halifax County and from New Campbellton and Indian Brook in northern Cape Breton. Found on open slopes, sand or gravel; shores and meadows. Basic soils. Anthropogenic habitats (man-made or disturbed habitats), fields and edges of wetlands. Spores are produced throughout the summer (Go Botany and Munro et al., 2014).
<i>Botrychium simplex</i>	Least Moonwort	S2S3	0	0	0	Scattered locations from Yarmouth County to Cape Breton: Cedar Lake (Digby-Yarmouth border), West Berlin (Queens County), Petpeswick and in Antigonish, Victoria and Inverness Counties. Reported from various habitats, usually involving damp or mossy streambanks or lakeshores. Also anthropogenic habitats (man-made or disturbed habitats), meadows and fields. Subspecies: occurs primarily in open sites, including prairies, wetlands, and abandoned mine sites. Spores produced in late May and June (Minnesota DNR, Go Botany and Munro et al., 2014).
<i>Botrychium simplex</i> var. <i>simplex</i>	Least Moonwort	S2S3	0	0	0	Scattered locations from Yarmouth County to Cape Breton: Cedar Lake (Digby-Yarmouth border), West Berlin (Queens County), Petpeswick and in Antigonish, Victoria and Inverness Counties. Reported from various habitats, usually involving damp or mossy streambanks or lakeshores. Also anthropogenic habitats (man-made or disturbed habitats), meadows and fields. Subspecies: occurs primarily in open sites, including prairies, wetlands, and abandoned mine sites. Spores produced in late May and June (Minnesota DNR, Go Botany and Munro et al., 2014).
<i>Bromus latiglumis</i>	Broad-Glumed Brome	S2	0	0	0	Floodplain (River or stream floodplains), forest, shores of rivers or lakes (Go Botany)
<i>Cardamine dentata</i>	Toothed Bittercress	S1	0	0	0	rare species of calcareous swamps and fens
<i>Cardamine maxima</i>	Large Toothwort	S2	0	0	0	rich, moist forests. Floodplain (river or stream floodplains), forests, talus and rocky slopes
<i>Cardamine parviflora</i>	Small-flowered Bittercress	S3	0	0	0	Flowers early, from April to August. Dry, shady ledges, exposed soils; sandy substrates. Bay of Fundy counties, from Brier Island to Cape d'Or. Central and northern Cape Breton.



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<i>Carex adusta</i>	Lesser Brown Sedge	S2S3	0	0	0	dry open forest or recent clearings (cutblocks) on acidic, gravelly soils. Frequent after fire. Flowering and fruiting from June to September (Munro, Newell & Hill, 2014)
<i>Carex grisea</i>	Inflated Narrow-leaved Sedge	S1	0	0	0	floodplain forest and deciduous woods (Munro, Newell & Hill, 2014)
<i>Carex houghtoniana</i>	Houghton's Sedge	S2S3	0	0	0	sandy soils, along roadsides. Sandy disturbed area.
<i>Carex lupulina</i>	Hop Sedge	S3	0	0	0	Found in muck soils, in forests, swamps, swales and intervals. Flowers and fruits in June (Munro, Newell & Hill 2014)
<i>Carex normalis</i>	a Sedge	S1	0	0	0	Open, often wet, woods, thickets, meadows and roadsides. Fruiting early summer (Flora of North America, nd)
<i>Carex peckii</i>	White-Tinged Sedge	S2?	0	0	0	Dry or mesic slopes, mixed deciduous forests, rocky outcrops, old quarry. Flowering and fruiting from May - mid-July. So far known from White Rock, Kings Co., Rhodes Co., Lunenburg Co. and Halifax and the Pennants area, Halifax Co. (DAL herbarium only) (Munro, Newell & Hill 2014)
<i>Carex pennsylvanica</i>	Pennsylvania Sedge	S1?	0	0	0	Grows in dry, rocky soils as in dry open woodlands. Flowers and fruits produced early to mid-May (Munro, Newell & Hill 2014)
<i>Carex plantaginea</i>	Plantain-Leaved Sedge	S1	0	0	0	Rich, moist, deciduous or mixed deciduous-evergreen forests, on slopes along streams or along edges of moist depressions, southward in mountain gorges. Fruiting in spring (Flora of North America, nd)
<i>Carex rosea</i>	Rosy Sedge	S3	0	0	0	Grows in dry soils beneath deciduous forests and thickets. Flowers from May to early July.
<i>Carex scirpoidea</i> ssp. <i>scirpoidea</i>	Scirpuslike Sedge	S2S3	0	0	0	Moist alpine meadows, stream banks, and open rocky slopes, thin and rocky soils, rock outcrops, and talus slopes. Flowers June - August (DNR WA, nd)
<i>Carex vacillans</i>	Estuarine Sedge	S1S3	0	0	0	Saline, brackish shores, swales, salt and intertidal marshes. Fruiting in June to August (Flora of North America).
<i>Carex viridula</i> ssp. <i>brachyrrhyncha</i>	Greenish Sedge	S1	0	0	0	Found along river and lake shores (Go Botany).
<i>Carex viridula</i> var. <i>elatior</i>	Greenish Sedge	S1	0	0	0	Moist to wet fens and runnels, on lime-rich soils. Fruiting in July-August (Flora North America).
<i>Carex viridula</i> var. <i>saxilittoralis</i>	Greenish Sedge	S1	0	0	0	Moist to wet, exposed shores and limestone barrens. Fruiting July-August (Flora North America).

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<i>Caulophyllum thalictroides</i>	Blue Cohosh	S2S3	0	0	0	Shade-tolerant, restricted to river floodplain deciduous forests. Appears in April, until beginning of June. A wide and patchy distribution over the northern portion of the province from Annapolis River to River Denys in Cape Breton (Munro, Newell & Hill, 2014).
<i>Cerastium arvense ssp. strictum</i>	Matted Field Chickweed	S1?	0	0	0	flowers May until frost.cliffs, talus slopes, quarries, rocky beaches, coastal headlands, and in high-pH and serpentine communities. Compacted soils, especially on moist lawns and other arable land
<i>Ceratophyllum echinatum</i>	Prickly Hornwort	S3	0	0	0	Marshes. A plant more typical of the shallows of acidic water bodies than its congener.
<i>Cochlearia tridactylites</i>	Limestone Scurvy-grass	S1	0	0	0	Summer-flowering. Brackish or calcareous soils. Little White Island and Big White Island, Halifax County represent the only confirmed localities yet.
<i>Coleataenia longifolia</i>	Long-leaved Panicgrass	S3S4	0	0	0	Marshes, meadows and fields, shores of rivers or lakes (GO Botany).
<i>Coleataenia longifolia ssp. longifolia</i>	Coastal Plain Panicgrass	S3S4	0	0	0	Marshes, meadows and fields, shores of rivers or lakes (GO Botany).
<i>Comandra umbellata ssp. umbellata</i>	Bastard's Toadflax	S2	0	0	0	Found in swamps and bogs, rich mesic sites, dry, sandy or rocky soils, savannas, early successional forests. Flowers March - August (Flora of North America, nd)
<i>Conioselinum chinense</i>	Chinese Hemlock-parsley	S3	0	0	0	Found in treed swamps, mossy coniferous forest, seepy coastal slopes. Flowers from August to October. Common on Saint Paul Island and infrequent elsewhere (Munro, Newell & Hill, 2014).
<i>Conopholis americana</i>	American Cancer-root	S2	0	0	0	Reported from the western half of the province - Parasitic plant found in trees, particularly oaks and other deciduous trees - Flowers April to July (Munro, Newell & Hill, 2014)
<i>Crataegus submollis</i>	Quebec Hawthorn	S2?	0	0	0	Anthropogenic (man-made or disturbed habitats), forest edges, meadows and fields, shrublands or thickets. Flowers in June (GoBotany, nd).
<i>Crataegus succulenta</i>	Fleshy Hawthorn	S3S4	0	0	0	Forest edges, forests, meadows and fields. Also found in abandoned farmland, along streams and in forest openings. Flowers in late spring (Natural Resources Canada, nd).
<i>Crataegus succulenta var. succulenta</i>	Fleshy Hawthorn	S3S4	0	0	0	Forest edges, forests, meadows and fields. Also found in abandoned farmland, along streams and in forest openings. Flowers in late spring (Natural Resources Canada, nd).

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<i>Cuscuta cephalanthi</i>	Buttonbush Dodder	S2?	0	0	0	Flowers during August and September. Low-lying coastal areas, often seen parasitizing <i>Symphyotrichum novi-begii</i> . Anthropogenic (man-made or disturbed habitats), meadows and fields, shores of rivers or lakes, swamps
<i>Cyperus lupulinus ssp. macilentus</i>	Hop Flatsedge	S1	0	0	0	Various well-drained, open places. Fruiting summer (Flora North America).
<i>Cypripedium parviflorum var. makasin</i>	Small Yellow Lady's- Slipper	S2	0	0	0	Mesic to wet fens, prairies, meadows, thickets, open coniferous, and mixed forest. Flowering in May to August (Flora of North America).
<i>Cypripedium reginae</i>	Showy Lady's- Slipper	S2	0	0	0	Found at Meander River in Hants Co., Musquodoboit River Valley, Halifax Co. Lives in alkaline swamps and bogs. Flowers from June to August (Munro, et al. 2014).
<i>Diphasiastrum complanatum</i>	Northern Ground- cedar	S3S4	0	0	0	Infrequent, scattered through the Cobequid hills southwest to the Annapolis Valley and east to Cape Breton. Deciduous forests and brushy hillsides spreading out into abandoned fields. Anthropogenic (man-made or disturbed habitats) habitats, forest edges, forests, meadows and fields. Flowers from July to October (Minnesota Environment and Natural Resources Trust Fund, Go Botany and Munro et al., 2014).
<i>Diphasiastrum sitchense</i>	Sitka Ground- cedar	S3S4	0	0	0	Has been observed in Kings County to Northern Victoria County. Commonly found on alpine and subalpine barrens or wooded slopes in Northern Nova Scotia. Also found in anthropogenic habitats (man-made or disturbed habitats), meadows and fields. Subspecies: somewhat rare but widespread ground-cedar hybrid that frequently occurs in the absence of its parents. No sources that state specific flowering time, most likely during the general growing season in Nova Scotia: June to September (Go Botany and Munro et al., 2014).
<i>Diphasiastrum x sabinifolium</i>	Savin- leaved Ground- cedar	S3?	0	0	0	Has been observed in Kings County to Northern Victoria County. Commonly found on alpine and subalpine barrens or wooded slopes in Northern Nova Scotia. Also found in anthropogenic habitats (man-made or disturbed habitats), meadows and fields. Subspecies: somewhat rare but widespread ground-cedar hybrid that frequently occurs in the absence of its parents. No sources that state specific flowering time, most likely during the general growing season in Nova Scotia: June to September (Go Botany and Munro et al., 2014).
<i>Elatine americana</i>	American Waterwort	S1	0	0	0	Brackish or salt marshes and flats, lacustrine (in lakes or ponds), riverine (in rivers or streams), shores of rivers or lakes

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<i>Eleocharis erythropoda</i>	Red-stemmed Spikerush	S1	0	0	0	Non-calcareous or calcareous fresh or brackish shores. Fruiting occurs in the summer (Flora North America).
<i>Eleocharis flavescens</i>	Pale Spikerush	S3	0	0	0	Bogs, brackish or salt marshes and flats, floodplain (river or stream floodplains), marshes, shores of rivers or lakes, wetland margins (edges of wetlands) (Go Botany).
<i>Eleocharis flavescens</i> var. <i>olivacea</i>	Bright-green Spikerush	S3	0	0	0	Bogs, cold springs, dry stream banks, lake and pond margins, maritime mud flats, marshes, moist meadows, swamps. Fruiting summer-winter (June-November) (Flora North America).
<i>Eleocharis ovata</i>	Ovate Spikerush	S2S3	0	0	0	Grows on muddy streambanks, streambeds, and lakeshores often in subsiding water. Fruiting from May through October. (Munro, et al. 2014).
<i>Empetrum atropurpureum</i>	Purple Crowberry	S2S3	0	0	0	Alpine or subalpine zones, mountain summits and plateaus, ridges or ledges
<i>Empetrum eamesii</i>	Pink Crowberry	S3	0	0	0	flower early, producing fruit from July until frost. Habitat includes sands and gravels of headlands, bogs and barrens. Recently found at South Canoe Lake a Corema community on granite. Collected from Halifax to Peggys Cove and in northern Cape Breton, with both subspecies having similar distribution in the province
<i>Epilobium lactiflorum</i>	White-flowered Willowherb	S1?	0	0	0	Alpine or subalpine zones, cliffs, balds or ledges, shores of rivers or lakes (GoBotany, nd).
<i>Epilobium strictum</i>	Downy Willowherb	S3	0	0	0	Scattered throughout throughout Cape Breton Island, infrequently elsewhere - Found in bogs and other peatlands - Flowers July to September (Munro, Newell & Hill, 2014)
<i>Equisetum palustre</i>	Marsh Horsetail	S1	0	0	0	A single collection each from Kings County and Halifax Counties. Found in edges of wetlands, marshes, swamps and shores of rivers or lakes. Flowers in summer (Minnesota Environment and Natural Resources Trust Fund, Go Botany and Munro et al., 2014).
<i>Equisetum pratense</i>	Meadow Horsetail	S3S4	0	0	0	Known to be in several streams in Hants, Colchester and Cumberland counties, in addition to Victoria and Inverness Counties. Uncommon and limited to alluvial thickets, pastures and treed streambanks, including gravelly bars. Flowers mid to late spring (Minnesota Environment and Natural Resources Trust Fund and Munro et al., 2014).
<i>Erigeron philadelphicus</i>	Philadelphia Fleabane	S2S3	0	0	0	Habitats include fields, meadows and springy slopes. Not common, scattered stations from Digby and Cumberland counties to central Cape Breton. Flowers from June to August (Munro, Newell & Hill, 2014).

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<i>Erigeron philadelphicus</i> var. <i>philadelphicus</i>	Philadelphia Fleabane	S2S3	0	0	0	Habitats include fields, meadows and springy slopes. Not common, scattered stations from Digby and Cumberland counties to central Cape Breton. Flowers from June to August (Munro, Newell & Hill, 2014).
<i>Eriophorum gracile</i>	Slender Cottongrass	S3	0	0	0	Grows in wet peat and inundated shores. Flowers and fruits during early summer. (Munro, et al. 2014).
<i>Eriophorum gracile</i> ssp. <i>gracile</i>	Slender Cottongrass	S3	0	0	0	Grows in wet peat and inundated shores. Flowers and fruits during early summer. (Munro, et al. 2014).
<i>Euphrasia farlowii</i>	Farlow's Eyebright	S1S3	0	0	0	Dry, grassy habitats on sandstone or limestone barrens, rocks, ledges, sandy beaches. <a href="http://beta.floranorthamerica.org/Euphrasia_farlowii">http://beta.floranorthamerica.org/Euphrasia farlowii</a>
<i>Fagus grandifolia</i>	American Beech	S3S4	0	0	0	Forests
<i>Fallopia scandens</i>	Climbing False Buckwheat	S3S4	0	0	0	Uncommon and local, from Digby to Richmond counties on the northern side of the province - Grows on low ground in riparian zones - Flowers mid-August to October (Munro, Newell & Hill, 2014)
<i>Festuca prolifera</i>	Proliferous Fescue	S1S2	0	0	0	Alpine or subalpine zones, cliffs, balds, or ledges, talus and rocky slopes (Go Botany).
<i>Festuca prolifera</i> var. <i>prolifera</i>	Proliferous Fescue	S1S2	0	0	0	Proliferous fescue is a rare alpine species found only in Maine and New Hampshire, where it forms mats on cliffs, seeps and in ravines <a href="https://gobotany.nativeplanttrust.org/species/festuca/prolifera/">https://gobotany.nativeplanttrust.org/species/festuca/prolifera/</a> .
<i>Fimbristylis autumnalis</i>	Slender Fimbry	S1	0	0	0	Moist to wet sands, peats, slits, or clays primarily of disturbed, sunny ground such as seeps, ditches, savanna, stream banks, reservoir drawdowns, and pond shores (Flora of North America)
<i>Fragaria vesca</i>	Woodland Strawberry	S3S4	0	0	0	Forming dense patches in shady forests, ravines. Flowers in June. A white-berried form of this species persists in a number of locations within the province: White Rock, Wolfville, Grand Pré and Barrington. (Munro, Newell & Hill, 2014).
<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry	S3S4	0	0	0	Forming dense patches in shady forests, ravines. Flowers in June. A white-berried form of this species persists in a number of locations within the province: White Rock, Wolfville, Grand Pré and Barrington. (Munro, Newell & Hill, 2014).

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<i>Fraxinus nigra</i>	Black Ash	S1S2	Threatened	Not on Schedule 1	Threatened	Black ash is typically found in poorly drained areas that are often seasonally flooded. It is most common on peat and muck soils, but also grows on fine sands over sands and loams. Although this species can tolerate still semi-stagnant conditions, there is a preference for swampy woodland stream and river banks with moving water. It is often associated with species such as Red maple, Speckled alder, Balsam poplar, and Black spruce. The species is shade intolerant, and seedlings, saplings and sprouts tend to regenerate only in partially opened forest canopies.
<i>Fraxinus pennsylvanica</i>	Red Ash	S1	0	0	0	Flowers May - June. Found in riparian and upland forest and shelter belts (Minnesota Wildflowers, nd)
<i>Galium aparine</i>	Common Bedstraw	S3S4	0	0	0	Composts, ballast and waste soils. Flowers from May until July (Munro, Newell & Hill, 2014)
<i>Gentianella amarella ssp. acuta</i>	Northern Gentian	S1	0	0	0	Open and forested river banks, subalpine gullies and brook sides, occurring in regions of high-pH bedrock and/or till.
<i>Geocaulon lividum</i>	Northern Comandra	S3S4	0	0	0	Damp sands and other sterile soils, especially in acid or peaty sites. Flowers from late May to early August (Munro, Newell & Hill, 2014)
<i>Geranium bicknellii</i>	Bicknell's Crane's-bill	S3	0	0	0	Colonizes recently burned or cleared land; recently exposed lakeshores. Flowers from late June to July (Munro, Newell & Hill, 2014)
<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain	S2S3	0	0	0	Forms in large colonies in woodlands and thickets. Flower in July and August (Munro, et al., 2014).
<i>Goodyera repens</i>	Lesser Rattlesnake-plantain	S3S4	0	0	0	Shady, moist, coniferous or mixed woods, on mossy or humus-covered ground. Sometimes it is found in bogs or cedar swamps. Flowering early July-early September (Flora North America).
<i>Hedeoma pulegioides</i>	American False Pennyroyal	S2S3	0	0	0	Found in coastal areas in stony soils on open sites. Most common on the hills surrounding the Annapolis Valley and scattered in Colchester and Cumberland counties; infrequent elsewhere. Flowers in August
<i>Hepatica americana</i>	Round-lobed Hepatica	S2	0	0	0	Local and rare at Bridgewater, New Minas, Windsor, Pictou, Stewiacke, Antigonish and at a couple of North Mountain sites. Recently discovered along the Cogmagun River, Hants Co. Long known from along the St. Andrews River. Populations at Wolfville and St. Croix appear to be extirpated. Grows in dry, mixed deciduous forests. Flowers in April (Munro, Newell & Hill, 2014)
<i>Hieracium paniculatum</i>	Panicled Hawkweed	S3S4	0	0	0	Mixed forest on dryish soils, especially oak. Occasional from Yarmouth east to Kings and Halifax counties. Common about Kentville and at Keji. Flowers August and September (Munro, Newell & Hill, 2014).

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<i>Hordeum brachyantherum</i>	Meadow Barley	S1	0	0	0	Grows in pastures and along streams and lake shores (Flora of North America).
<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i>	Meadow Barley	S1	0	0	0	Grows in pastures and along streams and lake shores (Flora of North America).
<i>Hudsonia ericoides</i>	Pinebarren Golden Heather	S2	0	0	0	Late May to early in July. Sand barrens and other areas where the soil is dry and rocky, as at Jack Pine barrens at Williams Lake, Halifax Co. Ranges from Shelburne to Halifax counties along the Atlantic shore and known from several localities through the centre of the Annapolis Valley. Only a single Cape Breton locality.
<i>Humulus lupulus</i> var. <i>lupuloides</i>	Common Hop	S1?	0	0	0	Anthropogenic (man-made or disturbed habitats), floodplain (river or stream floodplains), forests, shrublands or thickets
<i>Huperzia selago</i>	Northern Firmoss	S1?	0	0	0	Limited to the northern half of the province, as far west as Brier Island, Digby County. Many localities clustered about the Bay of Fundy, inland to the south-facing slopes of the Cobequids and along the slopes of northern Cape Breton. Grows in rock crevices along streams and moist ravines. Anthropogenic habitats (man-made or disturbed habitats), cliffs, balds, or ledges, forests, meadows and fields, shores of rivers or lakes. Flowers from summer to early fall (Minnesota Environment and Natural Resources Trust Fund, Go Botany and Munro et al., 2014).
<i>Hylodesmum glutinosum</i>	Large Tick-trefoil	S2	0	0	0	Anthropogenic (man-made or disturbed habitats), cliffs, balds, or ledges, forest edges, forests, ridges or ledges, talus and rocky slopes. Flowers June to August
<i>Hypericum majus</i>	Large St John's-wort	S2S3	0	0	0	Flowers July to September. Wet or dry open soil. wet or dry open soil in bogs, marshes, ditches, meadows, woodlands, and other damp habitats.[4] It prefers elevations between 0–1,200 m Widely scattered locations. Until recently, only known from Halifax area and Big Baddeck, Victoria County, and thought to be historic.
<i>Hypericum x dissimulatum</i>	Disguised St. John's-wort	S2S3	0	0	0	Wet mucky soils in lacustrine habitats. Historically collected from Digby to Halifax Co. with a single specimen from each of Pictou and Guysborough counties (Munro, Newell & Hill, 2014).
<i>Juncus alpinoarticulatus</i>	Northern Green Rush	S2	0	0	0	Fen, fresh tidal marshes or flats, marshes, meadows and fields, shores of rivers or lakes. Fruiting mid summer to fall (Go Botany).

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<i>Juncus antheratus</i>	Greater Poverty Rush	S1?	0	0	0	Exposed or partially shaded sites in moist or seasonally wet sandy or clay soils. Flowering and fruiting in spring (Flora North America).
<i>Juncus caesariensis</i>	New Jersey Rush	S3	Special Concern	Special Concern	Vulnerable	New Jersey Rush is reported from 16 bogs and fens on the coastal plain of southeastern Cape Breton Island, Nova Scotia. These sites ranged from the Gracieville/Point Michaud area in the south, northeastwards along the coast to Fourchu Bay, a distance of approximately 50 km. Populations also occurred as much as 20 km inland (vicinity of Loch Lomond). The frequent association of this species with animals and lightly used all-terrain-vehicle trails on the edges of bogs and fens suggests a possible dependence on some level of disturbance for the maintenance of open habitat. These disturbances would reduce competition from other species. Seasonal flooding of New Jersey Rush habitats would also prevent the establishment of many species including shrubs.
<i>Juncus greenei</i>	Greene's Rush	S2	0	0	0	Found only on sandy soils and in dune hollows. Flowers and fruits produced from June through October. (Munro, et al., 2014).
<i>Juncus stygius ssp. americanus</i>	Moor Rush	S3	0	0	0	Wet moss, bogs and bog-pools. Flowering and fruiting in mid to late summer.
<i>Juncus subcaudatus</i>	Woods-Rush	S3S4	0	0	0	Conifer woods and spruce swamps, where substrate is soggy. Flowers and fruits produced from July through October. (Munro, et al. 2014).
<i>Koeleria spicata</i>	Narrow False Oats	S3S4	0	0	0	Grows in rocky soils on outcrops, cliffs, streamsides. Flowers and fruits from June through August (Munro, et al., 2014).
<i>Lactuca hirsuta</i>	Hairy Lettuce	S2S3	0	0	0	Grows in dryish soils in open forest and cut-overs. Scattered in the western part of NS. Flowers from July through September (Munro, Newell & Hill, 2014).
<i>Limosella australis</i>	Southern Mudwort	S3S4	0	0	0	Only on muddy shores or gravels of ponds, lakes and rivers along the coast. Flowers late June to October (Munro, Newell & Hill, 2014)
<i>Liparis loeselii</i>	Loesel's Twayblade	S3S4	0	0	0	Cool, moist ravines, bogs, or fens, wet peaty or sandy meadows, and exposed sand along edges of lakes, often colonizing previously open and disturbed habitats during early and middle stages of reforestation. Flowering May-August (Go Botany).
<i>Lorinseria areolata</i>	Netted Chain Fern	S3S4	0	0	0	Bogs, meadows and fields, swamps, wetland margins (edges of wetlands) (Go Botany).
<i>Luzula parviflora ssp. melanocarpa</i>	Black-fruited Woodrush	S3S4	0	0	0	uncommon in damp coniferous or mixed woods, cool ravines and banks (Hinds, 2000)



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<i>Lysimachia minima</i>	Chaffweed	S1	0	0	0	Its habitat is typically described as sandy or muddy soil that is prone to temporary standing water, such as pond edges and low ground in old fields. Flowers April - September (Minnesota Wildflowers, nd). Can also be found in man-made or disturbed habitats (GoBotany, nd)
<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife	S1	0	0	0	Anthropogenic (man-made or disturbed habitats), grassland, woodlands, fens, moist prairies (GoBotany, n.d.). Flowers from July - August (LBJ Wildflower Centre, nd).
<i>Malaxis monophyllos</i>	White Adder's-mouth	S1	0	0	0	Found in Fens, ridges or ledges, swamps with northern white-cedar. Flowering in summer (GoBotany).
<i>Malaxis monophyllos var. brachypoda</i>	North American White Adder's-mouth	S1	0	0	0	Found in swamps and bogs. Flower in summer (Flora fo North America).
<i>Mononeuria groenlandica</i>	Greenland Stitchwort	S3	0	0	0	peak flowering time of two weeks in the middle of July,[4] although it does flower anywhere between June to August. isolated and elevated areas. Thin coarse soil or in cracks of acidic rock on open rocky alpine and sub-alpine areas. Sometimes forming large masses in the appropriate habitat.
<i>Montia fontana</i>	Water Blinks	S1	0	0	0	Seepy slopes and rills, wet or brackish shores. Flowers June - September Found on the Northwest Arm Halifax (1883), Brier Island, Digby Co.; Port Hawkesbury, Inverness Co. Abundant on the east side of Burke Brook, Advocate, Cumberland Co. (Munr, Newell and Hill, 2014).
<i>Nabalus racemosus</i>	Glaucous Rattlesnakeroot	S1	0	0	0	Favours calcareous riverbanks, shores and damp prairies (Maine Department of Agriculture, Conservation & Forestry, nd).
<i>Neottia bifolia</i>	Southern Twayblade	S3	0	0	0	Bogs and swamps (Go Botany)
<i>Nuphar microphylla</i>	Small Yellow Pond-lily	S3S4	0	0	0	Ponds, lakes, sluggish streams, sloughs, ditches and occasionally tidal waters. Flowers summer - early fall (Flora of North America, nd)
<i>Oenothera fruticosa</i>	Narrow-leaved Evening Primrose	S2S3	0	0	0	Scattered from Yarmouth to the Northumberland Strait - Found in dry open soil habitats such as old fields, edges of thickets and roadsides - Flowers from June to August (Munro, Newell & Hill, 2014)

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<i>Oenothera fruticosa ssp. tetragona</i>	Narrow-leaved Evening Primrose	S2S3	0	0	0	Scattered from Yarmouth to the Northumberland Strait - Found in dry open soil habitats such as old fields, edges of thickets and roadsides - Flowers from June to August (Munro, Newell & Hill, 2014)
<i>Ophioglossum pusillum</i>	Northern Adder's-tongue	S2S3	0	0	0	Known from Yarmouth and Digby Counties; scattered east to Halifax and Amherst; a single Cape Breton record from George River. Found in sterile soils, swamps and sandy or cobbly lakeshores. Anthropogenic habitats (man-made or disturbed habitats), marshes, meadows, fields and edges of wetland margins. Spores produced May to August (Go Botany and Munro et al., 2014).
<i>Oreojuncus trifidus</i>	Highland Rush	S3	0	0	0	Grows in a number of habitat types, especially in alpine environments. Found on cliffs and ledges, fellfields, tundra, meadows. The soils may be dry to moist, calcareous and acidic (Wikipedia).
<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely	S2S3	0	0	0	Intervale soils where fertility is high; deciduous forests. Flowers Late June to July. Scattered along the North Mountain in Annapolis and Kings counties to Cumberland Cobequids, infrequent in Cape Breton (Munro, Newell and Hill, 2014)
<i>Oxybasis rubra</i>	Red Goosefoot	S2S3	0	0	0	moist, disturbed soils such pond and lake shores, river and creek banks, and mud flats. Flowers July to September
<i>Oxybasis rubra var. rubra</i>	Red Goosefoot	S2S3	0	0	0	In New York, Red Pigweed has been found along the coast in wet interdunal swales, stony beaches, and the shores of coastal ponds, as well as amongst ship ballast and waste places (New York Natural Heritage Program 2010). Salt marshes (Clemants 1992). Salt marshes and brackish soil (Gleason and Cronquist 1991). Waste ground, shores, and river banks (Voss 1985).
<i>Oxytropis campestris var. johannensis</i>	Field Locoweed	S2	0	0	0	Ice-scoured river shores in regions of high-pH bedrock and/or till, on ledge, cobble, and gravel substrate. Calcareous rock ledges, gravel, and outcrops near rivers and bays. Variety reported to be relatively common in Newfoundland and Quebec. Also known from from 7 occurrences in Maine, all on the St. John River.
<i>Packera paupercula</i>	Balsam Groundsel	S3S4	0	0	0	Confined to calcareous or gypsum soils, on cliffs, talus and outcrops. Flowers in July. Abundant where found but local to Hants Co. north to northern Inverness Co. (Munro, Newell & Hill, 2014).
<i>Packera paupercula var. paupercula</i>	Balsam Groundsel	S3S4	0	0	0	Confined to calcareous or gypsum soils, on cliffs, talus and outcrops. Flowers in July. Abundant where found but local to Hants Co. north to northern Inverness Co. (Munro, Newell & Hill, 2014).

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<i>Panicum dichotomiflorum</i> ssp. <i>puritanorum</i>	Spreading Panicgrass	S1?	0	0	0	Flowering and fruiting from June through October
<i>Parnassia parviflora</i>	Small-flowered Grass-of-Parnassus	S1S2	0	0	0	Rocky seeps. Flowers August to September (Jepson Herbarium, 2021)
<i>Persicaria amphibia</i> var. <i>emersa</i>	Long-root Smartweed	S3?	0	0	0	Bloom on moist soil and are terrestrial-adapted. Flower June - September (Flora of North America)
<i>Persicaria arifolia</i>	Halberd-leaved Tearthumb	S3	0	0	0	Found inf shaded swamps, ponds, tidal marshes along rivers, wet ravine in forests. Flowers July - October (Flora of North America, nd)
<i>Persicaria careyi</i>	Carey's Smartweed	S1	0	0	0	Low thickets, swamps, bogs, moist shorelines, clearings, recent burns, cultivated ground. Flowering July - October (Flora of North America, nd)
<i>Persicaria pennsylvanica</i>	Pennsylvania Smartweed	S3S4	0	0	0	Moist, disturbed places, ditches, riverbanks, cultivated fields, shorelines of ponds and reservoirs. Flowers May - December (Flora of North America, nd)
<i>Pilea pumila</i>	Dwarf Clearweed	S3				Usually grows in cool shady habitats as found on forested slopes of maple-beech, in the centre of the Province. Flowers from July - October. So far only known from West Branch, Pictou Co.; Little River, near Brookfield, Halifax Co.; and along the Herbert River, Hants Co. at Woodville.
<i>Piptatheropsis canadensis</i>	Canada Ricegrass	S3				Dry sandy or gravelly soil. Open woods clearings, pine plantations, barrens, wooded slopes. Fruiting season-July (Minnesota Wildflowers).
<i>Plantago rugelii</i>	Rugel's Plantain	S3				Grows in anthropogenic (man-made or disturbed habitat), grassland, meadows, fields (GoBotany, nd)
<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchid	S2				Known from a variety of habitats: sandy, gravelly or peaty shorelines of lakes or streams; bogs, swamps and meadows. Found along the Tusket River, Yarmouth Co., Medway River, Queens County and north to Kings and Colchester Co. (Kemptown) (Munro, Newell & Hill, 2014).
<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid	S3				Found in north-central and Southwestern NS. Favours wet meadows and riparian habitats. Flowers in July.

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<i>Platanthera hookeri</i>	Hooker's Orchid	S3				Scattered in most of the province, local in the southwestern counties. So far absent from the eastern shore. Grows in open dry forests of mixed conifers. Flower appear from May to August (Munro, et al., 2014).
<i>Platanthera huronensis</i>	Fragrant Green Orchid	S1S2				No good record found. Habitat are known from streamsides, in wetlands, even forests. Flowers throughout the summer (Munro, et al., 2014).
<i>Platanthera obtusata</i>	Blunt-leaved Orchid	S3S4				Fens, Forests, Meadows field and swamps
<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed	S1				Medium to fast flowing river bottoms with ledge, cobble or sand substrate (GoBotany, nd)
<i>Polygala sanguinea</i>	Blood Milkwort	S3				Previously documented throughout the central/ northern mainland, usually in scant populations - Prefers acidic or run-out soil as found in fallow fields or brushlands - Flowers from late June into October (Munro, Newell & Hill, 2014)
<i>Polygonum aviculare ssp. buxiforme</i>	Box Knotweed	S2S3				Roadsides, vacant lots, sidewalks, packed and nondrifting sands, borders of marshes and dunes. Flowering July - December (Flora of North America, nd)
<i>Polygonum aviculare ssp. neglectum</i>	Narrow-leaved Knotweed	S3?				Found in disturbed areas. Flowers June - November (Flora of North America, nd)
<i>Polygonum oxyspermum</i>	Sharp-fruit Knotweed	S2S3				Collected from Shelburne and Queens counties, east to Strait of Canso; Bras d'Or Lakes to northern Cape Breton - Found in damp sands and gravels on the coast - Terminally deciduous ocreae with prominent persistent veins; smooth achenes without tubercles (Munro, Newell & Hill, 2014)
<i>Polygonum oxyspermum ssp. raii</i>	Ray's Knotweed	S2S3				Collected from Shelburne and Queens counties, east to Strait of Canso; Bras d'Or Lakes to northern Cape Breton - Found in damp sands and gravels on the coast - Ocreae are scarcely veined and nearly all deciduous; the achenes are roughened and sometimes tubercled (Munro, Newell & Hill, 2014)
<i>Polypodium appalachianum</i>	Appalachian Polypody	S3				Nova Scotia distribution still remains unclear. Habitat is restricted to cliffs, rocky slopes, balds, ridges or ledges and talus. No sources that state specific spore production time, most likely during the general growing season in Nova Scotia: June to September (Go Botany and Munro et al., 2014).

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<i>Potamogeton polygonifolius</i>	oblong-leaved pondweed	S1				Occurs in almost any wet or semi-wet oligotrophic and/or acidic habitat so long as flow is not too rapid. It may be found in lakes, slow-flowing rivers, ponds, ditches, seeps and among bog mosses (Wikipedia).
<i>Potentilla canadensis</i>	Canada Cinquefoil	S2S3				Found on dry rock barrens and other open areas. Flowers in June. (Munro, Newell & Hill, 2014)
<i>Potentilla litoralis</i>	Coastal Cinquefoil	S1				Coastal beaches (sea beaches), meadows and fields, ridges or ledges (GoBotany, nd). Flowering in the summer (Floras of Nova Scotia, nd)
<i>Ranunculus pennsylvanicus</i>	Pennsylvania Buttercup	S1				Found in wet fields, ditches, marshes, along shores. Flowers June - August (Minnesota Wildflowers, nd)
<i>Ranunculus sceleratus</i>	Cursed Buttercup	S2				Anthropogenic (man-made or disturbed habitats), fresh tidal marshes or flats, marshes, swamps (GoBotany, n.d.). Flowers May - September (Minnesota Wildflowers, nd)
<i>Ranunculus sceleratus var. sceleratus</i>	Cursed Buttercup	S1S2				Ponds, riverbanks. Flowers from April - June, October (Jepson Herbarium, 2021)
<i>Rhinanthus minor ssp. groenlandicus</i>	Little Yellow Rattle	S1				Grows on disturbed, compacted soils as on roadsides, abandoned fields and the like. Flowers from mid-June through July (Munro, Newell & Hill, 2014)
<i>Ribes americanum</i>	Wild Black Currant	S1				Look for this shrub on shady slopes and in bottomland thickets where soils are fertile. Reported here from Truro and Windsor areas (Munro, Newell & Hill, 2014). Flowers May to June (Minnesota Wildflower, nd)
<i>Rosa acicularis</i>	Prickly Rose	S1				Found in thickets and rocky shaded slopes on acidic soil. Reported only from Beaverbank, Halifax Co. Flowers mid-June to July (Munro, Newell & Hill, 2014)
<i>Rosa acicularis ssp. sayi</i>	Prickly Rose	S1				Across its range, it grows in a wide variety of forested and open habitats, with a wide variety of soil and moisture conditions. Flowers in the spring (Schori, 2003)
<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower	S2				Grows in wet fertile soils along the edge of swamps, swales or streams. Often colonial. Flowers in August. Common in Kings Co., isolated colonies from Annapolis and Cumberland counties to Guysborough (Munro, Newell & Hill, 2014).
<i>Rumex triangulivalvis</i>	Triangular-valve Dock	S2S3				Grows in moist areas and disturbed habitats, meadows and fields (GoBotany, nd)
<i>Sagina nodosa</i>	Knotted Pearlwort	S3				Flowers from July to September. Coastal cliffs, sand flats and dune slopes. Cliffs, balds, or ledges, coastal beaches (sea beaches), meadows and fields, ridges or ledges Scattered from Annapolis to Guysborough counties. Nova Scotia Plants by Munro, Newell & Hill (2014).

Antrim Gypsum Mine - Priority Species List  
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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Salix glauca</i> var. <i>cordifolia</i>	Beautiful Willow	S1				Sand and cobbles among granitic boulders, sandy alluvium, on exposed eskers, scree slopes, Sphagnum bogs, Empetrum heaths, snowbeds. Flowers late May - early July (Flora of North America, nd)
<i>Salix myrtilifolia</i>	Blueberry Willow	S1				Reed bogs, fens, stream banks, subalpine spruce thickets, Pinus contorta woods, sand dunes, coal spoils. Flowers early May - late July (Flora of North America, nd)
<i>Salix pedicellaris</i>	Bog Willow	S3				Grows in acidic substrate as in bogs; nutrient-rich marshes and in sphagnum lacustrine habitats. Flowers from May - July. Queens County, occasionally seen along Sharpe Brook in Kings County. Collections from South Branch, Stewiacke River, Colchester Co., Black River fen, Inverness Co. and several Queens Co. localities are recent. (Munro, Newell & Hill, 2014)
<i>Salix sericea</i>	Silky Willow	S3				Low-lying ground as in riparian zones. Flowers in late March until May. Rare and only reported from western NS. Parr Lake and Lake Fanning, Yarmouth Co.; Queens and Lunenburg counties to Halifax County,. (Munro, Newell & Hill, 2014)
<i>Salix serissima</i>	Autumn Willow	S1				Fens, meadows and fields, swamps (GoBotany, nd). Also found in brackish marshy strands, marly lakeshores, treed bogs, gravelly stream banks, lakeshores. Flowers from early June to early July (Flora of North America, nd).
<i>Samolus parviflorus</i>	Seaside Brookweed	S3				Prefers wet places, shallow water, often on tidal shores. It can also be found in brackish or salt marshes and flats, fresh tidal marshes or flats, riverine (in rivers or streams), swamps (GoBotany, nd; Newell, L. 1977)
<i>Saxifraga cernua</i>	Nodding Saxifrage	S1				Imperfectly drained moist areas (near creeks and lakeshores, on moist ledges and in exposed dry sites); acidic, or calcareous, or nitrophilous (often near Thule sites and human habitation), or circum-neutral. Spring to summer flowering time (Aiken et al. 2007)
<i>Saxifraga oppositifolia</i> ssp. <i>oppositifolia</i>	Purple Mountain Saxifrage	S1				Arctic and alpine tundra, mountain ledges, rock crevices, calcareous gravel, raised beach ridges. Flowers spring - summer (Flora of North America, nd)
<i>Sceptridium dissectum</i>	Dissected Moonwort	S3				Frequent in the southwestern counties and scattered eastward to Cape Breton. Not abundant but often seen. Generally in sandy, gravelly, grassy or open soils. Spores from September to November (Munro et al., 2014).
<i>Solidago hispida</i>	Hairy Goldenrod	S1?				Grows in wooded banks and rocky shores. Infrequent, occasionally seen from Yarmouth to Colchester counties (Munro, Newell & Hill, 2014).
<i>Solidago hispida</i> var. <i>hispida</i>	Hairy Goldenrod	S1?				Grows in wooded banks and rocky shores. Infrequent, occasionally seen from Yarmouth to Colchester counties (Munro, Newell & Hill, 2014).

Antrim Gypsum Mine - Priority Species List  
ACCDC Rankings: June 2022



Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Solidago rugosa</i> <i>var. sphagnophila</i>	Cedar-swamp Goldenrod	S1S3				Frequents waste soils, forests and fallow fields. Flowers late in August through September. Common throughout the province (Munro, Newell & Hill, 2014).
<i>Sparganium androcladum</i>	Branching Bur-Reed	S1				Found in lakes, ponds, rivers or streams or the shore of rivers or lakes (Go Botany).
<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses	S3?				Located in the western half of the province, northwest to Hants Co. Found in driest sand barrens, roadsides, and fields. Autumn-flowering from Sept-Oct (Munro, et al., 2014).
<i>Stellaria humifusa</i>	Saltmarsh Starwort	S2S3				Flowers from June to August. Limited to saltmarshes. Cumberland, Colchester and along the Atlantic coast from Halifax to Cape Breton County. It is possibly more common than the collections indicate.
<i>Stellaria longifolia</i>	Long-leaved Starwort	S3				Flowers appear from May until July. Damp grassy habitats, in sandy or mucky soils. moist habitat, including meadows, marshes, and roadsides. Locally abundant along the Salmon River at Truro and Kemptown, Colchester Co.; along the Musquodoboit and Stewiacke rivers; Isle Haute
<i>Symphyotrichum boreale</i>	Boreal Aster	S3				Favours lacustrine gravels, streamsides and edges of peatlands. Flowers during August and September . Scattered from Yarmouth to Cape Breton uncommon (Munro, Newell & Hill, 2014).
<i>Symphyotrichum ciliolatum</i>	Fringed Blue Aster	S3				Favours open fields, lawns and edges. Flowers during August and September. Scattered from Hants and Colchester counties to Cumberland, Pictou and Inverness counties (Munro, Newell & Hill, 2014).
<i>Symphyotrichum undulatum</i>	Wavy-leaved Aster	S3				Favours edges of fields and forests. Flowers during August and September. Scattered about Lunenburg Co, Queens, Hants, Kings, and Halifax (Munro, Newell & Hill, 2014).
<i>Thalictrum confine</i>	Northern Meadow-rue	S1				Alluvial or shingly calcareous shores and talus. Flowers June - July (Flora of North America, nd)
<i>Toxicodendron vernix</i>	Poison Sumac	S1				Usually found in swamps or marshes. Flowers from May to July. Only known in Telfer Lake and Apple Tree Lake in Queens county (Munro, Newell & Hill, 2014)
<i>Trichostema dichotomum</i>	Forked Bluecurls	S1				Relatively new to Nova Scotia. Found in anthropogenic/disturbed habitats, grasslands, meadows and fields, sandplains and barrens (GoBotany, nd). Flowers from August to October (Peterson & McKenny, 1968).
<i>Triosteum aurantiacum</i> <i>var. aurantiacum</i>	Orange-fruited Tinker's Weed	S3				Dry-mesic to mesic forests, woodlands, and forest borders

Antrim Gypsum Mine - Priority Species List  
ACCDC Rankings: June 2022



Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Utricularia ochroleuca</i>	Yellowish-white Bladderwort	S1				Shallow (generally <30cm) acidic waters. Flowers June - September (Jepson Herbarium, 2021)
<i>Vaccinium boreale</i>	Northern Blueberry	S3S4				Grows on the windswept headlands and barrens. Flowering late spring–early summer. Scattered at several Cape Breton localities, rare on the mainland.
<i>Vaccinium uliginosum</i>	Alpine Bilberry	S3				Wide tolerance of moisture and fertility, but generally acidic soils. bedrock outcrops, alpine thickets. Flowers in June. Ranges from Halifax and Digby along the east coast to Baleine; northern Cape Breton.
<i>Vallisneria americana</i>	Wild Celery	S2S3				Locally abundant: Shortts Lake, Colchester Co. Along the Musquodoboit River, Halifax Co.; Lake Killarney, Cumberland Co. Reported from northern Cape Breton. Found only in quiet waters. Flowers from July to October. (Munro, et al. 2014).
<i>Verbena hastata</i>	Blue Vervain	S3S4				Limited to mucky fertile soils, as along floodplains. Flowers during August - September (Munro, Newell & Hill, 2014)
<i>Veronica catenata</i>	Pink Water-Speedwell	S1				Shores of rivers or lakes, wetland margins (edges of wetlands) (GoBotany, nd). Flowers May - September (Minnesota Wildflowers, nd)
<i>Viola sagittata</i>	Arrow-Leaved Violet	S3S4				Sterile woods, clearing and fields. Flowers April - May (Munro, Newell & Hill 2014)
<i>Viola sagittata var. ovata</i>	Arrow-Leaved Violet	S3S4				Open woods and thickets, disturbed ground, roadsides, powerline rights-of-way. Flowers April - June (Flora of North America, nd)
<i>Zizia aurea</i>	Golden Alexanders	S2				Found in meadows, shores, thickets and wooded swamps. Flowers May and June. Occasionally reported in: Pomquet and South River, Antigonish County, Upper Musquodoboit, Halifax County (Munro, Newell and Hill, 2014).
<b>Lichen</b>						
<i>Anzia colpodes</i>	Black-foam Lichen	S3	S3	Threatened	Threatened	<i>Anzia colpodes</i> requires mature deciduous tree habitats with high humidity and high light levels. The required humidity is supplied by wetlands, nearby brooks, lakes or by the host's position on upland slopes above a water body. Host tree trunks are usually free of dense undergrowth and the lichen usually occurs at or above the height of the undergrowth (in swamps and fens). A few of the <i>Anzia</i> collections from are reported to be from the canopy of Red Maple trees. Recent searches have found that <i>A. colpodes</i> occurs from 20 cm above the ground to 2 m up the tree trunks.



Antrim Gypsum Mine - Priority Species List  
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Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Erioderma mollissimum</i>	Graceful Felt Lichen	S1	S1	Endangered	Endangered	As of January 2012, Vole Ears Lichen was known from two populations at 29 sites along the Atlantic Coast of Nova Scotia totaling 153 adults and 23 juveniles. Vole Ears Lichen is often found in, or very near to, wetlands. It is found at the following specific sites: Blandford, Bon Mature Lake, Canada Hill/Mackenzies Barren, Clyde River Road1, Clyde River Road2, Duck Hole, Four Mile Brook, Fresh Water Brook, Haley Lake, Johnstons Pond, Jones Harbour, Jordan River, Lake John Road, Martin Brook, Misery Lake, Misery Lake Brook, Oakhill, Port L'Herbert, Pumpkinvine Brook, Roberts Pond, Robs Lake, Thomas Radall, Provincial Park, and Tidney.
<i>Erioderma pedicellatum</i>	Boreal Felt Lichen	S1	S1	Endangered	Endangered	The existing boreal felt lichen occurs within 25 km of the sea coast at an elevation of up to 300 m above sea level and they are found in forested habitats with low open crown closure. Boreal Felt Lichens are typically found in balsam fir stands, on north-facing trunks of mature and overmature trees. Habitat preference for boreal felt lichen is cool and moist and remains relatively constant throughout the year. They are often located on or at the base of slopes with northern or northeastern exposure.
<i>Fuscopannaria leucosticta</i>	White-rimmed Shingle Lichen	S3	S3	Not on Schedule 1	0	The second subpopulation in Nova Scotia occurs mainly on the east coast of southwestern Nova Scotia (in Shelburne and Queens counties), with sporadic sites throughout the eastern mainland. Common understory associates of <i>Fuscopannaria leucosticta</i> include ferns in the genus <i>Osmundastrum</i> , hollies, and ash, with peat mosses dominating the ground cover in depressions and feathermosses dominating on hummocks. <i>Fuscopannaria leucosticta</i> grows on the bark of Red Maple trees in Nova Scotia (COSEWIC Assessment and Status Report).

Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	S2S3	S2S3	Threatened	Threatened	The Wrinkled Shingle Lichen colonizes mature deciduous trees, most often Red Maple that grow near, but not usually within, imperfectly drained habitats. Hence, this lichen is found on trees close to the edge of treed swamps or floodplains. The Wrinkled Shingle Lichen most frequently inhabits sites near imperfectly drained, humid habitats dominated by deciduous trees. Such sites are close to the edge of treed swamps or riparian floodplains, or are at the base of moderate to steep slopes. A few occurrences are known from upland hardwood stands at the tops of slopes that are less than 100m in elevation. Only two occurrences are within a few kilometres of the coast. Canopy density is moderately open. The lichen grows on the rough bark of mature trees, mainly on the more sun-exposed sides. Red maple is the main host species, with poplar the second most frequent species. It is also known from Black and White Ash, Sugar Maple, Red Oak and American Beech.
<i>Pannaria lurida</i> <i>ssp. russellii</i>	Wrinkled Shingle Lichen	S2S3	S2S3	Threatened	Threatened	The Wrinkled Shingle Lichen colonizes mature deciduous trees, most often Red Maple that grow near, but not usually within, imperfectly drained habitats. Hence, this lichen is found on trees close to the edge of treed swamps or floodplains. The Wrinkled Shingle Lichen most frequently inhabits sites near imperfectly drained, humid habitats dominated by deciduous trees. Such sites are close to the edge of treed swamps or riparian floodplains, or are at the base of moderate to steep slopes. A few occurrences are known from upland hardwood stands at the tops of slopes that are less than 100m in elevation. Only two occurrences are within a few kilometres of the coast. Canopy density is moderately open. The lichen grows on the rough bark of mature trees, mainly on the more sun-exposed sides. Red maple is the main host species, with poplar the second most frequent species. It is also known from Black and White Ash, Sugar Maple, Red Oak and American Beech.
<i>Pectenia plumbea</i>	Blue Felt Lichen	S3	S3	Special Concern	Vulnerable	The Blue Felt Lichen is usually found on the trunks of old broad-leaved trees growing in moist habitats or close to streams and lake margins. This lichen occurs in coastal suboceanic areas but also some distance inland in damp valleys. It prefers cool, humid woodlands that may be mixed coniferous/hardwood or dominated by deciduous trees. The Blue Felt Lichen seems to prefer mature deciduous trees, particularly maple, ash and yellow birch. At its northerly limit of distribution in Nova Scotia, the Blue Felt Lichen has once been found on moss-covered rocks.

Antrim Gypsum Mine - Priority Species List  
 ACCDC Rankings: June 2022



Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
<i>Peltigera hydrothyria</i>	Eastern Waterfan	S1	S1	Threatened	Threatened	Eastern Waterfan grows attached to rocks at or below water level in clear, cool, partially shaded streams. Small waterfalls, exposed boulders and sinuous stream configurations create quiet or protected backwaters where the lichen grows outside the main current. In summer, this lichen is often partially or completely exposed during low water flow periods. Partial shade may be needed to help keep humidity high and temperatures low during summer months.
<i>Sclerophora peronella</i> (Atlantic pop.)	Frosted Glass-whiskers (Atlantic population)	S3S4	S3S4			This lichen has only been collected in two localities in Nova Scotia. It was observed on Cape Breton Island, in two forests in Inverness County. Collections from Nova Scotia were on exposed heartwood of living red maple trees growing in old-growth hardwood stands. Frosted Glass-whiskers grows on old deciduous trees, usually on the exposed heartwood of living trunks and more rarely on bark, in humid and rather shaded situations. This arboreal lichen is often associated with old-growth forests in coastal regions, but it is also found in open forests, in clearings, and on the margins of old deciduous forests (COSEWIC Assessment and Status Report).



**APPENDIX C: ACCDC REPORT**

# DATA REPORT 7222: Lake Egmont, NS

Prepared 23 March 2022  
by J. Pender, Data Manager

## CONTENTS OF REPORT

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- 5.1 Source Bibliography



**Map 1.** A 100 km buffer around the study area

## 1.0 PREFACE

The Atlantic Canada Conservation Data Centre (AC CDC; [www.accdc.com](http://www.accdc.com)) 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 AC CDC 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 AC CDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees.

Upon request and for a fee, the AC CDC 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 AC CDC includes locations of managed areas with some level of protection, and known sites of ecological interest or sensitivity.

### 1.1 DATA LIST

Included datasets:

<u>Filename</u>	<u>Contents</u>
LkEgmontNS_7222ob.xls	Rare or legally-protected Flora and Fauna in your study area
LkEgmontNS_7222ob100km.xls	A list of Rare and legally protected Flora and Fauna within 100 km of your study area
LkEgmontNS_7222msa.xls	Managed and Biologically Significant Areas in your study area

## 1.2 RESTRICTIONS

The AC CDC 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 AC CDC 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 AC CDC 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) AC CDC 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) AC CDC 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 AC CDC data response.

## 1.3 ADDITIONAL INFORMATION

The accompanying Data Dictionary provides metadata for the data provided.

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

### Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney  
Senior Scientist / Executive Director  
(506) 364-2658  
[sean.blaney@accdc.ca](mailto:sean.blaney@accdc.ca)

### Animals (Fauna)

John Klymko  
Zoologist  
(506) 364-2660  
[john.klymko@accdc.ca](mailto:john.klymko@accdc.ca)

### Data Management, GIS

James Churchill  
Conservation Data Analyst / Field Biologist  
(902) 679-6146  
[james.churchill@accdc.ca](mailto:james.churchill@accdc.ca)

### Billing

Jean Breau  
Financial Manager / Executive Assistant  
(506) 364-2657  
[jean.breau@accdc.ca](mailto:jean.breau@accdc.ca)

Questions on the biology of Federal Species at Risk can be directed to AC CDC: (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 Hubert Askanas, Energy and Resource Development: (506) 453-5873.

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 Donna Hurlburt, NS DLF: (902) 679-6886. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NS DLF Regional Biologist:

**Western:** Emma Vost  
(902) 670-8187  
[Emma.Vost@novascotia.ca](mailto:Emma.Vost@novascotia.ca)

**Western:** Sarah Spencer  
(902) 541-0081  
[Sarah.Spencer@novascotia.ca](mailto:Sarah.Spencer@novascotia.ca)

**Central:** Shavonne Meyer  
(902) 893-0816  
[Shavonne.Meyer@novascotia.ca](mailto:Shavonne.Meyer@novascotia.ca)

**Central:** Kimberly George  
(902) 890-1046  
[Kimberly.George@novascotia.ca](mailto:Kimberly.George@novascotia.ca)

**Eastern:** Harrison Moore  
(902) 497-4119  
[Harrison.Moore@novascotia.ca](mailto:Harrison.Moore@novascotia.ca)

**Eastern:** Maureen Cameron-MacMillan  
(902) 295-2554  
[Maureen.Cameron-MacMillan@novascotia.ca](mailto:Maureen.Cameron-MacMillan@novascotia.ca)

**Eastern:** Elizabeth Walsh  
(902) 563-3370  
[Elizabeth.Walsh@novascotia.ca](mailto:Elizabeth.Walsh@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

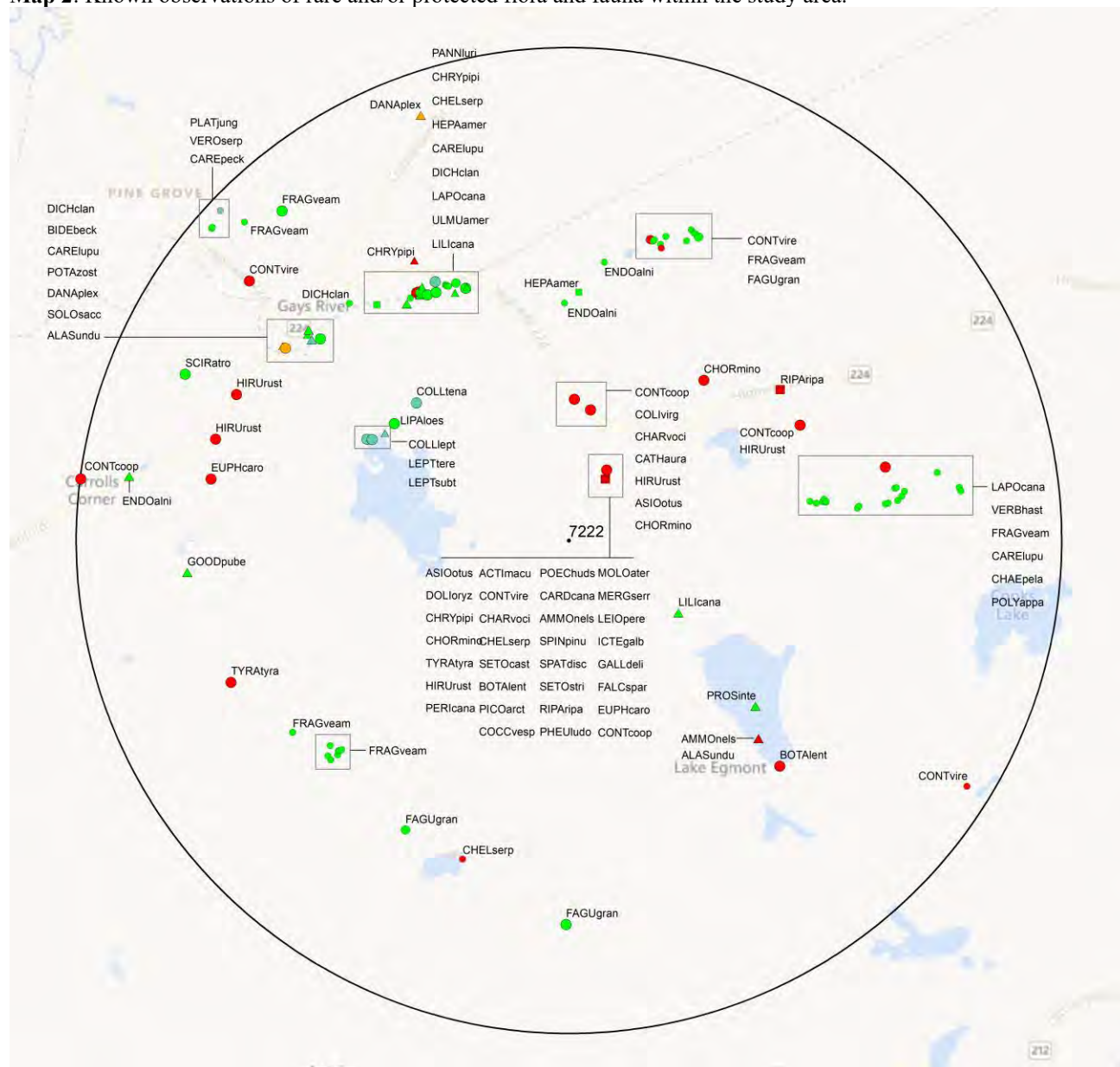
### 2.1 FLORA

The study area contains 81 records of 19 vascular, 7 records of 7 nonvascular flora (Map 2 and attached: \*ob.xls), excluding 'location-sensitive' species.

### 2.2 FAUNA

The study area contains 112 records of 34 vertebrate, 4 records of 2 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List), excluding 'location-sensitive' species. 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

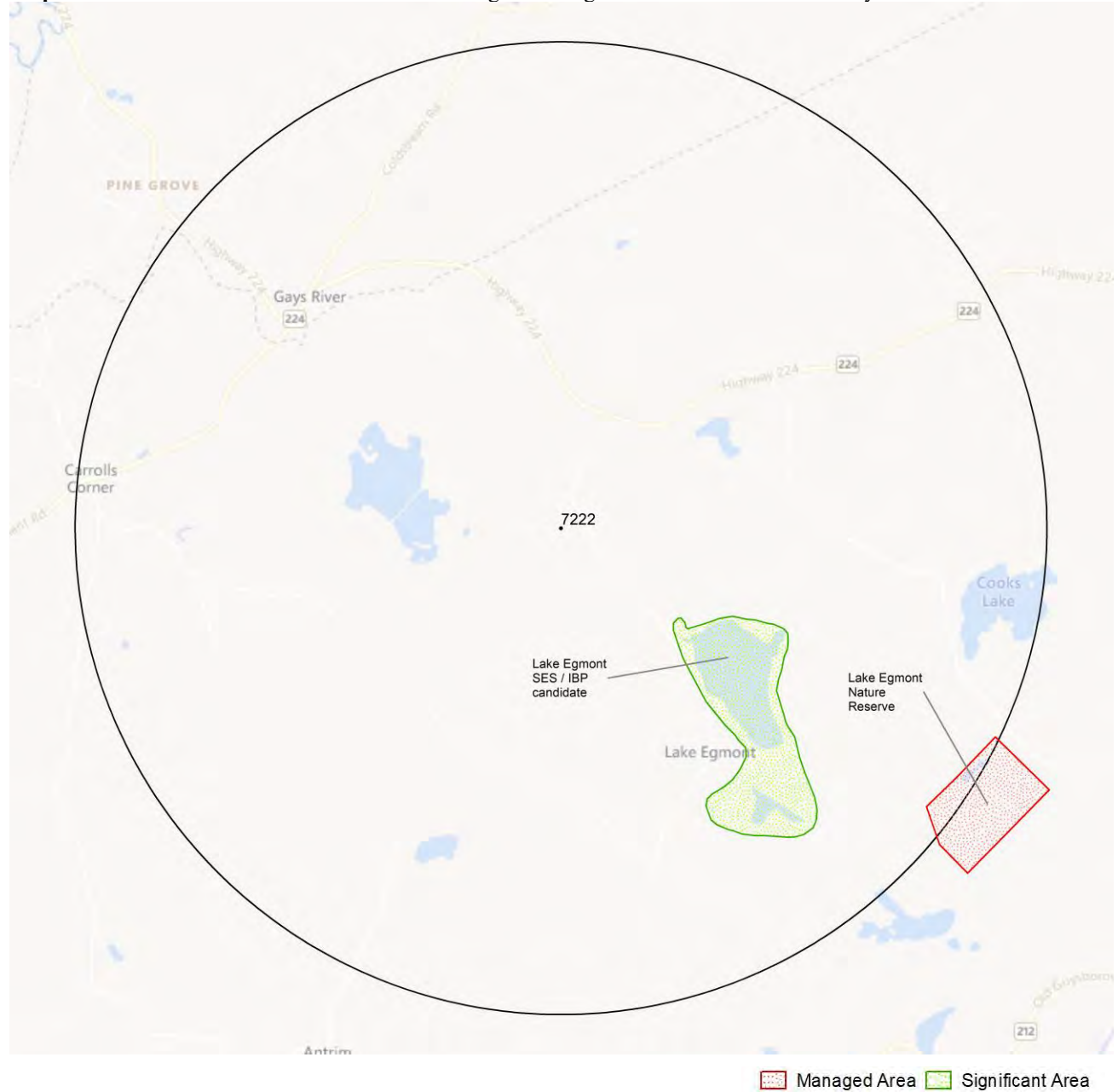
#### 3.1 MANAGED AREAS

The GIS scan identified 1 managed area in the vicinity of the study area (Map 3 and attached file: \*msa.xls).

#### 3.2 SIGNIFICANT AREAS

The GIS scan identified 1 biologically significant site in the vicinity of the study area (Map 3 and attached file: \*msa.xls).

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





## 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	# recs	Distance (km)
N	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	1	3.0 $\pm$ 0.0
N	<i>Platydictya jungermannioides</i>	False Willow Moss				S2?	1	4.9 $\pm$ 0.0
N	<i>Collema leptaleum</i>	Crumpled Bat's Wing Lichen				S2S3	1	2.3 $\pm$ 0.0
N	<i>Solorina saccata</i>	Woodland Owl Lichen				S3	1	3.3 $\pm$ 2.0
N	<i>Enchylium tenax</i>	Soil Tarpaper Lichen				S3S4	1	2.1 $\pm$ 0.0
N	<i>Scytinium teretiusculum</i>	Curly Jellyskin Lichen				S3S4	1	2.2 $\pm$ 0.0
N	<i>Scytinium subtile</i>	Appressed Jellyskin Lichen				S3S4	1	2.2 $\pm$ 0.0
P	<i>Scirpus atrovirens</i>	Dark-green Bulrush				S1	1	4.2 $\pm$ 0.0
P	<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				S1S2	1	2.5 $\pm$ 0.0
P	<i>Hepatica americana</i>	Round-lobed Hepatica				S2	14	2.5 $\pm$ 7.0
P	<i>Lilium canadense</i>	Canada Lily				S2	2	1.3 $\pm$ 1.0
P	<i>Carex peckii</i>	White-Tinged Sedge				S2?	1	4.8 $\pm$ 0.0
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2S3	1	3.9 $\pm$ 1.0
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	9	2.6 $\pm$ 0.0
P	<i>Carex lupulina</i>	Hop Sedge				S3	5	2.6 $\pm$ 0.0
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S3	3	3.4 $\pm$ 0.0
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	1	4.0 $\pm$ 0.0
P	<i>Bidens beckii</i>	Water Beggarticks				S3S4	1	3.4 $\pm$ 0.0
P	<i>Fagus grandifolia</i>	American Beech				S3S4	3	3.3 $\pm$ 0.0
P	<i>Endotropis alnifolia</i>	alder-leaved buckthorn				S3S4	3	2.4 $\pm$ 0.0
P	<i>Fragaria vesca ssp. americana</i>	Woodland Strawberry				S3S4	23	2.9 $\pm$ 0.0
P	<i>Veronica serpyllifolia</i>	Thyme-Leaved Speedwell				S3S4	1	4.8 $\pm$ 0.0
P	<i>Ulmus americana</i>	White Elm				S3S4	1	2.9 $\pm$ 1.0
P	<i>Verbena hastata</i>	Blue Vervain				S3S4	5	2.5 $\pm$ 0.0
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	1	2.1 $\pm$ 0.0
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3S4	5	2.8 $\pm$ 0.0

### 4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	<i>Colinus virginianus</i>	Northern Bobwhite	Endangered	Endangered			1	1.4 $\pm$ 0.0
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2B	5	0.7 $\pm$ 7.0
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2S3B,S1M	1	3.3 $\pm$ 0.0
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Vulnerable	S3B	5	0.7 $\pm$ 7.0
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	3	0.7 $\pm$ 7.0
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	3	0.7 $\pm$ 10.0
A	<i>Hirundo rustica</i>	Barn Swallow	Special Concern	Threatened	Endangered	S3B	11	0.7 $\pm$ 7.0
A	<i>Cardellina canadensis</i>	Canada Warbler	Special Concern	Threatened	Endangered	S3B	1	0.7 $\pm$ 7.0
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S3B	7	0.7 $\pm$ 7.0
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B	5	0.7 $\pm$ 7.0
A	<i>Coccythraustes vespertinus</i>	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	4	0.7 $\pm$ 7.0
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	10	0.7 $\pm$ 7.0
A	<i>Chrysemys picta picta</i>	Eastern Painted Turtle	Special Concern	Special Concern		S4	7	0.7 $\pm$ 10.0
A	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	2	0.7 $\pm$ 7.0
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	1	0.7 $\pm$ 7.0

	<b>Scientific Name</b>	<b>Common Name</b>	<b>COSEWIC</b>	<b>SARA</b>	<b>Prov Legal Prot</b>	<b>Prov Rarity Rank</b>	<b># recs</b>	<b>Distance (km)</b>
A	<i>Asio otus</i>	Long-eared Owl				S2S3	2	0.7 ± 7.0
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B,S4S5M	1	1.4 ± 0.0
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B,SUM	2	0.7 ± 7.0
A	<i>Perisoreus canadensis</i>	Canada Jay				S3	1	0.7 ± 7.0
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	1	0.7 ± 7.0
A	<i>Spinus pinus</i>	Pine Siskin				S3	2	0.7 ± 7.0
A	<i>Spatula discors</i>	Blue-winged Teal				S3B	1	0.7 ± 7.0
A	<i>Charadrius vociferus</i>	Killdeer				S3B	8	0.7 ± 7.0
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	4	0.7 ± 7.0
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S3B	2	0.7 ± 7.0
A	<i>Falco sparverius</i>	American Kestrel				S3B,S4S5M	5	0.7 ± 7.0
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B,S5M	4	0.7 ± 7.0
A	<i>Setophaga striata</i>	Blackpoll Warbler				S3B,S5M	1	0.7 ± 7.0
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	1	0.7 ± 7.0
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B,S4S5M	5	0.7 ± 7.0
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B,S4S5M	2	0.7 ± 7.0
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	2	0.7 ± 7.0
A	<i>Leiothlypis peregrina</i>	Tennessee Warbler				S3S4B,S5M	1	0.7 ± 7.0
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5M,S5N	1	0.7 ± 7.0
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Endangered	S2?B,S3M	2	3.5 ± 0.0
I	<i>Alasmidonta undulata</i>	Triangle Floater				S2S3	2	2.8 ± 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”.

#### Nova Scotia

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within the Study Site?
<i>Fraxinus nigra</i>	Black Ash		Threatened	No
<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Vulnerable	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	YES
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
<b>Bat hibernaculum or bat species occurrence</b>		<b>[Endangered]'</b>	<b>[Endangered]'</b>	<b>YES</b>

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 NS Endangered Species Act.

### 4.4 SOURCE BIBLIOGRAPHY

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

# recs	CITATION
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## 5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 28704 records of 145 vertebrate and 1346 records of 66 invertebrate fauna; 7266 records of 271 vascular, 3249 records of 181 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 (including “location-sensitive” species). 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	# recs	Distance (km)	Prov
A	<i>Coregonus huntsmani</i>	Atlantic Whitefish	Endangered	Endangered	Endangered	S1	1	96.8 $\pm$ 1.0	NS
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	197	3.2 $\pm$ 0.0	NS
A	<i>Myotis septentrionalis</i>	Northern Myotis	Endangered	Endangered	Endangered	S1	17	9.6 $\pm$ 0.0	NS
A	<i>Perimyotis subflavus</i>	Tricolored Bat	Endangered	Endangered	Endangered	S1	17	9.6 $\pm$ 0.0	NS
A	<i>Salmo salar pop. 1</i>	Atlantic Salmon - Inner Bay of Fundy population	Endangered	Endangered		S1	36	8.8 $\pm$ 0.0	NS
A	<i>Salmo salar pop. 6</i>	Atlantic Salmon - Nova Scotia Southern Upland population	Endangered			S1	37	20.1 $\pm$ 0.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus subspecies	Endangered	Endangered	Endangered	S1B	632	36.0 $\pm$ 0.0	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	64	38.2 $\pm$ 0.0	NS
A	<i>Dermochelys coriacea pop. 2</i>	Leatherback Sea Turtle - Atlantic population	Endangered	Endangered		S1S2N	2	70.0 $\pm$ 5.0	NS
A	<i>Morone saxatilis pop. 2</i>	Striped Bass - Bay of Fundy population	Endangered			S2S3B,S2S3N	4	8.8 $\pm$ 0.0	NS
A	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Endangered	Threatened		SNA	1	57.7 $\pm$ 0.0	NS
A	<i>Protonotaria citrea</i>	Prothonotary Warbler	Endangered	Endangered		SNA	1	63.1 $\pm$ 0.0	NS
A	<i>Icteria virens</i>	Yellow-Breasted Chat	Endangered	Endangered		SNA	5	27.8 $\pm$ 0.0	NS
A	<i>Colinus virginianus</i>	Northern Bobwhite	Endangered	Endangered			3	1.4 $\pm$ 0.0	NS
A	<i>Antrostomus vociferus</i>	Eastern Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	12	10.4 $\pm$ 7.0	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Threatened	Special Concern		S1B	14	43.7 $\pm$ 0.0	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	1220	2.2 $\pm$ 0.0	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2B	1651	0.7 $\pm$ 7.0	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2S3B,S1M	351	3.3 $\pm$ 0.0	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit	Threatened			S2S3M	52	36.1 $\pm$ 0.0	NS
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened			S2S3N	7	8.8 $\pm$ 0.0	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Vulnerable	S3B	716	0.7 $\pm$ 7.0	NS
A	<i>Hydrobates leucorhous</i>	Leach's Storm-Petrel	Threatened			S3B	73	38.6 $\pm$ 0.0	NS
A	<i>Tringa flavipes</i>	Lesser Yellowlegs	Threatened			S3M	567	31.4 $\pm$ 0.0	NS
A	<i>Anguilla rostrata</i>	American Eel	Threatened			S3N	49	8.8 $\pm$ 0.0	NS
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened	Threatened		SHB	2	70.4 $\pm$ 7.0	NS
A	<i>Melanerpes lewis</i>	Lewis's Woodpecker	Threatened	Threatened		SNA	1	59.2 $\pm$ 0.0	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened	Threatened		SUB	36	7.1 $\pm$ 0.0	NS
A	<i>Salmo salar pop. 12</i>	Atlantic Salmon - Gaspé - Southern Gulf of St. Lawrence population	Special Concern			S1	28	69.2 $\pm$ 50.0	NS
A	<i>Passerculus sandwichensis princeps</i>	Ipswich Sparrow	Special Concern	Special Concern		S1B	5	40.8 $\pm$ 0.0	NS
A	<i>Bucephala islandica</i>	Barrow's Goldeneye	Special Concern	Special Concern		S1N,SUM	5	82.2 $\pm$ 2.0	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	236	0.7 $\pm$ 7.0	NS
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern	Special Concern		S2S3M	5	40.4 $\pm$ 0.0	NS
A	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern population	Special Concern	Special Concern	Endangered	S2S3N,SUM	54	38.6 $\pm$ 0.0	NS
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	135	0.7 $\pm$ 10.0	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Special Concern	Threatened	Endangered	S3B	1177	0.7 $\pm$ 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Cardellina canadensis</i>	Canada Warbler	Special Concern	Threatened	Endangered	S3B	958	0.7 ± 7.0	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S3B	438	0.7 ± 7.0	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B	872	0.7 ± 7.0	NS
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	680	0.7 ± 7.0	NS
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern	Special Concern		S3N,SUM	5	65.3 ± 0.0	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	903	0.7 ± 7.0	NS
A	<i>Phocoena phocoena</i>	Harbour Porpoise	Special Concern			S4	4	44.6 ± 0.0	NS
A	<i>Chrysemys picta picta</i>	Eastern Painted Turtle	Special Concern	Special Concern		S4	185	0.7 ± 10.0	NS
A	<i>Calidris subruficollis</i>	Buff-breasted Sandpiper	Special Concern	Special Concern		SNA	3	40.7 ± 0.0	NS
A	<i>Zonotrichia querula</i>	Harris's Sparrow	Special Concern			SNA	1	43.3 ± 0.0	NS
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B,SUN,SUM	5	40.0 ± 0.0	NS
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1B	12	28.5 ± 7.0	NS
A	<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius	Not At Risk	Special Concern	Vulnerable	S1B,SUM	89	47.1 ± 0.0	NS
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk			S2	2	60.6 ± 0.0	NS
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S2?B,SUM	8	14.0 ± 7.0	NS
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3	2	25.4 ± 100.0	NS
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	29	11.9 ± 0.0	NS
A	<i>Megaptera novaeangliae</i>	Humpback Whale	Not At Risk			S3	1	78.5 ± 0.0	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	296	9.4 ± 7.0	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	60	9.1 ± 0.0	NS
A	<i>Buteo lagopus</i>	Rough-legged Hawk	Not At Risk			S3N	1	47.5 ± 0.0	NS
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	136	9.7 ± 7.0	NS
A	<i>Glaucomys volans</i>	Southern Flying Squirrel	Not At Risk			S3S4	6	80.4 ± 10.0	NS
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4	6	56.0 ± 2.0	NS
A	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	149	0.7 ± 7.0	NS
A	<i>Calidris canutus rufa</i>	Red Knot rufa subspecies - wintering population Tierra del Fuego / Patagonia	E,SC	Endangered	Endangered	S2M	154	32.6 ± 0.0	NS
A	<i>Morone saxatilis</i>	Striped Bass	E,SC			S2S3B,S2S3N	8	11.0 ± 0.0	NS
A	<i>Gadus morhua</i>	Atlantic Cod	E,SC,DD			SNR	2	66.8 ± 0.0	NS
A	<i>Alces alces americana</i>	Moose			Endangered	S1	96	13.9 ± 3.0	NS
A	<i>Uria aalge</i>	Common Murre				S1?B	1	41.1 ± 0.0	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B,SUM	21	14.3 ± 7.0	NS
A	<i>Oxyura jamaicensis</i>	Ruddy Duck				S1B	1	40.9 ± 0.0	NS
A	<i>Gallinula galeata</i>	Common Gallinule				S1B	8	59.6 ± 7.0	NS
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S1B	23	22.8 ± 7.0	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	45	39.4 ± 7.0	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	15	40.6 ± 7.0	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S4M	826	32.6 ± 0.0	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S4M	575	32.6 ± 0.0	NS
A	<i>Anas acuta</i>	Northern Pintail				S1B,SUM	28	14.3 ± 7.0	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1B,SUM	28	20.5 ± 0.0	NS
A	<i>Vespertilionidae sp.</i>	bat species				S1S2	189	2.5 ± 0.0	NS
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S1S2B,SUM	43	19.6 ± 7.0	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B,SUM	54	8.8 ± 0.0	NS
A	<i>Alca torda</i>	Razorbill				S2B	17	90.5 ± 0.0	NS
A	<i>Fratercula arctica</i>	Atlantic Puffin				S2B	22	80.9 ± 7.0	NS
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	25	9.4 ± 7.0	NS
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	141	0.7 ± 7.0	NS
A	<i>Spatula clypeata</i>	Northern Shoveler				S2B,SUM	15	9.4 ± 7.0	NS
A	<i>Mareca strepera</i>	Gadwall				S2B,SUM	30	30.6 ± 7.0	NS
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B,SUM	34	29.0 ± 7.0	NS
A	<i>Calidris alba</i>	Sanderling				S2N,S3M	421	32.6 ± 0.0	NS
A	<i>Asio otus</i>	Long-eared Owl				S2S3	25	0.7 ± 7.0	NS
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	30	14.3 ± 7.0	NS
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S2S3B	8	61.7 ± 0.0	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	322	7.0 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3B,S2S3N	68	35.7 ± 7.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B,S4S5M	25	1.4 ± 0.0	NS
A	<i>Setophaga pinus</i>	Pine Warbler				S2S3B,S4S5M	19	39.2 ± 0.0	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S2S3B,S5N,S5M	142	29.4 ± 7.0	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B,SUM	74	0.7 ± 7.0	NS
A	<i>Pluvialis dominica</i>	American Golden-Plover				S2S3M	78	35.2 ± 0.0	NS
A	<i>Numerius phaeopus hudsonicus</i>	Whimbrel				S2S3M	81	34.9 ± 0.0	NS
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S2S3M	3	40.4 ± 0.0	NS
A	<i>Perisoreus canadensis</i>	Canada Jay				S3	563	0.7 ± 7.0	NS
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	710	0.7 ± 7.0	NS
A	<i>Spinus pinus</i>	Pine Siskin				S3	510	0.7 ± 7.0	NS
A	<i>Salvelinus fontinalis</i>	Brook Trout				S3	65	10.6 ± 0.0	NS
A	<i>Salvelinus namaycush</i>	Lake Trout				S3	2	10.6 ± 0.0	NS
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3	1	87.2 ± 0.0	NS
A	<i>Pekania pennanti</i>	Fisher				S3	5	55.7 ± 0.0	NS
A	<i>Calcarius lapponicus</i>	Lapland Longspur				S3?N,SUM	3	46.9 ± 0.0	NS
A	<i>Spatula discors</i>	Blue-winged Teal				S3B	112	0.7 ± 7.0	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3B	553	0.7 ± 7.0	NS
A	<i>Tringa semipalmata</i>	Willet				S3B	905	9.4 ± 7.0	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	62	39.4 ± 7.0	NS
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	83	6.5 ± 0.0	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	249	0.7 ± 7.0	NS
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S3B	456	0.7 ± 7.0	NS
A	<i>Alosa pseudoharengus</i>	Alewife				S3B	31	8.8 ± 0.0	NS
A	<i>Somateria mollissima</i>	Common Eider				S3B,S3M,S3N	600	31.2 ± 7.0	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S4M	941	17.5 ± 0.0	NS
A	<i>Falco sparverius</i>	American Kestrel				S3B,S4S5M	368	0.7 ± 7.0	NS
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B,S5M	695	0.7 ± 7.0	NS
A	<i>Setophaga striata</i>	Blackpoll Warbler				S3B,S5M	128	0.7 ± 7.0	NS
A	<i>Cardellina pusilla</i>	Wilson's Warbler				S3B,S5M	97	13.4 ± 7.0	NS
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S3B,S5N,S5M	139	9.2 ± 0.0	NS
A	<i>Setophaga tigrina</i>	Cape May Warbler				S3B,SUM	198	19.4 ± 7.0	NS
A	<i>Branta bernicla</i>	Brant				S3M	2	75.6 ± 0.0	NS
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	705	32.6 ± 0.0	NS
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	307	32.6 ± 0.0	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	733	32.6 ± 0.0	NS
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S3M	119	36.1 ± 0.0	NS
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	538	31.3 ± 0.0	NS
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	7	31.2 ± 7.0	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	190	0.7 ± 7.0	NS
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	203	9.4 ± 7.0	NS
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B,S4S5M	261	0.7 ± 7.0	NS
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B,S4S5M	564	0.7 ± 7.0	NS
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	748	0.7 ± 7.0	NS
A	<i>Leiothlypis peregrina</i>	Tennessee Warbler				S3S4B,S5M	559	0.7 ± 7.0	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B,S5M	109	9.7 ± 7.0	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5M,S5N	138	0.7 ± 7.0	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3S4N	43	27.5 ± 0.0	NS
A	<i>Lanius borealis</i>	Northern Shrike				S3S4N	1	21.2 ± 0.0	NS
A	<i>Morus bassanus</i>	Northern Gannet				SHB	15	38.9 ± 0.0	NS
A	<i>Aythya americana</i>	Redhead				SHB	2	43.0 ± 0.0	NS
A	<i>Leucophaeus atricilla</i>	Laughing Gull				SHB	9	38.5 ± 0.0	NS
A	<i>Progne subis</i>	Purple Martin				SHB	5	41.1 ± 0.0	NS
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N,S5M	9	13.4 ± 7.0	NS
I	<i>Bombus bohemicus</i>	Ashton Cuckoo Bumble Bee	Endangered	Endangered	Endangered	S1	24	10.6 ± 5.0	NS
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Endangered	S2?B,S3M	300	3.5 ± 0.0	NS
I	<i>Danaus plexippus plexippus</i>	Monarch	Endangered	Special Concern		S2?B,S3M	1	55.3 ± 0.0	NS

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	<i>Gomphurus ventricosus</i>	Skillet Clubtail	Endangered	Endangered		SH	2	19.0 ± 0.0	NS
	<i>Barnea truncata</i>	Atlantic Mud-piddock	Threatened	Threatened		S1	1	56.3 ± 1.0	NS
	<i>Bombus suckleyi</i>	Suckley's Cuckoo Bumble Bee	Threatened			SH	1	39.3 ± 5.0	NS
	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern	Special Concern	Threatened	S3	13	5.7 ± 0.0	NS
	<i>Bombus terricola</i>	Yellow-banded Bumble Bee	Special Concern	Special Concern	Vulnerable	S3	81	8.8 ± 5.0	NS
	<i>Coccinella transversoguttata richardsoni</i>	Transverse Lady Beetle	Special Concern		Endangered	SH	8	48.6 ± 2.0	NS
	<i>Cicindela formosa</i>	Big Sand Tiger Beetle				S1	1	91.1 ± 1.0	NS
	<i>Erora laeta</i>	Early Hairstreak				S1	1	48.3 ± 1.0	NS
	<i>Pachydiplax longipennis</i>	Blue Dasher				S1	4	39.4 ± 0.0	NS
	<i>Atlanticoncha ochracea</i>	Tidewater Mucket				S1	10	97.5 ± 1.0	NS
	<i>Polygonia comma</i>	Eastern Comma				S1?	19	45.9 ± 0.0	NS
	<i>Polygonia satyrus</i>	Satyr Comma				S1?	7	41.5 ± 5.0	NS
	<i>Euphyes bimacula</i>	Two-spotted Skipper				S1S2	1	74.7 ± 0.0	NS
	<i>Boloria chariclea</i>	Arctic Fritillary				S1S2	3	62.9 ± 2.0	NS
	<i>Somatochlora brevicincta</i>	Quebec Emerald				S1S2	1	31.8 ± 0.0	NS
	<i>Tharsalea dospassosi</i>	Maritime Copper				S2	34	79.9 ± 0.0	NS
	<i>Satyrium acadica</i>	Acadian Hairstreak				S2	13	48.1 ± 2.0	NS
	<i>Neurocordulia michaeli</i>	Broad-tailed Shadowdragon				S2	19	65.5 ± 0.0	NS
	<i>Coenagrion resolutum</i>	Taiga Bluet				S2	2	32.1 ± 1.0	NS
	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	129	5.7 ± 0.0	NS
	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	7	44.7 ± 1.0	NS
	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S2S3	17	30.9 ± 2.0	NS
	<i>Aglais milberti</i>	Milbert's Tortoiseshell				S2S3	18	34.0 ± 2.0	NS
	<i>Aglais milberti milberti</i>	Milbert's Tortoise Shell				S2S3	3	90.8 ± 0.0	NS
	<i>Lanthus vernalis</i>	Southern Pygmy Clubtail				S2S3	7	79.6 ± 0.0	NS
	<i>Somatochlora kennedyi</i>	Kennedy's Emerald				S2S3	3	44.7 ± 1.0	NS
	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S2S3	4	81.7 ± 0.0	NS
	<i>Stylurus scudderi</i>	Zebra Clubtail				S2S3	6	8.6 ± 0.0	NS
	<i>Alasmidonta undulata</i>	Triangle Floater				S2S3	31	2.8 ± 0.0	NS
	<i>Strophiona nitens</i>	Chestnut Bark Long-horned Beetle				S3	2	46.2 ± 0.0	NS
	<i>Hippodamia parenthesis</i>	Parenthesis Lady Beetle				S3	1	46.0 ± 0.0	NS
	<i>Naemia seriata</i>	Seaside Lady Beetle				S3	13	40.2 ± 0.0	NS
	<i>Chilocorus stigma</i>	Twice-stabbed Lady Beetle				S3	3	49.8 ± 0.0	NS
	<i>Monochamus marmorator</i>	Balsam Fir Sawyer				S3	1	93.0 ± 0.0	NS
	<i>Trachysida aspera</i>	Rough Flower Longhorn Beetle				S3	1	38.6 ± 0.0	NS
	<i>Astylopsis sexguttata</i>	Six-speckled Long-horned Beetle				S3	1	33.0 ± 0.0	NS
	<i>Satyrium calanus</i>	Banded Hairstreak				S3	64	18.0 ± 2.0	NS
	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	20	33.6 ± 2.0	NS
	<i>Strymon melinus</i>	Gray Hairstreak				S3	12	48.8 ± 1.0	NS
	<i>Phanogomphus descriptus</i>	Harpoon Clubtail				S3	4	78.6 ± 0.0	NS
	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S3	6	56.2 ± 0.0	NS
	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S3	13	62.0 ± 0.0	NS
	<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S3	36	8.6 ± 0.0	NS
	<i>Epitheca princeps</i>	Prince Baskettail				S3	17	21.3 ± 0.0	NS
	<i>Somatochlora forcipata</i>	Forcinate Emerald				S3	4	44.7 ± 1.0	NS
	<i>Enallagma vernale</i>	Vernal Bluet				S3	6	29.9 ± 1.0	NS
	<i>Strophitus undulatus</i>	Creeper				S3	6	90.2 ± 0.0	NS
	<i>Polygonia interrogationis</i>	Question Mark				S3B	159	11.3 ± 0.0	NS
	<i>Cecropiterus pylades</i>	Northern Cloudywing				S3S4	18	48.6 ± 0.0	NS
	<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper				S3S4	32	18.0 ± 2.0	NS
	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3S4	21	43.0 ± 1.0	NS
	<i>Argynnis aphrodite</i>	Aphrodite Fritillary				S3S4	35	28.7 ± 2.0	NS
	<i>Polygonia faunus</i>	Green Comma				S3S4	19	18.5 ± 5.0	NS

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I	<i>Oeneis jutta</i>	Jutta Arctic				S3S4	7	44.7 ± 2.0	NS
I	<i>Aeshna clepsydra</i>	Mottled Darner				S3S4	12	9.2 ± 1.0	NS
I	<i>Aeshna constricta</i>	Lance-Tipped Darner				S3S4	21	9.2 ± 1.0	NS
I	<i>Boyeria grafiانا</i>	Ocellated Darner				S3S4	9	50.8 ± 1.0	NS
I	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3S4	7	19.2 ± 0.0	NS
I	<i>Somatochlora franklini</i>	Delicate Emerald				S3S4	2	44.7 ± 1.0	NS
I	<i>Nannothemis bella</i>	Elfin Skimmer				S3S4	15	36.1 ± 0.0	NS
I	<i>Amphiagrion saucium</i>	Eastern Red Damsel				S3S4	2	39.8 ± 1.0	NS
I	<i>Icaricia saepiolus</i>	Greenish Blue				SH	4	47.2 ± 2.0	NS
I	<i>Polygonia gracilis</i>	Hoary Comma				SH	2	39.6 ± 2.0	NS
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered	Endangered	Endangered	S1	33	20.0 ± 0.0	NS
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	512	20.0 ± 0.0	NS
N	<i>Peltigera hydrothyria</i>	Eastern Waterfan	Threatened	Threatened	Threatened	S1	87	16.9 ± 0.0	NS
N	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	123	3.0 ± 0.0	NS
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened	Threatened	Threatened	S3	41	14.4 ± 0.0	NS
N	<i>Fuscopannaria leucosticta</i>	White-rimmed Shingle Lichen	Threatened			S3	8	26.5 ± 0.0	NS
N	<i>Pectenla plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	204	14.4 ± 0.0	NS
N	<i>Sclerophora peronella</i> (Atlantic pop.)	Frosted Glass-whiskers (Atlantic population)	Special Concern	Special Concern		S3S4	28	22.1 ± 0.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	15	25.4 ± 0.0	NS
N	<i>Fissidens exilis</i>	Pygmy Pocket Moss	Not At Risk			S3	14	27.0 ± 0.0	NS
N	<i>Chaenotheca servitii</i>	Flexuous Golden Stubble	Data Deficient			S1	1	57.9 ± 1.0	NS
N	<i>Aloina brevirostris</i>	Short-Beaked Rigid Screw Moss				S1	1	56.4 ± 2.0	NS
N	<i>Sematophyllum demissum</i>	a Moss				S1	1	31.3 ± 2.0	NS
N	<i>Cyrto-hypnum minutulum</i>	Tiny Cedar Moss				S1	1	58.0 ± 0.0	NS
N	<i>Blennothallia crispa</i>	Crinkled Jelly Lichen				S1	1	60.4 ± 0.0	NS
N	<i>Umbilicaria vellea</i>	Grizzled Rocktripe Lichen				S1	1	55.1 ± 5.0	NS
N	<i>Usnea perplexans</i>	Powdered Beard Lichen				S1	1	68.5 ± 0.0	NS
N	<i>Scytinium dactylinum</i>	Brown-buttoned Jellyskin Lichen				S1	1	99.7 ± 0.0	NS
N	<i>Lathagrium cristatum</i>	Fingered Jelly Lichen				S1	3	59.9 ± 0.0	NS
N	<i>Epebe perspinulosa</i>	Thread Lichen				S1	1	99.7 ± 1.0	NS
N	<i>Fuscopannaria praetermissa</i>	Moss Shingles Lichen				S1	1	61.9 ± 0.0	NS
N	<i>Scytinium schraderi</i>	Wrinkled Jellyskin Lichen				S1	1	30.3 ± 0.0	NS
N	<i>Lichina confinis</i>	Marine Seaweed Lichen				S1	4	55.0 ± 0.0	NS
N	<i>Polychidium muscicola</i>	Eyed Mossthorns				S1	1	37.8 ± 0.0	NS
N	<i>Sticta limbata</i>	Woollybear Lichen				S1	1	37.8 ± 0.0	NS
N	<i>Sticta limbata</i>	Powdered Moon Lichen				S1	4	75.5 ± 3.0	NS
N	<i>Leptogium hibernicum</i>	Hibernia Jellyskin Lichen				S1	1	66.1 ± 0.0	NS
N	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen				S1	4	60.3 ± 0.0	NS
N	<i>Bryoria nitidula</i>	Tundra Horsehair Lichen				S1	2	58.5 ± 0.0	NS
N	<i>Hypogymnia hultenii</i>	Powdered Honeycomb Lichen				S1	15	38.2 ± 0.0	NS
N	<i>Calypogeia neogaea</i>	Common Pouchwort				S1?	1	53.8 ± 0.0	NS
N	<i>Aloina rigida</i>	Aloe-Like Rigid Screw Moss				S1?	4	51.8 ± 0.0	NS
N	<i>Imbricium muehlenbeckii</i>	Muehlenbeck's Bryum Moss				S1?	2	80.0 ± 0.0	NS
N	<i>Conardia compacta</i>	Coast Creeping Moss				S1?	1	74.0 ± 2.0	NS
N	<i>Tortula obtusifolia</i>	a Moss				S1?	3	33.0 ± 0.0	NS
N	<i>Didymodon tophaceus</i>	Olive Beard Moss				S1?	1	60.3 ± 0.0	NS
N	<i>Paludella squarrosa</i>	Tufted Fen Moss				S1?	3	50.9 ± 0.0	NS
N	<i>Physcomitrium immersum</i>	a Moss				S1?	1	87.0 ± 0.0	NS
N	<i>Schistostega pennata</i>	Luminous Moss				S1?	1	42.5 ± 0.0	NS
N	<i>Syntrichia ruralis</i>	a Moss				S1?	1	33.6 ± 0.0	NS
N	<i>Melanelia culbersonii</i>	Appalachian Camouflage Lichen				S1?	1	79.6 ± 0.0	NS



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N	<i>Arrhenopterum heterostichum</i>	One-sided Groove Moss				S1S2	2	56.4 ± 2.0	NS
N	<i>Mnium thomsonii</i>	Thomson's Leafy Moss				S1S2	1	61.1 ± 2.0	NS
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1S2	2	78.9 ± 3.0	NS
N	<i>Platydictya confervoides</i>	a Moss				S1S2	1	60.5 ± 0.0	NS
N	<i>Sematophyllum marylandicum</i>	a Moss				S1S2	2	23.7 ± 6.0	NS
N	<i>Timmia megapolitana</i>	Metropolitan Timmia Moss				S1S2	3	64.5 ± 0.0	NS
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S1S2	1	84.3 ± 3.0	NS
N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S1S2	2	51.7 ± 0.0	NS
N	<i>Haplocladium microphyllum</i>	Tiny-leaved Haplocladium Moss				S1S2	1	36.7 ± 5.0	NS
N	<i>Enchylium bachmanianum</i>	Bachman's Jelly Lichen				S1S2	1	60.3 ± 0.0	NS
N	<i>Placidium squamulosum</i>	Limy Soil Stipplescale Lichen				S1S2	1	31.7 ± 6.0	NS
N	<i>Peltigera ponojensis</i>	Pale-bellied Pelt Lichen				S1S2	1	69.0 ± 0.0	NS
N	<i>Pilophorus cereolus</i>	Powdered Matchstick Lichen				S1S2	1	65.5 ± 3.0	NS
N	<i>Rhizoplaca subdiscrepans</i>	Scattered Rock-posy Lichen				S1S2	1	81.2 ± 1.0	NS
N	<i>Parmotrema reticulatum</i>	Netted Ruffle Lichen				S1S2	5	92.8 ± 0.0	NS
N	<i>Parmeliella parvula</i>	Poor-man's Shingles Lichen				S1S2	12	24.6 ± 0.0	NS
N	<i>Lecanora polytropa</i>	a lichen				S1S3	1	63.0 ± 1.0	NS
N	<i>Heterodermia galactophylla</i>	Branching Fringe Lichen				S1S3	1	81.4 ± 0.0	NS
N	<i>Xylopsora friesii</i>	a Lichen				S1S3	2	47.4 ± 0.0	NS
N	<i>Stereocaulon grande</i>	Grand Foam Lichen				S1S3	1	58.5 ± 0.0	NS
N	<i>Stereocaulon intermedium</i>	Pacific Brain Foam Lichen				S1S3	2	45.8 ± 0.0	NS
N	<i>Anacamptodon splachnoides</i>	a Moss				S2	2	45.8 ± 30.0	NS
N	<i>Sphagnum platyphyllum</i>	Flat-leaved Peat Moss				S2	2	26.9 ± 3.0	NS
N	<i>Sphagnum subnitens</i>	Lustrous Peat Moss				S2	1	44.3 ± 2.0	NS
N	<i>Usnea flavocardia</i>	Blood-splattered Beard Lichen				S2	1	55.3 ± 4.0	NS
N	<i>Cystocoleus ebeneus</i>	Rockgossamer Lichen				S2	2	46.5 ± 0.0	NS
N	<i>Hypotrachyna catawbiensis</i>	Powder-tipped Antler Lichen				S2	1	80.8 ± 0.0	NS
N	<i>Nephroma arcticum</i>	Arctic Kidney Lichen				S2	1	54.6 ± 1.0	NS
N	<i>Nephroma resupinatum</i>	a lichen				S2	11	25.8 ± 1.0	NS
N	<i>Placynthium flabelliforme</i>	Scaly Ink Lichen				S2	1	11.8 ± 17.0	NS
N	<i>Riccardia multifida</i>	Delicate Germanderwort				S2?	1	24.9 ± 0.0	NS
N	<i>Anomodon viticulosus</i>	a Moss				S2?	1	74.9 ± 5.0	NS
N	<i>Weissia muhlenbergiana</i>	a Moss				S2?	4	61.1 ± 1.0	NS
N	<i>Atrichum angustatum</i>	Lesser Smoothcap Moss				S2?	2	45.7 ± 2.0	NS
N	<i>Ptychostomum pendulum</i>	Drooping Bryum				S2?	1	56.4 ± 2.0	NS
N	<i>Drepanocladus polygamus</i>	Polygamous Hook Moss				S2?	4	31.3 ± 2.0	NS
N	<i>Dicranum condensatum</i>	Condensed Broom Moss				S2?	1	68.3 ± 0.0	NS
N	<i>Ditrichum rhynchostegium</i>	a Moss				S2?	1	46.0 ± 1.0	NS
N	<i>Grimmia anomala</i>	Mountain Forest Grimmia				S2?	1	95.5 ± 1.0	NS
N	<i>Kiaeria starkei</i>	Starke's Fork Moss				S2?	1	32.8 ± 10.0	NS
N	<i>Orthotrichum anomalum</i>	Anomalous Bristle Moss				S2?	1	66.2 ± 2.0	NS
N	<i>Philonotis marchica</i>	a Moss				S2?	2	44.6 ± 0.0	NS
N	<i>Platydictya jungermannioides</i>	False Willow Moss				S2?	1	4.9 ± 0.0	NS
N	<i>Saelania glaucescens</i>	Blue Dew Moss				S2?	1	69.5 ± 0.0	NS
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2?	2	42.9 ± 5.0	NS
N	<i>Platylomella lescurii</i>	a Moss				S2?	4	38.7 ± 0.0	NS
N	<i>Phylliscum demangeonii</i>	Black Rock-wafer Lichen				S2?	1	71.5 ± 0.0	NS
N	<i>Oxyrrhynchium hians</i>	Light Beaked Moss				S2S3	4	9.4 ± 25.0	NS
N	<i>Platydictya subtilis</i>	Bark Willow Moss				S2S3	1	78.9 ± 3.0	NS
N	<i>Scorpidium revolvens</i>	Limprichtia Moss				S2S3	2	50.9 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
N	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen				S2S3	62	14.6 ± 0.0	NS
N	<i>Moelleropsis nebulosa ssp. frullaniae</i>	Blue-gray Moss Shingle Lichen				S2S3	3	23.5 ± 0.0	NS
N	<i>Ramalina thrausta</i>	Angelhair Ramalina Lichen				S2S3	13	16.0 ± 0.0	NS
N	<i>Collema leptaleum</i>	Crumpled Bat's Wing Lichen				S2S3	52	2.3 ± 0.0	NS
N	<i>Usnea ceratina</i>	Warty Beard Lichen				S2S3	1	71.0 ± 0.0	NS
N	<i>Usnea hirta</i>	Bristly Beard Lichen				S2S3	2	46.9 ± 0.0	NS
N	<i>Usnea rubicunda</i>	Red Beard Lichen				S2S3	4	38.1 ± 0.0	NS
N	<i>Ahtiana aurescens</i>	Eastern Candlewax Lichen				S2S3	15	32.2 ± 0.0	NS
N	<i>Usnocetraria oakesiana</i>	Yellow Band Lichen				S2S3	9	41.6 ± 0.0	NS
N	<i>Cladonia incrassata</i>	Powder-foot British Soldiers Lichen				S2S3	1	83.7 ± 0.0	NS
N	<i>Cladonia mateocyatha</i>	Mixed-up Pixie-cup				S2S3	3	47.0 ± 5.0	NS
N	<i>Cladonia parasitica</i>	Fence-rail Lichen				S2S3	3	40.5 ± 0.0	NS
N	<i>Chaenotheca gracilentia</i>	a lichen				S2S3	1	46.7 ± 0.0	NS
N	<i>Scytinium tenuissimum</i>	Birdnest Jellyskin Lichen				S2S3	8	33.0 ± 0.0	NS
N	<i>Melanohalea septentrionalis</i>	Northern Camouflage Lichen				S2S3	1	68.2 ± 0.0	NS
N	<i>Myelochroa aurulenta</i>	Powdery Axil-bristle Lichen				S2S3	4	40.2 ± 0.0	NS
N	<i>Parmelia fertilis</i>	Fertile Shield Lichen				S2S3	8	45.4 ± 0.0	NS
N	<i>Hypotrachyna minarum</i>	Hairless-spined Shield Lichen				S2S3	1	30.6 ± 0.0	NS
N	<i>Parmeliopsis ambigua</i>	Green Starburst Lichen				S2S3	3	47.9 ± 0.0	NS
N	<i>Racodium rupestre</i>	Rockhair Lichen				S2S3	3	41.2 ± 1.0	NS
N	<i>Umbilicaria polyphylla</i>	Petalled Rocktripe Lichen				S2S3	1	86.0 ± 2.0	NS
N	<i>Usnea cavernosa</i>	Pitted Beard Lichen				S2S3	2	68.5 ± 0.0	NS
N	<i>Usnea mutabilis</i>	Bloody Beard Lichen				S2S3	1	68.6 ± 0.0	NS
N	<i>Fuscopannaria sorediata</i>	a Lichen				S2S3	6	41.2 ± 1.0	NS
N	<i>Stereocaulon condensatum</i>	Granular Soil Foam Lichen				S2S3	3	75.7 ± 0.0	NS
N	<i>Physcia subtilis</i>	Slender Rosette Lichen				S2S3	1	18.0 ± 0.0	NS
N	<i>Dimelaena oreina</i>	Golden Moonglow Lichen				S2S3	2	51.8 ± 0.0	NS
N	<i>Cladonia coccifera</i>	Eastern Boreal Pixie-cup Lichen				S2S3	3	9.5 ± 4.0	NS
N	<i>Cladonia deformis</i>	Lesser Sulphur-cup Lichen				S2S3	3	78.2 ± 4.0	NS
N	<i>Cladonia phyllophora</i>	Felt Lichen				S2S3	2	97.9 ± 4.0	NS
N	<i>Usnea flammea</i>	Coastal Bushy Beard Lichen				S2S3	1	63.0 ± 1.0	NS
N	<i>Ephemerum serratum</i>	a Moss				S3	4	27.0 ± 0.0	NS
N	<i>Fissidens taxifolius</i>	Yew-leaved Pocket Moss				S3	9	27.0 ± 0.0	NS
N	<i>Anomodon tristis</i>	a Moss				S3	10	39.3 ± 15.0	NS
N	<i>Sphagnum contortum</i>	Twisted Peat Moss				S3	3	54.5 ± 0.0	NS
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S3	3	41.0 ± 0.0	NS
N	<i>Rostania occultata</i>	Crusted Tarpaper Lichen				S3	1	93.3 ± 0.0	NS
N	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen				S3	25	16.9 ± 0.0	NS
N	<i>Solorina saccata</i>	Woodland Owl Lichen				S3	10	3.3 ± 2.0	NS
N	<i>Fuscopannaria ahneri</i>	Corrugated Shingles Lichen				S3	92	15.8 ± 0.0	NS
N	<i>Heterodermia squamulosa</i>	Scaly Fringe Lichen				S3	79	32.2 ± 0.0	NS
N	<i>Scytinium lichenoides</i>	Tattered Jellyskin Lichen				S3	27	26.4 ± 0.0	NS
N	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen				S3	7	21.5 ± 3.0	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	8	27.3 ± 5.0	NS
N	<i>Placynthium nigrum</i>	Common Ink Lichen				S3	2	33.0 ± 0.0	NS
N	<i>Platismatia norvegica</i>	Oldgrowth Rag Lichen				S3	1	48.0 ± 0.0	NS
N	<i>Punctelia appalachensis</i>	Appalachian Speckleback Lichen				S3	99	84.5 ± 0.0	NS
N	<i>Viridothelium virens</i>					S3	2	45.6 ± 2.0	NS
N	<i>Ephebe lanata</i>	Waterside Rockshag Lichen				S3	2	11.8 ± 17.0	NS
N	<i>Phaeophyscia adiastrata</i>	Powder-tipped Shadow Lichen				S3	1	46.0 ± 0.0	NS

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N	<i>Phaeophyscia pusilloides</i>	Pompom-tipped Shadow Lichen				S3	10	23.5 ± 7.0	NS
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S3	12	22.7 ± 0.0	NS
N	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss				S3?	2	60.4 ± 0.0	NS
N	<i>Calliergon giganteum</i>	Giant Spear Moss				S3?	1	51.9 ± 3.0	NS
N	<i>Drummondia prorepens</i>	a Moss				S3?	1	67.8 ± 5.0	NS
N	<i>Elodium blandowii</i>	Blandow's Bog Moss				S3?	6	41.8 ± 7.0	NS
N	<i>Mnium stellare</i>	Star Leafy Moss				S3?	3	55.7 ± 0.0	NS
N	<i>Sphagnum lindbergii</i>	Lindberg's Peat Moss				S3?	1	54.3 ± 0.0	NS
N	<i>Sphagnum riparium</i>	Streamside Peat Moss				S3?	2	25.6 ± 0.0	NS
N	<i>Cladonia stygia</i>	Black-footed Reindeer Lichen				S3?	5	21.8 ± 0.0	NS
N	<i>Anomodon rugelii</i>	Rugel's Anomodon Moss				S3S4	1	85.7 ± 0.0	NS
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S3S4	3	35.3 ± 3.0	NS
N	<i>Dicranum leioneuron</i>	a Dicranum Moss				S3S4	1	73.3 ± 0.0	NS
N	<i>Encalypta ciliata</i>	Fringed Extinguisher Moss				S3S4	2	84.3 ± 3.0	NS
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	1	69.5 ± 0.0	NS
N	<i>Splachnum ampullaceum</i>	Cruet Dung Moss				S3S4	2	26.3 ± 0.0	NS
N	<i>Thamnobryum alleghaniense</i>	a Moss				S3S4	7	76.8 ± 0.0	NS
N	<i>Tomentypnum nitens</i>	Golden Fuzzy Fen Moss				S3S4	2	46.5 ± 2.0	NS
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S3S4	2	36.0 ± 0.0	NS
N	<i>Hylacomiastrum pyrenaicum</i>	a Feather Moss				S3S4	1	47.7 ± 0.0	NS
N	<i>Enchylium tenax</i>	Soil Tarpaper Lichen				S3S4	7	2.1 ± 0.0	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3S4	72	18.6 ± 0.0	NS
N	<i>Arctoparmelia incurva</i>	Finger Ring Lichen				S3S4	63	37.0 ± 0.0	NS
N	<i>Scytinium teretiusculum</i>	Curly Jellyskin Lichen				S3S4	10	2.2 ± 0.0	NS
N	<i>Leptogium acadense</i>	Acadian Jellyskin Lichen				S3S4	26	18.2 ± 0.0	NS
N	<i>Scytinium subtile</i>	Appressed Jellyskin Lichen				S3S4	19	2.2 ± 0.0	NS
N	<i>Cladonia floerkeana</i>	Gritty British Soldiers Lichen				S3S4	3	58.8 ± 0.0	NS
N	<i>Vahlia leucophaea</i>	Shelter Shingle Lichen				S3S4	10	75.9 ± 0.0	NS
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3S4	44	19.1 ± 0.0	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3S4	72	14.8 ± 4.0	NS
N	<i>Melanohalea olivacea</i>	Spotted Camouflage Lichen				S3S4	3	68.5 ± 0.0	NS
N	<i>Parmeliopsis hyperopta</i>	Gray Starburst Lichen				S3S4	3	67.2 ± 0.0	NS
N	<i>Parmotrema perlatum</i>	Powdered Ruffle Lichen				S3S4	11	40.8 ± 0.0	NS
N	<i>Peltigera hymenina</i>	Cloudy Pelt Lichen				S3S4	2	58.8 ± 2.0	NS
N	<i>Sphaerophorus fragilis</i>	Fragile Coral Lichen				S3S4	7	37.0 ± 0.0	NS
N	<i>Coccocarpha palmicola</i>	Salted Shell Lichen				S3S4	717	14.4 ± 0.0	NS
N	<i>Physcia caesia</i>	Blue-gray Rosette Lichen				S3S4	2	63.0 ± 1.0	NS
N	<i>Physcia tenella</i>	Fringed Rosette Lichen				S3S4	6	42.9 ± 0.0	NS
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	116	9.7 ± 3.0	NS
N	<i>Evernia prunastri</i>	Valley Oakmoss Lichen				S3S4	29	20.1 ± 0.0	NS
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	124	20.0 ± 0.0	NS
P	<i>Clethra alnifolia</i>	Coast Pepper-Bush	Endangered	Threatened	Vulnerable	S2	2	47.3 ± 0.0	NS
P	<i>Juglans cinerea</i>	Butternut	Endangered	Endangered		SNA	12	42.4 ± 0.0	NS
P	<i>Fraxinus nigra</i>	Black Ash	Threatened		Threatened	S1S2	477	5.2 ± 0.0	NS
P	<i>Liatrix spicata</i>	Dense Blazing Star	Threatened	Threatened		SNA	3	38.0 ± 0.0	NS
P	<i>Bartonia paniculata ssp. paniculata</i>	Branched Bartonia	Threatened	Threatened		SNA	1	45.3 ± 10.0	NS
P	<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S3	16	91.6 ± 1.0	NS
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S3	13	62.4 ± 0.0	NS
P	<i>Floerkea proserpinacoides</i>	False Mermidweed	Not At Risk			S2S3	5	41.9 ± 7.0	NS
P	<i>Acer saccharinum</i>	Silver Maple				S1	11	95.2 ± 0.0	NS
P	<i>Osmorhiza depauperata</i>	Blunt Sweet Cicely				S1	1	82.7 ± 5.0	NS
P	<i>Andersonglossum boreale</i>	Northern Wild Comfrey				S1	5	57.3 ± 1.0	NS
P	<i>Cochlearia tridactylites</i>	Limestone Scurvy-grass				S1	8	89.4 ± 0.0	NS
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	10	45.1 ± 7.0	NS

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P	<i>Hudsonia tomentosa</i>	Woolly Beach-heath				S1	2	92.9 ± 7.0	NS
P	<i>Ribes americanum</i>	Wild Black Currant				S1	4	30.5 ± 1.0	NS
P	<i>Fraxinus pennsylvanica</i>	Red Ash				S1	13	8.3 ± 0.0	NS
P	<i>Persicaria careyi</i>	Carey's Smartweed				S1	1	20.0 ± 3.0	NS
P	<i>Phytolacca americana</i>	Common Pokeweed				S1	1	40.8 ± 0.0	NS
P	<i>Montia fontana</i>	Water Blinks				S1	1	47.8 ± 1.0	NS
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	1	57.0 ± 0.0	NS
P	<i>Ranunculus pennsylvanicus</i>	Pennsylvania Buttercup				S1	31	75.1 ± 0.0	NS
P	<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry				S1	1	89.9 ± 1.0	NS
P	<i>Salix myrtilifolia</i>	Blueberry Willow				S1	1	11.1 ± 0.0	NS
P	<i>Salix serissima</i>	Autumn Willow				S1	2	11.1 ± 0.0	NS
P	<i>Carex garberi</i>	Garber's Sedge				S1	4	45.5 ± 0.0	NS
P	<i>Carex laxiflora</i>	Loose-Flowered Sedge				S1	1	86.9 ± 1.0	NS
P	<i>Carex plantaginea</i>	Plantain-Leaved Sedge				S1	4	42.3 ± 0.0	NS
P	<i>Carex prairea</i>	Prairie Sedge				S1	2	96.3 ± 1.0	NS
P	<i>Carex viridula</i> var. <i>saxillitoralis</i>	Greenish Sedge				S1	5	55.1 ± 2.0	NS
P	<i>Cyperus lupulinus</i> ssp. <i>macilentus</i>	Hop Flatsedge				S1	2	90.8 ± 0.0	NS
P	<i>Scirpus atrovirens</i>	Dark-green Bulrush				S1	5	4.2 ± 0.0	NS
P	<i>Juncus vaseyi</i>	Vasey Rush				S1	3	45.8 ± 0.0	NS
P	<i>Trillium grandiflorum</i>	White Trillium				S1	3	96.3 ± 1.0	NS
P	<i>Malaxis monophyllos</i> var. <i>brachypoda</i>	North American White Adder's-mouth				S1	5	72.2 ± 10.0	NS
P	<i>Spiranthes casei</i> var. <i>casei</i>	Case's Ladies'-Tresses				S1	1	87.5 ± 0.0	NS
P	<i>Elymus hystrix</i>	Spreading Wild Rye				S1	12	11.9 ± 1.0	NS
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S1	10	40.4 ± 1.0	NS
P	<i>Equisetum palustre</i>	Marsh Horsetail				S1	1	93.2 ± 5.0	NS
P	<i>Botrychium lunaria</i>	Common Moonwort				S1	8	41.0 ± 0.0	NS
P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1	1	56.6 ± 0.0	NS
P	<i>Solidago hispida</i>	Hairy Goldenrod				S1?	2	44.0 ± 7.0	NS
P	<i>Suaeda rolandii</i>	Roland's Sea-Blite				S1?	5	57.6 ± 2.0	NS
P	<i>Carex pennsylvanica</i>	Pennsylvania Sedge				S1?	3	19.7 ± 3.0	NS
P	<i>Bolboschoenus robustus</i>	Sturdy Bulrush				S1?	2	90.9 ± 5.0	NS
P	<i>Allium schoenoprasum</i>	Wild Chives				S1?	5	39.3 ± 10.0	NS
P	<i>Allium schoenoprasum</i> var. <i>sibiricum</i>	Wild Chives				S1?	1	40.6 ± 7.0	NS
P	<i>Crocanthemum canadense</i>	Long-branched Frostweed			Endangered	S1S2	2	54.3 ± 1.0	NS
P	<i>Cypripedium arietinum</i>	Ram's-Head Lady's-Slipper			Endangered	S1S2	291	53.5 ± 0.0	NS
P	<i>Sanicula odorata</i>	Clustered Sanicle				S1S2	9	30.2 ± 10.0	NS
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1S2	2	84.9 ± 0.0	NS
P	<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				S1S2	1	2.5 ± 0.0	NS
P	<i>Anemone virginiana</i> var. <i>alba</i>	Virginia Anemone				S1S2	5	40.6 ± 7.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1S2	3	40.9 ± 1.0	NS
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S1S2	1	49.6 ± 10.0	NS
P	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	Slim-stemmed Reed Grass				S1S2	1	92.3 ± 7.0	NS
P	<i>Carex vacillans</i>	Estuarine Sedge				S1S3	2	52.2 ± 0.0	NS
P	<i>Zizia aurea</i>	Golden Alexanders				S2	38	32.5 ± 1.0	NS
P	<i>Antennaria parlinii</i> ssp. <i>fallax</i>	Parlin's Pussytoes				S2	13	31.5 ± 7.0	NS
P	<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S2	15	45.4 ± 7.0	NS
P	<i>Rudbeckia laciniata</i> var. <i>laciniata</i>	Cut-Leaved Coneflower				S2	7	81.5 ± 0.0	NS
P	<i>Arabis pycnocarpa</i>	Cream-flowered Rockcress				S2	1	72.8 ± 0.0	NS
P	<i>Cardamine maxima</i>	Large Toothwort				S2	1	95.3 ± 0.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	127	44.0 ± 7.0	NS
P	<i>Desmodium canadense</i>	Canada Tick-trefoil				S2	22	39.3 ± 5.0	NS

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P	<i>Hylodesmum glutinosum</i>	Large Tick-trefoil				S2	19	49.4 ± 0.0	NS
P	<i>Conopholis americana</i>	American Cancer-root				S2	3	90.6 ± 1.0	NS
P	<i>Anemonastrum canadense</i>	Canada Anemone				S2	8	40.1 ± 0.0	NS
P	<i>Hepatica americana</i>	Round-lobed Hepatica				S2	62	2.5 ± 7.0	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S2	22	38.2 ± 0.0	NS
P	<i>Galium boreale</i>	Northern Bedstraw				S2	7	62.3 ± 1.0	NS
P	<i>Gratiola neglecta</i>	Clammy Hedge-Hyssop				S2	4	27.0 ± 2.0	NS
P	<i>Dirca palustris</i>	Eastern Leatherwood				S2	65	11.3 ± 1.0	NS
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S2	2	11.1 ± 0.0	NS
P	<i>Carex pellita</i>	Woolly Sedge				S2	12	32.2 ± 10.0	NS
P	<i>Carex livida</i>	Livid Sedge				S2	13	31.6 ± 0.0	NS
P	<i>Juncus greenii</i>	Greene's Rush				S2	6	30.1 ± 1.0	NS
P	<i>Allium tricoccum</i>	Wild Leek				S2	29	53.8 ± 0.0	NS
P	<i>Lilium canadense</i>	Canada Lily				S2	112	1.3 ± 1.0	NS
P	<i>Cypripedium parviflorum var. pubescens</i>	Yellow Lady's-slipper				S2	22	35.4 ± 7.0	NS
P	<i>Cypripedium parviflorum var. makasin</i>	Small Yellow Lady's-Slipper				S2	10	54.5 ± 0.0	NS
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	50	10.4 ± 7.0	NS
P	<i>Platanthera flava var. flava</i>	Southern Rein Orchid				S2	1	80.3 ± 7.0	NS
P	<i>Platanthera flava var. herbiola</i>	Pale Green Orchid				S2	11	54.0 ± 0.0	NS
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	14	51.5 ± 1.0	NS
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S2	33	27.9 ± 0.0	NS
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S2	20	28.1 ± 0.0	NS
P	<i>Elymus wiegandii</i>	Wiegand's Wild Rye				S2	21	31.2 ± 0.0	NS
P	<i>Festuca subverticillata</i>	Nodding Fescue				S2	13	32.5 ± 5.0	NS
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S2	3	64.4 ± 0.0	NS
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	3	69.9 ± 0.0	NS
P	<i>Rumex persicarioides</i>	Peach-leaved Dock				S2?	1	85.8 ± 0.0	NS
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S2?	6	19.6 ± 7.0	NS
P	<i>Carex peckii</i>	White-Tinged Sedge				S2?	4	4.8 ± 0.0	NS
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S2S3	955	14.5 ± 7.0	NS
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2S3	32	39.2 ± 5.0	NS
P	<i>Bidens hyperborea</i>	Estuary Beggarticks				S2S3	2	92.3 ± 0.0	NS
P	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				S2S3	2	32.3 ± 1.0	NS
P	<i>Lactuca hirsuta</i>	Hairy Lettuce				S2S3	3	29.4 ± 7.0	NS
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2S3	2	26.5 ± 0.0	NS
P	<i>Caulophyllum thalictroides</i>	Blue Cohosh				S2S3	81	9.1 ± 1.0	NS
P	<i>Boechera stricta</i>	Drummond's Rockcress				S2S3	12	44.2 ± 0.0	NS
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S2S3	13	84.9 ± 0.0	NS
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2S3	7	40.8 ± 0.0	NS
P	<i>Oxybasis rubra</i>	Red Goosefoot				S2S3	4	55.1 ± 2.0	NS
P	<i>Hypericum majus</i>	Large St John's-wort				S2S3	8	38.2 ± 0.0	NS
P	<i>Hypericum x dissimulatum</i>	Disguised St. John's-wort				S2S3	3	34.8 ± 0.0	NS
P	<i>Empetrum atropurpureum</i>	Purple Crowberry				S2S3	5	43.8 ± 7.0	NS
P	<i>Euphorbia polygonifolia</i>	Seaside Spurge				S2S3	1	99.7 ± 3.0	NS
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2S3	11	10.6 ± 7.0	NS
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	16	14.0 ± 5.0	NS
P	<i>Oenothera fruticosa ssp. tetragona</i>	Narrow-leaved Evening Primrose				S2S3	7	40.6 ± 7.0	NS
P	<i>Polygala polygama</i>	Racemed Milkwort				S2S3	1	45.8 ± 1.0	NS
P	<i>Polygonum aviculare ssp. buxiforme</i>	Box Knotweed				S2S3	8	40.6 ± 7.0	NS
P	<i>Polygonum oxyspermum ssp. raii</i>	Ray's Knotweed				S2S3	1	82.7 ± 1.0	NS
P	<i>Polygonum oxyspermum</i>	Sharp-fruit Knotweed				S2S3	1	41.1 ± 0.0	NS
P	<i>Rumex triangulivalvis</i>	Triangular-valve Dock				S2S3	11	29.9 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>Primula mistassinica</i>	Mistassini Primrose				S2S3	16	34.6 ± 1.0	NS
P	<i>Anemone quinquefolia</i>	Wood Anemone				S2S3	14	11.8 ± 0.0	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2S3	7	43.7 ± 0.0	NS
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	5	28.9 ± 5.0	NS
P	<i>Salix pellita</i>	Satiny Willow				S2S3	8	15.5 ± 2.0	NS
P	<i>Tiarella cordifolia</i>	Heart-leaved Foamflower				S2S3	222	5.1 ± 0.0	NS
P	<i>Agalinis purpurea</i> var. <i>parviflora</i>	Small-flowered Purple False Foxglove				S2S3	2	80.8 ± 0.0	NS
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S2S3	2	10.5 ± 0.0	NS
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	9	23.1 ± 7.0	NS
P	<i>Carex capillaris</i>	Hairlike Sedge				S2S3	1	79.8 ± 0.0	NS
P	<i>Carex comosa</i>	Bearded Sedge				S2S3	4	42.9 ± 0.0	NS
P	<i>Carex houghtoniana</i>	Houghton's Sedge				S2S3	5	19.8 ± 1.0	NS
P	<i>Carex hystericina</i>	Porcupine Sedge				S2S3	5	66.4 ± 1.0	NS
P	<i>Eleocharis ovata</i>	Ovate Spikerush				S2S3	9	55.3 ± 0.0	NS
P	<i>Scirpus pedicellatus</i>	Stalked Bulrush				S2S3	7	8.9 ± 0.0	NS
P	<i>Vallisneria americana</i>	Wild Celery				S2S3	3	15.1 ± 1.0	NS
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2S3	2	48.2 ± 0.0	NS
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2S3	14	3.9 ± 1.0	NS
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2S3	28	8.8 ± 1.0	NS
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S2S3	10	40.3 ± 5.0	NS
P	<i>Woodsia glabella</i>	Smooth Cliff Fern				S2S3	2	58.2 ± 1.0	NS
P	<i>Botrychium lanceolatum</i> ssp. <i>angustisegmentum</i>	Narrow Triangle Moonwort				S2S3	8	15.8 ± 5.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	5	38.8 ± 0.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	6	35.4 ± 7.0	NS
P	<i>Potamogeton pulcher</i>	Spotted Pondweed			Vulnerable	S3	3	31.4 ± 2.0	NS
P	<i>Angelica atropurpurea</i>	Purple-stemmed Angelica				S3	1	30.3 ± 0.0	NS
P	<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S3	3	36.9 ± 0.0	NS
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S3	3	38.0 ± 1.0	NS
P	<i>Iva frutescens</i>	Big-leaved Marsh-elder				S3	33	56.6 ± 0.0	NS
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S3	27	40.4 ± 0.0	NS
P	<i>Symphyotrichum boreale</i>	Boreal Aster				S3	5	24.8 ± 5.0	NS
P	<i>Symphyotrichum undulatum</i>	Wavy-leaved Aster				S3	7	41.7 ± 7.0	NS
P	<i>Symphyotrichum ciliolatum</i>	Fringed Blue Aster				S3	20	10.9 ± 0.0	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S3	30	21.3 ± 0.0	NS
P	<i>Betula pumila</i>	Bog Birch				S3	3	10.1 ± 0.0	NS
P	<i>Cardamine parviflora</i>	Small-flowered Bittercress				S3	13	53.1 ± 0.0	NS
P	<i>Palustricodon aparinoides</i>	Marsh Bellflower				S3	38	31.1 ± 0.0	NS
P	<i>Mononeuria groenlandica</i>	Greenland Stitchwort				S3	75	14.9 ± 0.0	NS
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S3	38	37.2 ± 1.0	NS
P	<i>Sagina nodosa</i> ssp. <i>borealis</i>	Knotted Pearlwort				S3	10	52.2 ± 0.0	NS
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S3	12	13.1 ± 0.0	NS
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S3	12	31.4 ± 0.0	NS
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S3	65	41.9 ± 7.0	NS
P	<i>Viburnum edule</i>	Squashberry				S3	2	68.2 ± 0.0	NS
P	<i>Crassula aquatica</i>	Water Pygmyweed				S3	1	74.6 ± 0.0	NS
P	<i>Empetrum eamesii</i>	Pink Crowberry				S3	93	43.8 ± 7.0	NS
P	<i>Vaccinium uliginosum</i>	Alpine Bilberry				S3	3	57.7 ± 1.0	NS
P	<i>Halenia deflexa</i>	Spurred Gentian				S3	3	70.6 ± 0.0	NS
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	12	64.0 ± 3.0	NS
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S3	3	33.1 ± 0.0	NS
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	6	22.6 ± 0.0	NS
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	23	31.8 ± 5.0	NS
P	<i>Persicaria arifolia</i>	Halberd-leaved Tearthumb				S3	15	9.7 ± 0.0	NS
P	<i>Plantago rugelii</i>	Rugel's Plantain				S3	10	28.0 ± 0.0	NS
P	<i>Primula laurentiana</i>	Laurentian Primrose				S3	10	90.1 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>Samolus parviflorus</i>	Seaside Brookweed				S3	9	44.0 ± 5.0	NS
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	2	59.1 ± 0.0	NS
P	<i>Anemone virginiana</i>	Virginia Anemone				S3	17	32.1 ± 7.0	NS
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S3	6	47.2 ± 0.0	NS
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S3	79	7.6 ± 0.0	NS
P	<i>Salix pedicellaris</i>	Bog Willow				S3	55	20.6 ± 0.0	NS
P	<i>Salix sericea</i>	Silky Willow				S3	1	21.8 ± 1.0	NS
P	<i>Saxifraga paniculata</i> ssp. <i>laestadii</i>	Laestadius' Saxifrage				S3	4	82.3 ± 7.0	NS
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	38	48.9 ± 0.0	NS
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	56	2.6 ± 0.0	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S3	7	22.6 ± 0.0	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S3	10	27.2 ± 1.0	NS
P	<i>Carex bebbii</i>	Bebb's Sedge				S3	25	44.9 ± 0.0	NS
P	<i>Carex castanea</i>	Chestnut Sedge				S3	26	9.8 ± 0.0	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3	13	11.1 ± 0.0	NS
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	10	26.4 ± 0.0	NS
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S3	53	10.7 ± 7.0	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	45	2.6 ± 0.0	NS
P	<i>Carex rosea</i>	Rosy Sedge				S3	40	20.0 ± 0.0	NS
P	<i>Carex swanii</i>	Swan's Sedge				S3	3	40.3 ± 0.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S3	11	31.1 ± 0.0	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3	15	11.9 ± 0.0	NS
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S3	34	48.4 ± 0.0	NS
P	<i>Carex atratiformis</i>	Scabrous Black Sedge				S3	3	86.7 ± 0.0	NS
P	<i>Eleocharis nitida</i>	Quill Spikerush				S3	10	38.0 ± 5.0	NS
P	<i>Eleocharis flavescens</i> var. <i>olivacea</i>	Bright-green Spikerush				S3	5	20.4 ± 0.0	NS
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S3	13	39.4 ± 7.0	NS
P	<i>Coeloglossum viride</i>	Long-bracted Frog Orchid				S3	3	59.6 ± 0.0	NS
P	<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper				S3	545	49.3 ± 0.0	NS
P	<i>Neottia bifolia</i>	Southern Twayblade				S3	108	17.9 ± 0.0	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	112	10.9 ± 0.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	24	48.2 ± 0.0	NS
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S3	6	44.9 ± 0.0	NS
P	<i>Piptatheropsis canadensis</i>	Canada Ricegrass				S3	8	20.0 ± 3.0	NS
P	<i>Poa glauca</i>	Glaucous Blue Grass				S3	8	49.4 ± 1.0	NS
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S3	8	34.3 ± 5.0	NS
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S3	6	37.0 ± 0.0	NS
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S3	15	3.4 ± 0.0	NS
P	<i>Asplenium viride</i>	Green Spleenwort				S3	12	67.5 ± 7.0	NS
P	<i>Dryopteris fragrans</i>	Fragrant Wood Fern				S3	15	51.7 ± 7.0	NS
P	<i>Sceptridium dissectum</i>	Dissected Moonwort				S3	7	67.0 ± 1.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	17	4.0 ± 0.0	NS
P	<i>Persicaria amphibia</i> var. <i>emersa</i>	Long-root Smartweed				S3?	2	8.9 ± 0.0	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3?	15	37.1 ± 1.0	NS
P	<i>Diphasiastrum x sabinifolium</i>	Savin-leaved Ground-cedar				S3?	7	43.8 ± 0.0	NS
P	<i>Bidens vulgata</i>	Tall Beggarticks				S3S4	7	37.2 ± 0.0	NS
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3S4	24	28.2 ± 0.0	NS
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S3S4	19	63.0 ± 0.0	NS
P	<i>Bidens beckii</i>	Water Beggarticks				S3S4	9	3.4 ± 0.0	NS
P	<i>Packera paupercula</i>	Balsam Groundsel				S3S4	92	29.6 ± 5.0	NS
P	<i>Packera paupercula</i> var. <i>paupercula</i>	Balsam Groundsel				S3S4	1	55.3 ± 0.0	NS
P	<i>Atriplex glabriuscula</i> var. <i>franktonii</i>	Frankton's Saltbush				S3S4	15	64.3 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>Shepherdia canadensis</i>	Soapberry				S3S4	101	50.5 ± 7.0	NS
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3S4	4	36.4 ± 0.0	NS
P	<i>Vaccinium cespitosum</i>	Dwarf Bilberry				S3S4	60	40.9 ± 0.0	NS
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	2	38.2 ± 0.0	NS
P	<i>Fagus grandifolia</i>	American Beech				S3S4	247	3.3 ± 0.0	NS
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3S4	25	21.8 ± 7.0	NS
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3S4	5	46.0 ± 1.0	NS
P	<i>Nuphar microphylla</i>	Small Yellow Pond-lily				S3S4	4	66.4 ± 0.0	NS
P	<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed				S3S4	32	19.6 ± 7.0	NS
P	<i>Fallopia scandens</i>	Climbing False Buckwheat				S3S4	28	30.3 ± 0.0	NS
P	<i>Rumex pallidus</i>	Seabeach Dock				S3S4	1	34.4 ± 0.0	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3S4	10	20.1 ± 50.0	NS
P	<i>Endotropis alnifolia</i>	alder-leaved buckthorn				S3S4	167	2.4 ± 0.0	NS
P	<i>Amelanchier spicata</i>	Running Serviceberry				S3S4	15	54.7 ± 3.0	NS
P	<i>Crataegus succulenta</i>	Fleshy Hawthorn				S3S4	1	38.6 ± 0.0	NS
P	<i>Fragaria vesca ssp. americana</i>	Woodland Strawberry				S3S4	68	2.9 ± 0.0	NS
P	<i>Fragaria vesca</i>	Woodland Strawberry				S3S4	1	91.9 ± 0.0	NS
P	<i>Galium aparine</i>	Common Bedstraw				S3S4	25	38.1 ± 0.0	NS
P	<i>Geocaulon lividum</i>	Northern Comandra				S3S4	13	50.2 ± 0.0	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3S4	21	36.0 ± 5.0	NS
P	<i>Veronica serpyllifolia</i>	Thyme-Leaved Speedwell				S3S4	77	4.8 ± 0.0	NS
P	<i>Ulmus americana</i>	White Elm				S3S4	71	2.9 ± 1.0	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3S4	205	2.5 ± 0.0	NS
P	<i>Viola sagittata var. ovata</i>	Arrow-Leaved Violet				S3S4	13	28.3 ± 0.0	NS
P	<i>Viola selkirkii</i>	Great-Spurred Violet				S3S4	5	45.9 ± 4.0	NS
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S3S4	3	48.3 ± 0.0	NS
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	7	69.9 ± 1.0	NS
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	21	58.8 ± 0.0	NS
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	5	10.9 ± 0.0	NS
P	<i>Juncus subcaudatus</i>	Woods-Rush				S3S4	24	8.9 ± 1.0	NS
P	<i>Luzula parviflora ssp. melanocarpa</i>	Black-fruited Woodrush				S3S4	5	62.6 ± 0.0	NS
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3S4	7	55.8 ± 0.0	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	7	2.1 ± 0.0	NS
P	<i>Platanthera obtusata</i>	Blunt-leaved Orchid				S3S4	8	28.2 ± 1.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3S4	26	40.6 ± 7.0	NS
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3S4	23	5.8 ± 0.0	NS
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3S4	156	2.8 ± 0.0	NS
P	<i>Panicum philadelphicum</i>	Philadelphia Panicgrass				S3S4	13	48.9 ± 0.0	NS
P	<i>Koeleria spicata</i>	Narrow False Oats				S3S4	17	22.9 ± 0.0	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3S4	15	78.3 ± 0.0	NS
P	<i>Equisetum pratense</i>	Meadow Horsetail				S3S4	16	29.3 ± 0.0	NS
P	<i>Diphasiastrum complanatum</i>	Northern Ground-cedar				S3S4	14	45.7 ± 1.0	NS
P	<i>Diphasiastrum sitchense</i>	Sitka Ground-cedar				S3S4	2	47.1 ± 5.0	NS
P	<i>Huperzia appressa</i>	Mountain Firmoss				S3S4	18	36.4 ± 7.0	NS
P	<i>Sceptridium multifidum</i>	Leathery Moonwort				S3S4	10	22.8 ± 10.0	NS
P	<i>Botrychium matricariifolium</i>	Daisy-leaved Moonwort				S3S4	7	41.0 ± 0.0	NS
P	<i>Viola canadensis</i>	Canada Violet				SH	2	41.9 ± 7.0	NS
P	<i>Greeneochloa coarctata</i>	Small Reedgrass				SH	1	48.7 ± 6.0	NS



## 5.1 SOURCE BIBLIOGRAPHY (100 km)

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

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639	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database [as of 2018-03]. Mersey Tobeatic Research Institute.
623	Cameron, E. 2008. Canadian Gypsum Co. survey 2007-08. Conestoga-Rovers & Assoc., 623 recs.
515	Clayden, S. Digitization of Wolfgang Maass Nova Scotia forest lichen collections, 1964-2004. New Brunswick Museum. 2018.
439	Belliveau, A.G. 2020. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2019, 2020. E.C. Smith Herbarium.
412	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
403	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
357	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
340	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2015. Atlantic Canada Conservation Data Centre Fieldwork 2015. Atlantic Canada Conservation Data Centre, # recs.
338	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: <a href="http://luxor.acadiau.ca/library/Herbarium/project/">http://luxor.acadiau.ca/library/Herbarium/project/</a> . 582 recs.
333	Hicks, Andrew. 2009. Coastal Waterfowl Surveys Database, 2000-08. Canadian Wildlife Service, Sackville, 46488 recs (11149 non-zero).
332	Blaney, C.S.; Mazerolle, D.M. 2010. Fieldwork 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 15508 recs.
321	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
301	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 records.
295	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2014. Atlantic Canada Conservation Data Centre Fieldwork 2014. Atlantic Canada Conservation Data Centre, # recs.
282	Scott, F.W. 2002. Nova Scotia Herpetofauna Atlas Database. Acadia University, Wolfville NS, 8856 recs.
282	Wilhelm, S.I. et al. 2011. Colonial Waterbird Database. Canadian Wildlife Service, Sackville, 2698 sites, 9718 recs (8192 obs).
264	Blaney, C.S.; Mazerolle, D.M. 2012. Fieldwork 2012. Atlantic Canada Conservation Data Centre, 13,278 recs.
249	Paquet, Julie. 2019. Atlantic Canada Shorebird Survey ACSS database for 2019. Environment Canada, Canadian Wildlife Service.
239	Churchill, J.L. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2018. Atlantic Canada Conservation Data Centre, 907 recs.
236	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.
235	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.
234	Neily, T.H. 2017. Nova Scotia lichen records. Mersey Tobeatic Research Institute.
233	Belliveau, A.G. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
206	LaPaix, R.W.; Crowell, M.J.; MacDonald, M. 2011. Stantec rare plant records, 2010-11. Stantec Consulting, 334 recs.
191	Klymko, J. 2018. Maritimes Butterfly Atlas database. Atlantic Canada Conservation Data Centre.
191	Toms, B. 2018. Bat Species data from <a href="http://www.batconservation.ca">www.batconservation.ca</a> for Nova Scotia. Mersey Tobeatic Research Institute, 547 Records.
175	Phinney, Lori. 2020. Pre- and post White-nose Syndrome bat acoustic monitoring, NS. Mersey Tobeatic Research Institute, 1279 recs.
170	Bryson, I. 2013. Nova Scotia rare plant records. CBCL Ltd., 180 records.
140	Pepper, C. 2013. 2013 rare bird and plant observations in Nova Scotia. , 181 records.
138	Munro, Marian K. Tracked lichen specimens, Nova Scotia Provincial Museum of Natural History Herbarium. Atlantic Canada Conservation Data Centre. 2019.
137	Bryson, I.C. 2020. Nova Scotia flora and lichen observations 2020. Nova Scotia Environment, 139 recs.
134	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
132	Cameron, R.P. 2009. Cyanolichen database. Nova Scotia Environment & Labour, 1724 recs.
129	Manthorne, A. 2014. MaritimesSwiftwatch Project database 2013-2014. Bird Studies Canada, Sackville NB, 326 recs.
128	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
124	e-Butterfly. 2016. Export of Maritimes records and photos. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
122	Blaney, C.S.; Mazerolle, D.M.; Hill, N.M. 2011. Nova Scotia Crown Share Land Legacy Trust Fieldwork. Atlantic Canada Conservation Data Centre, 5022 recs.
116	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
112	Blaney, C.S. 2000. Fieldwork 2000. Atlantic Canada Conservation Data Centre. Sackville NB, 1265 recs.
112	iNaturalist. 2018. iNaturalist Data Export 2018. iNaturalist.org and iNaturalist.ca, Web site: 11700 recs.
104	Chapman, C.J. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 11171 recs.
103	e-Butterfly. 2019. Export of Maritimes records and photos. McFarland, K. (ed.) e-butterfly.org.
93	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
89	Nussey, Pat & NCC staff. 2019. AEI tracked species records, 2016-2019. Chapman, C.J. (ed.) Atlantic Canada Conservation Data Centre, 333.

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87	McNeil, J.A. 2018. Wood Turtle records, 2018. Mersey Tobeatic Research Institute, 68 recs.
85	Richardson, Leif. 2018. Maritimes Bombus records from various sources. Richardson, Leif.
84	Chapman-Lam, C.J. 2021. Atlantic Canada Conservation Data Centre 2020 botanical fieldwork. Atlantic Canada Conservation Data Centre, 17309 recs.
81	Brazner, J. 2016. Nova Scotia Forested Wetland Bird Surveys. Nova Scotia Department of Lands and Forestry.
78	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
76	Cameron, R.P. 2011. Lichen observations, 2011. Nova Scotia Environment & Labour, 731 recs.
74	Pepper, C. 2021. Rare bird, plant and mammal observations in Nova Scotia, 2017-2021.
73	Bryson, I. 2020. Nova Scotia and Newfoundland rare species observations, 2018-2020. Nova Scotia Environment.
72	Staicer, C. & Bliss, S.; Achenbach, L. 2017. Occurrences of tracked breeding birds in forested wetlands. , 303 records.
71	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-03-18]. Mersey Tobeatic Research Institute.
68	Roland, A.E. & Smith, E.C. 1969. The Flora of Nova Scotia, 1st Ed. Nova Scotia Museum, Halifax, 743pp.
65	Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
64	Belliveau, A.G. 2014. Plant Records from Southern and Central Nova Scotia. Atlantic Canada Conservation Data Centre, 919 recs.
61	Klymko, J.J.D. 2012. Insect fieldwork & submissions, 2011. Atlantic Canada Conservation Data Centre. Sackville NB, 760 recs.
60	Cameron, R.P. 2009. Erioderma pedicellatum database, 1979-2008. Dept Environment & Labour, 103 recs.
59	Neily, T.H. & Pepper, C. 2020. Nova Scotia SMP lichen surveys 2020. Mersey Tobeatic Research Institute.
56	Blaney, C.S.; Mazerolle, D.M.; Oberndorfer, E. 2007. Fieldwork 2007. Atlantic Canada Conservation Data Centre. Sackville NB, 13770 recs.
55	LaPaix, R.W.; Crowell, M.J.; MacDonald, M.; Neily, T.D.; Quinn, G. 2017. Stantec Nova Scotia rare plant records, 2012-2016. Stantec Consulting.
53	iNaturalist. 2020. iNaturalist butterfly records selected for the Maritimes Butterfly Atlas. iNaturalist.
50	Churchill, J.L. 2020. Atlantic Canada Conservation Data Centre Fieldwork 2020. Atlantic Canada Conservation Data Centre, 1083 recs.
48	Belliveau, A.G. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre, 10695 recs.
45	Benjamin, L.K. (compiler). 2001. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources, 15 spp, 224 recs.
45	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
44	Chapman, C.J. 2019. Atlantic Canada Conservation Data Centre 2019 botanical fieldwork. Atlantic Canada Conservation Data Centre, 11729 recs.
44	Hall, R.A. 2001. S. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 178 recs.
44	Hall, R.A. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 189 recs.
44	Neily, T.H. & Pepper, C.; Toms, B. 2015. Nova Scotia lichen location database [as of 2015-02-15]. Mersey Tobeatic Research Institute, 1691 records.
42	Blaney, C.S. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 1042 recs.
42	Nova Scotia Nature Trust. 2013. Nova Scotia Nature Trust 2013 Species records. Nova Scotia Nature Trust, 95 recs.
42	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.
41	Amirault, D.L. & McKnight, J. 2003. Piping Plover Database 1991-2003. Canadian Wildlife Service, Sackville, unpublished data. 7 recs.
40	Blaney, C.S.; Spicer, C.D.; Popma, T.M.; Hanel, C. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 2252 recs.
40	Cameron, E. 2007. Canadian Gypsum Co. survey 2005-07. Dillon Consulting Ltd, 40 recs.
40	NatureServe Canada. 2019. iNaturalist Maritimes Butterfly Records. iNaturalist.org and iNaturalist.ca.
39	Belliveau, A.G. 2018. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2018. E.C. Smith Herbarium, 6226 recs.
38	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2013. Atlantic Canada Conservation Data Centre Fieldwork 2013. Atlantic Canada Conservation Data Centre, 9000+ recs.
38	Mazerolle, D.M. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 13515 recs.
37	Klymko, J.J.D.; Robinson, S.L. 2012. 2012 field data. Atlantic Canada Conservation Data Centre, 447 recs.
37	Mersey Tobeatic Research Institute. 2021. 2020 Monarch records from the MTRI monitoring program. Mersey Tobeatic Research Institute, 72 records.
37	Stewart, J.I. 2010. Peregrine Falcon Surveys in New Brunswick, 2002-09. Canadian Wildlife Service, Sackville, 58 recs.
36	Churchill, J.L. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre, 2318 recs.
35	Ogden, J. NS DNR Butterfly Collection Dataset. Nova Scotia Department of Natural Resources. 2014.
34	Blaney, C.S. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2018. Atlantic Canada Conservation Data Centre.
33	Mazerolle, D.M. 2017. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
32	Canadian Wildlife Service, Dartmouth. 2010. Piping Plover censuses 2007-09, 304 recs.
32	Neily, T.H. 2019. Tom Neily NS Bryophyte records (2009-2013). T.H. Neily, Atlantic Canada Conservation Data Centre, 1029 specimen records.
31	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
30	Ferguson, D.C. 1954. The Lepidoptera of Nova Scotia. Part I, macrolepidoptera. Proceedings of the Nova Scotian Institute of Science, 23(3), 161-375.
28	Pepper, Chris. 2012. Observations of breeding Canada Warbler's along the Eastern Shore, NS. Pers. comm. to S. Blaney, Jan. 20, 28 recs.
27	Benjamin, L.K. 2011. NSDNR fieldwork & consultant reports 1997, 2009-10. Nova Scotia Dept Natural Resources, 85 recs.
27	Cameron, R.P. 2018. Degellia plumbea records. Nova Scotia Environment.
27	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
26	Neily, T.H. 2010. Erioderma Pedicellatum records 2005-09. Mersey Tobiatic Research Institute, 67 recs.
26	Porter, Caitlin. 2021. Field data for 2020 in various locations across the Maritimes. Atlantic Canada Conservation Data Centre, 3977 records.
25	Blaney, C.S.; Mazerolle, D.M.; Klymko, J.; Spicer, C.D. 2006. Fieldwork 2006. Atlantic Canada Conservation Data Centre. Sackville NB, 8399 recs.
25	Popma, T.M. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 113 recs.
24	Belliveau, A.G. 2021. New Black ash site records near Kentville, NS. Acadia University, 47 records.
23	Archibald, D.R. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 213 recs.
23	Neily, T.H. 2013. Email communication to Sean Blaney regarding <i>Listera australis</i> observations made from 2007 to 2011 in Nova Scotia. , 50.

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23	Ogden, K. Nova Scotia Museum butterfly specimen database. Nova Scotia Museum. 2017.
23	Westwood, A., Staicer, C. 2016. Nova Scotia landbird Species at Risk observations. Dalhousie University.
22	Nelly, T.H. 2006. <i>Cyprripedium arietinum</i> in Hants Co. Pers. comm. to C.S. Blaney. 22 recs, 22 recs.
22	Powell, B.C. 1967. Female sexual cycles of <i>Chrysemy spicta</i> & <i>Clemmys insculpta</i> in Nova Scotia. <i>Can. Field-Nat.</i> , 81:134-139. 26 recs.
21	Belliveau, A. 2013. Rare species records from Nova Scotia. Mersey Tobeatic Research Institute. 296 records. 296 recs.
21	Cameron, R.P. 2014. 2013-14 rare species field data. Nova Scotia Department of Environment, 35 recs.
20	MacDonald, E.C. 2018. CWS Piping Plover Census, 2010-2017. Canadian Wildlife Service, 672 recs.
20	NS DNR. 2017. Black Ash records from NS DNR Permanent Sample Plots (PSPs), 1965-2016. NS Dept of Natural Resources.
18	Neily, T.H. 2012. 2012 <i>Erioderma pedicellatum</i> records in Nova Scotia.
18	Phinney, Lori; Toms, Brad; et. al. 2016. Bank Swallows ( <i>Riparia riparia</i> ) in Nova Scotia: inventory and assessment of colonies. Merser Tobeiatc Research Institute, 25 recs.
17	Richardson, D., Anderson, F., Cameron, R, McMullin, T., Clayden, S. 2014. Field Work Report on Black Foam Lichen ( <i>Anzia colpodes</i> ). COSEWIC.
17	Robinson, S.L. 2014. 2013 Field Data. Atlantic Canada Conservation Data Centre.
16	Gilhen, J. 1984. Amphibians & Reptiles of Nova Scotia, 1st Ed. Nova Scotia Museum, 164pp.
16	McNeil, J.A. 2016. Blandings Turtle ( <i>Emydoidea blandingii</i> ), Eastern Ribbonsnake ( <i>Thamnophis sauritus</i> ), Wood Turtle ( <i>Glyptemys insculpta</i> ), and Snapping Turtle ( <i>Chelydra serpentina</i> ) sightings, 2016. Mersey Tobeatic Research Institute, 774 records.
15	Basquill, S.P. 2011 vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.
15	Cameron, R.P. 2013. 2013 rare species field data. Nova Scotia Department of Environment, 71 recs.
14	Churchill, J.L. 2019. Atlantic Canada Conservation Data Centre Fieldwork 2019. Atlantic Canada Conservation Data Centre.
13	Blaney, C.S.; Mazerolle, D.M. 2008. Fieldwork 2008. Atlantic Canada Conservation Data Centre. Sackville NB, 13343 recs.
13	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
13	e-Butterfly. 2018. Selected Maritimes butterfly records from 2016 and 2017. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
13	Manthorne, A. 2019. Incidental aerial insectivore observations. Birds Canada.
13	Nova Scotia Nature Trust. 2014. Ladyslipper records from Saint Croix Nova Scotia, JLC Ed. Nova Scotia Nature Trust.
13	Robinson, S.L. 2015. 2014 field data.
12	Basquill, S.P. 2012. 2012 rare vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.
12	Cameron, R.P. 2017. 2017 rare species field data. Nova Scotia Environment, 64 recs.
12	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.
11	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of <i>C. insculpta</i> sightings. Acadia University, Wolfville NS, 88 recs.
10	Basquill, S.P. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 69 recs.
10	Churchill, J.L.; Walker, J. 2017. Species at Risk Surveys at Correctional Services Canada Properties in Nova Scotia and New Brunswick. Atlantic Canada Conservation Data Centre.
10	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.
10	Neily, T. H. 2018. Lichen and Bryophyte records, AEI 2017-2018. Tom Neily; Atlantic Canada Conservation Data Centre.
10	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-05-25]. Mersey Tobeatic Research Institute, 668 recs.
10	Patrick, Allison. 2021. Animal and plant records from NCC properties from 2019 and 2020. Nature Conservancy Canada.
9	Benjamin, L.K. 2006. <i>Cyprripedium arietinum</i> . Pers. comm. to D. Mazerolle. 9 recs, 9 recs.
9	Benjamin, L.K. 2012. NSDNR fieldwork & consultant reports 2008-2012. Nova Scotia Dept Natural Resources, 196 recs.
9	Cameron, R.P. 2005. <i>Erioderma pedicellatum</i> unpublished data. NS Dept of Environment, 9 recs.
9	Cameron, R.P. 2006. <i>Erioderma pedicellatum</i> 2006 field data. NS Dept of Environment, 9 recs.
9	Chapman, C.N. (Cody). 2020. Nova Scotia Black Ash ( <i>Fraxinus nigra</i> ) field observations by Confederacy of Mainland Mi'kmaq. Forestry Program, Confederacy of Mainland Mi'kmaq.
9	Edsall, J. 2007. Personal Butterfly Collection: specimens collected in the Canadian Maritimes, 1961-2007. J. Edsall, unpubl. report, 137 recs.
9	Klymko, J.J.D. 2018. 2017 field data. Atlantic Canada Conservation Data Centre.
9	Webster, R.P. Atlantic Forestry Centre Insect Collection, Maritimes butterfly records. Natural Resources Canada. 2014.
9	Wilhelm, S.I. et al. 2019. Colonial Waterbird Database. Canadian Wildlife Service.
8	Doucet, D.A. 2009. Census of Globally Rare, Endemic Butterflies of Nova Scotia Gulf of St Lawrence Salt Marshes. Nova Scotia Dept of Natural Resources, Species at Risk, 155 recs.
8	King, Katie; Jean, Samuel. 2021. Black ash observations near Booklyn, NS. E.C. Smith Herbarium.
8	Neily, T.H. & Anderson, F. 2011. Lichen observations from NRC site at Sandy Cove. , 97.
7	Boyne, A.W. & Grecian, V.D. 1999. Tern Surveys. Canadian Wildlife Service, Sackville, unpublished data. 23 recs.
7	Cameron, B. 2006. <i>Hepatica americana</i> Survey at Scotia Mine Site in Gays River, and Discovery of Three Yellow-listed Species. Conestoga-Rovers and Associates, (a consulting firm), october 25. 7 recs.
7	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
7	MacDonald, E.C. 2018. Piping Plover nest records from 2010-2017. Canadian Wildlife Service.
7	O'Neil, S. 1998. Atlantic Salmon: Northumberland Strait Nova Scotia part of SFA 18. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-08. 9 recs.
7	Pulsifer, M.D. 2002. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 369 recs.
7	Richardson, D., Anderson, F., Cameron, R, Pepper, C., Clayden, S. 2015. Field Work Report on the Wrinkled Shingle lichen ( <i>Pannaria lurida</i> ). COSEWIC.
6	Benjamin, L.K. 2009. Boreal Felt Lichen, Mountain Avens, Orchid and other recent records. Nova Scotia Dept Natural Resources, 105 recs.
6	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.
6	Gallop, John. 2021. Sheet Harbour rare lichen observations. McCallum Environmental.
6	Hall, R. 2008. Rare plant records in old fieldbook notes from Truro area. Pers. comm. to C.S. Blaney. 6 recs, 6 recs.
6	Klymko, J. Butterfly records at the Nova Scotia Museum not yet accessioned by the museum. Atlantic Canada Conservation Data Centre. 2017.
6	Matthew Smith. 2010. Field trip report from Avon Caving Club outlining the discovery of <i>Cyprripedium arietinum</i> and <i>Hepatica nobilis</i> populations. Public Works and Government Services Canada.

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6	Mazerolle, D.M. 2020. Atlantic Canada Conservation Data Centre botanical fieldwork 2019. Atlantic Canada Conservation Data Centre.
6	Neily, T.H. Tom Neily NS Sphagnum records (2009-2014). T.H. Neily, Atlantic Canada Conservation Data Centre. 2019.
6	Sollows, M.C.. 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.
6	White, S. 2019. Notable species sightings, 2018. East Coast Aquatics.
6	Whittam, R.M. 1999. Status Report on the Roseate Tern (update) in Canada. Committee on the Status of Endangered Wildlife in Canada, 36 recs.
5	Basquill, S.P., Porter, C. 2019. Bryophyte and lichen specimens submitted to the E.C. Smith Herbarium. NS Department of Lands and Forestry.
5	Blaney, C.S.; Spicer, C.D.; Mazerolle, D.M. 2005. Fieldwork 2005. Atlantic Canada Conservation Data Centre. Sackville NB, 2333 recs.
5	Cameron-MacMillan, Maureen. 2020. Northern Goshawk Nests in Eastern Nova Scotia, as of November, 2020. Nova Scotia Department of Lands and Forestry.
5	Cameron, R.P. 2012. Additional rare plant records, 2009. , 7 recs.
5	Carter, Jeff; Churchill, J.; Churchill, I.; Churchill, L. 2020. Bank Swallow colony Scots Bay, NS. Atlantic Canada Conservation Data Centre.
5	Holder, M.L.; Kingsley, A.L. 2000. Kinglsey and Holder observations from 2000 field work.
5	Klymko, J.J.D.; Robinson, S.L. 2014. 2013 field data. Atlantic Canada Conservation Data Centre.
5	Mazerolle, D.M. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
5	McNeil, J.A. 2020. Snapping Turtle and Eastern Painted Turtle records, 2020. Mersey Tobeatic Research Institute.
5	Olsen, R. Herbarium Specimens. Nova Scotia Agricultural College, Truro. 2003.
5	Towell, C. 2014. 2014 Northern Goshawk and Common Nighthawk email reports, NS. NS Department of Natural Resources.
5	Walker, J. 2017. Bird inventories at French River, NS, and Memramcook, NB, for Nature Conservancy of Canada. Pers. comm. to AC CDC.
4	Bateman, M.C. 2001. Coastal Waterfowl Surveys Database, 1965-2001. Canadian Wildlife Service, Sackville, 667 recs.
4	Bredin, K.A. 2002. NS Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centre, 30 recs.
4	Cameron, R.P. 2009. Nova Scotia nonvascular plant observations, 1995-2007. Nova Scotia Dept Natural Resources, 27 recs.
4	Cody, W.J. 2003. Nova Scotia specimens of Equisetum pratense at the DAO herbarium in Ottawa. , Pers. comm. to C.S. Blaney. 4 recs.
4	Doucet, D.A. 2007. Lepidopteran Records, 1988-2006. Doucet, 700 recs.
4	Forsythe, B. 2006. Cypripedium arietinum at Meadow Pond, Hants Co. Pers. comm. to C.S. Blaney. 4 recs, 4 recs.
4	Klymko, J. Dataset of butterfly records at the New Brunswick Museum not yet accessioned by the museum. Atlantic Canada Conservation Data Centre. 2016.
4	Mills, Pamela. 2007. Iva frutescens records. Nova Scotia Dept of Natural Resources, Wildlife Div. Pers. comm. to S. Basquill, 4 recs.
4	Newell, R. & Neily, T.; Toms, B.; Proulx, G. et al. 2011. NCC Properties Fieldwork in NS: August-September 2010. Nature Conservancy Canada, 106 recs.
4	O'Neil, S. 1998. Atlantic Salmon: Eastern Shore Nova Scotia SFA 20. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-10. 4 recs.
3	Bagnell, B.A. 2001. New Brunswick Bryophyte Occurrences. B&B Botanical, Sussex, 478 recs.
3	Basquill, S.P. 2009. 2009 field observations. Nova Scotia Dept of Natural Resources.
3	Benjamin, L.K. 2009. NSDNR Fieldwork & Consultants Reports. Nova Scotia Dept Natural Resources, 143 recs.
3	Blaney, C.S. Miscellaneous specimens received by ACCDC (botany). Various persons. 2001-08.
3	Brunelle, P.-M. (compiler). 2010. ADIP/MDDS Odonata Database: NB, NS Update 1900-09. Atlantic Dragonfly Inventory Program (ADIP), 935 recs.
3	Calhoun, J.C. Butterfly records databased at the McGuire Center for Lepidoptera and Biodiversity. Calhoun, J.C. 2020.
3	Cameron, R.P. 2012. Rob Cameron 2012 vascular plant data. NS Department of Environment, 30 recs.
3	Chapman, Cody. Unreported Species at Risk Records across Nova Scotia. Chapman, Cody, 5 records.
3	Clayden, S.R. 1998. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 19759 recs.
3	Doubt, J. 2013. Email to Sean Blaney with Nova Scotia records of Fissidens exilis at Canadian Museum of Nature. pers. comm., 3 records.
3	Frittaion, C. 2012. NSNT 2012 Field Observations. Nova Scotia Nature Trust, Pers comm. to S. Blaney Feb. 7, 34 recs.
3	Hill, N. and D. Patriquin. 2013. 2013 rare plant observations in Williams Lake Backlands area. Fern Hill Institute of Plant Conservation, Berwick, Nova Scotia, 3 records.
3	McNeil, J.A. 2019. Snapping Turtle records, 2019. Mersey Tobeatic Research Institute.
3	Oldham, M.J. 2000. Oldham database records from Maritime provinces. Oldham, M.J; ONHIC, 487 recs.
3	Parker, M. 2016. Wood turtle (Glyptemys insculpta) Visual Surveys at Black, Wallace, Musquodobit and Sackville Rivers, Nova Scotia. East Coast Aquatics Inc., 3 records.
3	Plissner, J.H. & Haig, S.M. 1997. 1996 International piping plover census. US Geological Survey, Corvallis OR, 231 pp.
3	Porter, K. 2013. 2013 rare and non-rare vascular plant field data. St. Mary's University, 57 recs.
3	Sabine, M. 2016. NB DNR staff incidental Black Ash observations. New Brunswick Department of Natural Resources.
3	Standley, L.A. 2002. Carex haydenii in Nova Scotia. , Pers. comm. to C.S. Blaney. 4 recs.
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1	Bruce, J. 2014. 2014 Wood Turtle email report, Nine Mile River, NS. NS Department of Natural Resources.
1	Clayden, S.R. 2006. <i>Pseudevernia cladonia</i> records. NB Museum. Pers. comm. to S. Blaney, Dec, 4 recs.
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1	deGooyer, K. 2019. Snapping Turtle and Eastern White Cedar observations. Nova Scotia Environment.
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1	Haughian, S.R. 2018. Description of <i>Fuscopannaria leucosticta</i> field work in 2017. New Brunswick Museum, 314 recs.
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# recs	CITATION
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## ANTRIM GYPSUM PROJECT

### APPENDIX D: MARITIME BREEDING BIRD ATLAS SQUARE



**Square Summary (20MQ78)**

#species (1st atlas)		#species (2nd atlas)		#hours	#pc done						
poss	prob	conf	total	1st	2nd	road	offrd				
44	17	40	101	20	22	65	107	58	146.2	15	2

**Region summary (#20: Chebucto - Musquodoboit)**

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
103	93	98	146	177	944	386

**Target number of point counts in this square:** 14 road side, 1 off road (1 in Mature coniferous). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Canada Goose		FY	15	61	Great Blue Heron §	H	H	26	40	Common Tern §			17	30
Wood Duck	FL	DD	17	46	Green Heron †			0	0	Arctic Tern †§			9	11
Gadwall ‡			0	4	Turkey Vulture ‡¶			0	4	Black Guillemot †§			1	12
Eurasian Wigeon ‡			0	0	Osprey	T	NY	56	72	Rock Pigeon	ON	AE	49	67
American Wigeon ‡			0	7	Bald Eagle ¶	T	D	24	69	Mourning Dove	H	FY	24	81
American Black Duck	AY	FY	68	84	Northern Harrier	H	CF	41	53	Black-billed Cuckoo			4	17
Mallard		P	17	38	Sharp-shinned Hawk	H	FY	20	43	Great Horned Owl		T	24	47
Mallard x Am. Black Duck ‡			0	4	<u>Northern Goshawk</u>	H		17	33	Barred Owl	T	T	37	67
Blue-winged Teal		FY	8	6	Red-should Hawk †			1	0	Long-eared Owl †		S	1	7
Northern Pintail			3	3	Broad-winged Hawk		H	22	45	Short-eared Owl †			1	2
<u>Green-winged Teal</u>	DD		21	24	Red-tailed Hawk	H	T	37	63	North Saw-whet Owl		S	16	45
Ring-necked Duck	AY	T	40	50	Virginia Rail †			2	3	Common Nighthawk †	FL	FY	49	56
Greater Scaup †			0	0	<u>Sora</u>	H		15	10	<u>Chimney Swift</u> †	H		35	14
Common Eider §			7	20	American Coot †			0	1	Ruby-thr Hummingbird	FL	FY	52	86
Harlequin Duck †			0	0	Semipalmated Plover †			2	0	Belted Kingfisher	P	FY	49	82
Common Goldeneye ‡			0	7	Piping Plover †			3	6	Yellow-bellied Sapsucker	H	NY	36	41
Hooded Merganser			6	28	Killdeer	FL	AE	51	36	Downy Woodpecker	AY	CF	51	81
Common Merganser		FY	33	55	Spotted Sandpiper	P	FY	54	66	Hairy Woodpecker	P	NY	54	86
Red-breast Merganser		FY	6	15	Greater Yellowlegs †			3	23	Black-back Woodpecker		P	22	47
Ring-necked Pheasant		FY	29	70	Willet			16	24	Northern Flicker	NY	AE	82	92
Ruffed Grouse	FL	FY	49	78	Lesser Yellowlegs ‡			0	0	Pileated Woodpecker	NY	FY	41	72
Spruce Grouse			25	27	Least Sandpiper †			4	2	American Kestrel	H	A	39	50
Common Loon	FL	FY	61	72	Wilson's Snipe	H	DD	45	43	Merlin		H	18	52
Pied-billed Grebe	NE	FY	10	13	American Woodcock	H	NE	20	53	Olive-sided Flycatcher †	H	T	44	60
Leach's Storm-Petrel †§			1	5	Black-headed Gull ‡			0	0	Eastern Wood-Pewee	A	CF	55	55
Northern Gannet ‡			0	0	Ring-billed Gull †§			0	3	<u>Yellow-bellied Flycatcher</u>	H		58	73
Double-crest Cormorant §			13	31	Herring Gull §			31	40	Alder Flycatcher	H	CF	77	89
Great Cormorant †§			2	5	Great Black-backed Gull §			31	31	Least Flycatcher	T	V	36	68
American Bittern	H	T	19	26	Roseate Tern †§			3	2	Eastern Phoebe		T	4	15

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## Maritimes Breeding Bird Atlas - Summary Sheet for Square 20MQ78 (page 2 of 3)

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Gr Crested Flycatcher			6	2	American Robin	AY	NY	87	91	Vesper Sparrow †			0	3
Eastern Kingbird	H	FY	22	25	Gray Catbird	H	S	51	57	Savannah Sparrow	A	P	58	58
Blue-headed Vireo	AY	V	69	89	Northern Mockingbird †			9	2	Ipswich Sparrow †			0	2
Warbling Vireo †			0	4	Brown Thrasher †			1	2	<u>Nelson's Sh.-tail Sparrow</u>	FL		13	15
Philadelphia Vireo ‡			2	9	European Starling	AY	CF	75	75	Fox Sparrow			10	16
Red-eyed Vireo	NB	CF	81	88	Cedar Waxwing	C	NY	68	88	Song Sparrow	AY	NY	84	92
Gray Jay	H	H	62	68	Ovenbird	AY	CF	66	74	Lincoln's Sparrow	H	T	41	57
Blue Jay	H	FY	77	85	North Waterthrush	H	S	40	34	Swamp Sparrow	AY	CF	58	85
American Crow	H	CF	83	91	Black-white Warbler	AY	T	81	87	White-throat Sparrow	AY	CF	87	90
Common Raven	H	AE	74	91	Tennessee Warbler	H	CF	78	48	Dark-eyed Junco	AY	CF	86	91
Horned Lark †			3	1	Nashville Warbler	H	CF	65	83	Scarlet Tanager †			4	4
Tree Swallow	AY	NY	80	87	<u>Mourning Warbler</u>	A		32	32	Northern Cardinal ‡			0	7
Bank Swallow §	ON	NY	49	22	Common Yellowthroat	AY	CF	86	91	Rose-breast Grosbeak	H	S	32	30
<u>Cliff Swallow §</u>	H		34	18	American Redstart	AY	FY	87	88	Indigo Bunting ‡			1	1
Barn Swallow	ON	NY	83	75	Cape May Warbler			19	29	Bobolink	C	S	38	24
Black-capp Chickadee	AY	CF	79	91	Northern Parula	T	CF	72	85	Red-wing Blackbird	AY	CF	61	71
<u>Boreal Chickadee</u>	AY		72	78	Magnolia Warbler	T	CF	77	91	Rusty Blackbird †		FY	49	24
Red-breast Nuthatch	AY	T	73	89	Bay-breasted Warbler	H	T	52	54	Common Grackle	AY	FY	76	88
White-breast Nuthatch		S	17	24	Blackburnian Warbler	H	H	56	68	Brown-head Cowbird		H	39	14
Brown Creeper		T	27	65	Yellow Warbler	H	CF	69	81	Baltimore Oriole		S	5	5
House Wren †			0	0	Chestn-sided Warbler	AY	AE	51	72	<u>Pine Grosbeak</u>	H		54	30
Winter Wren	H	FY	60	82	Blackpoll Warbler	H	H	10	27	Purple Finch	H	FY	74	87
Golden-crown Kinglet	H	S	70	90	Black-thr Blue Warbler		S	32	39	House Finch †			3	1
Ruby-crown Kinglet	AY	CF	81	88	Palm Warbler	H	CF	62	87	<u>Red Crossbill †</u>	H		21	32
Eastern Bluebird †			3	5	Yellow-rumped Warbler	AY	AE	82	92	<u>White-winged Crossbill</u>	H		53	38
Veery	H	T	44	30	Black-thr Green Warbler	H	T	82	89	Pine Siskin	H	H	65	68
Swainson's Thrush	T	H	74	85	<u>Canada Warbler †</u>	T		66	52	American Goldfinch	H	FY	82	88
Hermit Thrush	AY	CF	80	91	Wilson's Warbler			15	20	Evening Grosbeak	H	CF	58	48
Wood Thrush †			1	4	Chipping Sparrow	A	A	51	54	House Sparrow	NB	H	63	46

This list includes all species found during the Maritimes Breeding Bird Atlas (1st atlas: 1986-1990, 2nd atlas: 2006-2010) in the region #20 (Chebucto - Musquodoboit). Underlined species are those that you should try to add to this square (20MQ78). They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. "Code" is the code for the highest breeding evidence for that species in square 20MQ78 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #20). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), † (rare in the Maritimes) or □ (rare in the Maritimes, documentation only required for confirmed records). Current as of 15/01/2024. An up-to-date version of this sheet is available from <http://www.mba-aom.ca/jsp/summaryform.jsp?squareID=20MQ78?lang=en>

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**APPENDIX E: POINT COUNT (PC) DATA – SPRING/FALL MIGRATION AND BREEDING SEASONS**











