Six Mile Brook Pit Expansion Project – 2023 Avifauna Biophysical Baseline Report:

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EXECUTIVE SUMMARY

McCallum Environmental Ltd. (MEL) was retained by S.W. Weeks Construction Limited (S.W. Weeks; the Proponent) to prepare baseline biophysical reports, including avifauna surveys, for the proposed Six Mile Brook Pit Expansion Project (the Project), which is a sand and gravel pit located in Six Mile Brook, Nova Scotia. These assessments are to support the preparation and submission of the provincial EARD.

The objectives of the avifauna species surveys were to:

- Identify species and habitat usage with a focus on Species at Risk (SAR) and Species of Conservation Interest (SOCI) within and surrounding the Study Area (the Study Area was designed to include the maximum extent of expected terrestrial impacts (and in consideration of property ownership)).
- Determine trends in species composition and bird group usage throughout different seasons.

The biophysical surveys completed by MEL took place within the EA Study Area, which borders Stillman Road to the south, and is within 300 m of Four Mile Brook Rd to the east. The Study Area includes the entirety of PIDs 65173437, 00834622, and 00834721 as well as the northern portion of PID 00834739 and a 100 m buffer on a mapped watercourse, south of the proposed expansion. The EA Study Area is 96.9 ha in size, which includes 36.3 ha of disturbed area (historic and current pit), as indicated in Figure 1. Several nighthawk and nocturnal owl surveys occurred outside the Study Area to provide greater context to species activity in the area.

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

In April 2023, biophysical field surveys were initiated and continued through October 2023 and a total of 16.18 hours (971 minutes) of surveys were completed by MEL biologists. The field studies were completed as follows:

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

Avian biophysical surveys resulted in the observation of 1139 individuals, representing 90 bird species (not including incidentals or unknowns) within the Study Area.

The most abundant bird group observed (by total number of species) were passerines accounting for 87.18% of species observed, followed by other landbirds (7.9%), waterfowl (2.28%), nocturnal raptors (0.79%), shorebirds (0.79%), diurnal raptors (0.7%), and other waterbirds (0.35%). These percentages represent species diversity within the Study Area. Note that these percentages include unknown individuals that were identified to the level of bird group (e.g., passerines).

The most observed species was the American robin (n=108), black-capped chickadee (n=89), and American goldfinch (n=78). In total, six avian SAR and seven avian SOCI were observed (Section 3.2). The six avian SAR species observed were as follows:

- Canada warbler (*Cardellina canadensis*);
- Eastern wood-pewee (*Contopus virens*);

- Olive-sided flycatcher (*Contopus cooperi*);
- Peregrine falcon (*Falco peregrinus*);
- Rusty blackbird (*Euphagus carolinus*), and
- Wood thrush (*Hylocichla mustelina*).

No common nighthawk (*Chordeiles minor*) or Eastern whip-poor-will (*Antrostomus vociferus*) were observed during the nightjar surveys.

Overall, survey points located in open areas (e.g., swamp/pond, pit area) with forested edges had the highest individual and species counts. The higher number of species and individuals at these locations is likely due to this habitat variability and structure (e.g., vegetation height differences provided by edge habitat). This would attract a variety of species (passerines, woodpeckers, raptors, waterfowl, and shorebirds).

There were no observations of migratory behaviour or general migratory patterns noted within the Study Area during the spring migration, breeding bird, or fall migration surveys (e.g., specific direction or migratory areas/corridors).

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1 INTRODUCTION

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

1.1 Regulatory Context

This Project requires an EARD submission (*Class I* undertaking under Section 9 (1) of the *Nova Scotia Environmental Assessment Regulations*), which involves a biophysical baseline study that requires avifauna surveys. The Project has potential to interact with avifauna species that are protected under several federal and provincial legislations. The avifauna surveys were designed to detect species that are listed in these documents. 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 conducted as follows:

- April 5, 2023: MEL provided an avian survey methodology document to ECCC-CWS for review and comment. No response was received.
- April 28, 2023: MEL had a Project scoping meeting with the Nova Scotia Department of Environment and Climate Change (NSECC) EA branch.
- June 7, 2023: MEL had a meeting with NSDNRR to discuss the biophysical program.

2 METHODOLOGY

Completion of the avifauna surveys is a two-part process consisting of a desktop review and field surveys.

2.1 Desktop Review Methodology

A review of the Canada Important Bird Areas database, Atlantic Canada Conservation Data Centre (ACCDC) 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 Study Area is within, or adjacent to special features, such as protected areas. To ensure the Study Area 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

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

- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and *Species at Risk Act* (SARA): All species listed as Endangered, Threatened, or Special Concern;
- *Nova Scotia Endangered Species Act* (NSESA): All species listed as Endangered, Threatened, or Vulnerable, and
- Atlantic Canada Conservation Data Centre (ACCDC) Conservation Rank: All Species designated as S1, S2, or S3 as defined by the ACCDC.

Species listed under SARA and/or NSESA are termed Species at Risk (SAR) and species listed under COSEWIC and/or ACCDC are termed Species of Conservation Interest (SOCI). The priority list of species was first narrowed

by a broad geographic area (e.g., county the Study Area is located in) and then further narrowed by identifying specific habitat requirements for each species. For example, if a listed species under NSESA required salt marsh habitat, and that habitat is not present inside the Study Area, this species was not carried forward to the final list of priority species.

The data sets and reports described above and in Section 2.1 were reviewed and used to develop the priority species list. The ACCDC report was one of the key documents used in the development of the priority species list, as this report summarizes known and observed occurrences of rare species in the general location of the Study Area.

The final priority species list is included in Appendix B, the ACCDC report is included in Appendix C, and a list of birds observed during the MBBA atlas that includes the Study Area (square 20NR04) 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.

Note: 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 Study Area where these bird groups would be detected if they were present. PC coverage within the Study Area adequately recorded raptor presence and absence 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 Study Area:

- 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 aforementioned databases were used, and the major vegetation communities and habitat types listed below were delineated using a habitat model (referred to as the MEL habitat model) created in QGIS using the forestry,

depth-to-water (DTW), and canopy height model (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 (i.e., PC surveys) employed during spring, fall, and breeding season surveys.

Point count locations (PCs) were selected in representative habitats within the Study Area. 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 recommended 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 Study Area and they provide identification of a broad range of species while minimizing the possibly 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 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 Study Area 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 2, Appendix A). Based on this design, the maximum number of PCs were placed within the Study Area while maintaining the 250 m minimum distance apart.

Overall, PC layout focused on habitat coverage and the proposed infrastructure (i.e., Project footprint, to understand what birds will be inhabiting the area directly impacted by the Project) to understand the full extent of terrestrial effects relating to bird migration and breeding.

2.2.2 Nocturnal Owl Surveys

Four locations (Figure 2, Appendix A) were surveyed by vehicle during the nocturnal owl surveys. Distance between locations ranged from approximately 1.75 – 3 km apart to cover area within and adjacent to the Study Area. Nocturnal owl PC stations are spaced at least 1.6 km apart to reduce the chances of detecting the same owl at multiple stations. Survey locations were within or on the edge of forested areas to represent suitable owl habitat in the area and all survey locations (Owl PCs) located outside of the Study Area were on public roads.

Nocturnal owl surveys started after sunset when it became dark. Two rounds of owl surveys were targeted to occur in mid-April and early May 2023 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 Study Area does contain suitable habitat for the common nighthawk, such as open bogs, 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 2018).

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).

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 Study Area and the area bordering the Study Area. A minimum of 1.5 km spacing (with a maximum distance of approximately two km) was used to provide adequate coverage of the area while minimizing overlapping observations (i.e., hearing the same individual at multiple locations). Five PC locations were selected in the preliminary desktop review (Figure 2, Appendix A). All PC locations were on public roadsides and in open areas (e.g., pit and clearcuts or cultivated lands/agricultural fields) within and adjacent to the Study Area. 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.

Table 2-1: Avian Surveys Completed within the Study Area

Survey Type	Survey Rounds	Survey Locations	Dates	Rationale	Reference for Survey Dates and Methods
Spring migration	2	10 PCs	April to May 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	April to early May 2023	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 Study Area.	ACCDC (2023 Project report)
Breeding bird	2	10 PCs	Early June to early July 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	10 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	5 CONI PCs	Early June to early July 2023	To understand the use of the land within and surrounding the Study Area by common nighthawk and Eastern whip-poor-will. Suitable habitat for both species is found within and adjacent to the Study Area. Based on ACCDC, common nighthawk have been observed 6.5 (± 7) km away from the Study Area and Eastern whip-poor-will have been observed 67.7 (± 7) km away from the Study Area.	Birds Canada (2022) ACCDC (2023 Project report)

Habitat descriptions at each PC were recorded and each field-verified 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 Study Area. 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), Pandidonidae (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 2, Appendix A. Two rounds of spring migration surveys were completed on April 25, 2023, and May 30, 2023. Three rounds of fall migration surveys were completed on August 24, 2023, September 21, 2023, and October 13, 2023. Survey rounds were separated by a minimum of ten days.

Ten PC locations were surveyed during spring and fall migration seasons (Figure 2, Appendix A). Total effort for both spring and fall migration PC surveys was 200 minutes for spring migration and 300 minutes for fall migration. Surveys began at, or within half an hour of, sunrise and effort was be 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 fly-overs will 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 Table 2-3.

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

PC ID	Coordinates*		Habitat (Aerial Imagery)	Surveyor Habitat Field Notes
	Easting	Northing		
1	506808.56	5048897.47	Forested. By watercourse.	Hardwood dominant forest (older/mature). By watercourse and close to a walking/ATV trail. At intersection of watercourses (WC) 5 and 7*.
2	507013.60	5049067.99	Forested.	Hardwood dominant forest, few softwood trees. Close to pit edge.
3	507374.80	5049235.39	Edge of pit area.	Edge of pit area. Mixedwood forest surrounding site. On trail leading out of pit area.
4	507461.31	5049569.15	Forested. Trail/road.	ATV trail. Mixedwood forest, more hardwood trees than softwood trees.
5	507699.62	5049463.10	Forested.	Hardwood dominant forest with a few softwood trees. Signs of historical disturbance (i.e., old cutting activity, young forest).
6	507815.24	5049137.03	Forested, in more open area.	Open little area surrounded by wetland and mixedwood forest. Little open area has sedge/grass/rushes. Habitat indicates a drain path/floodplain sloping towards a wetland and watercourse. Mixedwood trees spread throughout this open area. Signs of historical disturbance (i.e., cutter trails, old cutting activity, young forest).
7	507751.19	5048894.56	Forested. Wetland.	Wet area/treed swamp (wetland (WL) 5)*. Hardwood dominant forest with softwood trees spread throughout. Signs of historical disturbance (i.e., cutter trails, old cutting activity, young forest).
8	507719.17	5048640.45	Edge of open wetland.	Edge of an open water swamp (with cattails, snags, lily pads, etc. and grassy/weedy and shrubby edges) with open canopy. Evidence of beaver activity. Does have treed swamp edges. Mixedwood forest surrounding with more hardwood trees. Overall, a mosaic wetland (WL 5): open water swamp/pond with shrubby swamp riparian edges transitioning to a shrubby and treed swamp extending past the open water portion to the north (watercourse enters and leaves pond/swamp). Few large snags in wetland and surrounding. Watercourses nearby (WC 1 and 3 < 50 m away).
9	507647.63	5048369.44	Edge of pit area. By watercourse.	Edge of cleared/disturbed pit area with gravel and some fields/grassy/sedge/rush areas that are overgrown. Habitat indicates a restoration area that is no longer in use. Watercourse nearby (WC 3 < 50 m away) and mixedwood forest surrounding site.
10	507321.57	5048812.79	In pit area, by settling ponds.	Cleared/disturbed pit area. Gravel with sedge/grass/rush. Beside settling ponds and big pit areas. Swampy patches around this area within the pit area that were avoided during pit construction/operation. Apple trees close to settling ponds. Mixedwood forest surrounding site. Edge and WL 1 and WC 1 is < 50 m away.

***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 Study Area.**

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

Survey Round	Date	Temperature (°C)	Wind (Beaufort Scale)	Precipitation
Spring Migration				
Round 1	April 25, 2023	4 - 6	0 - 1	0
Round 2	May 30, 2023	4 - 15	0 - 1	0
Fall Migration				
Round 1	August 24, 2023	11 - 23	1 - 2	0
Round 2	September 21, 2023	12 - 16	1	0 - 1
Round 3	October 13, 2023	10 - 14	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.

2.3.2 Breeding Bird Surveys

Two rounds of breeding bird surveys were completed in June and July 2023 at PCs 1-10 (refer to Table 2-2 for locations and habitat field descriptions). The 10 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 200 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, with the addition of area searches and surveying for breeding evidence within the Study Area. Area searches 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 notable high activity (within the Study Area). 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 75 minutes in length. In total, approximately 135 minutes of area searches were completed during breeding bird surveys (Figure 2, Appendix A).

To understand breeding bird activity within and adjacent to the Study Area, 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 7, 2023	8	0	1
Round 2	July 6, 2023	17 - 25	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.

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. Some of the louder owls, such as the barred owl, can be heard at distances of two kilometers or more (Takats *et al.* 2001). However, most of the smaller owls cannot be heard as far or as clearly. 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 (Figure 3, Appendix A).

The four locations (Figure 3, Appendix A) were surveyed by vehicle during the nocturnal owl surveys. The four locations were selected for their ease of access and suitable habitat.These locations are as follows (coordinates in NAD 83 UTM 20):

- **Owl 1:** 507475.03, 5049119.10 (middle of pit with fields and mixedwood forest surrounding);
- **Owl 2:** 505850.54, 5047440.53 (road surrounded by hardwood dominant forest. Watercourse by the road. Clear-cuts close-by);
- **Owl 3:** 510409.61, 5048486.10 (road surrounded by softwood dominant forest. Clearcuts close-by), and
- **Owl 4:** 507745.37, 5051262.01 (road surrounded by softwood dominant forest with a watercourse close-by; side of road, down a hill).

Prior to commencing the survey, the selected 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 if possible (distance/bearing, gender, age, habitat, and/or behaviour). Surveys were completed during periods of good or fair weather.

Moon phase and noise levels (traffic, wind, machinery, etc.) were recorded and weather data was recorded 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.

Dates and weather/environmental conditions for the nocturnal owl surveys were as follows:

- **Round 1:** April 14, 2023; four to seven degrees Celsius, zero wind level (Beaufort scale), no precipitation, no cloud cover, and no moon visible.
    - No noise or very little (i.e., the sound of spring peepers and dogs barking in the distance throughout the survey, with the occasional car and plane in the distance. Slight noise from watercourses at survey locations Owl 2 and 4.

- **Round 2:** May 6, 2023; two to four degrees Celsius, zero wind level (Beaufort scale), no precipitation, and approximately five percent cloud cover. A full moon was visible (wanning gibbous).
    - No noise or very little (i.e., the sound of spring peepers and dogs barking in the distance occasionally throughout the survey, with the occasional car and plane in the distance. Slight noise

from watercourses at survey locations Owl 2 and 4. Only one car passed the surveyor on the road at Owl 4).

- Noise levels did not negatively impact either survey round.

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 6, 2023, and July 7, 2023 at five PC locations (Table 2-5; Figure 4, 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 60 minutes of effort. Survey round, date, location, and weather conditions are listed in Table 2-6.

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 and in open areas (e.g., cultivated lands/agricultural fields) spread throughout and outside the Study Area. 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 4, Appendix A).

Table 2-5: Nightjar Point Count (PC) Locations and Habitat Field Descriptions

CONI PC ID	Coordinates (NAD 83 UTM 20)		Surveyor Habitat Field Notes
	Easting	Northing	
1	507387.70	5048966.05	Middle of pit, settling ponds, and fields. Mixedwood and hardwood forest surrounding.
2	505806.45	5048652.87	Rock pit close to Study Area (southwest). Hardwood forest surrounding.
3	508610.64	5047896.57	Road. By field and farmland (cultivated land). Hardwood and mixedwood forest surrounding.
4	509214.11	5049762.70	Road. Mixedwood to one side of road and mixedwood, disturbed land, and pit ing to other side of road.
5	506479.17	5051078.18	Road. By mixedwood/hardwood forests and fields (natural and cultivated).

Table 2-6: Nightjar Survey Dates and Weather Conditions

Survey Round	Date	Temperature (°C)	Wind (Beaufort Scale)	Precipitation	Surveyor Notes
Round 1	June 6, 2023	10	1	0 - 1	No noise.
Round 2	July 7, 2023	21 - 23	0 - 2	0	5 to 20% cloud cover, no moon visible, and no to slight noise (i.e., slight sound of cars and ATVs in the distance). Only one car passed by surveyor at survey location CONI 3. The noise did not negatively impact the survey.

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

Results from the desktop review and field surveys are described below.

3.1 Desktop Results

The ACCDC (Appendix C) identified five avian SAR and 10 avian SOCI within five km of the Study Area (Figure 5, 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);
- Eastern wood-pewee (*Contopus virens*; SARA/COSEWIC Special Concern), and
- Olive-sided flycatcher (*Contopus cooperi*; SARA Threatened, COSEWIC Special Concern).

Eastern wood-pewee and olive-sided flycatcher were both observed during the biophysical surveys conducted within the Study Area and will be discussed in Section 3.3. The bobolink observation is likely due to the agricultural land (e.g., farm fields), older regenerating developed land, and natural fields/meadows that surround the Study Area. This habitat is not present within the Study Area (i.e., habitat that would contain tracts of undisturbed tall grass, sedge, and rush herbaceous species). ACCDC also noted barn and bank swallows within five km of the Study Area. No barn or bank swallows were observed during the biophysical surveys conducted in the Study Area.

Based on desktop analysis, there are no protected parks, wilderness areas, nature reserves, game sanctuaries, IBAs, migratory bird sanctuaries, or significant habitat related to birds within the Study Area. The Project is within the MBBA square 20NR04.

Two nature reserves are within six km of the Study Area. The Mackay Brook Nature Reserve is approximately five km northwest from the Study Area and the Dalhousie Mountain Nature Reserve is approximately 5.5 km southwest from the Study Area. The closest Important Bird Area (IBA) to the Study Area is the Cobequid Bay IBA (NS019), which is approximately 41.5 km southwest from the Study Area (Figure 5, Appendix A). This section will continue with information regarding these areas as well as the results from the MBBA square.

Further desktop analysis revealed no projects (research or development) or other significant areas near the Study Area.

3.1.1 Mackay Brook and Dalhousie Mountain Nature Reserves

The Mackay Brook Nature Reserve is approximately 20 ha and represents a small remnant of mature mixedwood forest (e.g., hemlock, spruce, and various hardwood species) in the area (Figure 5, Appendix A). The area was protected due to the heavy forest fragmentation occurring within the Northumberland Strait Plain of Pictou County. The site is adjacent to lands that have recently been acquired by the Friends of Redtail Society, a non-profit society in Nova Scotia that focuses on protecting and conserving wild areas (Mackay Brook Nature Reserve, NSECC n.d.).

The Dalhousie Mountain Nature Reserve is approximately 46 ha and represents mixedwood forest, which includes stands of tolerant hardwood trees that support the growth of various rare plants and a diversity of wildflowers (Figure 5, Appendix A). Anthropogenic uses include the Dalhousie Mountain Hiking Trail and the Dalhousie Mountain Wind Farm, which partially surround the site on the western, northern, and eastern sides (Dalhousie Mountain Nature Reserve, NSECC n.d.).

Although the Study Area includes mixedwood and hardwood forest, the habitat differs from the habitat within these nature reserves due to the young age and disturbed nature of the forest surrounding the existing pit.

3.1.2 Cobequid Bay Important Bird Area (NS019)

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

The Cobequid Bay IBA (IBA NS019) is approximately 47768 ha in size and is situated in the Bay of Fundy near Truro, Nova Scotia (Figure 5, Appendix A). Cobequid Bay is a long (approximately 40 km) and point-shaped bay that widens at the eastern 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. The famous Bay of Fundy drastic tide levels is the reason for the change in habitat types along the coastline depending on the time of day (IBA Canada n.d.). 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 (including this IBA and adjacent IBAs) before fall migration. The high abundance of food source 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 Study Area is approximately 11 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 (20NR04) encompasses the entirety of the Study Area (results are provided in Appendix D). Observations within this square are listed below:

- The first atlas has 1 confirmed breeder.
- The second atlas has 26 possible, 32 probable, and 27 confirmed breeders.
    - Of these breeding species, there were two SAR:
        - Eastern wood-pewee (*Contopus virens*), and
        - olive-sided flycatcher (*Contopus cooperi*).
- SOCI observations within these MBBA squares (or SAR recorded with no breeding evidence) are presented in Appendix D.

The 20NR04 MBBA summary square had common nighthawk observations, but no observations of breeding evidence recorded. The common nighthawk is reported to be within 6.5 (± 7) km of the Study Area by ACCDC (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 point count surveys (spring migration, breeding season, fall migration, nocturnal owl surveys, and nightjar surveys) and 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 a 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 426 individuals representing 63 species (this number does not include unknowns) were observed during dedicated surveys.

One avian species at risk (SAR; rusty blackbird) and two avian species of conservation interest (SOCI; boreal owl and killdeer) were identified during the 2023 spring migration surveys (Figure 6, Appendix A; Table 3-1). Note that the bay-breasted warbler (S3S4B, S4S5M), blackpoll warbler (S3B, S5M), fox sparrow (S3S4B, S5M), spotted sandpiper (S3S4B, S5M), 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 are discussed in Section 3.3.

Passerines comprised 83.33% of the species observed, followed by other landbirds (11.5%), waterfowl (3.52%), nocturnal raptors (0.7%), shorebirds (0.7%), and other waterbirds (0.23%). These percentages include unknown

individuals that were identified to the level of bird group (e.g., diurnal raptors). American robin (n=53) and black-capped chickadee (n=34) were the most abundant species observed. All species, their abundance, and observed PC locations are presented in Table 3-1.

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 Study Area and surrounding landscape.

During spring migration, the PC locations with the highest number of individuals and species observed were PCs 1 and 8 (Figure 2, Appendix A). PC 1 had 61 individuals representing 32 species and PC 8 had 59 individuals representing 27 species. Both PCs represent different habitat types, with PC 1 being in a portion of older, hardwood dominant forest and beside a watercourse, and PC 8 being located at an open water wetland (i.e., swamp/pond). Both of these PC locations are examples of edge habitat due to PC 1 being close to a road and the pit edge and PC 8 being an open wetland surrounded by mixedwood forest. The wetland at PC 8 transitions to a treed/shrub swamp farther north. The higher number of species and individuals at these locations is likely due to this habitat variability and structure (e.g., vegetation height differences provided by edge habitat). This would attract a variety of species (passerines, woodpeckers, raptors, waterfowl, and shorebirds).

There were various observations of probable and confirmed breeding behaviour (MBBA n.d.) during the spring migration surveys, which include:

- A male and female downy woodpecker pair (probable);
- A male and female Northern parula pair (probable);
- A male mallard was observed with five females in a settling pond by PC 10 (probable);
- A male common merganser was observed with two females in a settling pond by PC 10 (probable);
- A male and female red-winged blackbird were observed showing intense agitation and stress (i.e., distress calls) due to the presence of the surveyor, which gave a strong indication of a nearby nest in the vegetation of the wetland (i.e., swamp/marsh) at PC 8 (probable). A male rusty blackbird was observed with the red-winged blackbirds showing signs of agitation and stress as well but there was no sign of a female partner, and
- A male and female chipping sparrow pair were observed mating at PC 9 (confirmed).

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

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex	PC Observations	Group
RUBL	**Rusty blackbird**	***Euphagus carolinus***	**SC**	**E**	**S2B**	**1**	**M**	**8**	**6**
BOOW	**Boreal owl**	***Aegolius funereus***	-	-	**S2?B, SUM**	**1**	-	**7**	**5**
KILL	**Killdeer**	***Charadrius vociferus***	-	-	**S3B**	**1**	-	**9**	**2**
ALFL	Alder flycatcher	*Empidonax alnorum*	-	-	S5B	8	-	1, 3, 6, 7, 8, 10	6
AMCR	American crow	*Corvus brachyrhynchos*	-	-	S5	13	-	1, 2, 5, 7, 8, 9, 10	6
AMGO	American goldfinch	*Carduelis tristis*	-	-	S5	18	-	1, 3, 6, 7, 8, 9, 10	6
AMRE	American redstart	*Setophaga ruticilla*	-	-	S5B	7	-	1, 2, 4, 10	6
AMRO	American robin	*Turdus migratorius*	-	-	S5B, S3N	53	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	6
BDOW	Barred owl	*Strix varia*	-	-	S5	2	-	2, 3	5
BBWA	Bay-breasted warbler	*Setophaga castanea*	-	-	S3S4B, S4S5M	3	-	1, 8	6
BEKI	Belted kingfisher	*Megaceryle alcyon*	-	-	S4S5B	1	-	1	3
BLPW	Blackpoll warbler	*Setophaga striata*	-	-	S3B, S5M	1	-	3	6
BCCH	Black-capped chickadee	*Poecile atricapilla*	-	-	S5	34	-	1, 2, 4, 5, 6, 7, 8, 9	6
BTBW	Black-throated blue warbler	*Setophaga caerulescens*	-	-	S5B	1	-	2	6
BTNW	Black-throated green warbler	*Dendroica virens*	-	-	S5B	9	-	2, 3, 4, 5, 6, 9	6
BLJA	Blue jay	*Cyanocitta cristata*	-	-	S5	16	-	1, 2, 4, 5, 6, 7, 8, 9	6
BHVI	Blue-headed vireo	*Vireo solitarius*	-	-	S5B	8	-	1, 2, 3, 5, 6, 7, 9	6
CAGO	Canada goose	*Branta canadensis*	-	-	SUB, S4N, S5M	3	-	3, 7, 10	1
CSWA	Chestnut-sided warbler	*Setophaga pensylvanica*	-	-	S5B	4	-	1, 9, 10	6
CHSP	Chipping sparrow	*Spizella passerina*			S4B, S5M	2	1 M, 1 F	9	6
COGR	Common grackle	*Quiscalus quiscula*	-	-	S5B	20	-	1, 7, 8, 9	6
COME	Common merganser	*Mergus merganser*	-	-	S5B, S4N	3	1 M, 2 F	10	1
CORA	Common raven	*Corvus corax*	-	-	S5	7	-	1, 5, 7, 9, 10	6
COYE	Common yellowthroat	*Geothlypis trichas*	-	-	S5B	5	-	1, 6, 7, 8	6

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex	PC Observations	Group
DEJU	Dark-eyed junco	*Junco hyemalis*	-	-	S4S5	4	-	1, 5, 8	6
DOWO	Downy woodpecker	*Dryobates pubescens*	-	-	S5	5	1 M, 1 F	1, 4, 6, 8	7
EAPH	Eastern phoebe	*Sayornis phoebe*	-	-	S4S5B, S4M	2	-	9, 10	6
EUST	European starling	*Sturnus vulgaris*	-	-	SNA	7	-	1, 2, 6, 8	6
FOSP	Fox sparrow	*Passerella iliaca*	-	-	S3S4B, S5M	1	-	2	6
GCKI	Golden-crowned kinglet	*Regulus satrapa*	-	-	S5	5	-	1, 2, 4, 5	6
HAWO	Hairy woodpecker	*Picoides villosus*	-	-	S5	2	-	6, 10	7
HETH	Hermit thrush	*Catharus guttatus*	-	-	S5B	10	-	1, 2, 3, 4, 6, 9	6
HOME	Hooded merganser	*Lophodytes cucullatus*	-	-	S4S5B, S5M	2	1 M, 1 F	8, 10	1
LEFL	Least flycatcher	*Empidonax minimus*	-	-	S4S5B, S5M	1	-	3	6
LISP	Lincoln's sparrow	*Melospiza lincolnii*	-	-	S4B, S5M	1	-	9	6
MAWA	Magnolia warbler	*Dendroica magnolia*	-	-	S5B	7	-	1, 3, 4	6
MALL	Mallard	*Anas platyrhynchos*	-	-	S5B, S5N	6	5 M, 1 F	10	1
MODO	Mourning dove	*Zenaida macroura*	-	-	S5	5	-	1, 5, 9, 10	7
NAWA	Nashville warbler	*Vermivora ruficapilla*	-	-	S4B, S5M	3	-	6, 8, 9	6
NOFL	Northern flicker	*Colaptes auratus*	-	-	S5B	16	-	1, 3, 4, 5, 6, 7, 10	7
NOPA	Northern parula	*Parula americana*	-	-	S5B	9	1 M, 1 F	1, 2, 3, 6, 9	6
NOWA	Northern waterthrush	*Parkesia noveboracensis*	-	-	S4B, S5M	1	-	10	6
OVEN	Ovenbird	*Seiurus aurocapilla*	-	-	S5B	21	-	1, 2, 3, 4, 5, 6, 7, 8, 9	6
PAWA	Palm warbler	*Dendroica palmarum*	-	-	S5B	3	-	2, 3, 8	6
PUFI	Purple finch	*Carpodacus purpureus*	-	-	S4S5B, S3S4N, S5M	11	-	1, 3, 5, 6, 7, 8, 9	6
RBNU	Red-breasted nuthatch	*Sitta canadensis*	-	-	S4S5	2	-	1, 8	6
REVI	Red-eyed vireo	*Vireo olivaceus*	-	-	S5B	12	-	1, 2, 3, 4, 5, 7, 9, 10	6
RWBL	Red-winged blackbird	*Agelaius phoeniceus*	-	-	S4B	9	1 M, 1 F	7, 8, 10	6
RNDU	Ring-necked duck	*Aythya collaris*	-	-	S5B	1	M	10	1

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex	PC Observations	Group
RCKI	Ruby-crowned kinglet	*Regulus calendula*	-	-	S4B, S5M	3	-	8, 9, 10	6
RUGR	Ruffed grouse	*Bonasa umbellus*	-	-	S5	10	-	2, 3, 5, 6, 7, 8, 9	7
SOSP	Song sparrow	*Melospiza melodia*	-	-	S5B	5	-	2, 3, 9, 10	6
SPSA	Spotted sandpiper	*Actitis macularius*	-	-	S3S4B, S5M	2	-	10	2
SWSP	Swamp sparrow	*Melospiza georgiana*	-	-	S5B	3	-	7, 8	6
TRES	Tree swallow	*Tachycineta bicolor*	-	-	S4B	3	-	1, 10	6
VEER	Veery	*Catharus fuscescens*	-	-	S4B	1	-	7	6
WTSP	White-throated sparrow	*Zonotrichia albicollis*	-	-	S4S5B, S5M	5	-	1, 3, 6, 8	6
WIWA	Wilson's warbler	*Cardellina pusilla*	-	-	S3B, S5M	2	-	8, 9	6
WIWR	Winter wren	*Troglodytes troglodytes*	-	-	S5B	1	-	9	6
YBFL	Yellow-bellied flycatcher	*Empidonax flaviventris*	-	-	S4B, S5M	1	-	1	6
YBSA	Yellow-bellied sapsucker	*Sphyrapicus varius*	-	-	S5B	10	-	2, 3, 4, 6, 7, 8	7
YWAR	Yellow warbler	*Dendroica petechia*	-	-	S5B	3	-	1, 2, 10	6
YRWA	Yellow-rumped warbler	*Dendroica coronata*	-	-	S5B	9	-	1, 2, 3, 8, 10	6
-	Unknown woodpecker (hairy or downy woodpecker)	-	-	-	-	1	-	3	7
Total Number of Individuals				**426**	**Total Number of Species (does not include unknowns)**				**63**

Notes: incidental observations not included (those observed outside of point count locations). All individuals recorded were adults. 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 (December 2023). "-" represents no federal designation.

3.2.2 Breeding Bird Surveys

During breeding bird PC surveys, a total of 334 individuals representing 62 species were observed.

Four avian SAR (Canada warbler, Eastern wood-pewee, olive-sided flycatcher, and wood thrush) and two avian SOCI (Cape May warbler and solitary sandpiper; Table 3-2; Figure 6, Appendix A) were observed during the breeding bird surveys. All avian SAR and SOCI are discussed in Section 3.3.

Passerines comprised 90.72% of the species observed, followed by other landbirds (6.29%), waterfowl (1.2%), other waterbirds (0.9%), diurnal raptors (0.6%), and shorebirds (0.3%). American goldfinch (n=29) and American robin (n=29) were the most abundant species observed. All the species identified are native species in this region of Nova Scotia and the province in general (with the exception of European starling). Typical and common habitat to support these species is present within the Study Area and surrounding landscape. All species, their abundance and observed PC locations, are listed in Table 3-2.

During breeding season, the PC locations with the highest number of individuals and species observed were PCs 8 and 10 (Figure 2, Appendix A). PC 8 had 51 individuals representing 27 species and PC 10 had 55 individuals representing 31 species. Both PCs represent different habitat types, with PC 8 being located at an open water wetland (i.e., swamp/pond), and PC 10 being in an open area in the middle of the pit (e.g., near the pit, gravel piles, and settling ponds). Both of these PC locations are situated in edge habitat, with both being an example of an open area surrounded by mixedwood forest. The wetland at PC 8 transitions to a treed/shrub swamp farther north. The higher number of species and individuals at these locations is likely due to this habitat variability and structure (e.g., vegetation height differences provided by edge habitat). This would attract a variety of species (passerines, woodpeckers, raptors, waterfowl, and shorebirds).

There were various observations of probable breeding behaviour (MBBA n.d.) during the breeding bird surveys, which include:

- A male and female American redstart pair;
- A male and female American robin pair showing intense agitation and stress calls (i.e., distress calls) due to the presence of the surveyor, which gave the strong indication of a nearby nest at PC 5;
- A male and female yellow-bellied sapsucker pair showing intense agitation and stress calls due to the presence of the surveyor, which gave the strong indication of a nearby nest at PC 6;
- A male and female white-throated sparrow pair showing intense agitation and stress calls due to the presence of the surveyor, which gave the strong indication of a nearby nest at PC 6;
- A male and female red-winged blackbird pair showing intense agitation and stress calls due to the presence of the surveyor, which gave the strong indication of a nearby nest in the vegetation of the wetland (i.e., swamp/marsh) at PC 8, and
- A male mallard was observed with two females in the wetland (i.e., swamp/marsh) at PC 8.

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	PC Observations	Group
CAWA	**Canada warbler**	***Cardellina canadensis***	**T**	**E**	**S3B**	**2**	-	**6, 7**	**6**
EAWP	**Eastern wood-pewee**	***Contopus virens***	**SC**	**V**	**S3S4B**	**1**	-	**4**	**6**
OSFL	**Olive-sided flycatcher**	***Contopus cooperi***	**SC**	**T**	**S3B**	**1**	-	**10**	**6**
WOTH	**Wood thrush**	***Hylocichla mustelina***	**T**	**-**	**SUB**	**1**	-	**2**	**6**
CMWA	**Cape May warbler**	***Setophaga tigrina***	**-**	**-**	**S3B, SUM**	**1**	-	**2**	**6**
SOSA	**Solitary sandpiper**	***Tringa solitaria***	**-**	**-**	**SUB, S3S4M**	**1**	-	**10**	**2**
ALFL	Alder flycatcher	*Empidonax alnorum*	-	-	S5B	4	-	3, 7, 8, 9	6
AMCR	American crow	*Corvus brachyrhynchos*	-	-	S5	8	-	1, 7, 8, 10	6
AMGO	American goldfinch	*Carduelis tristis*	-	-	S5	29	-	1, 2, 3, 5, 7, 8, 9, 10	6
AMRE	American redstart	*Setophaga ruticilla*	-	-	S5B	10	1 M, 1 F	1, 2, 3, 4, 7, 10	6
AMRO	American robin	*Turdus migratorius*	-	-	S5B, S3N	29	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	6
BEKI	Belted kingfisher	*Megaceryle alcyon*	-	-	S4S5B	2	-	8	3
BLBW	Blackburnian warbler	*Setophaga fusca*	-	-	S4B, S5M	1	-	4	6
BAWW	Black-and-white warbler	*Mniotilta varia*	-	-	S5B	9	1 F	1, 2, 3, 4, 6	6
BCCH	Black-capped chickadee	*Poecile atricapilla*	-	-	S5	12	-	1, 2, 4, 7, 8, 9	6
BTBW	Black-throated blue warbler	*Setophaga caerulescens*	-	-	S5B	1	-	1	6
BTNW	Black-throated green warbler	*Dendroica virens*	-	-	S5B	8	-	2, 4, 5, 6, 9	6
BLJA	Blue jay	*Cyanocitta cristata*	-	-	S5	10	-	1, 3, 4, 5, 6, 8, 10	6
BHVI	Blue-headed vireo	*Vireo solitarius*	-	-	S5B	3	-	3, 4, 7	6
BRCR	Brown creeper	*Certhia americana*	-	-	S5	2	-	10	6
CEDW	Cedar waxwing	*Bombycilla cedrorum*	-	-	S5B	6	-	4, 8, 10	6
COGR	Common grackle	*Quiscalus quiscula*	-	-	S5B	5	-	3, 7, 8	6
CORA	Common raven	*Corvus corax*	-	-	S5	2	-	1, 8	6
COYE	Common yellowthroat	*Geothlypis trichas*	-	-	S5B	8	-	1, 7, 8, 10	6

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex	PC Observations	Group
DEJU	Dark-eyed junco	*Junco hyemalis*	-	-	S4S5	4	-	1, 6, 9, 10	6
DOWO	Downy woodpecker	*Dryobates pubescens*	-	-	S5	2	-	9, 10	7
EAPH	Eastern phoebe	*Sayornis phoebe*	-	-	S4S5B, S4M	1	-	10	6
EUST	European starling	*Sturnus vulgaris*	-	-	SNA	3	-	10	6
GCKI	Golden-crowned kinglet	*Regulus satrapa*	-	-	S5	3	-	8, 9, 10	6
HAWO	Hairy woodpecker	*Picoides villosus*	-	-	S5	2	-	1, 10	7
HETH	Hermit thrush	*Catharus guttatus*	-	-	S5B	11	-	1, 2, 5, 6, 7, 8, 10	6
LEFL	Least flycatcher	*Empidonax minimus*	-	-	S4S5B, S5M	3	-	1, 10	6
MAWA	Magnolia warbler	*Dendroica magnolia*	-	-	S5B	1	-	8	6
MALL	Mallard	*Anas platyrhynchos*	-	-	S5B, S5N	3	1 M, 2 F	8	1
MERL	Merlin	*Falco columbarius*	-	-	S5B	1	-	9	4
MODO	Mourning dove	*Zenaida macroura*	-	-	S5	2	-	9, 10	7
NAWA	Nashville warbler	*Vermivora ruficapilla*	-	-	S4B, S5M	1	-	8	6
NOFL	Northern flicker	*Colaptes auratus*	-	-	S5B	10	-	3, 4, 6, 7, 8, 9, 10	7
NOPA	Northern parula	*Parula americana*	-	-	S5B	15	-	1, 2, 3, 5, 6, 7, 8, 9, 10	6
NOWA	Northern waterthrush	*Parkesia noveboracensis*	-	-	S4B, S5M	1	-	8	6
OVEN	Ovenbird	*Seiurus aurocapilla*	-	-	S5B	24	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	6
PAWA	Palm warbler	*Dendroica palmarum*	-	-	S5B	3	-	1, 9, 10	6
PUFI	Purple finch	*Carpodacus purpureus*	-	-	S4S5B, S3S4N, S5M	4	-	1, 3, 7	6
RBNU	Red-breasted nuthatch	*Sitta canadensis*	-	-	S4S5	5	-	1, 2, 5, 7, 10	6
REVI	Red-eyed vireo	*Vireo olivaceus*	-	-	S5B	24	-	1, 2, 3, 4, 5, 7, 8, 9, 10	6
RWBL	Red-winged blackbird	*Agelaius phoeniceus*	-	-	S4B	6	1 M, 1 F	7, 8	6
RNDU	Ring-necked duck	*Aythya collaris*	-	-	S5B	1	-	8	1
RIPH	Ring-necked pheasant	*Phasianus colchicus*	-	-	SNA	1	-	1	7
ROPI	Rock pigeon	*Columba livia*	-	-	SNA	2	-	Area Search	7
RTHU	Ruby-throated hummingbird	*Archilochus colubris*	-	-	S5B	1	-	10	6

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex	PC Observations	Group
SSHA	Sharp-shinned hawk	*Accipiter striatus*	-	-	S5	1	-	9	4
SOSP	Song sparrow	*Melospiza melodia*	-	-	S5B	9	-	1, 3, 8, 9, 10	6
SORA	Sora	*Porzana carolina*	-	-	S5B	1	-	8	3
SWSP	Swamp sparrow	*Melospiza georgiana*	-	-	S5B	3	-	1, 10	6
TRES	Tree swallow	*Tachycineta bicolor*	-	-	S4B	1	-	9	6
VEER	Veery	*Catharus fuscescens*	-	-	S4B	8	-	3, 4, 5, 7, 8	6
WBNU	White-breasted nuthatch	*Sitta carolinensis*	-	-	S4	1	-	9	6
WTSP	White-throated sparrow	*Zonotrichia albicollis*	-	-	S4S5B, S5M	11	1 M, 1 F	1, 3, 6, 7, 8, 9, 10	6
WIWR	Winter wren	*Troglodytes troglodytes*	-	-	S5B	1	-	6	6
YBSA	Yellow-bellied sapsucker	*Sphyrapicus varius*	-	-	S5B	2	1 M, 1 F	6	7
YWAR	Yellow warbler	*Dendroica petechia*	-	-	S5B	2	-	10	6
YRWA	Yellow-rumped warbler	*Dendroica coronata*	-	-	S5B	4	-	3, 4, 9, 10	6
Total Number of Individuals				**334**	**Total Number of Species**				**62**

Notes: incidental observations not included (those observed outside of point count locations). All individuals recorded were adults. 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 (December 2023). "-" represents no federal designation. "Area Search" under the PC Locations column represents a species observed during the area searches conducted after the morning PC surveys.

3.2.3 Fall Migration Surveys

During fall migration PC surveys, a total of 346 individuals representing 47 species (this number does not include unknowns) were observed. One avian SAR (peregrine falcon) and three avian SOCI (boreal chickadee, pine siskin, and rough-legged hawk; Figure 6, Appendix A) were observed. All species, their abundance, and observed PC locations are listed in Table 3-3. Note that the pine warbler (S2S3B, S4S5M) is not considered a priority species due to their ACCDC SRank during the migration season. All avian SAR and SOCI are discussed in Section 3.3.

Passerines were the most abundant bird group and comprised 90.46% of the species observed, followed by other landbirds (5.78%), waterfowl (2.02%), and diurnal raptors (1.73%). These percentages include unknown individuals that were identified to the level of bird group (e.g., diurnal raptors). Black-capped chickadee (n=43) and blue jay (n=43) were most abundant species 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 Study Area and surrounding landscape.

During fall migration, the PC locations with the highest number of individuals and species observed were PCs 8 and 10 (Figure 2, Appendix A). PC 8 had 71 individuals representing 23 species (not including unknowns) and PC 10 had 48 individuals representing 16 species. PC 8 and 10 represent different habitat types, with PC 8 being located at an open water wetland (i.e., swamp/pond), and PC 10 being in an open area in the middle of the pit (e.g., near the pit, gravel piles, and settling ponds). These are both examples of edge habitat, since both PCs represent an open area surrounded by mixedwood forest. The wetland at PC 8 transitions to a treed/shrub swamp farther north. The higher number of species and individuals at these locations is likely due to this habitat variability and structure (e.g., vegetation height differences provided by edge habitat). This correlates with what was observed during the breeding season.

There was one observation of breeding behaviour during the fall migration surveys. A male and female white-throated sparrow pair were observed showing signs of agitation and stress (e.g., distress calls) due to the presence of the surveyor, indicating a possible nest nearby. This is considered to be 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	PC Observations	Group
PEFA	**Peregrine falcon**	***Falco peregrinus***	-	V	**S1B, SUM**	**1**	-	**8**	**4**
BOCH	**Boreal chickadee**	***Poecile hudsonica***	-	-	**S3**	**1**	-	**8**	**6**
PISI	**Pine siskin**	***Spinus pinus***	-	-	**S3**	**2**	-	**9**	**6**
RLHA	**Rough-legged hawk**	***Buteo lagopus***	-	-	**S3N**	**1**	-	**10**	**4**
ALFL	Alder flycatcher	*Empidonax alnorum*	-	-	S5B	2	-	8	6
AMCR	American crow	*Corvus brachyrhynchos*	-	-	S5	15	-	2, 4, 8, 9, 10	6
AMGO	American goldfinch	*Carduelis tristis*	-	-	S5	30	-	2, 3, 6, 7, 8, 9, 10	6
AMRE	American redstart	*Setophaga ruticilla*	-	-	S5B	5	-	2, 4, 5, 7	6
AMRO	American robin	*Turdus migratorius*	-	-	S5B, S3N	25	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	6
BAWW	Black-and-white warbler	*Mniotilta varia*	-	-	S5B	3	-	2, 5, 8	6
BCCH	Black-capped chickadee	*Poecile atricapilla*	-	-	S5	43	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	6
BTBW	Black-throated blue warbler	*Setophaga caerulescens*	-	-	S5B	1	M	5	6
BTNW	Black-throated green warbler	*Dendroica virens*	-	-	S5B	4	1 F	1, 4, 5, 10	6
BLJA	Blue jay	*Cyanocitta cristata*	-	-	S5	43	-	1, 2, 3, 4, 5, 6, 7, 8, 10	6
BHVI	Blue-headed vireo	*Vireo solitarius*	-	-	S5B	7	-	1, 2, 3, 6, 7	6
BRCR	Brown creeper	*Certhia americana*	-	-	S5	3	-	6, 7	6
CEDW	Cedar waxwing	*Bombycilla cedrorum*	-	-	S5B	9	-	4, 8, 10	6
COGR	Common grackle	*Quiscalus quiscula*	-	-	S5B	1	-	3	6
CORA	Common raven	*Corvus corax*	-	-	S5	11	-	1, 5, 8, 9, 10	6
COYE	Common yellowthroat	*Geothlypis trichas*	-	-	S5B	1	F or Juvenile	6	6
DEJU	Dark-eyed junco	*Junco hyemalis*	-	-	S4S5	12	-	1, 2, 3, 5, 7, 8, 9, 10	6
GCKI	Golden-crowned kinglet	*Regulus satrapa*	-	-	S5	9	-	2, 4, 5, 6, 7	6
GRCA	Gray catbird	*Dumetella carolinensis*	-	-	S4B	1	-	3	6
HETH	Hermit thrush	*Catharus guttatus*	-	-	S5B	9	-	3, 4, 6, 7, 8, 9	6
LEFL	Least flycatcher	*Empidonax minimus*	-	-	S4S5B, S5M	1	-	7	6

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	PC Observations	Group
MALL	Mallard	*Anas platyrhynchos*	-	-	S5B, S5N	6	-	3, 8	1
MODO	Mourning dove	*Zenaida macroura*	-	-	S5	4	-	1, 6, 7, 10	7
NAWA	Nashville warbler	*Vermivora ruficapilla*	-	-	S4B, S5M	1	-	6	6
NOFL	Northern flicker	*Colaptes auratus*	-	-	S5B	14	-	3, 4, 6, 7, 8, 9	7
NOPA	Northern parula	*Parula americana*	-	-	S5B	3	-	3, 6, 7	6
NOWA	Northern waterthrush	*Parkesia noveboracensis*	-	-	S4B, S5M	1	-	8	6
OVEN	Ovenbird	*Seiurus aurocapilla*	-	-	S5B	5	-	1, 2, 5, 8	6
PIWA	Pine warbler	*Setophaga pinus*	-	-	S2S3B, S4S5M	1	F	2	6
RBNU	Red-breasted nuthatch	*Sitta canadensis*	-	-	S4S5	3	-	2, 5	6
REVI	Red-eyed vireo	*Vireo olivaceus*	-	-	S5B	28	-	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	6
RTHA	Red-tailed hawk	*Buteo jamaicensis*	-	-	S5	1	-	8	4
RCKI	Ruby-crowned kinglet	*Regulus calendula*	-	-	S4B, S5M	1	-	6	6
RTHU	Ruby-throated hummingbird	*Archilochus colubris*	-	-	S5B	1	-	6	6
RUGR	Ruffed grouse	*Bonasa umbellus*	-	-	S5	2	-	4, 10	7
SAVS	Savannah sparrow	*Passerculus sandwichensis*	-	-	S4S5B, S5M	1	-	8	6
SOSP	Song sparrow	*Melospiza melodia*	-	-	S5B	12	-	2, 3, 6, 8, 9, 10	6
SWSP	Swamp sparrow	*Melospiza georgiana*	-	-	S5B	2	-	8	6
VEER	Veery	*Catharus fuscescens*	-	-	S4B	1	-	4	6
WBNU	White-breasted nuthatch	*Sitta carolinensis*	-	-	S4	1	-	6	6
WTSP	White-throated sparrow	*Zonotrichia albicollis*	-	-	S4S5B, S5M	9	1 M 1 F	2, 6, 8, 9, 10	6
YBFL	Yellow-bellied flycatcher	*Empidonax flaviventris*	-	-	S4B, S5M	1	-	7	6
YRWA	Yellow-rumped warbler	*Dendroica coronata*	-	-	S5B	4	-	2, 5, 6, 10	6
-	Unknown buteo	-	-	-	-	2	-	4, 8	4
-	Unknown duck	-	-	-	-	1	-	8	1
-	Unknown hawk	-	-	-	-	1	-	4	4

Code	Common Name	Scientific Name	SARA	NSESA	SRank	#	Sex / Age	PC Observations	Group
Total Number of Individuals				**346**	**Total Number of Species (does not include unknowns)**				**47**

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 (December 2023). "-" represents no federal designation.

3.2.4 Nocturnal Owl Surveys

During the first round of nocturnal owl surveys, two boreal owls and two barred owls were observed. Observation notes are as follows:

- The boreal owls were vocalizing back and forth at survey location Owl 1 (Figure 3, Appendix A). One was approximately 60 to 70 m away and the other was approximately 100 to 150 m away to the south within the forested area surrounding the pit area. The two boreal owls were calling back and forth for approximately five minutes while the surveying was prepping for the survey. The vocalizations stopped before the survey start time (i.e., when the owl track began). Once the track began, one of the boreal owls responded to the second boreal owl call within the track and moved closer to the edge of the treeline, closer to the surveyor location (approximately 50 m south). The owl moved closer and vocalized for approximately two minutes and then stopped once the barred owl section of the track started playing. Overall, two boreal owls in total were observed at Owl 1 but only one responded during the owl track played.

- The barred owls were observed at survey location Owl 2 and approached quickly near the end of the survey time (i.e., end of the track), due to being attracted to the barred owl calls within the owl track. The barred owls were initially heard approximately 400 to 500 m away from the location, responding to the track (one approached from the north and the other approached from the east). After approximately one minute after the track ended, both barred owls were less than 50 to 70 m away and vocalizing. One barred owl flew and perched in a tree directly over the surveyor, vocalizing in response to the track despite it having ended. The individual vocalized for approximately two minutes before leaving the area. Overall, two barred owls in total were observed and both responded to the owl track played.

Other observations at survey location Owl 1 during the first round of nocturnal owl surveys include:

- Three American woodcocks (*Scolopax minor*; ACCDC S5B) were conducting aerial breeding displays and vocalizing over the fields in the pit area before the sun set and the nocturnal owl surveys began. The surveyor noted this while waiting for the survey to begin. All three individuals were relatively close together (within 50 to 80 m of the survey location) within the pit and grassy areas and fields within the Study Area. Conducting a breeding display is considered as possible breeding behaviour (MBBA n.d.).
- One American robin was singing nearby (< 50 m away).
- Ten American crows were calling in the distance (> 100 m away).

During the second round of nocturnal owl surveys, two barred owls were observed at survey location Owl 2. After the survey ended (i.e., track was finished), two barred owls arrived and flew and perched directly over the surveyor in a tree for approximately one minute and vocalized, responding to the survey track. After one minute, both barred owls flew off. Both owls sat very close together in the tree, indicating a possible mating pair. It is also a possibility these are the same two owls from the first survey round since they were observed at the same location and took approximately the same amount of time to approach the surveyor (and over the same distance). Overall, two barred owls in total were observed and both responded to the owl track played.

Other observations during the second round of nocturnal owl surveys include:

- One American woodcock, one hermit thrush, and one white-throated sparrow were heard nearby (< 50 m away) at survey location Owl 1.
- One American woodcock and one white-throated sparrow were heard nearby (< 50 m) at survey location Owl 2.

When compared to the spring/fall migration and breeding bird surveys, the only novel species observed during the nocturnal owl surveys was the American woodcock.

3.2.5 Nightjar Surveys

As discussed in Section 2.3.4, the Study Area 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 2018). 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).

No nightjars (Eastern whip-poor-will or common nighthawk) were observed during either nightjar survey round. There were no results from opportunistic turtle surveys conducted during the nightjar surveys either.

Other avian species were observed during nightjar survey round two and include:

- One common raven heard at survey location CONI 1 (Figure 4, Appendix A).
- One American goldfinch, one chestnut-sided warbler, one common raven, two common yellowthroats, one purple finch, and one yellow-rumped warbler were heard and/or observed at CONI 4.
    - The two common yellowthroats observed were a mating pair doing a distraction display due to the presence of the surveyor. This is considered confirmed breeding behaviour since there was likely a nest nearby based on their 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 pileated woodpecker. All other incidental birds were also observed during the dedicated bird surveys.

Incidentals during a spring Pellet Group Inventory (PGI) moose survey (March 2, 2023):

- 1 American goldfinch,
- 3 American redstarts,
- 1 American robin,
- 1 black-and-white warbler,
- 1 black-capped chickadee,
- 1 blackburnian warbler,
- 1 blue jay,
- 1 common grackle,
- 1 common yellowthroat,
- 1 Nashville warbler,
- 1 northern flicker,
- 4 ovenbirds,
- 1 purple finch,
- 3 red-eyed vireos,
- 2 veery, and

- 1 yellow warbler.

Incidentals during early botany surveys (June 12 and 13, 2023):

- 10 cedar waxwings,
- 3 Eastern wood-pewees (SAR),
- 1 grey catbird,
- 1 pileated woodpecker (*Dryocopus pileatus*; ranked by ACCDC as S5),
- 1 song sparrow,
- 1 sora, and
- 1 veery.

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

The only avian SAR observed during these incidental observations were the Eastern-wood pewees observed during the early botany surveys. One was located by watercourse (WC) 3 near the southeastern border of the Study Area, one was located by the northern edge of the pit, and the other was located near the southern edge of the pit by a watercourse (not field delineated) and Six Mile Brook Road. Note that all avian SAR observation locations can be viewed in Figure 6, Appendix A. All avian SAR are discussed in Section 3.3. Refer to the wetland and fish habitat Project biophysical baseline reports for figures and information on wetlands and watercourses within the Study Area.

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 a 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 6, 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 6 is a map that reflects where the observation is precisely located based on surveyor data (i.e., distance and direction recorded).

3.3.1 Species at Risk

Six avian SAR were observed during surveys throughout the dedicated survey period in 2023. The SAR, its habitat requirements, and the habitat present within the Study Area, are described below.

Most of the avian SAR observations (Eastern wood-pewee, peregrine falcon, olive-sided flycatcher, Canada warbler, and rusty blackbird) within the Study Area are all associated with edge habitat, open areas, as well as wetlands and watercourses. Avian SAR observations in wetlands include Canada warbler, olive-sided flycatcher, and rusty blackbird. Further information will be included in this section. Refer to Figure 6, 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 *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 Study Area. 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).

Two Canada warblers were observed within the study area within a wet/floodplain area and a wetland (WL 5; a wetland mosaic of marsh/swamp).

3.3.1.2 *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 Study Area. 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 2012a). 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 2012a).

All Eastern-wood pewee observations within the Study Area are associated with edge habitat around the pit site or the watercourses or wetlands to the east within the Study Area. Due to the nature of the field observations, no observations of Eastern wood-pewees could be definitively placed in a wetland.

All Eastern wood-pewee observation locations, including the incidental observations during the early botany surveys, can be viewed in Figure 6, Appendix A.

3.3.1.3 *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-sixed bird belonging to the passerine group. There is suitable foraging and breeding habitat for this species within the Study Area. 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 2018). 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 2018).

One olive-sided flycatcher was observed in a wetland (WL 2; a treed swamp).

3.3.1.4 *Peregrine falcon*

The peregrine falcon (listed as Special Concern by COSEWIC, Vulnerable by NSESA, and ranked by ACCDC as S1B, SUM) is a medium to large-sized bird belonging to the diurnal raptor group. There is suitable foraging habitat for this species within the Study Area. The peregrine falcon can exist in a range of habitats although, specifically, they typically use cliffs for nesting as it provides viewing for hunting and territorial defence. Suitable breeding habitat is typically found in areas where there is sufficient prey and prey habitat (COSEWIC 2017). The peregrine falcon prefers a wide variety of habitats that include tundra, open wetlands, coastal islands, anthropogenic areas (cities and towns), coastline/coastal areas, large rivers, lakes, cliffsides, and mountains. This species prefers open habitat with tall structures (natural or anthropogenic) for perching and nesting (e.g., tall cliff edges). Although this species is still being studied and is known to have adapted to human development, current threats to this species

include the loss and/or degradation of habitat, persecution by humans (e.g., nest destruction and hunting), and environmental contaminants (COSEWIC 2017).

One peregrine falcon observation occurred within the Study Area. The Peregrine falcon was observed flying and hunting over the Study Area over open areas (e.g., pit area and swamp/marsh WL 5). Due to the lack of cliffs or tall structures within or surrounding the Study Area, the peregrine falcon was likely hunting in the area and not nesting.

3.3.1.5 *Rusty blackbird*

The rusty blackbird (listed as Special Concern by SARA/COSEWIC, Endangered by NSESA, and ranked by ACCDC as S2B) is a small to medium-sized bird belonging to the passerine group. There is suitable foraging and breeding habitat for this species within the Study Area. Habitat for this species is generally characterized as wet open areas or wooded wetlands that are often associated with stagnant or slow-moving water, with dense understory vegetation for cover (COSEWIC 2017). Breeding habitat for this species includes softwood dominant forests adjacent to wetlands or riparian areas adjacent to slow-moving streams (e.g., peat bogs, sedge meadows, wet pastures, alder/willow thickets, marshes, swamps, ponds with beaver activity, and sometimes lakes). Nesting occurs on the edges of wetlands within shrubs or small trees (with some form of understory cover) either over or adjacent to water. The most significant threat to this species is the loss and/or degradation of habitat (COSEWIC 2017).

One rusty blackbird was observed in a wetland (WL 5; a wetland mosaic of marsh/swamp).

3.3.1.6 *Wood thrush*

The wood thrush (listed as Threatened by SARA/COSEWIC and ranked by ACCDC as SUB) is a small-sized bird belonging to the passerine group. The wood thrush nests mainly in second-growth and mature deciduous and mixedwood forests, with well-developed understory layers for cover. Wood thrush generally prefer large, contiguous forest mosaics (undisturbed to moderately disturbed) but can also be found in small forest fragments. The most significant threat to this species is the loss and/or degradation of habitat (COSEWIC 2012b).

The one wood thrush observation was on the western side of the Study Area and close to the boundary within forested habitat. Due to the wood thrush's preference for large forest mosaics, the pit and the area surrounding the site would likely not be suitable habitat for this species.

The wood thrush observation occurred at PC 2 (Figure 6, Appendix A) but was estimated to be at a distance closer to PC 1. PC 1 was located in older/mature hardwood and mixedwood forest. This was a small section of this particular habitat type within the Study Area and differs from the younger and disturbed forest that represents the greater portion of the Study Area.

3.3.2 Species of Conservation Interest Observed

Across all survey seasons, a total of seven avian SOCI were observed (Figure 6, 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 and the survey season/type when they were observed are as follows:

- Boreal chickadee (fall migration 2023);
- Boreal owl (spring migration and nocturnal owl 2023);
- Cape May warbler (breeding bird 2023);
- Killdeer (spring migration 2023);
- Pine siskin (fall migration 2023);
- Rough-legged hawk (fall migration 2023), and

- Solitary sandpiper (breeding bird 2023).

4 AVIFAUNA SUMMARY

McCallum Environmental Ltd. (MEL) was retained by S.W. Weeks Construction Limited (S.W. Weeks; the Proponent) to prepare baseline biophysical reports, including avifauna surveys, for the proposed Six Mile Brook Pit Expansion Project (the Project), which is a sand and gravel pit located in Six Mile Brook, Nova Scotia. These assessments are to support the preparation and submission of the provincial EARD.

The Project is a sand and gravel pit located in Six Mile Brook, Nova Scotia, located approximately 20 km west of New Glasgow in Pictou County (Figure 1, Appendix A).

The Study Area is approximately 96.9 ha in size, which includes 36.3 ha of disturbed area (i.e., historic and current pit).

The avifauna survey program occurred within the Study Area (a area surrounding the Project infrastructure footprint, that was used to describe the maximum extent of terrestrial impacts). The Study Area comprises a mosaic of habitats including open developed areas (e.g., pit and unused regenerating fields) and softwood, hardwood, and mixedwood forest (with mixedwood being dominant) with watercourses spread throughout. The eastern side of the Study Area contains treed swamp and a mosaic of treed/shrub swamp and freshwater marsh habitat. The forest age surrounding the current pit area ranges from young to mid-aged and there are signs of historical logging and clearcutting (e.g., rutting and cutter trails) as well as signs of young and regenerating forest. Surveyors did not have any observations of mature forest within the Study Area, except a small tract near the southwestern border.

The Study Area provides a range of habitats suitable for a variety of bird species with different habitat requirements. There are expansive areas of open habitat that provide foraging and breeding habitat for certain species (e.g., raptors and passerines). Forests and shrub-dominated areas with stand heterogeneity (i.e., stands with different height classes) 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 (e.g., swallows and flycatchers).

The Study Area mainly consists open (e.g., pit, wetlands) habitat and forest with segments that have signs of historical disturbance. This area also has the Six Mile Brook and Six Mile Brook Trail south of the southern boundary of the Study Area. There is also an ATV park approximately one km away from the pit. The Study Area is surrounded by forest, residences, farmland, and fields on all sides.

The objectives of the avifauna species surveys were to:

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

In April 2023, biophysical field surveys were initiated and continued through October 2023 and a total of 16.18 hours (971 minutes) of surveys were completed by MEL biologists. The field studies were completed as follows:

- Spring migration surveys (April – May);
- Nocturnal owl surveys (April – May);
- Breeding bird surveys (June – July);
- Nightjar surveys (June – July), and

- Fall migration surveys (August – October).

Avian biophysical surveys resulted in the observation of 1139 individuals, representing 90 bird species (not including incidentals or unknowns) within the Study Area[1].

The most abundant bird group observed (by total number of species) were passerines accounting for 87.18% of species observed, followed by other landbirds (7.9%), waterfowl (2.28%), nocturnal raptors (0.79%), shorebirds (0.79%), diurnal raptors (0.7%), and other waterbirds (0.35%). These percentages represent species diversity within the Study Area. Note that these percentages include unknown individuals that were identified to the level of bird group (e.g., passerines). The most observed species was the American robin (n=108), black-capped chickadee (n=89), and American goldfinch (n=78).

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 (pit area), etc.).

In total, six avian SAR and seven avian SOCI were observed across all survey seasons (Section 3.2). The six avian SAR species observed were as follows:

- Canada warbler;
- Eastern wood-pewee;
- Olive-sided flycatcher;
- Peregrine falcon;
- Rusty blackbird, and
- Wood thrush.

No common nighthawk or Eastern whip-poor-will were observed during the nightjar surveys.

The seven avian SOCI species observed were as follows:

- Boreal chickadee;
- Boreal owl;
- Cape May warbler;
- Killdeer;
- Pine siskin;
- Rough-legged hawk, and
- Solitary sandpiper.

Overall, survey locations located in open areas (e.g., swamp/pond, area) with forested edges had the highest individual and species counts. The higher number of species and individuals at these locations is likely due to this habitat variability and structure (e.g., vegetation height differences provided by edge habitat). This would attract a variety of species (passerines, woodpeckers, raptors, waterfowl, and shorebirds).

[1] Note that incidental observations (Section 3.2.6) were not included in these calculations.

There were no observations of migratory behaviour or general migratory patterns noted within the Study Area during the spring migration, breeding bird, or fall migration surveys (e.g., 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 its 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.

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7 REFERENCES

Atlantic Canada Conservation Data Centre Database (ACCDC). 2023. Data Report for Six Mile Brook, NS 7620.

Atlantic Canada Conservation Data Centre (ACCDC). 2023. Rank Definitions. Retrieved from: http://accdc.com/en/ranks.html.

Bird Studies Canada - Atlantic Region. 2019. *Nova Scotia Nocturnal Owl Survey: Guide for Volunteers.* Sackville, NB: Bird Studies Canada.

Birds Canada. 2022. Canadian Nightjar Survey: Protocol 2022. Based on an original document written by Elly Knight. Published in collaboration with Environment and Climate Change Canada. 23 pages.

Canadian Wildlife Service (CWS). 2018. Wind Turbines and Birds - Updated Guidance for Environmental Assessment and Monitoring. Canadian Wildlife Service – Atlantic Region.

Canadian Wildlife Service (CWS). 2022. Environment and Climate Change Canada's Canadian Wildlife Service (Atlantic Region) - Wind Energy & Birds Environmental Assessment Guidance Update. Updated April 2022. 4 pp.

COSEWIC. 2020. IN PRESS. COSEWIC assessment and status report on the Canada Warbler *Cardellina canadensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 54 pp.

COSEWIC. 2018. COSEWIC assessment and status report on the Common Nighthawk (*Chordeiles minor*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 50 pp. (Species at Risk Public Registry).

COSEWIC. 2012a. COSEWIC assessment and status report on the Eastern Wood-pewee *Contopus virens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp.

COSEWIC. 2018. COSEWIC assessment and status report on the Olive-sided Flycatcher *Contopus cooperi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 52 pp.

COSEWIC. 2017. COSEWIC assessment and status report on the Peregrine Falcon *Falco peregrinus* (*pealei* subspecies - *Falco peregrinus pealei* and *anatum/tundrius* - *Falco peregrinus anatum/tundrius*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xviii + 108 pp.

COSEWIC. 2017. COSEWIC assessment and status report on the Rusty Blackbird *Euphagus carolinus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 64 pp.

COSEWIC. 2012b. COSEWIC assessment and status report on the Wood Thrush *Hylocichla mustelina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp.

Environment and Climate Change Canada (ECCC). 2018a. Nesting Periods. Retrieved from: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html

Environment and Climate Change Canada (ECCC). 2018b. Recovery Strategy for the Eastern Whip-poor-will (Antrostomus vociferus) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. vi + 107 pp.

Environment Canada – Canadian Wildlife Service (EC CWS). 2007a. Wind Turbines and Birds – A Guidance Document for Environmental Assessment.

Environment Canada – Canadian Wildlife Service (EC CWS). 2007b. Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds.

Important Bird Areas Canada (IBA Canada). N.d. IBA Site Summary: Cobequid Bay (NS019). Retrieved from: https://www.ibacanada.ca/site.jsp?siteID=NS019

Maritime Breeding Bird Atlas (MBBA). 2008. Atlassing for Species at Risk in the Maritime Provinces: A supplement to the Maritimes Breeding Bird Atlas Guide for Atlassers. 2nd Edition. Government of Canada. Habitat Stewardship Program for Species at Risk.

Maritime Breeding Bird Atlas (MBBA). N.d. Breeding Evidence Codes. Retrieved online: https://www.mba-aom.ca/jsp/codes.jsp?lang=en&pg=breeding.

Maritime Breeding Bird Atlas (MBBA). 2023. Breeding Dates Retrieved from: https://www.mba-aom.ca/downloads/breedingdates.pdf

Nova Scotia Environment (NSE). 2009. Guide to Addressing Wildlife Species and Habitat in an EA Registration Document. Policy and Corporate Services Division. Environmental Assessment Branch. Retrieved from: https://www.novascotia.ca/nse/ea/docs/EA.Guide-AddressingWildSpecies.pdf.

Nova Scotia Environment and Climate Change (NSECC). N.d. Mackay Brook Nature Reserve. Retrieved from: https://novascotia.ca/nse/protectedareas/nr_mackaybrook.asp.

Nova Scotia Environment and Climate Change (NSECC). N.d. Dalhousie Mountain. Retrieved from: https://novascotia.ca/nse/protectedareas/nr_dalhousiemountain.asp.

Takats, D. L., C. M. Francis, G. L. Holroyd, J. R. Duncan, K. M. Mazur, R. J. Cannings, W. Harris, D. Holt. 2001. Guidelines for Nocturnal Owl Monitoring in North America. Beaverhill Bird Observatory and Bird Studies Canada, Edmonton, Alberta. 32 pp.

APPENDIX A. FIGURES

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FIGURE 1

Project Overview

Six Mile Brook Pit Expansion

Pictou County, NS

- Project Location
- Contour Line (5m)
- Roads
- Mapped Watercourse (NSTDB)
- Secondary Watersheds
- West River Pictou Secondary Watershed (1DP-1)
- Mapped Waterbody (NSTDB)
- On-site Settling Ponds
- Proposed Quarry Expansion Area
- Historic Workings To Be Remediated Prior IA Expiration June 2024
- Area To Be Remediated As Part of EA
- Pit Floor Currently In use
- Study Area

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

0 75 150 300 m

1:6,000 Scale when printed @ 11" x 17"

Drawn By: MD
Reviewed By:

Project Number: 23-767
Date: 2023-12-21

McCallum Environmental Ltd.

Document Name: 231221_SixMile_EARD_ProjectOverview

Six Mile Brook

Six Mile Brook Rd

Four Mile Brook Road

Back Rd

Six Mile Brook

5049600 5049500 5049400 5049300 5049200 5049100 5049000 5048900 5048800 5048700 5048600 5048500 5048400 5048300 5048200 5048100

506400 506500 506600 506700 506800 506900 507000 507100 507200 507300 507400 507500 507600 507700 507800 507900 508000 508100 508200 508300 508400

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FIGURE 2

Avian Survey Methods and Results

Six Mile Brook Pit Expansion

Pictou County, NS

- Project Location
- Building (NSTDB)
- Owl Survey Point Count
- Common Nighthawk Survey Point Count
- Avifauna Survey Point Count
- Boreal chickadee
- Boreal owl
- Canada warbler
- Cape May warbler
- Eastern wood-pewee
- Killdeer
- Olive-sided flycatcher
- Peregrine falcon
- Pine siskin
- Rough-legged hawk
- Rusty blackbird
- Solitary sandpiper
- Wood thrush
- American beech
- Meadow horsetail
- Spotted camouflage lichen
- Fuscopannaria sorediata
- Contour Line (5m)
- BB1 Area Search
- BB2 Area Search
- Nightjar and opportunistic turtle survey
- Roads
- Field Delineated Watercourses
- Mapped Watercourse (NSTDB)
- On-site Settling Ponds
- Mapped Waterbody (NSTDB)
- Potential Wetland of Special Significance
- Field Delineated Wetlands
- NSECC Wetland Inventory
- Proposed Quarry Expansion Area
- Historic Workings To Be Remediated Prior IA Expiration June 2024
- Pit Floor Currently In use
- Area To Be Remediated As Part of EA
- Study Area

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

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Document Name: 231221_SixMile_EARD_AvianSurveys

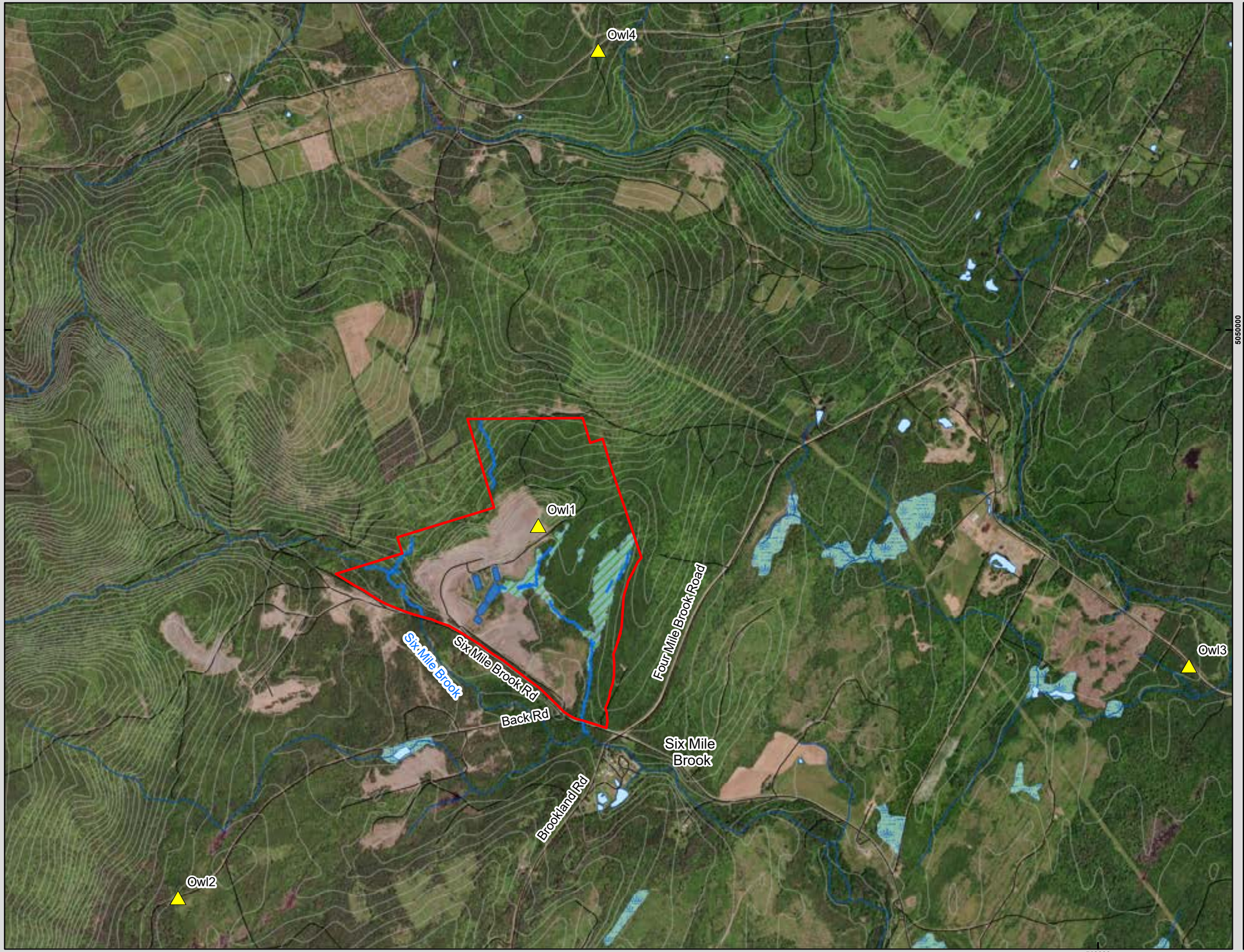

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FIGURE 3

Nocturnal Owl Point Count Locations

Six Mile Brook Pit Expansion

Pictou County, NS

- Project Location
- Owl Survey Point Count
- Roads
- Contour Line (5m)
- Field Delineated Watercourses
- NSTDB Mapped Watercourses
- On-site Settling Ponds
- Mapped Waterbody (NSTDB)
- NSE Mapped Wetlands
- Field Delineated Wetlands
- Study Area

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

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Document Name: 231221_SixMile_EARD_NocturnalOwlPC

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FIGURE 4

Nightjar Point Count (CONI OC) Locations & Opportunistic Turtle Survey Track

Six Mile Brook Pit Expansion

Pictou County, NS

- Project Location
- Common Nighthawk Survey Point Count
- Nightjar and opportunistic turtle survey
- Roads
- Contour Line (5m)
- Field Delineated Watercourses
- NSTDB Mapped Watercourses
- On-site Settling Ponds
- Mapped Waterbody (NSTDB)
- NSE Mapped Wetlands
- Field Delineated Wetlands
- Study Area

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

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Document Name: 231221_SixMile_EARD_NightjarPC

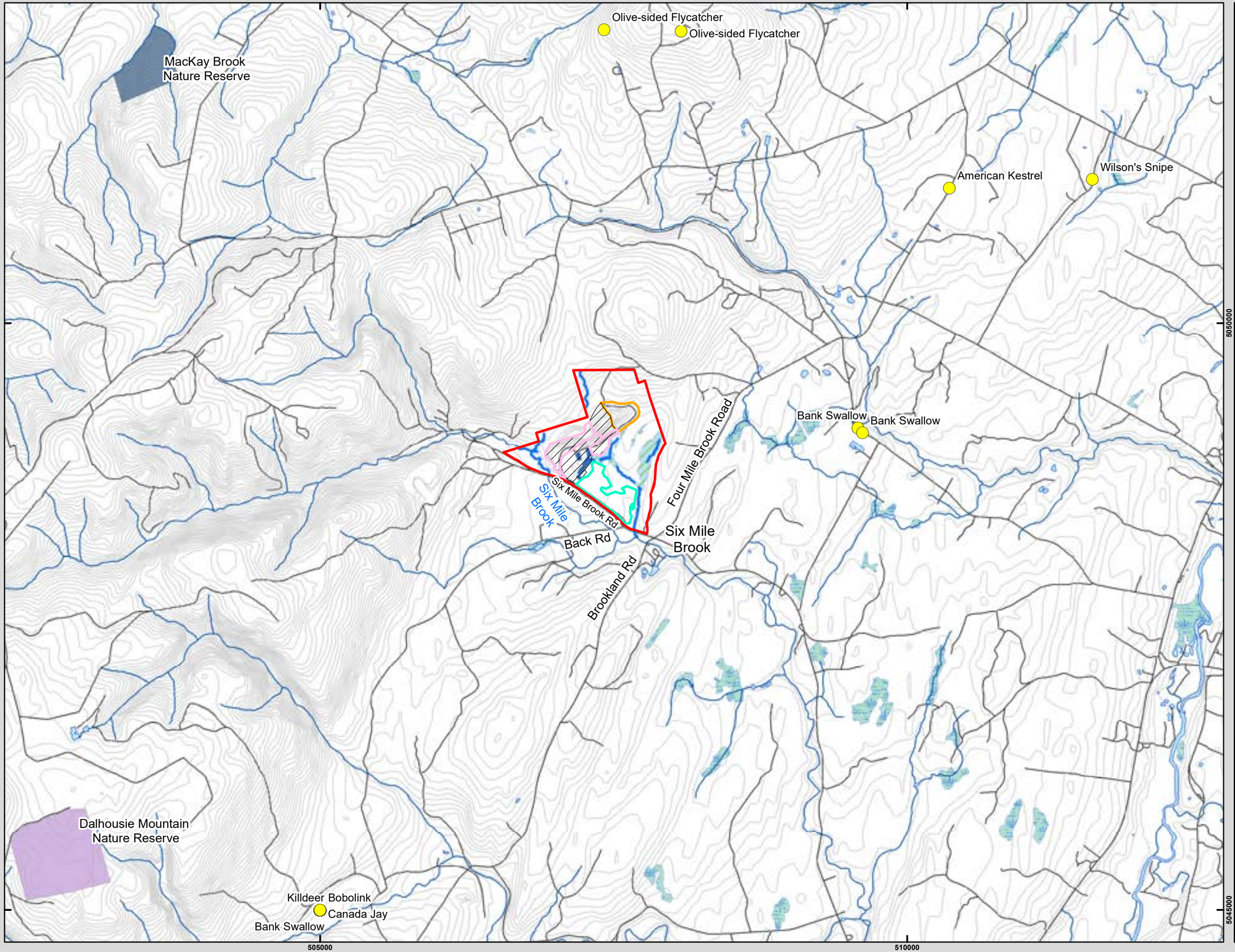

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FIGURE 5

Avian Study Area and Desktop Results

Six Mile Brook Pit Expansion

Pictou County, NS

- Project Location
- SAR/SOCI Bird Observations (ACCDC)
- Roads
- Contour Line (5m)
- Field Delineated Watercourses
- NSTDB Mapped Watercourses
- Proposed Quarry Expansion Area
- Historic Workings To Be Remediated Prior IA Expiration June 2024
- Pit Floor Currently In use
- Area To Be Remediated As Part of
- On-site Settling Ponds
- Mapped Waterbody (NSTDB)
- NSE Mapped Wetlands
- Field Delineated Wetlands
- Dalhousie Mountain Nature Reserve
- MacKay Brook Nature Reserve
- Cobequid Bay IBA (NS019)
- Study Area

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

0 255 510 1,020 m

1:30,000 Scale when printed @ 11" x 17"

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Document Name: 231221_SixMile_EARD_AvianDesktop

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FIGURE 6

Avian Priority Species Observations

Six Mile Brook Pit Expansion

Pictou County, NS

- Project Location
- Building (NSTDB)
- Owl Survey Point Count
- Common Nighthawk Survey Point Count
- Avifauna Survey Point Count
- SAR
- SOCI
- Contour Line (5m)
- BB1 Area Search
- BB2 Area Search
- Nightjar and opportunistic turtle survey
- Roads
- Field Delineated Watercourses
- Mapped Watercourse (NSTDB)
- On-site Settling Ponds
- Mapped Waterbody (NSTDB)
- Potential Wetland of Special Significance
- Field Delineated Wetlands
- NSECC Wetland Inventory
- Study Area

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

0 50 100 200 m

1:6,000

Scale when printed @ 11" x 17"

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APPENDIX B. PRIORITY SPECIES LIST

Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
			VASCULAR PLANTS			
Agalinis purpurea	Purple False-Foxglove	S2S3	-	-	-	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).
Agalinis purpurea var. parviflora	Small-flowered Purple False Foxglove	S2S3	-	-	-	Sandy soils of stream and lake margins, bogs, and barren (NatureServe, 2021)
Agalinis tenuifolia	Slender Agalinis	S1	-	-	-	Anthropogenic (man-made or disturbed habitats), brackish or salt marshes and flats, fresh tidal marshes or flats, meadows and fields, woodlands https://gobotany.nativeplanttrust.org/species/agalinis/tenuifolia/ ; Exotic to Nova Scotia, http://www.accdc.com/webranks/NSall.htm.
Ageratina altissima var. altissima	White Snakeroot	S1S2	-	-	-	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)
Allium schoenoprasum	Wild Chives	S1?	-	-	-	Wet meadows, rocky or gravelly stream banks and lake shores. Flowering June to August (Flora North America).
Allium schoenoprasum var. sibiricum	Wild Chives	S1?	-	-	-	Wet meadows, rocky or gravelly stream banks and lake shores. Flowering June to August (Flora North America).
Allium tricoccum var. burdickii	Narrow-leaved Wild Leek	S1?	-	-	-	DISTRIBUTION NOT KNOWN IN NS. Dry soil in upland woods. Flowering early June (Flora North America).
Amelanchier fernaldii	Fernald's Serviceberry	S2S3	-	-	-	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).
Amelanchier spicata	Running Serviceberry	S3S4	-	-	-	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)

Andersonglossum boreale	Northern Wild Comfrey	S1	-	-	-	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
Anemone virginiana	Virginia Anemone	S3	-	-	-	Calcareous and slate ledges along streams. Intervals and thickets of same. Flowers in early July (Munro, Newell & Hill, 2014)
Anemone virginiana var. alba	Virginia Anemone	S1S2	-	-	-	Calcareous and slate ledges along streams. Intervals and thickets of same. Flowers in early July (Munro, Newell & Hill, 2014)
Angelica atropurpurea	Purple-stemmed Angelica	S3	-	-	-	Grows in swamps, meadows, in ditches and along streams. Flowers late May until September. Very abundant in northern Cape Breton (Munro, Newell & Hill, 2014)
Antennaria parlinii	Parlin's Pussytoes	S2	-	-	-	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).
Antennaria parlinii ssp. fallax	Parlin's Pussytoes	S2	-	-	-	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).
Asplenium viride	Green Spleenwort	S3	-	-	-	Limestone and other basic rocks (Flora of North America).

Atriplex glabriuscula var. franktonii	Frankton's Saltbush	S3S4	-	-	-	confined to indigenous salt marsh and beach habitats. t is very common in northern areas, such as the Northumberland Strait region and along Cape Breton's northern coasts. Occasionally seen elsewhere as near Truro and Halifax.
Barbarea orthoceras	American Yellow Rocket	S1	-	-	-	It inhabits ice-scoured river shores on high-pH bedrock or till, and on wet talus in the subalpine zone.
Bartonia virginica	Yellow Bartonia	S3S4	-	-	-	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.
Bidens beckii	Water Beggarticks	S3S4	-	-	-	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).
Bidens vulgata	Tall Beggarticks	S3S4	-	-	-	Widely tolerant of habitats, from waste urban ground to dykelands. Scattered from Kings and Cumberland counties to Pictou. Reported to be common at Truro. Flowers through late summer (Munro, Newell & Hill, 2014).
Botrychium lanceolatum	Triangle Moonwort	S2S3	-	-	-	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).
Botrychium lanceolatum ssp. angustisegmentum	Narrow Triangle Moonwort	S2S3	-	-	-	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).

Botrychium simplex	Least Moonwort	S2S3	-	-	-	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).
Botrychium simplex var. simplex	Least Moonwort	S2S3	-	-	-	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).
Bromus latiglumis	Broad-Glumed Brome	S2	-	-	-	Floodplain (River or stream floodplains), forest, shores of rivers or lakes (Go Botany)
Caltha palustris	Yellow Marsh Marigold	S2S3	-	-	-	Restricted to the Northumberland coast, majority found in Inverness county. Grows in open or treed swamps, alder marshes and meadows. Flowers in early June. Restricted to the Northumberland coastal plain: Mabou, Northeast Margaree, Margaree River, Terre Noir. St. Josephdu-Moine, Cheticamp, Pleasant Bay area, all of Inverness County. North shore of Merigomish Island, Pictou County represents the only mainland collection to date
Cardamine dentata	Toothed Bittercress	S1	-	-	-	rare species of calcareous swamps and fens
Cardamine maxima	Large Toothwort	S2	-	-	-	rich, moist forests. Floodplain (river or stream floodplains), forests, talus and rocky slopes
Carex adusta	Lesser Brown Sedge	S2S3	-	-	-	dry open forest or recent clearings (cutblocks) on acidic, gravelly soils. Frequent after fire. Flowering and fruting from June to September (Munro, Newell & Hill, 2014)

Carex digitalis	Slender Wood Sedge	S1	-	-	-	Generally found in forested habitats: deciduous or mixed deciduous (but focus on richer areas -moist slopes) over a variety of soils. Only found in Keji park at this time. Fruits in early summer. (Munro, Newell & Hill, 2014)
Carex digitalis var. digitalis	Slender Wood Sedge	S1	-	-	-	Generally found in forested habitats: deciduous or mixed deciduous (but focus on richer areas -moist slopes) over a variety of soils. Only found in Keji park at this time. Fruits in early summer. (Munro, Newell & Hill, 2014)
Carex grisea	Inflated Narrow-leaved Sedge	S1	-	-	-	floodplain forest and deciduous woods (Munro, Newell & Hill, 2014)
Carex hirtifolia	Pubescent Sedge	S3	-	-	-	calcareous regions in thickets, deciduous forests and floodplains, forest openings (Illinois Wildflowers, nd). Scattered around the lowlands in the central counties as at Shubenacadie and Brookfield. Also along the Meander and Herbert rivers, Hants Co (Munro, Newell & Hill, 2014)
Carex houghtoniana	Houghton's Sedge	S2S3	-	-	-	sandy soils, along roadsides. Sandy disturbed area.
Carex hystericina	Porcupine Sedge	S2S3	-	-	-	*note: resembles the more common C. lurida, but for the presence of many nerves on the perigynia, extending to the orifice. Habitat: seeps, marshes and shoreline fens. Fruits in late spring to mid-summer. Orange listed (Minnesota Wildflowers, nd)
Carex normalis	a Sedge	S1	-	-	-	Open, often wet, woods, thickets, meadows and roadsides. Fruiting early summer (Flora of North America, nd)
Carex pellita	Woolly Sedge	S2	-	-	-	Wet soils in fields, meadows and marshes, especially in calcareous regions under successional conditions. Flowering and fruiting from May - August. Known only from East River of Pictou, Pictou Co. (Munro, Newell & Hill 2014)
Carex pensylvanica	Pennsylvania Sedge	S1?	-	-	-	Grows in dry, rocky soils as in dry open woodlands. Flowers and fruits produced early to mid-May (Munro, Newell & Hill 2014)
Carex plantaginea	Plantain-Leaved Sedge	S1	-	-	-	Rich, moist, deciduous or mixed deciduous-evergreen forests, on slopes along streams or along edges of moit depressions, southward in mountain gorges. Fruiting in spring (Flora of North America, nd)
Carex rosea	Rosy Sedge	S3	-	-	-	Grows in dry soils beneath deciduous forests and thickets. Flowers from May to early July.

Carex scirpoidea ssp. scirpoidea	Scirpuslike Sedge	S2S3	-	-	-	Moist alpine meadows, stream banks, and open rocky slopes, thin and rocky soils, rock outcrops, and talus slopes. Flowers June - August (DNR WA, nd)
Carex vacillans	Estuarine Sedge	S1S3	-	-	-	Saline, brackish shores, swales, salt and intertidal marshes. Fruiting in June to August (Flora of North America).
Carex viridula ssp. brachyrrhyncha	Greenish Sedge	S1	-	-	-	Found along river and lake shores (Go Botany).
Carex viridula var. elatior	Greenish Sedge	S1	-	-	-	Moist to wet fens and runnels, on lime-rich soils. Fruiting in July-August (Flora North America).
Carex viridula var. saxilittoralis	Greenish Sedge	S1	-	-	-	Moist to wet, exposed shores and limestone barrens. Fruiting July-August (Flora North America).
Caulophyllum thalictroides	Blue Cohosh	S2S3	-	-	-	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).
Cerastium arvense ssp. strictum	Matted Field Chickweed	S1?	-	-	-	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
Ceratophyllum echinatum	Prickly Hornwort	S3	-	-	-	Marshes. A plant more typical of the shallows of acidic water bodies than its congener.
Coleataenia longifolia	Long-leaved Panicgrass	S3S4	-	-	-	Marshes, meadows and fields, shores of rivers or lakes (GO Botany).
Coleataenia longifolia ssp. longifolia	Coastal Plain Panicgrass	S3S4	-	-	-	Marshes, meadows and fields, shores of rivers or lakes (GO Botany).
Comandra umbellata ssp. umbellata	Bastard's Toadflax	S2	-	-	-	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)
Conioselinum chinense	Chinese Hemlock-parsley	S3	-	-	-	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).

Conopholis americana	American Cancer-root	S2	-	-	-	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)
Crataegus submollis	Quebec Hawthorn	S2?	-	-	-	Anthropogenic (man-made or disturbed habitats), forest edges, meadows and fields, shrublands or thickets. Flowers in June (GoBotany, nd).
Crataegus succulenta	Fleshy Hawthorn	S3S4	-	-	-	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).
Crataegus succulenta var. succulenta	Fleshy Hawthorn	S3S4	-	-	-	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).
Cuscuta cephalanthi	Buttonbush Dodder	S2?	-	-	-	Flowers during August and September. Low-lying coastal areas, often seen parsitizing Symphyotrichum novi-begii.Anthropogenic (man-made or disturbed habitats), meadows and fields, shores of rivers or lakes, swamps
Cyperus lupulinus ssp. macilentus	Hop Flatsedge	S1	-	-	-	Various well-drained, open places. Fruiting summer (Flora North America).
Cypripedium parviflorum var. makasin	Small Yellow Lady's-Slipper	S2	-	-	-	Mesic to wet fens, prairies, meadows, thickets, open coniferous, and mixed forest. Flowering in May to August (Flora of North America).
Desmodium canadense	Canada Tick-trefoil	S2	-	-	-	Flowers in late July. Riparian, open forests. average to moist sandy or rocky soil; prairies, along shores, along roads, railroads, open woods. Kejimkujik Park to the Pictou County rivers. Rare from Annapolis to Colchester Co.
Dichanthelium linearifolium	Narrow-leaved Panic Grass	S3	-	-	-	Soils both dry and sandy. Flowers and fruiting from July to October (Munro, et al., 2014).
Diphasiastrum complanatum	Northern Ground-cedar	S3S4	-	-	-	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).
Diphasiastrum sitchense	Sitka Ground-cedar	S3S4	-	-	-	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).
Diphasiastrum x sabinifolium	Savin-leaved Ground-cedar	S3?	-	-	-	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).
Eleocharis flavescens	Pale Spikerush	S3	-	-	-	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).
Eleocharis flavescens var. olivacea	Bright-green Spikerush	S3	-	-	-	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).
Elymus hystrix	Spreading Wild Rye	S1	-	-	-	Meander River and Five Mile River, Hants Co, and East River of Pictou Co. Wooded lowlands and terraces. Fruiting from June to August (Munro, et al., 2014).
Epilobium lactiflorum	White-flowered Willowherb	S1?	-	-	-	Alpine or subalpine zones, cliffs, balds or ledges, shores of rivers or lakes (GoBotany, nd).
Equisetum pratense	Meadow Horsetail	S3S4	-	-	-	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 streamsides, including gravelly bars. Flowers mid to late spring (Minnesota Environment and Natural Resources Trust Fund and Munro et al., 2014).
Euphrasia farlowii	Farlow's Eyebright	S1S3	-	-	-	Dry, grassy habitats on sandstone or limestone barrens, rocks, ledges, sandy beaches. http://beta.floranorthamerica.org/Euphrasia_farlowii
Fagus grandifolia	American Beech	S3S4	-	-	-	Forests
Fallopia scandens	Climbing False Buckwheat	S3S4	-	-	-	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)
Fimbristylis autumnalis	Slender Fimbry	S1	-	-	-	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)
Fragaria vesca	Woodland Strawberry	S3S4	-	-	-	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).
Fragaria vesca ssp. americana	Woodland Strawberry	S3S4	-	-	-	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).
Fraxinus nigra	Black Ash	S1S2	Threatened	No Status	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 regenerates only in partially opened forest canopies.
Fraxinus pennsylvanica	Red Ash	S1	-	-	-	Flowers May - June. Found in riparian and upland forest and shelter belts (Minnesota Wildflowers, nd)
Galium aparine	Common Bedstraw	S3S4	-	-	-	Composts, ballast and waste soils. Flowers from May until July (Munro, Newell & Hill, 2014)
Gentianella amarella ssp. acuta	Northern Gentian	S1	-	-	-	Open and forested river banks, subalpine gullies and brook sides, occurring in regions of high-pH bedrock and/or till.
Goodyera repens	Lesser Rattlesnake-plantain	S3S4	-	-	-	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).

Hepatica americana	Round-lobed Hepatica	S2	-	-	-	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)
Hordeum brachyantherum	Meadow Barley	S1	-	-	-	Grows in pastures and along streams and lake shores (Flora of North America).
Hordeum brachyantherum ssp. brachyantherum	Meadow Barley	S1	-	-	-	Grows in pastures and along streams and lake shores (Flora of North America).
Humulus lupulus var. lupuloides	Common Hop	S1?	-	-	-	Anthropogenic (man-made or disturbed habitats), floodplain (river or stream floodplains), forests, shrublands or thickets
Huperzia appressa	Mountain Firmoss	S3S4	-	-	-	Also known as Huperzia appalachiana. In Nova Scotia, known from the Fundy coast, Cumberland County (McAlese Brook and Moose River) and Kings County (Amethyst Cove). Also a collection from Clyburne Brook, Victoria County. Found on damp acidic granite as on talus slopes or exposed cliffs. Alpine or subalpine zones, cliffs, balds, or ledges, mountain summits and plateaus, ridges or ledges. Flowers from summer to early fall (Minnesota Environment and Natural Resources Trust Fund, Go Botany and Munro et al., 2014).
Huperzia selago	Northern Firmoss	S1?	-	-	-	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).
Hylodesmum glutinosum	Large Tick-trefoil	S2	-	-	-	Anthropogenic (man-made or disturbed habitats), cliffs, balds, or ledges, forest edges, forests, ridges or ledges, talus and rocky slopes. Flowers June to August

Hypericum x dissimulatum	Disguised St. John's-wort	S2S3	-	-	-	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).
Juncus alpinoarticulatus	Northern Green Rush	S2	-	-	-	Fen, fresh tidal marsshes or flats, marshes, meadows and fields, shores of rivers or lakes. Fruiting mid summer to fall (Go Botany).
Juncus anthelatus	Greater Poverty Rush	S1?	-	-	-	Exposed or partially shaded sites in moist or seasonally wet sandy or clay soils. Flowering and fruiting in spring (Flora North America).
Juncus caesariensis	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.
Juncus stygius ssp. americanus	Moor Rush	S3	-	-	-	Wet moss, bogs and bog-pools. Flowering and fruiting in mid to late summer.
Kalmia procumbens	Alpine Azalea	S1	-	-	-	Alpine or subalpine zones, ridges or ledges
Laportea canadensis	Canada Wood Nettle	S3	-	-	-	Limited to fertile loam or alluvium in deciduous forests and within floodplains. Flowers from July to September (Munro, Newell & Hill, 2014)
Lindernia dubia	Yellow-seeded False Pimperel	S3	-	-	-	Riparian, muddy streamsides, drained ponds. Flowers from late June until frost (Munro, Newell & Hill, 2014)
Liparis loeselii	Loesel's Twayblade	S3S4	-	-	-	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).

Lorinseria areolata	Netted Chain Fern	S3S4	-	-	-	Bogs, meadows and fields, swamps, wetland margins (edges of wetlands) (Go Botany).
Luzula parviflora ssp. melanocarpa	Black-fruited Woodrush	S3S4	-	-	-	uncommon in damp coniferous or mixed woods, cool ravines and banks (Hinds, 2000)
Lysimachia quadrifolia	Whorled Yellow Loosestrife	S1	-	-	-	Anthropogenic (man-made or disturbed habitats), grassland, woodlands, fens, moist prairies (GoBotany, n.d.). Flowers from July - August (LBJ Wildflower Centre, nd).
Malaxis monophyllos	White Adder's-mouth	S1	-	-	-	Found in Fens, ridges or ledges, swamps with northern white-cedar. Flowering in summer (GoBotany).
Malaxis monophyllos var. brachypoda	North American White Adder's-mouth	S1	-	-	-	Found in swamps and bogs. Flower in summer (Flora fo North America).
Mononeuria groenlandica	Greenland Stitchwort	S3	-	-	-	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.
Neottia bifolia	Southern Twayblade	S3	-	-	-	Bogs and swamps (Go Botany)
Nuphar microphylla	Small Yellow Pond-lily	S3S4	-	-	-	Ponds, lakes, sluggish streams, sloughs, ditches and occasionally tidal waters. Flowers summer - early fall (Flora of North America, nd)
Oenothera fruticosa	Narrow-leaved Evening Primrose	S2S3	-	-	-	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)
Oenothera fruticosa ssp. tetragona	Narrow-leaved Evening Primrose	S2S3	-	-	-	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)
Ophioglossum pusillum	Northern Adder's-tongue	S2S3	-	-	-	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).

Osmorhiza longistylis	Smooth Sweet Cicely	S2S3	-	-	-	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)
Oxybasis rubra	Red Goosefoot	S2S3	-	-	-	moist, disturbed soils such pond and lake shores, river and creek banks, and mud flats. Flowers July to September
Oxybasis rubra var. rubra	Red Goosefoot	S2S3	-	-	-	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).
Packera paupercula	Balsam Groundsel	S3S4	-	-	-	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).
Packera paupercula var. paupercula	Balsam Groundsel	S3S4	-	-	-	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).
Panicum dichotomiflorum ssp. puritanorum	Spreading Panicgrass	S1?	-	-	-	Flowering and fruiting from June through October
Parnassia parviflora	Small-flowered Grass-of-Parnassus	S1S2	-	-	-	Rocky seeps. Flowers August to September (Jepson Herbarium, 2021)
Persicaria amphibia var. emersa	Long-root Smartweed	S3?	-	-	-	Bloom on moist soil and are terrestrial-adapted. Flower June - September (Flora of North America)
Persicaria arifolia	Halberd-leaved Tearthumb	S3	-	-	-	Found inf shaded swamps, ponds, tidal marshes along rivers, wet ravine in forests. Flowers July - October (Flora of North America, nd)
Persicaria careyi	Carey's Smartweed	S1	-	-	-	Low thickets, swamps, bogs, moist shorelines, clearings, recent burns, cultivated ground. Flowering July - October (Flora of North America, nd)

Persicaria pensylvanica	Pennsylvania Smartweed	S3S4	-	-	-	Moist, disturbed places, ditches, riverbanks, cultivated fields, shorelines of ponds and reservoirs. Flowers May - December (Flora of North America, nd)
Pilea pumila	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.
Piptatheropsis canadensis	Canada Ricegrass	S3	-	-	-	Dry sandy or gravelly soil. Open woods clearings, pine plantations, barrens, wooded slopes. Fruiting season-July (Minnesota Wildflowers).
Piptatheropsis pungens	Slender Ricegrass	S2	-	-	-	Sandy dry forests and savannas on dunes and plains, usually with aspen, oak, jack pine, and/or red pine; rocky forests and summits; rock barrens (Reznicek, Voss & Walters, 2011).
Plantago rugelii	Rugel's Plantain	S3	-	-	-	Grows in anthropogenic (man-made or disturbed habitat), grassland, meadows, fields (GoBotany, nd)
Platanthera hookeri	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).
Platanthera huronensis	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).
Platanthera obtusata	Blunt-leaved Orchid	S3S4	-	-	-	Fens, Forests, Meadows field and swamps
Podostemum ceratophyllum	Horn-leaved Riverweed	S1	-	-	-	Medium to fast flowing river bottoms with ledge, cobble or sand substrate (GoBotany, nd)
Polygala sanguinea	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)
Polygonum aviculare ssp. buxiforme	Box Knotweed	S2S3	-	-	-	Roadsides, vacant lots, sidewalks, packed and nondrifting sands, borders of marshes and dunes. Flowering July - December (Flora of North America, nd)

Polygonum aviculare ssp. neglectum	Narrow-leaved Knotweed	S3?	-	-	-	Found in disturbed areas. Flowers June - November (Flora of North America, nd)
Polypodium appalachianum	Appalachian Polypody	S3	-	-	-	Nova Scotia distrbiution 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).
Potamogeton polygonifolius	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).
Ranunculus pensylvanicus	Pennsylvania Buttercup	S1	-	-	-	Found in wet fields, ditches, marshes, along shores. Flowers June - August (Minnesota Wildflowers, nd)
Ranunculus sceleratus	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)
Ranunculus sceleratus var. sceleratus	Cursed Buttercup	S1S2	-	-	-	Ponds, riverbanks. Flowers from April - June, October (Jepson Herbarium, 2021)
Rhinanthus minor ssp. groenlandicus	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)
Rosa acicularis ssp. sayi	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)
Rumex triangulivalvis	Triangular-valve Dock	S2S3	-	-	-	Grows in moist areas and disturbed habitats, meadows and fields (GoBotany, nd)
Salix glauca var. cordifolia	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)
Salix myrtillifolia	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)
Salix serissima	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).
Samolus parviflorus	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)
Sanicula odorata	Clustered Sanicle	S1S2	-	-	-	Found only on fertile alluvial soils and on intervales. Flowers during July and August. Found at Five Mile River, Hants County, Cornwallis River, Kings County, West River, Pictou County, Salmon River, Colchester County and Southwest Margaree River, Inverness County (Munro, Newell and Hill, 2014).
Saxifraga cernua	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)
Saxifraga oppositifolia ssp. oppositifolia	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)
Sceptridium dissectum	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).
Solidago hispida	Hairy Goldenrod	S1?	-	-	-	Grows in wooded banks and rocky shores. Infrequent, occasionally seen from Yarmouth to Colchester counties (Munro, Newell & Hill, 2014).
Solidago hispida var. hispida	Hairy Goldenrod	S1?	-	-	-	Grows in wooded banks and rocky shores. Infrequent, occasionally seen from Yarmouth to Colchester counties (Munro, Newell & Hill, 2014).
Solidago rugosa var. sphagnophila	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).
Sparganium androcladum	Branching Bur-Reed	S1	-	-	-	Found in lakes, ponds, rivers ro streams or the shore of rivers or lakes (Go Botany).

Spiranthes lucida	Shining Ladies'-Tresses	S2S3	-	-	-	Few Know locations in central NS. Grows in alluvial soils and damp rocky shores. Found in thickets and meadows. Flowers appear in early July (Munro, et al., 2014).
Symphyotrichum boreale	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).
Symphyotrichum ciliolatum	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).
Thalictrum confine	Northern Meadow-rue	S1	-	-	-	Alluvial or shingly calcareous shores and talus. Flowers June - July (Flora of North America, nd)
Thuja occidentalis	Eastern White Cedar	S2S3	-	-	-	Found in riparian areas along streams, in swamps, along lakeshores, in woodland forests and in old pastures. It is shade-tolerant and typically occurs in cool, moist habitats that are nutrient rich. It does best in moderate drainage conditions that are neither too wet nor dry. Eastern White Cedar is typically observed in cool, moist shaded areas.
Tiarella cordifolia	Heart-leaved Foamflower	S2S3	-	-	-	Alluvial soils, deciduous forests even stony roadsides. Flowers mid-May to mid-June (Munro, Newell & Hill, 2014)
Toxicodendron vernix	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)
Trichostema dichotomum	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).
Triosteum aurantiacum var. aurantiacum	Orange-fruited Tinker's Weed	S3	-	-	-	Dry-mesic to mesic forests, woodlands, and forest borders
Utricularia ochroleuca	Yellowish-white Bladderwort	S1	-	-	-	Shallow (generally <30cm) acidic waters. Flowers June - September (Jepson Herbarium, 2021)
Verbena hastata	Blue Vervain	S3S4	-	-	-	Limited to mucky fertile soils, as along floodplains. Flowers during August - September (Munro, Newell & Hill, 2014)
Veronica catenata	Pink Water-Speedwell	S1	-	-	-	Shores of rivers or lakes, wetland margins (edges of wetlands) (GoBotany, nd). Flowers May - September (Minnesota Wildflowers, nd)

Viola nephrophylla	Northern Bog Violet	S3	-	-	-	Cool, mossy sites: bogs, streamsides and wet woods. Flowers May - July (Munro, Newell & Hill, 2014)
Viola sagittata var. ovata	Arrow-Leaved Violet	S3S4	-	-	-	Open woods and thickets, disturbed ground, roadsides, powerline rights-of-way. Flowers April - June (Flora of North America, nd)
Woodsia glabella	Smooth Cliff Fern	S2S3	-	-	-	Mainland Nova Scotia has a single locality in Jeffers Brook, Cumberland County. The remainder of known sites are in Northern Nova Scotia: Big Southwest Brook, Lockhart Brook, and on Sky Glen Mountain. A very rare fern, only found on vertical cliffs or streamside (e.g. cliffs, balds, or ledges, ridges or ledges). Spores produced in summer to early fall (Minnesota Environment and Natural Resources Trust Fund, Go Botany and Munro et al., 2014).

Scientific Name	Common Name	SRank	COSEWIC	SARA	NSESA	Habitat Description
LICHENS						
Anzia colpodes	Black-foam Lichen	S3	Threatened	Threatened	Threatened	Anzia colpodes 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 Anzia collections from are reported to be from the canopy of Red Maple trees. Recent searches have found that A. colpodes occurs from 20 cm above the ground to 2 m up the tree trunks.
Erioderma pedicellatum	Boreal Felt Lichen	S1	Endangered	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.

Pectenia plumbea	Blue Felt Lichen	S3	Special Concern	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.
Peltigera hydrothyria	Eastern Waterfan	S1	Threatened	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.
Sclerophora peronella (Atlantic pop.)	Frosted Glass-whiskers (Atlantic population)	S3S4	Special Concern	Special Concern	-	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).

MAMMALS						
Alces alces	Moose	S1	-	-	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.

Lasionycteris noctivagans	Silver-haired Bat	S1M, SUB	-	-	-	Most commonly found in boreal or coniferous and deciduous forests near bodies of water. Summer day roosts are typically under loose bark in trees such as, willows, maple, ash and dead trees. Maternity colonies can be found in cavities in these trees. Uncommonly, they use human structures (garages, sheds, etc). During the winter, these bats have been found in caves and other rocky areas that provide shelter, in tree cavities, and in buildings.
Lasiurus borealis	Eastern Red Bat	S1M, SUB	-	-	-	Lives in forests, forest edges, and hedgerows. It roosts among foliage, usually in deciduous trees, but sometimes roosts in coniferous trees. Rare in heavily urbanized areas.
Lasiurus cinereus	Hoary Bat	S1M, SUB	-	-	-	They prefer deciduous and coniferous trees at the edge of clearings, but have been found in trees in heavy forests, open wooded glades, and shade trees along urban streets and in city parks.
Myotis lucifugus	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.
Myotis septentrionalis	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.
Pekania pennanti	Fisher	S3	-	-	-	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.

Perimyotis subflavus	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.
Sorex maritimensis	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.
Sorex palustris	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.
Synaptomys cooperi	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.

HERPETOFAUNA

Chelydra serpentina	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.
Chrysemys picta picta	Eastern Painted Turtle	S4	Special Concern	Special Concern	-	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).

Glyptemys insculpta	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 throughought 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.
Hemidactylium scutatum	Four-toed Salamander	S3	-	-	-	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).

AVIFAUNA						
Accipiter cooperii	Cooper's Hawk	S1?B,SUN,SUM	-	-	-	Not common in Nova Scotia but does breed in the province. Found in mature forest, open woodlands, wood edges and river groves. Nests in coniferous, deciduous and mixed woods, typically those with tall trees and with openings or edge habitat nearby. Also found among trees along rivers through open country, and increasingly in suburbs and cities where tall trees exist for nesting (e.g., parks, open fields and even backyards with feeders). Breeds between April and July (Audubon and The Cornell Lab)
Accipiter gentilis	Northern Goshawk	S3S4	-	-	-	Found in coniferous and mixed forests. Generally restricted to wooded areas (along riparian corridors) but may be in relatively open woods or along edges. Often more common as a breeding bird in mixed woods (e.g., mature and old-growth forests with more than 60% closed canopy). In the East, goshawks seek out nest sites in mixed-hardwood forests where beeches, birch, hemlock and maples dominate. Goshawks often build nests near breaks in the canopy, such as a forest trail, road or opening created by a downed tree and prefer sites with a creek, pond or lake nearby. Breeds between April and July. May mate for life (Audubon and The Cornell Lab).
Actitis macularius	*Spotted Sandpiper*	S3S4	Spotted Sandpiper	-	-	Common near fresh and saltwater. Habitat includes pebbly lake shores, ponds, and stream sides (and seashores in the winter). Spotted Sandpipers spend the winter along the coasts of North America. During migration and winter, this species is found along the coast on mudflats, beaches, and breakwaters (also found in inland habitats such as sewage ponds and irrigation ditches). Breeds near the edge of fresh water in a wide variety of settings, including lakes, ponds, rivers, and streams (in either open or wooded country). Breeding territories generally need to have a shoreline, a semi-open area for the nest and patches of dense vegetation to conceal the

						chicks. Breeds between April and July (Audubon and The Cornell Lab).
Aegolius funereus	*Boreal Owl*	S2?B,SUM	-	-	-	Year-round resident, mainly in Cape Breton (MBBA, as of July 2021). Does not migrate regularly, but is nomadic and moves outside of range when prey is scarce. Boreal Owls occur in stands of spruce, aspen, poplar, birch and fir in the boreal forest (muskeg, mixed-wood and conifer forests). They also occur in high elevation mountains with subalpine forests in Canada. In the winter, they forage in spruce-fir forests where uncrusted snow under the trees facilitates access to prey. In spring, they often forage in clearcuts and agricultural fields where small mammals are easier to locate. Beginning in late winter or early spring, male sings at night to defend territory and attract a female (Audubon and The Cornell Lab).K
Anas acuta	Northern Pintail	S1B,SUM	-	-	-	Found in marshes, prairies, fresh ponds, lakes and salt bays. Summers in wide variety of open habitats, including prairies, farmland, northern tundra and near bodies of water. Breeds in seasonal wetlands, open areas with short vegetation, wet meadows, grasslands and crop fields. During the nonbreeding season they use flooded and dry agricultural fields, lakes, reservoirs, estuaries, saltmarshes, freshwater and brackish wetlands and bays. Pintails also use different habitats depending on time of day (e.g. tend to forage in wetlands during the day). Breeds between April and July (Audubon and The Cornell Lab)
Antrostomus vociferus	Eastern Whip-Poor-Will	S1?B	Threatened	Threatened	Threatened	Roughly 50% of home ranges consisted of open habitats, used primarily for foraging. Common habitat choices include rock or sand barrens with scattered trees, savannahs, old burns or other disturbed sites in a state of early to mid-forest succession, or open conifer plantations. Accordingly, pine

						(barrens and plantations), oak (barrens and savannahs), and aspen and birch (early to mid-succession) are common tree species associations. Individuals will often feed in nearby shrubby pastures or wetlands where perches, and power-line and roadway corridors are also occupied. Other necessary habitat elements are thought to involve ground-level vegetation and woodland size. Areas with little ground cover are preferred.
Asio flammeus	Short-eared Owl	S1B	Threatened	Special Concern	-	Short-eared Owls breed primarily in well-drained grasslands near coastal wetlands. In areas with extensive coastlines, some caution is warranted in summarizing breeding habitat as inland marshes and bogs are less frequently monitored and thus may be under-represented in assessments of breeding habitat (COSEWIC Assessment and Status Report).
Asio otus	Long-eared Owl	S2S3	-	-	-	Known to breed throughout Nova Scotia. They occur at elevations ranging from near sea level to above 6,500 feet. May be nomadic at times, moving about in response to changing food supplies. Favored habitat includes dense trees for nesting and roosting and open country (e.g. grasslands and shrublands) for hunting. Inhabits a wide variety of such settings, including forest with extensive meadows to groves of conifers or deciduous trees. Generally, avoids unbroken forest. Known to be an early breeder. Breeds between April and July (Audubon and The Cornell Lab).
Botaurus lentiginosus	American Bittern	S3S4B, S4S5M	-	-	-	Found in marshes and reedy lakes. Breeds in freshwater marshes, mainly large, shallow wetlands with a large amount of tall marsh vegetation (cattails, grasses and sedges) and areas of open shallow water. Sometimes feeds in dry grassy fields. They are rarely seen out in the open, prefers vegetation

						cover. Breeds between April and July (Audubon and The Cornell Lab)
Branta bernicla	Brant	S3M	-	-	-	Found throughout all of Nova Scotia during migration (winter to spring breeding season). Most migrating and wintering Brant in eastern North America use coastal waters, especially lagoon systems behind barrier beaches, where eelgrass, sedges, and algae are plentiful. When not feeding, Brant roost on mudflats, barrier islands and sand spits near their foraging areas. Breeds between April and July (Audubon and The Cornell Lab)
Bucephala islandica	Barrow's Goldeneye	S1N, SUM	Special Concern	Special Concern	-	Lakes and ponds. They are usually in coniferous or aspen woodlands (elevations of up to about 6,100 feet). They favor shallower waters than Common Goldeneyes. In winter, they live in coastal waters and rivers. Breeds on cold inland waters, such as small lakes, rivers, beaver ponds, mostly in forested country but also in open terrain. In winter they are mainly on shallow, protected coastal waters, such as bays and estuaries. May winter far inland on lakes and rivers, even in very cold regions where hot springs keep water open. Barrow's Goldeneye wintering habitat extends along the shores of the Atlantic provinces.
Buteo lagopus	Rough-legged Hawk	S3N	-	-	-	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).
Calcarius lapponicus	Lapland Longspur	S3?N,SUM	-	-	-	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).
Cardellina canadensis	Canada Warbler	S3B	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.
Cardellina pusilla	Wilson's Warbler	S3B,S5M	-	-	-	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).
Cathartes aura	Turkey Vulture	S2S3B,S4 S5M	-	-	-	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)
Charadrius vociferus	Killdeer	S3B	-	-	-	Favors fields, sandbars, lawns, riverbanks, 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 close by 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).
Chordeiles minor	Common Nighthawk	S3B	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.
Coccothraustes vespertinus	Evening Grosbeak	S3B,S3N, S3M	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.
Coccyzus erythropthalmus	Black-billed Cuckoo	S3B	-	-	-	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).
Contopus cooperi	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).
Contopus virens	Eastern Wood-Pewee	S3S4B	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.
Coturnicops noveboracensis	Yellow Rail	SUB	Special Concern	Special Concern	-	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).
Dolichonyx oryzivorus	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.
Empidonax traillii	Willow Flycatcher	S2B	-	-	-	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).
Euphagus carolinus	Rusty Blackbird	S2B	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.

Fulica americana	American Coot	S1B				The American Coot inhabits a wide variety of freshwater wetlands including prairie potholes, coastal bays, ponds, swamps, marshes, suburban parks, sewage ponds and large lakes (the two main features of their habitat include heavy stands of emergent aquatic vegetation along some portion of a shoreline and some depth of standing water within that vegetation). Seasonal wetlands are used during years of high water, while drought years cause breeding to be limited to permanent wetlands. Migrants sometimes are seen out at sea, quite far from land. Breeds between April and July (Audubon and The Cornell Lab).
Falco sparverius	American Kestrel	S3B,S4S5M	-	-	-	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).
Gallinago delicata	Wilson's Snipe	S3B,S5M	-	-	-	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 streamside’s and northern tundra. Breeds between April and July (Audubon and The Cornell Lab).

Gallinula galeata	Common Gallinule	S1B	-	-	-	Common Gallinules use freshwater and brackish marshes, ponds and lakes that have a mix of submerged, floating, and emergent aquatic vegetation and are open water year-round. They also use artificial aquaculture ponds, rice fields, sewage lagoons and urban stormwater retention ponds. May be on more open ponds with less marsh cover or on still, slow-moving waters. Found with American Coot in many places but requires more marsh growth. Breeds between April and July (Audubon and The Cornell Lab).
Haemorhous purpureus	Purple Finch	S3S4N, S4S5B, S5M	-	-	-	Found throughout the entire province year-round. Purple finches can be found in woods, groves, suburbs. Breeds mostly in coniferous and mixed woods, both in forest interior and along edges. In migration and winter, found in a wide variety of wooded and semi-open areas, including forest, suburbs, swamps, and overgrown fields. Breeding occurs from April to July (The Cornell Lab, Audubon)
Hirundo rustica	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.
Icterus galbula	Baltimore Oriole	S2S3B,SUM	-	-	-	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).
Ixobrychus exilis	Least Bittern	SUB	Threatened	Threatened		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)
Lanius borealis	Northern Shrike	S3S4N	-	-	-	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).
Limnodromus griseus	Short-billed Dowitcher	S3M	-	-	-	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).
Limosa haemastica	Hudsonian Godwit	S2S3M	Threatened	-	-	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).
Loxia curvirostra	Red Crossbill	S3S4	-	-	-	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)
Mimus polyglottos	Northern Mockingbird	S1B	-	-	-	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).
Molothrus ater	Brown-headed Cowbird	S2B	-	-	-	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).

Passerella iliaca	Fox Sparrow	S3S4B, S5M	-	-	-	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)
Passerina cyanea	Indigo Bunting	S1?B,SUM	-	-	-	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).
Perisoreus canadensis	Canada Jay	S3	-	-	-	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).

Petrochelidon pyrrhonota	Cliff Swallow	S2S3B	-	-	-	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).
Pheucticus ludovicianus	Rose-breasted Grosbeak	S3B	-	-	-	Look for these birds in forest edges and woodlands. Rose-breasted Grosbeaks breed in moist deciduous forests, deciduous-coniferous forests, thickets, and semi open 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)
Picoides arcticus	Black-backed Woodpecker	S3S4	-	-	-	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). Favors 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).
Pinicola enucleator	Pine Grosbeak	S3B, S5N, S5M	-	-	-	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).
Piranga olivacea	Scarlet Tanager	S2B, SUM	-	-	-	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)
Poecile hudsonicus	Boreal Chickadee	S3	-	-	-	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).

Pooecetes gramineus	Vesper Sparrow	S1S2B, SUM	-	-	-	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).
Rallus limicola	Virginia Rail	S2S3B	-	-	-	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).
Riparia riparia	Bank Swallow	S2B	Threatened	Threatened	-	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.
Setophaga castanea	Bay-breasted Warbler	S3S4B,S4S5M	-	-	-	Bay-breasted warblers are found in woodlands and 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)
Setophaga pinus	Pine Warbler	S2S3B,S4 S5M	-	-	-	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)
Setophaga striata	Blackpoll Warbler	S3B,S5M	-	-	-	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).
Setophaga tigrina	Cape May Warbler	S3B,SUM	-	-	-	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)
Spinus pinus	Pine Siskin	S3	-	-	-	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, many kinds of semi-open areas, woodland edges, weedy fields. Breeding occurs from April to July (The Cornell Lab, Audubon)

Toxostoma rufum	Brown Thrasher	S1B	-	-	-	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, shrubbery, 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).
Tringa solitaria	Solitary Sandpiper	S3S4M, SUB	-	-	-	Common migrant in Nova Scotia. A long-distance migrant that mostly migrates alone and at night. They are rarely seen on mudflats or saltmarshes with other shorebirds and will frequent areas with little water in almost any setting, from inner city to forest interior (e.g. fields, ditches, swamps, wooded wetlands at higher elevation, etc.). This bird often stops at lakes, ponds, or streams similar to their nesting habitat (areas with bog habitat and spruce trees), especially where there are extensive muddy margins. Breeds between April and July (Audubon and The Cornell Lab).
Turdus migratorius	American Robin	S3N, S5B	-	-	-	Common in most of Nova Scotia as a year-round resident and for breeding in the very Northern part of the province (mainly Cape Breton). This species occupies many habitat types, such as lawns, farmland, fields, and city parks, as well as in more wild places like woodlands, forests, mountains up to near tree line, recently burned forests and tundra. During winter many robins move to moist woods where berry-producing trees and shrubs are common. Males arrive first in the breeding season. Nests where there are trees and mud for nest-making material. Breeds between April and July (Audubon and The Cornell Lab).
Tyrannus tyrannus	Eastern Kingbird	S3B	-	-	-	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).
Vireo gilvus	Warbling Vireo	S1B,SUM	-	-	-	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 treetops (Cornell Lab). Breeds between April and July (Audubon and The Cornell Lab).
Vireo philadelphicus	Philadelphia Vireo	S2?B,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).
INVERTEBRATE						
Bombus bohemicus	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 from 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.
Bombus suckleyi	Suckley's Cuckoo Bumble Bee	SH	Threatened	Not on Schedule 1	-	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).
Bombus terricola	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.
Coccinella transversoguttata	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.
Danaus plexippus	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, riverbanks, 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 (Solidago spp.), asters (Doellingeria, Eurybia, Oclemena, Symphyotrichum and Virgulus), the introduced Purple Loosestrife (Lythrum

						salicaria), and various clovers (Trifolium spp. and Melilotus spp.)

APPENDIX C. ACCDC REPORT

DATA REPORT 7620: Six Mile Brook, NS

Prepared 7 March 2023
by J. Pender, Conservation Data Analyst

CONTENTS OF REPORT

Map 1. A 100 km buffer around the study area

1.0 PREFACE

The Atlantic Canada Conservation Data Centre (AC CDC; 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:

Filename	Contents
SixMileBkNS_7620ob.xls	Rare or legally-protected Flora and Fauna in your study area
SixMileBkNS_7620ob100km.xls	A list of Rare and legally protected Flora and Fauna within 100 km of your study area
SixMileBkNS_7620msa.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

Animals (Fauna)
John Klymko
Zoologist
(506) 364-2660
john.klymko@accdc.ca

Data Management, GIS
James Churchill
Conservation Data Analyst / Field Biologist
(902) 679-6146
james.churchill@accdc.ca

Billing
Jean Breau
Financial Manager / Executive Assistant
(506) 364-2657
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

Western: Sarah Spencer
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Eastern: Maureen Cameron-MacMillan
(902) 295-2554
Maureen.Cameron-MacMillan@novascotia.ca

Eastern: Elizabeth Walsh
(902) 563-3370
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

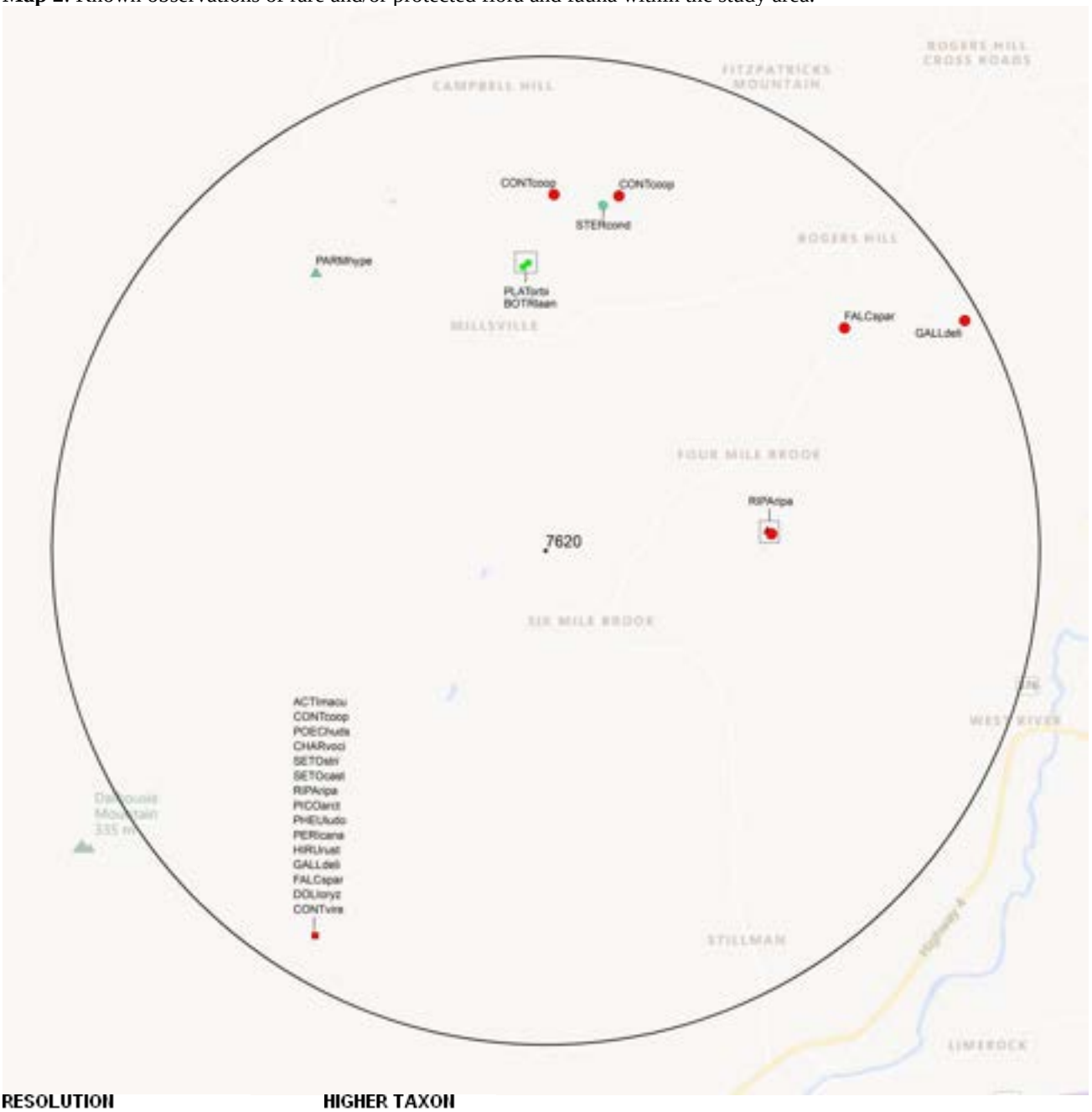
2.1 FLORA

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

2.2 FAUNA

The study area contains 24 records of 15 vertebrate and no records of 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.



3.0 SPECIAL AREAS

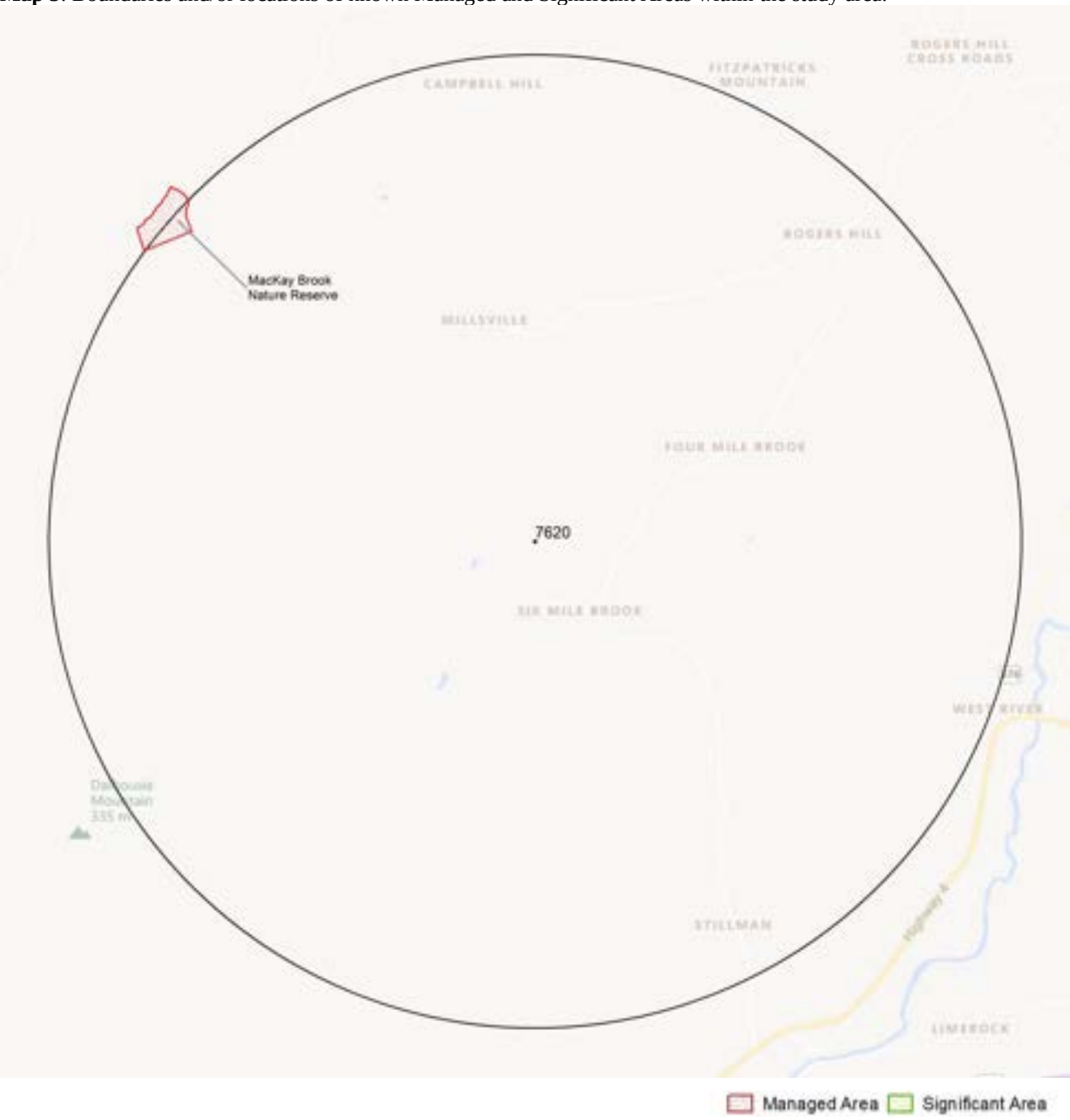
3.1 MANAGED AREAS

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 no biologically significant sites in the vicinity of the study area (Map 3).

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



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 (± 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	*Stereocaulon condensatum*	Granular Soil Foam Lichen				S2S3	1	3.5 ± 0.0
N	*Parmeliopsis hyperopta*	Gray Starburst Lichen				S3S4	1	3.7 ± 1.0
P	*Botrychium lanceolatum ssp. angustisegmentum*	Narrow Triangle Moonwort				S2S3	1	2.9 ± 0.0
P	*Platanthera orbiculata*	Small Round-leaved Orchid				S3S4	1	2.9 ± 0.0

4.2 FAUNA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	*Riparia riparia*	Bank Swallow	Threatened	Threatened	Endangered	S2B	3	2.3 ± 0.0
A	*Hirundo rustica*	Barn Swallow	Special Concern	Threatened	Endangered	S3B	1	4.5 ± 7.0
A	*Contopus cooperi*	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B	3	3.6 ± 0.0
A	*Dolichonyx oryzivorus*	Bobolink	Special Concern	Threatened	Vulnerable	S3B	1	4.5 ± 7.0
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	2	4.5 ± 7.0
A	*Perisoreus canadensis*	Canada Jay				S3	1	4.5 ± 7.0
A	*Poecile hudsonicus*	Boreal Chickadee				S3	2	4.5 ± 7.0
A	*Charadrius vociferus*	Killdeer				S3B	1	4.5 ± 7.0
A	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S3B	1	4.5 ± 7.0
A	*Falco sparverius*	American Kestrel				S3B,S4S5M	2	3.8 ± 0.0
A	*Gallinago delicata*	Wilson's Snipe				S3B,S5M	2	4.5 ± 7.0
A	*Setophaga striata*	Blackpoll Warbler				S3B,S5M	1	4.5 ± 7.0
A	*Picoides arcticus*	Black-backed Woodpecker				S3S4	1	4.5 ± 7.0
A	*Setophaga castanea*	Bay-breasted Warbler				S3S4B,S4S5M	2	4.5 ± 7.0
A	*Actitis macularius*	Spotted Sandpiper				S3S4B,S5M	1	4.5 ± 7.0

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?
Fraxinus nigra	Black Ash		Threatened	No
Emydoidea blandingii	*Blanding's Turtle - Nova Scotia pop.*	Endangered	Endangered	No
Glyptemys insculpta	Wood Turtle	Threatened	Threatened	No
Falco peregrinus pop. 1	Peregrine Falcon - anatum/tundrius pop.		Vulnerable	No
Bat hibernaculum or bat species occurrence		[Endangered][1]	[Endangered][1]	No

1 *Myotis lucifugus* (Little Brown Myotis), *Myotis septentrionalis* (Long-eared Myotis), and *Perimyotis subflavus* (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the 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
20	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
4	Blaney, C.S.; Spicer, C.D.; Mazerolle, D.M. 2005. Fieldwork 2005. Atlantic Canada Conservation Data Centre. Sackville NB, 2333 recs.
2	eBird. 2020. eBird Basic Dataset. Version: EBD_relNov-2019. Ithaca, New York. Nov 2019, Cape Breton Bras d'Or Lakes Watershed subset. Cornell Lab of Ornithology.
1	Canadian Wildlife Service. 2019. Canadian Protected and Conserved Areas Database (CPCAD). December 2019. ECCC.https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/protected-conserved-areas-database.html.
1	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
1	Munro, Marian K. Tracked lichen specimens, Nova Scotia Provincial Museum of Natural History Herbarium. Atlantic Canada Conservation Data Centre. 2019.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 48611 records of 135 vertebrate and 1032 records of 60 invertebrate fauna; 6009 records of 257 vascular and 2571 records of 137 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 (± 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	*Myotis lucifugus*	Little Brown Myotis	Endangered	Endangered	Endangered	S1	95	9.6 ± 0.0	NS
A	*Myotis septentrionalis*	Northern Myotis	Endangered	Endangered	Endangered	S1	90	52.1 ± 1.0	PE
A	*Perimyotis subflavus*	Tricolored Bat	Endangered	Endangered	Endangered	S1	5	61.0 ± 5.0	NS
A	*Salmo salar pop. 1*	Atlantic Salmon - Inner Bay of Fundy population	Endangered	Endangered		S1	22	21.3 ± 0.0	NS
A	*Salmo salar pop. 6*	Atlantic Salmon - Nova Scotia Southern Upland population	Endangered			S1	31	37.2 ± 0.0	NS
A	*Charadrius melodus melodus*	Piping Plover melodus subspecies	Endangered	Endangered	Endangered	S1B	2603	18.1 ± 0.0	NS
A	*Sterna dougallii*	Roseate Tern	Endangered	Endangered	Endangered	S1B	22	87.0 ± 0.0	NS
A	*Morone saxatilis pop. 2*	Striped Bass - Bay of Fundy population	Endangered			S2S3B,S2S3N	2	77.6 ± 0.0	NS
A	*Catharus bicknelli*	Bicknell's Thrush	Threatened	Threatened	Endangered	S1B	1	80.8 ± 7.0	NS
A	*Asio flammeus*	Short-eared Owl	Threatened	Special Concern		S1B	9	18.1 ± 7.0	NS
A	*Glyptemys insculpta*	Wood Turtle	Threatened	Threatened	Threatened	S2	4461	9.5 ± 5.0	NS
A	*Riparia riparia*	Bank Swallow	Threatened	Threatened	Endangered	S2B	2461	2.3 ± 0.0	NS
A	*Chaetura pelagica*	Chimney Swift	Threatened	Threatened	Endangered	S2S3B,S1M	639	9.8 ± 7.0	NS
A	*Limosa haemastica*	Hudsonian Godwit	Threatened			S2S3M	370	43.8 ± 0.0	NS
A	*Acipenser oxyrinchus*	Atlantic Sturgeon	Threatened			S2S3N	2	64.5 ± 0.0	NS
A	*Hydrobates leucorhous*	Leach's Storm-Petrel	Threatened			S3B	44	87.9 ± 7.0	NS
A	*Tringa flavipes*	Lesser Yellowlegs	Threatened			S3M	1427	15.6 ± 0.0	NS
A	*Anguilla rostrata*	American Eel	Threatened			S3N	67	35.5 ± 0.0	NS
A	*Hylocichla mustelina*	Wood Thrush	Threatened	Threatened		SUB	36	9.8 ± 0.0	NS
A	*Salmo salar pop. 12*	Atlantic Salmon - Gaspe - Southern Gulf of St. Lawrence population	Special Concern			S1	47	5.6 ± 0.0	NS
A	*Antrostomus vociferus*	Eastern Whip-Poor-Will	Special Concern	Threatened	Threatened	S1?B	7	67.7 ± 7.0	NS
A	*Passerculus sandwichensis princeps*	Ipswich Sparrow	Special Concern	Special Concern		S1B	1	91.9 ± 0.0	NS
A	*Bucephala islandica*	Barrow's Goldeneye	Special Concern	Special Concern		S1N,SUM	13	20.6 ± 0.0	NS
A	*Euphagus carolinus*	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	269	12.9 ± 7.0	NS
A	*Phalaropus lobatus*	Red-necked Phalarope	Special Concern	Special Concern		S2S3M	11	55.0 ± 0.0	NS
A	*Morone saxatilis pop. 1*	Striped Bass - Southern Gulf of St. Lawrence population	Special Concern			S2S3N	1	77.0 ± 1.0	NS
A	*Histrionicus histrionicus pop. 1*	Harlequin Duck - Eastern population	Special Concern	Special Concern	Endangered	S2S3N,SUM	24	58.7 ± 0.0	PE
A	*Chelydra serpentina*	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	79	10.3 ± 0.0	NS
A	*Hirundo rustica*	Barn Swallow	Special Concern	Threatened	Endangered	S3B	1552	4.5 ± 7.0	NS
A	*Cardellina canadensis*	Canada Warbler	Special Concern	Threatened	Endangered	S3B	1095	6.5 ± 7.0	NS
A	*Chordeiles minor*	Common Nighthawk	Special Concern	Threatened	Threatened	S3B	374	6.5 ± 7.0	NS
A	*Contopus cooperi*	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B	1249	3.6 ± 0.0	NS
A	*Dolichonyx oryzivorus*	Bobolink	Special Concern	Threatened	Vulnerable	S3B	1331	4.5 ± 7.0	NS
A	*Coccothraustes vespertinus*	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	779	6.5 ± 7.0	NS
A	*Podiceps auritus*	Horned Grebe	Special Concern	Special Concern		S3N,SUM	9	79.5 ± 0.0	NS
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	1254	4.5 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	*Phocoena phocoena*	Harbour Porpoise	Special Concern			S4	1	88.8 ± 5.0	PE
A	*Chrysemys picta picta*	Eastern Painted Turtle	Special Concern	Special Concern		S4	61	19.0 ± 1.0	NS
A	*Accipiter cooperii*	Cooper's Hawk	Not At Risk			S1?B,SUN,SUM	2	8.6 ± 7.0	NS
A	*Fulica americana*	American Coot	Not At Risk			S1B	17	14.1 ± 7.0	NS
A	*Chlidonias niger*	Black Tern	Not At Risk			S1B	1	90.0 ± 0.0	NS
A	*Falco peregrinus pop. 1*	Peregrine Falcon - anatum/tundrius	Not At Risk	Special Concern	Vulnerable	S1B,SUM	25	65.9 ± 0.0	PE
A	*Sorex dispar*	Long-tailed Shrew	Not At Risk			S2	1	65.2 ± 0.0	NS
A	*Aegolius funereus*	Boreal Owl	Not At Risk			S2?B,SUM	14	12.6 ± 0.0	NS
A	*Globicephala melas*	Long-finned Pilot Whale	Not At Risk			S2S3	1	66.4 ± 100.0	NS
A	*Hemidactylium scutatum*	Four-toed Salamander	Not At Risk			S3	8	30.2 ± 0.0	NS
A	*Sterna hirundo*	Common Tern	Not At Risk			S3B	489	9.8 ± 7.0	NS
A	*Sialia sialis*	Eastern Bluebird	Not At Risk			S3B	62	13.6 ± 0.0	NS
A	*Buteo lagopus*	Rough-legged Hawk	Not At Risk			S3N	4	60.7 ± 0.0	PE
A	*Accipiter gentilis*	Northern Goshawk	Not At Risk			S3S4	139	8.6 ± 7.0	NS
A	*Lagenorhynchus acutus*	Atlantic White-sided Dolphin	Not At Risk			S3S4	3	65.1 ± 0.0	NS
A	*Ammospiza nelsoni*	Nelson's Sparrow	Not At Risk			S3S4B	284	17.8 ± 7.0	NS
A	*Calidris canutus rufa*	Red Knot rufa subspecies	E,SC	Endangered	Endangered	S2M	477	15.6 ± 0.0	NS
A	*Morone saxatilis*	Striped Bass	E,SC			S2S3B,S2S3N	4	58.4 ± 1.0	NS
A	*Alces alces americana*	Moose			Endangered	S1	133	5.8 ± 0.0	NS
A	*Picoides dorsalis*	American Three-toed Woodpecker				S1?	8	72.0 ± 7.0	NS
A	*Passerina cyanea*	Indigo Bunting				S1?B,SUM	16	42.8 ± 0.0	NS
A	*Nycticorax nycticorax*	Black-crowned Night-heron				S1B	1	79.3 ± 7.0	NS
A	*Oxyura jamaicensis*	Ruddy Duck				S1B	12	67.8 ± 7.0	NS
A	*Gallinula galeata*	Common Gallinule				S1B	12	13.8 ± 7.0	NS
A	*Myiarchus crinitus*	Great Crested Flycatcher				S1B	15	8.6 ± 7.0	NS
A	*Cistothorus palustris*	Marsh Wren				S1B	1	89.5 ± 3.0	NB
A	*Mimus polyglottos*	Northern Mockingbird				S1B	38	18.1 ± 7.0	NS
A	*Toxostoma rufum*	Brown Thrasher				S1B	10	18.1 ± 7.0	NS
A	*Charadrius semipalmatus*	Semipalmated Plover				S1B,S4M	1723	16.0 ± 0.0	NS
A	*Calidris minutilla*	Least Sandpiper				S1B,S4M	1063	15.6 ± 0.0	NS
A	*Anas acuta*	Northern Pintail				S1B,SUM	60	34.5 ± 0.0	NS
A	*Vireo gilvus*	Warbling Vireo				S1B,SUM	20	20.3 ± 7.0	NS
A	*Vespertilionidae sp.*	bat species				S1S2	77	5.6 ± 0.0	NS
A	*Pooecetes gramineus*	Vesper Sparrow				S1S2B,SUM	57	12.9 ± 7.0	NS
A	*Vireo philadelphicus*	Philadelphia Vireo				S2?B,SUM	83	23.3 ± 0.0	NS
A	*Fratercula arctica*	Atlantic Puffin				S2B	3	87.5 ± 0.0	NB
A	*Empidonax traillii*	Willow Flycatcher				S2B	19	23.2 ± 7.0	NS
A	*Molothrus ater*	Brown-headed Cowbird				S2B	183	6.5 ± 7.0	NS
A	*Spatula clypeata*	Northern Shoveler				S2B,SUM	32	54.8 ± 7.0	NS
A	*Mareca strepera*	Gadwall				S2B,SUM	78	33.4 ± 0.0	NS
A	*Piranga olivacea*	Scarlet Tanager				S2B,SUM	14	9.8 ± 7.0	NS
A	*Calidris alba*	Sanderling				S2N,S3M	937	18.1 ± 0.0	NS
A	*Asio otus*	Long-eared Owl				S2S3	34	23.7 ± 0.0	NS
A	*Rallus limicola*	Virginia Rail				S2S3B	51	20.3 ± 7.0	NS
A	*Rissa tridactyla*	Black-legged Kittiwake				S2S3B	1	30.7 ± 0.0	NS
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2S3B	319	8.6 ± 7.0	NS
A	*Phalacrocorax carbo*	Great Cormorant				S2S3B,S2S3N	215	36.9 ± 7.0	PE
A	*Cathartes aura*	Turkey Vulture				S2S3B,S4S5M	8	68.0 ± 0.0	PE
A	*Setophaga pinus*	Pine Warbler				S2S3B,S4S5M	15	8.6 ± 7.0	NS
A	*Bucephala clangula*	Common Goldeneye				S2S3B,S5N,S5M	173	15.8 ± 13.0	NS
A	*Icterus galbula*	Baltimore Oriole				S2S3B,SUM	61	9.8 ± 7.0	NS
A	*Pluvialis dominica*	American Golden-Plover				S2S3M	163	16.0 ± 0.0	NS
A	*Numenius phaeopus hudsonicus*	Whimbrel				S2S3M	211	22.1 ± 0.0	NS
A	*Perisoreus canadensis*	Canada Jay				S3	583	4.5 ± 7.0	NS
A	*Poecile hudsonicus*	Boreal Chickadee				S3	946	4.5 ± 7.0	NS

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A	*Spinus pinus*	Pine Siskin				S3	531	6.5 ± 7.0	NS
A	*Salvelinus fontinalis*	Brook Trout				S3	66	5.6 ± 0.0	NS
A	*Salvelinus namaycush*	Lake Trout				S3	2	47.5 ± 0.0	NS
A	*Pekania pennanti*	Fisher				S3	6	17.3 ± 0.0	NS
A	*Calcarius lapponicus*	Lapland Longspur				S3?N,SUM	3	79.4 ± 0.0	NS
A	*Spatula discors*	Blue-winged Teal				S3B	321	6.5 ± 7.0	NS
A	*Charadrius vociferus*	Killdeer				S3B	752	4.5 ± 7.0	NS
A	*Tringa semipalmata*	Willet				S3B	1960	9.8 ± 7.0	NS
A	*Sterna paradisaea*	Arctic Tern				S3B	51	72.8 ± 7.0	NS
A	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B	129	8.6 ± 7.0	NS
A	*Tyrannus tyrannus*	Eastern Kingbird				S3B	365	6.5 ± 7.0	NS
A	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S3B	835	4.5 ± 7.0	NS
A	*Alosa pseudoharengus*	Alewife				S3B	24	5.6 ± 0.0	NS
A	*Somateria mollissima*	Common Eider				S3B,S3M,S3N	341	27.9 ± 11.0	NS
A	*Tringa melanoleuca*	Greater Yellowlegs				S3B,S4M	2368	15.6 ± 0.0	NS
A	*Falco sparverius*	American Kestrel				S3B,S4S5M	560	3.8 ± 0.0	NS
A	*Gallinago delicata*	Wilson's Snipe				S3B,S5M	1050	4.5 ± 7.0	NS
A	*Setophaga striata*	Blackpoll Warbler				S3B,S5M	101	4.5 ± 7.0	NS
A	*Cardellina pusilla*	Wilson's Warbler				S3B,S5M	101	16.3 ± 7.0	NS
A	*Pinicola enucleator*	Pine Grosbeak				S3B,S5N,S5M	117	9.8 ± 7.0	NS
A	*Setophaga tigrina*	Cape May Warbler				S3B,SUM	320	6.5 ± 7.0	NS
A	*Branta bernicla*	Brant				S3M	8	77.7 ± 0.0	NS
A	*Pluvialis squatarola*	Black-bellied Plover				S3M	2032	18.1 ± 0.0	NS
A	*Arenaria interpres*	Ruddy Turnstone				S3M	872	18.1 ± 0.0	NS
A	*Calidris pusilla*	Semipalmated Sandpiper				S3M	1685	16.0 ± 0.0	NS
A	*Calidris melanotos*	Pectoral Sandpiper				S3M	173	18.1 ± 0.0	NS
A	*Limnodromus griseus*	Short-billed Dowitcher				S3M	1023	18.1 ± 0.0	NS
A	*Chroicocephalus ridibundus*	Black-headed Gull				S3N	15	72.2 ± 0.0	NS
A	*Picoides arcticus*	Black-backed Woodpecker				S3S4	183	4.5 ± 7.0	NS
A	*Loxia curvirostra*	Red Crossbill				S3S4	153	6.5 ± 7.0	NS
A	*Sorex palustris*	American Water Shrew				S3S4	6	63.8 ± 0.0	PE
A	*Botaurus lentiginosus*	American Bittern				S3S4B,S4S5M	474	6.5 ± 7.0	NS
A	*Setophaga castanea*	Bay-breasted Warbler				S3S4B,S4S5M	672	4.5 ± 7.0	NS
A	*Actitis macularius*	Spotted Sandpiper				S3S4B,S5M	895	4.5 ± 7.0	NS
A	*Leiothlypis peregrina*	Tennessee Warbler				S3S4B,S5M	690	6.5 ± 7.0	NS
A	*Passerella iliaca*	Fox Sparrow				S3S4B,S5M	73	19.1 ± 0.0	NS
A	*Mergus serrator*	Red-breasted Merganser				S3S4B,S5M,S5N	104	9.8 ± 7.0	NS
A	*Calidris maritima*	Purple Sandpiper				S3S4N	30	22.1 ± 0.0	NS
A	*Lanius borealis*	Northern Shrike				S3S4N	4	74.8 ± 0.0	PE
A	*Morus bassanus*	Northern Gannet				SHB	43	26.0 ± 4.0	NS
A	*Aythya americana*	Redhead				SHB	3	96.8 ± 0.0	PE
A	*Leucophaeus atricilla*	Laughing Gull				SHB	4	90.2 ± 0.0	NS
A	*Progne subis*	Purple Martin				SHB	8	74.1 ± 7.0	NS
A	*Eremophila alpestris*	Horned Lark				SHB,S4S5N,S5M	8	56.6 ± 7.0	PE
I	*Bombus bohemicus*	Ashton Cuckoo Bumble Bee	Endangered	Endangered	Endangered	S1	32	31.5 ± 5.0	NS
I	*Danaus plexippus*	Monarch	Endangered	Special Concern	Endangered	S2?B,S3M	114	5.4 ± 0.0	NS
I	*Barnea truncata*	Atlantic Mud-piddock	Threatened	Threatened		S1	1	71.8 ± 1.0	NS
I	*Bombus suckleyi*	Suckley's Cuckoo Bumble Bee	Threatened			SH	1	38.7 ± 5.0	NS
I	*Alasmidonta varicosa*	Brook Floater	Special Concern	Special Concern	Threatened	S3	16	45.3 ± 0.0	NS
I	*Bombus terricola*	Yellow-banded Bumble Bee	Special Concern	Special Concern	Vulnerable	S3	116	10.3 ± 5.0	NS
I	*Coccinella transversoguttata richardsoni*	Transverse Lady Beetle	Special Concern		Endangered	SH	7	7.6 ± 2.0	NS
I	*Gomphurus ventricosus*	Skillet Clubtail	Special Concern	Endangered		SH	1	88.5 ± 0.0	NS
I	*Erora laeta*	Early Hairstreak				S1	1	76.2 ± 0.0	PE
I	*Atlanticoncha ochracea*	Tidewater Mucket				S1	1	96.8 ± 0.0	NS
I	*Polygonia satyrus*	Satyr Comma				S1?	16	34.4 ± 5.0	NS
I	*Euphyes bimacula*	Two-spotted Skipper				S1S2	2	38.2 ± 0.0	NS

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I	*Boloria chariclea*	Arctic Fritillary				S1S2	1	33.6 ± 2.0	NS
I	*Tharsalea dospassosi*	Maritime Copper				S2	76	18.6 ± 1.0	NS
I	*Satyrium acadica*	Acadian Hairstreak				S2	15	16.7 ± 2.0	NS
I	*Neurocordulia michaeli*	Broad-tailed Shadowdragon				S2	26	42.4 ± 0.0	NS
I	*Coenagrion resolutum*	Taiga Bluet				S2	50	49.3 ± 1.0	PE
I	*Margaritifera margaritifera*	Eastern Pearlshell				S2	154	5.8 ± 0.0	NS
I	*Pantala hymenaea*	Spot-Winged Glider				S2?B	1	77.3 ± 1.0	NS
I	*Nymphalis l-album*	Compton Tortoiseshell				S2S3	9	19.0 ± 2.0	NS
I	*Aglais milberti*	Milbert's Tortoiseshell				S2S3	16	19.0 ± 2.0	NS
I	*Aglais milberti milberti*	Milbert's Tortoise Shell				S2S3	3	51.7 ± 0.0	NS
I	*Lanthus vernalis*	Southern Pygmy Clubtail				S2S3	8	53.6 ± 0.0	NS
I	*Somatochlora kennedyi*	Kennedy's Emerald				S2S3	2	79.9 ± 1.0	PE
I	*Somatochlora williamsoni*	Williamson's Emerald				S2S3	12	82.7 ± 0.0	PE
I	*Williamsonia fletcheri*	Ebony Boghaunter				S2S3	4	50.6 ± 0.0	NS
I	*Stylurus scudderi*	Zebra Clubtail				S2S3	4	78.0 ± 0.0	NS
I	*Alasmidonta undulata*	Triangle Floater				S2S3	19	41.3 ± 0.0	NS
I	*Astyleiopus variegatus*	Variegated Long-horned Beetle				S3	1	95.8 ± 0.0	NS
I	*Naemia seriata*	Seaside Lady Beetle				S3	1	70.9 ± 0.0	NS
I	*Chilocorus stigma*	Twice-stabbed Lady Beetle				S3	1	73.0 ± 0.0	PE
I	*Monochamus marmorator*	Balsam Fir Sawyer				S3	2	38.5 ± 0.0	NS
I	*Satyrium calanus*	Banded Hairstreak				S3	3	20.4 ± 2.0	NS
I	*Callophrys lanoraieensis*	Bog Elfin				S3	6	36.8 ± 0.0	NS
I	*Phanogomphus descriptus*	Harpoon Clubtail				S3	4	58.8 ± 1.0	NS
I	*Ophiogomphus aspersus*	Brook Snaketail				S3	4	76.1 ± 0.0	NS
I	*Ophiogomphus mainensis*	Maine Snaketail				S3	14	39.2 ± 0.0	NS
I	*Ophiogomphus rupinsulensis*	Rusty Snaketail				S3	55	53.0 ± 0.0	NS
I	*Epitheca princeps*	Prince Baskettail				S3	11	50.7 ± 0.0	NS
I	*Somatochlora forcipata*	Forcipate Emerald				S3	3	73.6 ± 1.0	PE
I	*Enallagma vernale*	Vernal Bluet				S3	4	58.8 ± 1.0	NS
I	*Strophitus undulatus*	Creeper				S3	6	78.2 ± 1.0	NS
I	*Polygonia interrogationis*	Question Mark				S3B	48	16.7 ± 2.0	NS
I	*Cecropterus pylades*	Northern Cloudywing				S3S4	27	7.7 ± 0.0	NS
I	*Amblyscirtes hegon*	Pepper and Salt Skipper				S3S4	12	16.7 ± 2.0	NS
I	*Cupido comyntas*	Eastern Tailed Blue				S3S4	3	43.3 ± 0.0	NS
I	*Argynnis aphrodite*	Aphrodite Fritillary				S3S4	23	22.8 ± 100.0	NS
I	*Polygonia faunus*	Green Comma				S3S4	18	19.0 ± 2.0	NS
I	*Oeneis jutta*	Jutta Arctic				S3S4	8	39.8 ± 0.0	NS
I	*Aeshna clepsydra*	Mottled Darner				S3S4	4	80.6 ± 1.0	NS
I	*Aeshna constricta*	Lance-Tipped Darner				S3S4	28	16.8 ± 1.0	NS
I	*Boyeria grafiana*	Ocellated Darner				S3S4	11	51.7 ± 0.0	NS
I	*Gomphaeschna furcillata*	Harlequin Darner				S3S4	3	70.8 ± 0.0	PE
I	*Somatochlora franklini*	Delicate Emerald				S3S4	6	59.9 ± 1.0	NS
I	*Nannothemis bella*	Elfin Skimmer				S3S4	3	94.3 ± 1.0	NS
I	*Sympetrum danae*	Black Meadowhawk				S3S4	7	71.8 ± 1.0	NS
I	*Amphiagrion saucium*	Eastern Red Damsel				S3S4	2	23.8 ± 0.0	NS
I	*Sphaerophoria pyrrhina*	Violaceous Globetail				SH	1	39.1 ± 5.0	NS
I	*Icaricia saepiolus*	Greenish Blue				SH	3	20.1 ± 2.0	NS
I	*Polygonia gracilis*	Hoary Comma				SH	2	19.0 ± 2.0	NS
N	*Erioderma mollissimum*	Graceful Felt Lichen	Endangered	Endangered	Endangered	S1	30	67.4 ± 0.0	NS
N	*Erioderma pedicellatum (Atlantic pop.)*	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	523	56.0 ± 0.0	NS
N	*Peltigera hydrothyria*	Eastern Waterfan	Threatened	Threatened	Threatened	S1	34	8.7 ± 0.0	NS
N	*Pannaria lurida*	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	24	68.1 ± 1.0	NS
N	*Anzia colpodes*	Black-foam Lichen	Threatened	Threatened	Threatened	S3	33	40.5 ± 0.0	NS
N	*Fuscopannaria leucosticta*	White-rimmed Shingle Lichen	Threatened			S3	6	60.4 ± 0.0	NS
N	*Heterodermia squamulosa*	Scaly Fringe Lichen	Threatened			S3	8	77.4 ± 0.0	NS

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N	*Pectenia plumbea*	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	170	15.0 ± 0.0	NS
N	*Sclerophora peronella (Atlantic pop.)*	Frosted Glass-whiskers (Atlantic population)	Special Concern	Special Concern		S3S4	25	63.8 ± 0.0	NS
N	*Pseudevernia cladonia*	Ghost Antler Lichen	Not At Risk			S2S3	7	60.7 ± 1.0	NS
N	*Fissidens exilis*	Pygmy Pocket Moss	Not At Risk			S3	6	37.3 ± 0.0	NS
N	*Chaenotheca servitii*	Flexuous Golden Stubble	Data Deficient			S1	1	52.9 ± 1.0	NS
N	*Erioderma pedicellatum*	Boreal Felt Lichen	E,SC		Endangered	S1	1	67.3 ± 0.0	NS
N	*Tetrodontium brownianum*	Little Georgia				S1	1	98.3 ± 0.0	NS
N	*Cyrto-hypnum minutulum*	Tiny Cedar Moss				S1	1	53.1 ± 0.0	NS
N	*Blennothallia crispa*	Crinkled Jelly Lichen				S1	1	98.7 ± 0.0	NS
N	*Cladonia brevis*	Short Peg Lichen				S1	1	95.7 ± 4.0	PE
N	*Scytinium schraderi*	Wrinkled Jellyskin Lichen				S1	1	62.3 ± 0.0	NS
N	*Lichina confinis*	Marine Seaweed Lichen				S1	2	90.5 ± 2.0	NS
N	*Polychidium muscicola*	Eyed Mossthorns Woollybear Lichen				S1	1	48.4 ± 0.0	NS
N	*Peltigera lepidophora*	Scaly Pelt Lichen				S1	2	47.7 ± 0.0	PE
N	*Hypogymnia hultenii*	Powdered Honeycomb Lichen				S1	9	91.2 ± 0.0	NS
N	*Calypogeia neogaea*	Common Pouchwort				S1?	1	90.0 ± 0.0	NS
N	*Aloina rigida*	Aloe-Like Rigid Screw Moss				S1?	2	50.4 ± 0.0	NS
N	*Brachythecium erythrorrhizon*	Taiga Ragged Moss				S1?	2	91.5 ± 0.0	PE
N	*Campylostelium saxicola*	a Moss				S1?	2	75.9 ± 0.0	PE
N	*Tortula obtusifolia*	a Moss				S1?	3	36.4 ± 2.0	NS
N	*Didymodon tophaceus*	Olive Beard Moss				S1?	2	98.6 ± 4.0	NS
N	*Schistostega pennata*	Luminous Moss				S1?	1	98.1 ± 0.0	NS
N	*Enchylium limosum*	Lime-loving Tarpaper Lichen				S1?	2	73.8 ± 0.0	PE
N	*Scytinium intermedium*	Forty-five Jellyskin Lichen				S1?	2	77.5 ± 4.0	NS
N	*Arrhenopterum heterostichum*	One-sided Groove Moss				S1S2	1	91.5 ± 1.0	NS
N	*Plagiothecium latebricola*	Alder Silk Moss				S1S2	1	94.7 ± 3.0	NS
N	*Seligeria donniana*	Donian Beardless Moss				S1S2	1	99.5 ± 3.0	NS
N	*Sematophyllum marylandicum*	a Moss				S1S2	1	92.2 ± 6.0	NS
N	*Timmia megapolitana*	Metropolitan Timmia Moss				S1S2	3	49.9 ± 0.0	NS
N	*Pseudotaxiphyllum distichaceum*	a Moss				S1S2	2	95.5 ± 0.0	NS
N	*Haplocladium microphyllum*	Tiny-leaved Haplocladium Moss				S1S2	1	55.5 ± 5.0	NS
N	*Placidium squamulosum*	Limy Soil Stipplescale Lichen				S1S2	1	51.5 ± 6.0	NS
N	*Cladonia labradorica*	Labrador Lichen				S1S2	1	100.0 ± 0.0	NS
N	*Peltigera ponojensis*	Pale-bellied Pelt Lichen				S1S2	1	15.6 ± 0.0	NS
N	*Pilophorus cereolus*	Powdered Matchstick Lichen				S1S2	1	81.0 ± 3.0	NS
N	*Parmeliella parvula*	Poor-man's Shingles Lichen				S1S2	14	73.6 ± 0.0	NS
N	*Heterodermia galactophylla*	Branching Fringe Lichen				S1S3	2	61.6 ± 0.0	NS
N	*Peltigera neckeri*	Black-saddle Pelt Lichen				S1S3	2	70.7 ± 0.0	NS
N	*Stereocaulon grande*	Grand Foam Lichen				S1S3	1	51.0 ± 0.0	NS
N	*Anacamptodon splachnoides*	a Moss				S2	1	94.7 ± 3.0	NS
N	*Sphagnum platyphyllum*	Flat-leaved Peat Moss				S2	2	98.1 ± 3.0	NS
N	*Sphagnum subnitens*	Lustrous Peat Moss				S2	1	93.6 ± 2.0	NS
N	*Scytinium imbricatum*	Scaly Jellyskin Lichen				S2	1	85.3 ± 4.0	NS
N	*Nephroma resupinatum*	a lichen				S2	2	87.7 ± 0.0	NS
N	*Placynthium flabellosum*	Scaly Ink Lichen				S2	1	78.5 ± 17.0	NS
N	*Anaptychia crinalis*	Hanging Fringed Lichen				S2	2	95.7 ± 4.0	PE
N	*Riccardia multifida*	Delicate Germanderwort				S2?	2	71.7 ± 0.0	NS
N	*Anomodon viticulosus*	a Moss				S2?	1	50.6 ± 5.0	NS
N	*Atrichum angustatum*	Lesser Smoothcap Moss				S2?	3	30.6 ± 2.0	NS

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N	*Drepanocladus polygamus*	Polygamous Hook Moss				S2?	4	82.3 ± 0.0	PE
N	*Ditrichum rhynchostegium*	a Moss				S2?	1	47.2 ± 0.0	PE
N	*Kiaeria starkei*	Starke's Fork Moss				S2?	1	91.5 ± 10.0	NS
N	*Philonotis marchica*	a Moss				S2?	3	29.6 ± 0.0	NS
N	*Platydictya jungermannioides*	False Willow Moss				S2?	3	71.1 ± 0.0	NS
N	*Saelania glaucescens*	Blue Dew Moss				S2?	1	27.3 ± 0.0	NS
N	*Cyrtomnium hymenophylloides*	Short-pointed Lantern Moss				S2?	1	27.3 ± 0.0	NS
N	*Platylomella lescurii*	a Moss				S2?	1	95.4 ± 0.0	NS
N	*Oxyrrhynchium hians*	Light Beaked Moss				S2S3	1	68.7 ± 25.0	NS
N	*Platydictya subtilis*	Bark Willow Moss				S2S3	3	75.9 ± 0.0	PE
N	*Moelleropsis nebulosa*	Blue-gray Moss Shingle Lichen				S2S3	58	54.9 ± 0.0	NS
N	*Moelleropsis nebulosa ssp. frullaniae*	Blue-gray Moss Shingle Lichen				S2S3	3	73.5 ± 0.0	NS
N	*Ramalina thrausta*	Angelhair Ramalina Lichen				S2S3	15	36.1 ± 0.0	NS
N	*Collema leptaleum*	Crumpled Bat's Wing Lichen				S2S3	81	49.3 ± 0.0	PE
N	*Usnea ceratina*	Warty Beard Lichen				S2S3	1	91.2 ± 0.0	NS
N	*Usnea rubicunda*	Red Beard Lichen				S2S3	2	38.9 ± 0.0	NS
N	*Ahtiana aurescens*	Eastern Candlewax Lichen				S2S3	7	36.0 ± 6.0	NS
N	*Cladonia incrassata*	Powder-foot British Soldiers Lichen				S2S3	1	71.9 ± 0.0	NS
N	*Cladonia parasitica*	Fence-rail Lichen				S2S3	1	64.1 ± 1.0	NS
N	*Scytinium tenuissimum*	Birdnest Jellyskin Lichen				S2S3	16	39.1 ± 0.0	NS
N	*Melanohalea septentrionalis*	Northern Camouflage Lichen				S2S3	2	89.8 ± 0.0	PE
N	*Myelochroa aurulenta*	Powdery Axil-bristle Lichen				S2S3	1	37.2 ± 0.0	NS
N	*Parmelia fertilis*	Fertile Shield Lichen				S2S3	10	27.7 ± 0.0	NS
N	*Hypotrachyna minarum*	Hairless-spined Shield Lichen				S2S3	1	85.8 ± 0.0	NS
N	*Parmeliopsis ambigua*	Green Starburst Lichen				S2S3	4	17.3 ± 1.0	NS
N	*Fuscopannaria sorediata*	a Lichen				S2S3	6	60.6 ± 0.0	NS
N	*Stereocaulon condensatum*	Granular Soil Foam Lichen				S2S3	10	3.5 ± 0.0	NS
N	*Physcia subtilis*	Slender Rosette Lichen				S2S3	1	79.0 ± 0.0	NS
N	*Cladonia coccifera*	Eastern Boreal Pixie-cup Lichen				S2S3	2	52.4 ± 1.0	NS
N	*Cladonia deformis*	Lesser Sulphur-cup Lichen				S2S3	2	79.2 ± 0.0	PE
N	*Ephemerum serratum*	a Moss				S3	2	19.7 ± 3.0	NS
N	*Fissidens taxifolius*	Yew-leaved Pocket Moss				S3	2	8.1 ± 0.0	NS
N	*Anomodon tristis*	a Moss				S3	3	77.8 ± 0.0	NS
N	*Sphagnum contortum*	Twisted Peat Moss				S3	4	90.3 ± 4.0	NS
N	*Tetraplodon angustatus*	Toothed-leaved Nitrogen Moss				S3	3	74.1 ± 0.0	NS
N	*Rostania occultata*	Crusted Tarpaper Lichen				S3	5	66.9 ± 0.0	PE
N	*Collema nigrescens*	Blistered Tarpaper Lichen				S3	17	50.9 ± 2.0	NS
N	*Solorina saccata*	Woodland Owl Lichen				S3	7	64.0 ± 0.0	NS
N	*Fuscopannaria ahlneri*	Corrugated Shingles Lichen				S3	87	16.9 ± 0.0	NS
N	*Scytinium lichenoides*	Tattered Jellyskin Lichen				S3	28	47.4 ± 0.0	NS
N	*Leptogium milligranum*	Stretched Jellyskin Lichen				S3	9	51.0 ± 0.0	NS
N	*Nephroma bellum*	Naked Kidney Lichen				S3	8	30.4 ± 0.0	NS
N	*Placynthium nigrum*	Common Ink Lichen				S3	4	51.4 ± 0.0	NS
N	*Platismatia norvegica*	Oldgrowth Rag Lichen				S3	1	97.3 ± 0.0	NS
N	*Ephebe lanata*	Waterside Rockshag Lichen				S3	2	48.4 ± 0.0	NS
N	*Phaeophyscia adiastola*	Powder-tipped Shadow Lichen				S3	4	52.6 ± 0.0	PE
N	*Phaeophyscia pusilloides*	Pompom-tipped Shadow Lichen				S3	12	6.0 ± 0.0	NS
N	*Peltigera collina*	Tree Pelt Lichen				S3	16	29.2 ± 0.0	NS

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N	*Barbula convoluta*	Lesser Bird's-claw Beard Moss				S3?	1	46.9 ± 0.0	PE
N	*Calliergon giganteum*	Giant Spear Moss				S3?	1	78.9 ± 2.0	PE
N	*Elodium blandowii*	Blandow's Bog Moss				S3?	2	7.0 ± 3.0	NS
N	*Mnium stellare*	Star Leafy Moss				S3?	1	91.5 ± 1.0	NS
N	*Sphagnum lindbergii*	Lindberg's Peat Moss				S3?	1	92.8 ± 0.0	NS
N	*Sphagnum riparium*	Streamside Peat Moss				S3?	2	79.0 ± 0.0	NS
N	*Cladonia stygia*	Black-footed Reindeer Lichen				S3?	5	76.0 ± 0.0	NS
N	*Encalypta procera*	Slender Extinguisher Moss				S3S4	5	76.6 ± 0.0	NS
N	*Myurella julacea*	Small Mouse-tail Moss				S3S4	1	27.3 ± 0.0	NS
N	*Splachnum ampullaceum*	Cruet Dung Moss				S3S4	2	67.2 ± 0.0	NS
N	*Thamnobryum alleghaniense*	a Moss				S3S4	3	76.2 ± 0.0	NS
N	*Tomentypnum nitens*	Golden Fuzzy Fen Moss				S3S4	2	81.5 ± 0.0	PE
N	*Schistidium agassizii*	Elf Bloom Moss				S3S4	2	83.9 ± 0.0	NS
N	*Hylocomiastrum pyrenaicum*	a Feather Moss				S3S4	1	99.5 ± 3.0	NS
N	*Bryoria pseudofuscescens*	Mountain Horsehair Lichen				S3S4	17	53.6 ± 0.0	PE
N	*Enchylium tenax*	Soil Tarpaper Lichen				S3S4	7	47.4 ± 0.0	NS
N	*Sticta fuliginosa*	Peppered Moon Lichen				S3S4	52	16.0 ± 1.0	NS
N	*Arctoparmelia incurva*	Finger Ring Lichen				S3S4	10	83.5 ± 0.0	NS
N	*Scytinium teretiusculum*	Curly Jellyskin Lichen				S3S4	14	28.5 ± 0.0	NS
N	*Leptogium acadiense*	Acadian Jellyskin Lichen				S3S4	28	21.1 ± 0.0	NS
N	*Scytinium subtile*	Appressed Jellyskin Lichen				S3S4	36	50.0 ± 0.0	NS
N	*Vahliella leucophaea*	Shelter Shingle Lichen				S3S4	9	54.8 ± 0.0	NS
N	*Heterodermia speciosa*	Powdered Fringe Lichen				S3S4	20	16.6 ± 3.0	NS
N	*Leptogium corticola*	Blistered Jellyskin Lichen				S3S4	35	52.4 ± 0.0	NS
N	*Melanohalea olivacea*	Spotted Camouflage Lichen				S3S4	6	16.6 ± 3.0	NS
N	*Parmeliopsis hyperopta*	Gray Starburst Lichen				S3S4	5	3.7 ± 1.0	NS
N	*Parmotrema perlatum*	Powdered Ruffle Lichen				S3S4	1	84.4 ± 0.0	NS
N	*Peltigera hymenina*	Cloudy Pelt Lichen				S3S4	1	82.5 ± 1.0	NS
N	*Coccocarpia palmicola*	Salted Shell Lichen				S3S4	733	40.3 ± 0.0	NS
N	*Physcia tenella*	Fringed Rosette Lichen				S3S4	8	53.4 ± 0.0	PE
N	*Anaptychia palmulata*	Shaggy Fringed Lichen				S3S4	61	35.2 ± 0.0	NS
N	*Evernia prunastri*	Valley Oakmoss Lichen				S3S4	32	8.0 ± 5.0	NS
N	*Heterodermia neglecta*	Fringe Lichen				S3S4	57	13.1 ± 0.0	NS
P	*Fraxinus nigra*	Black Ash	Threatened		Threatened	S1S2	452	9.0 ± 0.0	NS
P	*Bartonia paniculata ssp. paniculata*	Branched Bartonia	Threatened	Threatened		SNA	1	44.6 ± 10.0	NS
P	*Lilaeopsis chinensis*	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S3	17	70.9 ± 0.0	NS
P	*Isoetes prototypus*	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S3	13	60.7 ± 0.0	NS
P	*Floerkea proserpinacoides*	False Mermaidweed	Not At Risk			S2S3	3	32.7 ± 7.0	NS
P	*Acer saccharinum*	Silver Maple				S1	1	96.9 ± 20.0	PE
P	*Nabalus racemosus*	Glaucous Rattlesnakeroot				S1	1	96.9 ± 20.0	PE
P	*Cochlearia tridactylites*	Limestone Scurvy-grass				S1	5	95.0 ± 0.0	NS
P	*Lobelia spicata*	Pale-Spiked Lobelia				S1	6	49.7 ± 7.0	NS
P	*Stellaria crassifolia*	Fleshy Stitchwort				S1	1	92.4 ± 5.0	PE
P	*Hudsonia tomentosa*	Woolly Beach-heath				S1	55	28.3 ± 7.0	NS
P	*Callitriche hermaphroditica*	Northern Water-starwort				S1	6	91.3 ± 0.0	PE
P	*Elatine americana*	American Waterwort				S1	1	78.9 ± 0.0	NS
P	*Ribes americanum*	Wild Black Currant				S1	2	38.6 ± 5.0	NS
P	*Fraxinus pennsylvanica*	Red Ash				S1	6	60.4 ± 0.0	NS
P	*Persicaria careyi*	Carey's Smartweed				S1	1	52.3 ± 3.0	NS
P	*Ranunculus pensylvanicus*	Pennsylvania Buttercup				S1	31	53.8 ± 0.0	NS
P	*Salix myrtillifolia*	Blueberry Willow				S1	1	69.1 ± 0.0	NS
P	*Salix serissima*	Autumn Willow				S1	2	69.1 ± 0.0	NS
P	*Carex alopecoidea*	Foxtail Sedge				S1	2	87.5 ± 0.0	NS
P	*Carex garberi*	Garber's Sedge				S1	4	22.7 ± 0.0	NS
P	*Carex ormostachya*	Necklace Spike Sedge				S1	1	94.8 ± 1.0	NB

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P	*Carex plantaginea*	Plantain-Leaved Sedge				S1	4	32.3 ± 0.0	NS
P	*Carex prairea*	Prairie Sedge				S1	1	82.5 ± 0.0	PE
P	*Carex tincta*	Tinged Sedge				S1	4	87.5 ± 1.0	NS
P	*Carex viridula var. saxilittoralis*	Greenish Sedge				S1	4	92.2 ± 0.0	NS
P	*Carex grisea*	Inflated Narrow-leaved Sedge				S1	6	77.2 ± 0.0	NS
P	*Cyperus lupulinus ssp. macilentus*	Hop Flatsedge				S1	15	21.6 ± 0.0	NS
P	*Scirpus atrovirens*	Dark-green Bulrush				S1	2	62.7 ± 0.0	NS
P	*Blysmopsis rufa*	Red Bulrush				S1	1	93.9 ± 5.0	PE
P	*Iris prismatica*	Slender Blue Flag				S1	2	73.3 ± 1.0	NS
P	*Juncus vaseyi*	Vasey Rush				S1	4	27.2 ± 0.0	NS
P	*Malaxis monophyllos var. brachypoda*	North American White Adder's-mouth				S1	3	90.5 ± 1.0	NS
P	*Elymus hystrix*	Spreading Wild Rye				S1	4	31.1 ± 1.0	NS
P	*Potamogeton nodosus*	Long-leaved Pondweed				S1	1	97.0 ± 5.0	NS
P	*Adiantum pedatum*	Northern Maidenhair Fern				S1	1	39.6 ± 1.0	NS
P	*Solidago hispida*	Hairy Goldenrod				S1?	1	51.9 ± 7.0	NS
P	*Suaeda rolandii*	Roland's Sea-Blite				S1?	1	82.0 ± 2.0	NS
P	*Carex pensylvanica*	Pennsylvania Sedge				S1?	3	54.6 ± 3.0	NS
P	*Carex rostrata*	Narrow-leaved Beaked Sedge				S1?	1	96.8 ± 5.0	PE
P	*Bolboschoenus robustus*	Sturdy Bulrush				S1?	2	49.7 ± 7.0	NS
P	*Allium schoenoprasum*	Wild Chives				S1?	4	17.3 ± 3.0	NS
P	*Allium schoenoprasum var. sibiricum*	Wild Chives				S1?	1	40.2 ± 7.0	NS
P	*Cypripedium arietinum*	Ram's-Head Lady's-Slipper			Endangered	S1S2	13	50.5 ± 0.0	NS
P	*Sanicula odorata*	Clustered Sanicle				S1S2	4	6.2 ± 10.0	NS
P	*Ageratina altissima*	White Snakeroot				S1S2	2	77.8 ± 1.0	NS
P	*Proserpinaca intermedia*	Intermediate Mermaidweed				S1S2	1	73.0 ± 0.0	NS
P	*Anemone virginiana var. alba*	Virginia Anemone				S1S2	5	30.3 ± 5.0	NS
P	*Parnassia parviflora*	Small-flowered Grass-of-Parnassus				S1S2	1	60.5 ± 1.0	NS
P	*Carex haydenii*	Hayden's Sedge				S1S2	4	38.5 ± 1.0	NS
P	*Platanthera huronensis*	Fragrant Green Orchid				S1S2	5	57.8 ± 10.0	NS
P	*Calamagrostis stricta ssp. stricta*	Slim-stemmed Reed Grass				S1S2	26	73.9 ± 0.0	PE
P	*Carex vacillans*	Estuarine Sedge				S1S3	3	87.5 ± 0.0	NS
P	*Zizia aurea*	Golden Alexanders				S2	47	21.8 ± 1.0	NS
P	*Antennaria parlinii ssp. fallax*	Parlin's Pussytoes				S2	4	10.9 ± 0.0	NS
P	*Rudbeckia laciniata*	Cut-Leaved Coneflower				S2	25	18.5 ± 0.0	NS
P	*Arabis pycnocarpa*	Cream-flowered Rockcress				S2	1	95.1 ± 0.0	NS
P	*Hudsonia ericoides*	Pinebarren Golden Heather				S2	3	93.9 ± 5.0	PE
P	*Desmodium canadense*	Canada Tick-trefoil				S2	20	19.9 ± 0.0	NS
P	*Anemonastrum canadense*	Canada Anemone				S2	1	37.2 ± 0.0	NS
P	*Hepatica americana*	Round-lobed Hepatica				S2	27	5.3 ± 0.0	NS
P	*Galium boreale*	Northern Bedstraw				S2	7	60.8 ± 5.0	NS
P	*Comandra umbellata*	Bastard's Toadflax				S2	51	83.8 ± 5.0	NS
P	*Gratiola neglecta*	Clammy Hedge-Hyssop				S2	5	44.9 ± 0.0	NS
P	*Dirca palustris*	Eastern Leatherwood				S2	5	68.5 ± 7.0	NS
P	*Carex chordorrhiza*	Creeping Sedge				S2	1	87.8 ± 1.0	PE
P	*Carex gynocrates*	Northern Bog Sedge				S2	2	69.1 ± 0.0	NS
P	*Carex pellita*	Woolly Sedge				S2	12	19.2 ± 0.0	NS
P	*Carex livida*	Livid Sedge				S2	14	51.9 ± 0.0	NS
P	*Juncus greenei*	Greene's Rush				S2	7	62.5 ± 1.0	NS
P	*Juncus alpinoarticulatus ssp.*	Northern Green Rush				S2	7	90.7 ± 3.0	PE

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	americanus								
P	*Luzula spicata*	Spiked Woodrush				S2	1	77.3 ± 0.0	NS
P	*Allium tricoccum*	Wild Leek				S2	8	18.3 ± 0.0	NS
P	*Lilium canadense*	Canada Lily				S2	109	5.8 ± 6.0	NS
P	*Cypripedium parviflorum var. pubescens*	Yellow Lady's-slipper				S2	37	17.8 ± 7.0	NS
P	*Cypripedium reginae*	Showy Lady's-Slipper				S2	68	12.3 ± 0.0	NS
P	*Platanthera flava var. herbiola*	Pale Green Orchid				S2	8	16.2 ± 0.0	NS
P	*Platanthera macrophylla*	Large Round-Leaved Orchid				S2	13	9.2 ± 5.0	NS
P	*Bromus latiglumis*	Broad-Glumed Brome				S2	33	35.1 ± 0.0	NS
P	*Cinna arundinacea*	Sweet Wood Reed Grass				S2	19	42.0 ± 0.0	NS
P	*Elymus wiegandii*	Wiegand's Wild Rye				S2	20	11.4 ± 0.0	NS
P	*Festuca subverticillata*	Nodding Fescue				S2	5	68.5 ± 1.0	NS
P	*Cryptogramma stelleri*	Steller's Rockbrake				S2	1	80.6 ± 0.0	NS
P	*Cuscuta cephalanthi*	Buttonbush Dodder				S2?	7	13.9 ± 1.0	NS
P	*Rumex persicarioides*	Peach-leaved Dock				S2?	5	68.9 ± 5.0	PE
P	*Crataegus submollis*	Quebec Hawthorn				S2?	6	36.4 ± 5.0	NS
P	*Carex peckii*	White-Tinged Sedge				S2?	3	34.3 ± 0.0	NS
P	*Thuja occidentalis*	Eastern White Cedar			Vulnerable	S2S3	937	59.4 ± 0.0	NS
P	*Osmorhiza longistylis*	Smooth Sweet Cicely				S2S3	18	9.9 ± 0.0	NS
P	*Bidens hyperborea*	Estuary Beggarticks				S2S3	3	72.1 ± 0.0	NS
P	*Erigeron philadelphicus*	Philadelphia Fleabane				S2S3	5	48.5 ± 5.0	NS
P	*Lactuca hirsuta*	Hairy Lettuce				S2S3	3	72.0 ± 5.0	PE
P	*Impatiens pallida*	Pale Jewelweed				S2S3	3	48.4 ± 0.0	NS
P	*Caulophyllum thalictroides*	Blue Cohosh				S2S3	58	18.2 ± 0.0	NS
P	*Boechera stricta*	Drummond's Rockcress				S2S3	8	28.0 ± 0.0	NS
P	*Stellaria humifusa*	Saltmarsh Starwort				S2S3	10	70.0 ± 1.0	PE
P	*Oxybasis rubra*	Red Goosefoot				S2S3	9	18.2 ± 0.0	NS
P	*Hypericum majus*	Large St John's-wort				S2S3	24	53.2 ± 0.0	NS
P	*Hypericum x dissimulatum*	Disguised St. John's-wort				S2S3	5	61.8 ± 1.0	NS
P	*Empetrum atropurpureum*	Purple Crowberry				S2S3	5	91.5 ± 5.0	PE
P	*Euphorbia polygonifolia*	Seaside Spurge				S2S3	13	42.4 ± 1.0	PE
P	*Myriophyllum farwellii*	Farwell's Water Milfoil				S2S3	9	41.7 ± 0.0	NS
P	*Hedeoma pulegioides*	American False Pennyroyal				S2S3	7	20.3 ± 5.0	NS
P	*Oenothera fruticosa ssp. tetragona*	Narrow-leaved Evening Primrose				S2S3	3	18.6 ± 7.0	NS
P	*Polygonum aviculare ssp. buxiforme*	Box Knotweed				S2S3	5	20.7 ± 0.0	NS
P	*Polygonum oxyspermum ssp. raii*	Ray's Knotweed				S2S3	4	90.3 ± 5.0	PE
P	*Rumex triangulivalvis*	Triangular-valve Dock				S2S3	7	54.4 ± 0.0	NS
P	*Primula mistassinica*	Mistassini Primrose				S2S3	16	29.5 ± 0.0	NS
P	*Anemone quinquefolia*	Wood Anemone				S2S3	20	41.7 ± 0.0	NS
P	*Caltha palustris*	Yellow Marsh Marigold				S2S3	53	35.5 ± 0.0	NS
P	*Amelanchier fernaldii*	Fernald's Serviceberry				S2S3	3	86.2 ± 5.0	NS
P	*Potentilla canadensis*	Canada Cinquefoil				S2S3	1	58.3 ± 5.0	NS
P	*Galium obtusum*	Blunt-leaved Bedstraw				S2S3	1	94.8 ± 1.0	NB
P	*Salix pellita*	Satiny Willow				S2S3	5	44.7 ± 0.0	NS
P	*Tiarella cordifolia*	Heart-leaved Foamflower				S2S3	222	9.3 ± 0.0	NS
P	*Agalinis purpurea var. parviflora*	Small-flowered Purple False Foxglove				S2S3	12	14.8 ± 0.0	NS
P	*Boehmeria cylindrica*	Small-spike False-nettle				S2S3	2	78.8 ± 0.0	NS
P	*Carex adusta*	Lesser Brown Sedge				S2S3	6	39.0 ± 0.0	NS
P	*Carex capillaris*	Hairlike Sedge				S2S3	1	96.0 ± 0.0	NS
P	*Carex comosa*	Bearded Sedge				S2S3	6	44.6 ± 7.0	NS
P	*Carex houghtoniana*	Houghton's Sedge				S2S3	5	54.5 ± 1.0	NS
P	*Carex hystericina*	Porcupine Sedge				S2S3	7	19.2 ± 0.0	NS

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P	*Eleocharis ovata*	Ovate Spikerush				S2S3	7	17.9 ± 0.0	NS
P	*Scirpus pedicellatus*	Stalked Bulrush				S2S3	7	42.9 ± 0.0	NS
P	*Vallisneria americana*	Wild Celery				S2S3	7	52.6 ± 1.0	NS
P	*Juncus ranarius*	Seaside Rush				S2S3	1	95.8 ± 25.0	PE
P	*Goodyera pubescens*	Downy Rattlesnake-Plantain				S2S3	2	74.4 ± 1.0	NS
P	*Spiranthes casei var. novaescotiae*	Case's Ladies'-Tresses				S2S3	2	85.2 ± 0.0	PE
P	*Spiranthes lucida*	Shining Ladies'-Tresses				S2S3	22	16.7 ± 5.0	NS
P	*Calamagrostis stricta*	Slim-stemmed Reed Grass				S2S3	11	74.9 ± 0.0	PE
P	*Potamogeton friesii*	Fries' Pondweed				S2S3	19	36.1 ± 5.0	NS
P	*Woodsia glabella*	Smooth Cliff Fern				S2S3	1	56.5 ± 1.0	NS
P	*Botrychium lanceolatum ssp. angustisegmentum*	Narrow Triangle Moonwort				S2S3	9	2.9 ± 0.0	NS
P	*Botrychium simplex*	Least Moonwort				S2S3	3	29.1 ± 0.0	NS
P	*Ophioglossum pusillum*	Northern Adder's-tongue				S2S3	7	12.1 ± 0.0	NS
P	*Potamogeton pulcher*	Spotted Pondweed			Vulnerable	S3	3	51.8 ± 2.0	NS
P	*Angelica atropurpurea*	Purple-stemmed Angelica				S3	8	43.3 ± 0.0	NS
P	*Conioselinum chinense*	Chinese Hemlock-parsley				S3	3	6.7 ± 5.0	NS
P	*Hieracium robinsonii*	Robinson's Hawkweed				S3	3	12.6 ± 7.0	NS
P	*Senecio pseudoarnica*	Seabeach Ragwort				S3	15	40.2 ± 7.0	NS
P	*Symphyotrichum boreale*	Boreal Aster				S3	59	40.2 ± 7.0	NS
P	*Symphyotrichum ciliolatum*	Fringed Blue Aster				S3	20	19.5 ± 0.0	NS
P	*Betula michauxii*	Michaux's Dwarf Birch				S3	32	57.6 ± 0.0	NS
P	*Betula pumila*	Bog Birch				S3	35	69.5 ± 0.0	NS
P	*Cardamine parviflora*	Small-flowered Bittercress				S3	4	93.5 ± 0.0	NS
P	*Palustricodon aparinoides*	Marsh Bellflower				S3	36	6.1 ± 0.0	NS
P	*Mononeuria groenlandica*	Greenland Stitchwort				S3	2	82.6 ± 0.0	NS
P	*Sagina nodosa*	Knotted Pearlwort				S3	9	91.9 ± 0.0	NS
P	*Sagina nodosa ssp. borealis*	Knotted Pearlwort				S3	9	90.7 ± 0.0	NS
P	*Stellaria longifolia*	Long-leaved Starwort				S3	18	15.3 ± 0.0	NS
P	*Ceratophyllum echinatum*	Prickly Hornwort				S3	13	42.0 ± 0.0	NS
P	*Triosteum aurantiacum*	Orange-fruited Tinker's Weed				S3	99	15.4 ± 0.0	NS
P	*Viburnum edule*	Squashberry				S3	3	5.3 ± 0.0	NS
P	*Crassula aquatica*	Water Pygmyweed				S3	6	86.0 ± 5.0	PE
P	*Empetrum eamesii*	Pink Crowberry				S3	12	68.6 ± 5.0	PE
P	*Halenia deflexa*	Spurred Gentian				S3	1	86.7 ± 1.0	NS
P	*Geranium bicknellii*	Bicknell's Crane's-bill				S3	5	50.8 ± 2.0	NS
P	*Myriophyllum verticillatum*	Whorled Water Milfoil				S3	2	42.3 ± 0.0	NS
P	*Epilobium strictum*	Downy Willowherb				S3	48	38.1 ± 5.0	NS
P	*Polygala sanguinea*	Blood Milkwort				S3	20	9.0 ± 0.0	NS
P	*Persicaria arifolia*	Halberd-leaved Tearthumb				S3	30	38.4 ± 0.0	NS
P	*Plantago rugelii*	Rugel's Plantain				S3	7	13.3 ± 0.0	NS
P	*Samolus parviflorus*	Seaside Brookweed				S3	22	55.3 ± 0.0	NS
P	*Pyrola minor*	Lesser Pyrola				S3	2	12.4 ± 0.0	NS
P	*Anemone virginiana*	Virginia Anemone				S3	28	19.9 ± 1.0	NS
P	*Galium labradoricum*	Labrador Bedstraw				S3	103	41.1 ± 0.0	NS
P	*Salix pedicellaris*	Bog Willow				S3	55	23.9 ± 7.0	NS
P	*Salix sericea*	Silky Willow				S3	1	90.5 ± 1.0	NS
P	*Lindernia dubia*	Yellow-seeded False Pimperel				S3	46	13.0 ± 0.0	NS
P	*Laportea canadensis*	Canada Wood Nettle				S3	46	13.1 ± 0.0	NS
P	*Pilea pumila*	Dwarf Clearweed				S3	29	36.8 ± 6.0	NS
P	*Viola nephrophylla*	Northern Bog Violet				S3	10	12.1 ± 1.0	NS
P	*Carex bebbii*	Bebb's Sedge				S3	20	28.1 ± 0.0	NS
P	*Carex castanea*	Chestnut Sedge				S3	26	62.6 ± 0.0	NS
P	*Carex cryptolepis*	Hidden-scaled Sedge				S3	13	41.8 ± 0.0	NS
P	*Carex eburnea*	Bristle-leaved Sedge				S3	33	47.4 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Carex hirtifolia*	Pubescent Sedge				S3	44	12.7 ± 0.0	NS
P	*Carex lupulina*	Hop Sedge				S3	30	6.6 ± 0.0	NS
P	*Carex rosea*	Rosy Sedge				S3	20	5.3 ± 0.0	NS
P	*Carex tenera*	Tender Sedge				S3	8	6.3 ± 1.0	NS
P	*Carex tribuloides*	Blunt Broom Sedge				S3	12	19.2 ± 2.0	NS
P	*Carex tuckermanii*	Tuckerman's Sedge				S3	12	6.8 ± 0.0	NS
P	*Eleocharis nitida*	Quill Spikerush				S3	4	83.5 ± 7.0	NS
P	*Eleocharis flavescens var. olivacea*	Bright-green Spikerush				S3	7	41.7 ± 0.0	NS
P	*Eleocharis quinqueflora*	Few-flowered Spikerush				S3	1	97.0 ± 3.0	PE
P	*Eriophorum gracile*	Slender Cottongrass				S3	14	38.3 ± 10.0	NS
P	*Schoenoplectus americanus*	Olney's Bulrush				S3	1	77.3 ± 0.0	NS
P	*Coeloglossum viride*	Long-bracted Frog Orchid				S3	1	64.7 ± 0.0	NS
P	*Cypripedium parviflorum*	Yellow Lady's-slipper				S3	26	12.2 ± 0.0	NS
P	*Neottia bifolia*	Southern Twayblade				S3	25	28.6 ± 0.0	NS
P	*Platanthera grandiflora*	Large Purple Fringed Orchid				S3	132	9.0 ± 0.0	NS
P	*Platanthera hookeri*	Hooker's Orchid				S3	17	50.5 ± 0.0	NS
P	*Dichanthelium linearifolium*	Narrow-leaved Panic Grass				S3	4	18.1 ± 7.0	NS
P	*Piptatheropsis canadensis*	Canada Ricegrass				S3	9	45.5 ± 1.0	NS
P	*Poa glauca*	Glaucous Blue Grass				S3	1	96.0 ± 0.0	NS
P	*Stuckenia filiformis*	Thread-leaved Pondweed				S3	7	81.1 ± 0.0	PE
P	*Potamogeton praelongus*	White-stemmed Pondweed				S3	43	17.7 ± 1.0	NS
P	*Potamogeton richardsonii*	Richardson's Pondweed				S3	6	12.9 ± 7.0	NS
P	*Potamogeton zosteriformis*	Flat-stemmed Pondweed				S3	16	43.3 ± 0.0	NS
P	*Asplenium viride*	Green Spleenwort				S3	9	62.5 ± 7.0	NS
P	*Dryopteris fragrans*	Fragrant Wood Fern				S3	7	26.3 ± 7.0	NS
P	*Sceptridium dissectum*	Dissected Moonwort				S3	6	11.6 ± 5.0	NS
P	*Polypodium appalachianum*	Appalachian Polypody				S3	13	12.8 ± 0.0	NS
P	*Persicaria amphibia var. emersa*	Long-root Smartweed				S3?	3	65.2 ± 0.0	NS
P	*Spiranthes ochroleuca*	Yellow Ladies'-tresses				S3?	13	25.1 ± 0.0	NS
P	*Diphasiastrum x sabinifolium*	Savin-leaved Ground-cedar				S3?	14	20.5 ± 0.0	NS
P	*Bidens vulgata*	Tall Beggarticks				S3S4	5	29.7 ± 0.0	NS
P	*Erigeron hyssopifolius*	Hyssop-leaved Fleabane				S3S4	36	56.6 ± 0.0	NS
P	*Hieracium paniculatum*	Panicled Hawkweed				S3S4	6	10.1 ± 0.0	NS
P	*Bidens beckii*	Water Beggarticks				S3S4	13	25.9 ± 0.0	NS
P	*Packera paupercula*	Balsam Groundsel				S3S4	75	20.0 ± 0.0	NS
P	*Atriplex glabriuscula var. franktonii*	Frankton's Saltbush				S3S4	7	27.0 ± 2.0	NS
P	*Vaccinium boreale*	Northern Blueberry				S3S4	4	90.7 ± 0.0	NS
P	*Vaccinium cespitosum*	Dwarf Bilberry				S3S4	54	26.7 ± 0.0	NS
P	*Vaccinium corymbosum*	Highbush Blueberry				S3S4	1	96.4 ± 3.0	PE
P	*Fagus grandifolia*	American Beech				S3S4	213	5.6 ± 1.0	NS
P	*Bartonia virginica*	Yellow Bartonia				S3S4	1	90.5 ± 7.0	NS
P	*Proserpinaca pectinata*	Comb-leaved Mermaidweed				S3S4	2	40.7 ± 1.0	NS
P	*Decodon verticillatus*	Swamp Loosestrife				S3S4	1	89.3 ± 0.0	PE
P	*Nuphar microphylla*	Small Yellow Pond-lily				S3S4	3	12.7 ± 2.0	NS
P	*Persicaria pensylvanica*	Pennsylvania Smartweed				S3S4	22	12.1 ± 0.0	NS
P	*Fallopia scandens*	Climbing False Buckwheat				S3S4	46	13.1 ± 0.0	NS
P	*Rumex pallidus*	Seabeach Dock				S3S4	2	76.6 ± 0.0	NS
P	*Pyrola asarifolia*	Pink Pyrola				S3S4	16	23.3 ± 0.0	NS
P	*Endotropis alnifolia*	alder-leaved buckthorn				S3S4	284	41.1 ± 0.0	NS
P	*Amelanchier spicata*	Running Serviceberry				S3S4	13	10.0 ± 2.0	NS
P	*Crataegus succulenta*	Fleshy Hawthorn				S3S4	5	80.4 ± 5.0	PE
P	*Fragaria vesca ssp. americana*	Woodland Strawberry				S3S4	68	23.1 ± 1.0	NS
P	*Fragaria vesca*	Woodland Strawberry				S3S4	1	62.7 ± 0.0	NS
P	*Galium aparine*	Common Bedstraw				S3S4	16	39.1 ± 4.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Geocaulon lividum*	Northern Comandra				S3S4	17	57.4 ± 0.0	NS
P	*Limosella australis*	Southern Mudwort				S3S4	45	52.0 ± 1.0	PE
P	*Ulmus americana*	White Elm				S3S4	87	6.3 ± 2.0	NS
P	*Verbena hastata*	Blue Vervain				S3S4	210	5.4 ± 0.0	NS
P	*Viola sagittata var. ovata*	Arrow-Leaved Violet				S3S4	4	70.3 ± 1.0	PE
P	*Viola selkirkii*	Great-Spurred Violet				S3S4	4	64.7 ± 0.0	NS
P	*Symplocarpus foetidus*	Eastern Skunk Cabbage				S3S4	19	92.7 ± 0.0	NB
P	*Carex argyrantha*	Silvery-flowered Sedge				S3S4	1	57.2 ± 5.0	PE
P	*Triglochin gaspensis*	Gasp ├ Arrowgrass				S3S4	24	90.5 ± 0.0	NS
P	*Juncus acuminatus*	Sharp-Fruit Rush				S3S4	3	64.1 ± 0.0	NS
P	*Juncus subcaudatus*	Woods-Rush				S3S4	19	19.6 ± 5.0	NS
P	*Luzula parviflora ssp. melanocarpa*	Black-fruited Woodrush				S3S4	5	57.6 ± 0.0	NS
P	*Goodyera repens*	Lesser Rattlesnake-plantain				S3S4	9	43.0 ± 1.0	PE
P	*Liparis loeselii*	Loesel's Twayblade				S3S4	23	43.5 ± 5.0	PE
P	*Platanthera obtusata*	Blunt-leaved Orchid				S3S4	6	65.6 ± 1.0	NS
P	*Platanthera orbiculata*	Small Round-leaved Orchid				S3S4	39	2.9 ± 0.0	NS
P	*Alopecurus aequalis*	Short-awned Foxtail				S3S4	26	33.1 ± 1.0	NS
P	*Dichanthelium clandestinum*	Deer-tongue Panic Grass				S3S4	119	59.9 ± 0.0	NS
P	*Panicum philadelphicum*	Philadelphia Panicgrass				S3S4	11	53.0 ± 0.0	NS
P	*Koeleria spicata*	Narrow False Oats				S3S4	9	20.3 ± 0.0	NS
P	*Equisetum pratense*	Meadow Horsetail				S3S4	10	30.1 ± 0.0	NS
P	*Diphasiastrum complanatum*	Northern Ground-cedar				S3S4	12	28.3 ± 0.0	NS
P	*Diphasiastrum sitchense*	Sitka Ground-cedar				S3S4	7	31.8 ± 5.0	NS
P	*Huperzia appressa*	Mountain Firmoss				S3S4	7	30.8 ± 5.0	NS
P	*Sceptridium multifidum*	Leathery Moonwort				S3S4	23	19.9 ± 0.0	NS
P	*Botrychium matricariifolium*	Daisy-leaved Moonwort				S3S4	17	12.4 ± 10.0	NS
P	*Viola canadensis*	Canada Violet				SH	1	32.7 ± 7.0	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.

# recs	CITATION
10612	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
10383	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
5870	Paquet, Julie. 2018. Atlantic Canada Shorebird Survey (ACSS) database 2012-2018. Environment Canada, Canadian Wildlife Service.
4904	Pardieck, K.L., Ziolkowski Jr., D.J., Lutmerding, M., Aponte, V.I., and Hudson, M-A.R. 2020. North American Breeding Bird Survey Dataset 1966 - 2019: U.S. Geological Survey data release, https://doi.org/10.5066/P9J6QUF6
4110	Eaton, S. 2014. Nova Scotia Wood Turtle Database. Environment and Climate Change Canada, 4843 recs.
3887	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
1185	eBird. 2020. eBird Basic Dataset. Version: EBD_relNov-2019. Ithaca, New York. Nov 2019, Cape Breton Bras d'Or Lakes Watershed subset. Cornell Lab of Ornithology.
911	iNaturalist. 2020. iNaturalist Data Export 2020. iNaturalist.org and iNaturalist.ca, Web site: 128728 recs.
889	Patrick, A.; Horne, D.; Noseworthy, J. et. al. 2017. Field data for Nova Scotia and New Brunswick, 2015 and 2017. Nature Conservancy of Canada.
801	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
620	Parks Canada. 2021. PEI National Park Bank swallow nest records from 2010-2019. Parks Canada, 1535 records.
614	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database [as of 2018-03]. Mersey Tobeatic Research Institute.
447	Clayden, S. Digitization of Wolfgang Maass Nova Scotia forest lichen collections, 1964-2004. New Brunswick Museum. 2018.
409	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2014. Atlantic Canada Conservation Data Centre Fieldwork 2014. Atlantic Canada Conservation Data Centre, # recs.
401	SwiftWatch. 2022. Total Chimney Swift counts from roost watches for the duration of the SwiftWatch program (2011-2021). Birds Canada.
387	Wilhelm, S.I. et al. 2011. Colonial Waterbird Database. Canadian Wildlife Service, Sackville, 2698 sites, 9718 recs (8192 obs).
333	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
331	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
330	Blaney, C.S.; Mazerolle, D.M. 2010. Fieldwork 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 15508 recs.
309	Paquet, Julie. 2019. Atlantic Canada Shorebird Survey ACSS database for 2019. Environment Canada, Canadian Wildlife Service.

# recs	CITATION
304	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 records.
286	Hicks, Andrew. 2009. Coastal Waterfowl Surveys Database, 2000-08. Canadian Wildlife Service, Sackville, 46488 recs (11149 non-zero).
272	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2015. Atlantic Canada Conservation Data Centre Fieldwork 2015. Atlantic Canada Conservation Data Centre, # 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.
226	Neily, T.H. 2017. Nova Scotia lichen records. Mersey Tobeatic Research Institute.
225	MacDonald, E.C. 2018. Piping Plover nest records from 2010-2017. Canadian Wildlife Service.
209	eBird. 2014. eBird Basic Dataset. Version: EBD_relNov-2014. Ithaca, New York. Nov 2014. Cornell Lab of Ornithology, 25036 recs.
208	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
199	Blaney, C.S.; Mazerolle, D.M. 2012. Fieldwork 2012. Atlantic Canada Conservation Data Centre, 13,278 recs.
187	Chapman, C.J. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 11171 recs.
185	Scott, F.W. 2002. Nova Scotia Herpetofauna Atlas Database. Acadia University, Wolfville NS, 8856 recs.
177	Island Nature Trust. 2016. Farmland birds project. Mader, Shannon (ed.) .
170	Bryson, I. 2013. Nova Scotia rare plant records. CBCL Ltd., 180 records.
169	MacDonald, E.C. 2018. CWS Piping Plover Census, 2010-2017. Canadian Wildlife Service, 672 recs.
168	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
166	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.
165	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: http://luxor.acadiau.ca/library/Herbarium/project/. 582 recs.
155	Klymko, J. 2018. Maritimes Butterfly Atlas database. Atlantic Canada Conservation Data Centre.
147	Bryson, I.C. 2020. Nova Scotia flora and lichen observations 2020. Nova Scotia Environment, 139 recs.
144	Mazerolle, D.M. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 13515 recs.
142	Catling, P.M., Erskine, D.S. & MacLaren, R.B. 1985. The Plants of Prince Edward Island with new records, nomenclatural changes & corrections & deletions, 1st Ed. Research Branch, Agriculture Canada, Ottawa, Publication 1798. 22pp.
137	Pepper, C. 2021. Rare bird, plant and mammal observations in Nova Scotia, 2017-2021.
135	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.
130	Chapman-Lam, C.J. 2022. Atlantic Canada Conservation Data Centre 2021 botanical fieldwork. Atlantic Canada Conservation Data Centre, 15099 recs.
128	Pepper, C. 2013. 2013 rare bird and plant observations in Nova Scotia. , 181 records.
127	MacDonald, Haley. 2022. Updates to Fraxinus nigra observations on NCC Docherty's Brook property. Nature Conservancy of Canada.
121	LaPaix, R.W.; Crowell, M.J.; MacDonald, M. 2011. Stantec rare plant records, 2010-11. Stantec Consulting, 334 recs.
120	Amirault, D.L. & McKnight, J. 2003. Piping Plover Database 1991-2003. Canadian Wildlife Service, Sackville, unpublished data. 7 recs.
111	Richardson, Leif. 2018. Maritimes Bombus records from various sources. Richardson, Leif.
110	Belliveau, A.G. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
109	Burke, Lindsey. 2022. Species data recorded during the 2021 season at Prince Edward Island National Park. Parks Canada.
109	Neily, T.H. & Pepper, C. 2020. Nova Scotia SMP lichen surveys 2020. Mersey Tobeatic Research Institute.
100	Klymko, J.J.D. 2012. Insect fieldwork & submissions, 2011. Atlantic Canada Conservation Data Centre. Sackville NB, 760 recs.
100	Toms, B. 2018. Bat Species data from www.batconservation.ca for Nova Scotia. Mersey Tobeatic Research Institute, 547 Records.
97	Cameron, R.P. 2009. Cyanolichen database. Nova Scotia Environment & Labour, 1724 recs.
91	Burns, L. 2013. Personal communication concerning bat occurrence on PEI. Winter 2013. Pers. comm.
88	Canadian Wildlife Service, Dartmouth. 2010. Piping Plover censuses 2007-09, 304 recs.
87	McNeil, J.A. 2018. Wood Turtle records, 2018. Mersey Tobeatic Research Institute, 68 recs.
83	Chapman-Lam, C.J. 2021. Atlantic Canada Conservation Data Centre 2020 botanical fieldwork. Atlantic Canada Conservation Data Centre, 17309 recs.
80	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
78	Nature Conservancy of Canada. 2022. NCC Field data for Nova Scotia. Nature Conservancy of Canada.
75	Blaney, C.S. 2000. Fieldwork 2000. Atlantic Canada Conservation Data Centre. Sackville NB, 1265 recs.
75	Cameron, R.P. 2011. Lichen observations, 2011. Nova Scotia Environment & Labour, 731 recs.
73	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-03-18]. Mersey Tobeatic Research Institute.
72	Staicer, C. & Bliss, S.; Achenbach, L. 2017. Occurrences of tracked breeding birds in forested wetlands. , 303 records.
69	Berrigan, L. 2019. Maritimes Marsh Monitoring Project 2013, 2014, 2016, 2017, and 2018 data. Bird Studies Canada, Sackville, NB.
68	Blaney, C.S.; Mazerolle, D.M. 2008. Fieldwork 2008. Atlantic Canada Conservation Data Centre. Sackville NB, 13343 recs.
68	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2013. Atlantic Canada Conservation Data Centre Fieldwork 2013. Atlantic Canada Conservation Data Centre, 9000+ recs.
63	Klymko, John. 2022. Atlantic Canada Conservation Data Centre zoological fieldwork 2021. Atlantic Canada Conservation Data Centre.
62	Blaney, C.S.; Mazerolle, D.M.; Oberndorfer, E. 2007. Fieldwork 2007. Atlantic Canada Conservation Data Centre. Sackville NB, 13770 recs.
62	Cameron, R.P. 2009. Erioderma pedicellatum database, 1979-2008. Dept Environment & Labour, 103 recs.
62	Manthorne, A. 2014. MaritimesSwiftwatch Project database 2013-2014. Bird Studies Canada, Sackville NB, 326 recs.
61	Arsenault, M. 2019. Cormorant colony nest counts. PE Department of Communities, Land, and Environment.
61	Ayles, P. 2006. Prince Edward Island National Park Digital Database. Parks Canada, 179 recs.
61	Glen, W. 1991. 1991 Prince Edward Island Forest Biomass Inventory Data. PEI Dept of Energy and Forestry, 10059 recs.
60	Mazerolle, D.M. 2017. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
57	Munro, Marian K. Tracked lichen specimens, Nova Scotia Provincial Museum of Natural History Herbarium. Atlantic Canada Conservation Data Centre. 2019.
57	Toms, Brad & Pepper, Chris; Neily, Tom. 2022. Nova Scotia lichen database [as of 2022-04]. Mersey Tobeatic Research Institute.

# recs	CITATION
56	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
52	Blaney, C.S.; Spicer, C.D.; Popma, T.M.; Hanel, C. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 2252 recs.
52	Roland, A.E. & Smith, E.C. 1969. The Flora of Nova Scotia, 1st Ed. Nova Scotia Museum, Halifax, 743pp.
50	Blaney, C.S.; Mazerolle, D.M.; Klymko, J; Spicer, C.D. 2006. Fieldwork 2006. Atlantic Canada Conservation Data Centre. Sackville NB, 8399 recs.
50	iNaturalist. 2018. iNaturalist Data Export 2018. iNaturalist.org and iNaturalist.ca, Web site: 11700 recs.
48	eBird. 2021. eBird Basic Dataset. Version: EBD_relOct-2020. Ithaca, New York. Oct 2020, Prince Edward Island Bird SAR subset. Cornell Lab of Ornithology.
47	Churchill, J.L. 2020. Atlantic Canada Conservation Data Centre Fieldwork 2020. Atlantic Canada Conservation Data Centre, 1083 recs.
47	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
45	Staicer, C. 2021. Additional compiled Nova Scotia Species at Risk bird records, 2005-2020. Dalhousie University.
44	Blaney, C.S. 2020. Sean Blaney 2020 field data. Atlantic Canada Conservation Data Centre, 4407 records.
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.
44	Nussey, Pat & NCC staff. 2019. AEI tracked species records, 2016-2019. Chapman, C.J. (ed.) Atlantic Canada Conservation Data Centre, 333.
43	Benjamin, L.K. 2012. NSDNR fieldwork & consultant reports 2008-2012. Nova Scotia Dept Natural Resources, 196 recs.
42	Erskine, D. 1960. The plants of Prince Edward Island, 1st Ed. Research Branch, Agriculture Canada, Ottawa., Publication 1088. 1238 recs.
41	Curley, F.R. 2005. PEF&W Collection 2003-04. PEI Fish & Wildlife Div., 716 recs.
41	Nova Scotia Nature Trust. 2013. Nova Scotia Nature Trust 2013 Species records. Nova Scotia Nature Trust, 95 recs.
40	Patrick, Allison. 2021. Animal and plant records from NCC properties from 2019 and 2020. Nature Conservancy Canada.
39	Staicer, Cindy. 2022. 2021 Landbird Species at Risk observations. Dalhousie University.
38	Pulsifer, M.D. 2002. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 369 recs.
37	Blaney, C.S. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 1042 recs.
37	PEI National Park. 2019. SAR and Bombus records from PEI NP from the 2019 field season. Moody, Allison (ed.) PEI National Park, 158 recs.
36	Hall, R.A. 2001. S.. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 178 recs.
36	Hall, R.A. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 189 recs.
34	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.
33	Blaney, C.S. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2018. Atlantic Canada Conservation Data Centre.
33	iNaturalist. 2020. iNaturalist butterfly records selected for the Maritimes Butterfly Atlas. iNaturalist.
32	Belliveau, A.G. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre, 10695 recs.
30	Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
30	Chapman, C.J. 2019. Atlantic Canada Conservation Data Centre 2019 botanical fieldwork. Atlantic Canada Conservation Data Centre, 11729 recs.
30	Parks Canada. 2021. PEI National Park 2020 Species at Risk records. Parks Canada, 40 records.
30	Tims, J. & Craig, N. 1995. Environmentally Significant Areas in New Brunswick (NBESA). NB Dept of Environment & Nature Trust of New Brunswick Inc, 6042 recs. https://doi.org/10.1037/arc0000014.
29	Benjamin, L.K. (compiler). 2001. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources, 15 spp, 224 recs.
29	Neily, T.H. 2010. Erioderma Pedicellatum records 2005-09. Mersey Tobiatic Research Institute, 67 recs.
28	Sharkie, R., MacQuarrie, K., Fraser, M. 2003. A Floral Inventory of the Western Section of Prince Edward Island National Park and adjacent Crown lands. Parks Canada Agency, v + 106 pp.
27	Sollows, M.C,. 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.
26	Belliveau, A.G. 2021. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2021. E.C. Smith Herbarium.
26	Popma, T.M. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 113 recs.
25	Blaney, C.S.; Spicer, C.D.; Mazerolle, D.M. 2005. Fieldwork 2005. Atlantic Canada Conservation Data Centre. Sackville NB, 2333 recs.
25	MacQuarrie, K.E., H. Schaefer, and K. Schoenrank. 1999. A Floral inventory of the Western Area, Greenwich, Prince Edward Island National Park. Parks Canada Agency, Parks Canada Technical Reports in Ecosystem Science, No 021.
25	Pepper, Chris. 2012. Observations of breeding Canada Warbler's along the Eastern Shore, NS. Pers. comm. to S. Blaney, Jan. 20, 28 recs.
24	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
23	Belliveau, A.G. 2020. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2019, 2020. E.C. Smith Herbarium.
23	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
23	MacDonald, M. 2008. PEI Power Corridor Floral Surveys, 2004-08. Jacques Whitford Ltd, 2238 recs (979 rare).
22	Anderson, Frances; Neily, Tom. 2010. A Reconnaissance Level Survey of Calciphilous Lichens in Selected Karst Topography in Nova Scotia with Notes on Incidental Bryophytes. Mersey Tobeatic Research Institute.
22	Archibald, D.R. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 213 recs.
22	Powell, B.C. 1967. Female sexual cycles of Chrysemy spicta & Clemmys insculpta in Nova Scotia. Can. Field-Nat., 81:134-139. 26 recs.
21	Chapman, C.N. (Cody). 2020. Nova Scotia Black Ash (Fraxinus nigra) field observations by Confederacy of Mainland Mi'kmaq. Forestry Program, Confederacy of Mainland Mi'kmaq.
21	Tranquilla, L. 2015. Maritimes Marsh Monitoring Project 2015 data. Bird Studies Canada, Sackville NB, 5062 recs.
20	Cameron, R.P. 2018. Degelia plumbea records. Nova Scotia Environment.
20	Grandtner, M.M. 1971. Ecological Study of the Interior Dunes of West Brackley Beach, Prince Edward Island National Park. Parks Canada, 1: 70. 41 recs.
20	LaPaix, Rich. 2022. Rare species observations, 2018-2022. Nova Scotia Nature Trust.
20	Neily, T.H. 2019. Tom Neily NS Bryophyte records (2009-2013). T.H. Neily, Atlantic Canada Conservation Data Centre, 1029 specimen records.
19	Haughian, Sean. 2021. Update to lichen data from 2017-2021. Nova Scotia Museum.
19	Klymko, J.J.D.; Robinson, S.L. 2012. 2012 field data. Atlantic Canada Conservation Data Centre, 447 recs.
19	NS DNR. 2017. Black Ash records from NS DNR Permanent Sample Plots (PSPs), 1965-2016. NS Dept of Natural Resources.
18	Cameron, R.P. 2014. 2013-14 rare species field data. Nova Scotia Department of Environment, 35 recs.

# recs	CITATION
18	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
18	Neily, T. H. 2018. Lichen and Bryophyte records, AEI 2017-2018. Tom Neily; Atlantic Canada Conservation Data Centre.
18	Neily, T.H. 2012. 2012 Erioderma pedicellatum records in Nova Scotia.
17	LaPaix, R.W.; Crowell, M.J.; MacDonald, M.; Neily, T.D.; Quinn, G. 2017. Stantec Nova Scotia rare plant records, 2012-2016. Stantec Consulting.
17	McMullin, R.T. 2022. Maritimes lichen records. Canadian Museum of Nature.
17	NatureServe Canada. 2019. iNaturalist Maritimes Butterfly Records. iNaturalist.org and iNaturalist.ca.
16	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of C. insculpta sightings. Acadia University, Wolfville NS, 88 recs.
16	Cameron, R.P. 2013. 2013 rare species field data. Nova Scotia Department of Environment, 71 recs.
16	Canadian Wildlife Service, Atlantic Region. 2010. Piping Plover censuses 2006-09. , 35 recs.
16	e-Butterfly. 2016. Export of Maritimes records and photos. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
16	Gilhen, J. 1984. Amphibians & Reptiles of Nova Scotia, 1st Ed. Nova Scotia Museum, 164pp.
16	McNeil, J.A. 2016. Blandings Turtle (Emydoidea blandingii), Eastern Ribbonsnake (Thamnophis sauritus), Wood Turtle (Glyptemys insculpta), and Snapping Turtle (Chelydra serpentina) sightings, 2016. Mersey Tobeatic Research Institute, 774 records.
15	Belliveau, A. 2013. Rare species records from Nova Scotia. Mersey Tobeatic Research Institute, 296 records. 296 recs.
15	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
15	Ogden, J. NS DNR Butterfly Collection Dataset. Nova Scotia Department of Natural Resources. 2014.
14	Churchill, J.L. 2019. Atlantic Canada Conservation Data Centre Fieldwork 2019. Atlantic Canada Conservation Data Centre.
14	Ferguson, D.C. 1954. The Lepidoptera of Nova Scotia. Part I, macrolepidoptera. Proceedings of the Nova Scotian Institute of Science, 23(3), 161-375.
14	Hagerman, Christianne. 2022. Wisqoq and Eastern White Cedar field work. E.C. Smith Herbarium, Acadia University.
14	Phinney, Lori; Toms, Brad; et. al. 2016. Bank Swallows (Riparia riparia) in Nova Scotia: inventory and assessment of colonies. Merset Tobeiatc Research Institute, 25 recs.
14	Richardson, D., Anderson, F., Cameron, R, McMullin, T., Clayden, S. 2014. Field Work Report on Black Foam Lichen (Anzia colpodes). COSEWIC.
14	Spicer, C.D. & Harries, H. 2001. Mount Allison Herbarium Specimens. Mount Allison University, 128 recs.
14	Toms, Brad. 2022. Non-Lichen Observations from Lichen SMP and NCC Property Searches. Mersey Tobeatic Research Institute.
13	Belliveau, A.G. 2014. Plant Records from Southern and Central Nova Scotia. Atlantic Canada Conservation Data Centre, 919 recs.
13	Robinson, S.L. 2015. 2014 field data.
13	Westwood, A., Staicer, C. 2016. Nova Scotia landbird Species at Risk observations. Dalhousie University.
13	Wilhelm, S.I. et al. 2019. Colonial Waterbird Database. Canadian Wildlife Service.
12	Basquill, S.P. 2010. Plant data from Prince Edward Island National Park Forest Community Plots. Atlantic Canada Conservation Data Centre, 150 records.
12	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.
12	McMullin, R.T.; van Miltenburg, N.; Atkinson, K.-L.; Ayles, P. 2022. A Provisional List of the Lichens and Allied Fungi of Prince Edward Island National Park. Canadian Museum of Nature, 37 pp.
12	Plissner, J.H. & Haig, S.M. 1997. 1996 International piping plover census. US Geological Survey, Corvallis OR, 231 pp.
12	Spicer, C.D. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 211 recs.
11	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
11	Klymko, J. 2021. Atlantic Canada Conservation Data Centre zoological fieldwork 2020. Atlantic Canada Conservation Data Centre.
11	McLelland, Don. 2021. Orchid observations on PEI. Don McLelland. Pers. comm. to C.S. Blaney.
11	Oldham, M.J. 2000. Oldham database records from Maritime provinces. Oldham, M.J; ONHIC, 487 recs.
11	White, S. 2018. Notable species sightings, 2016-2017. East Coast Aquatics.
10	Basquill, S.P. 2012. 2012 rare vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.
10	Bateman, M.C. 2001. Coastal Waterfowl Surveys Database, 1965-2001. Canadian Wildlife Service, Sackville, 667 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 (Isoetes prototypus). Committee on the Status of Endangered Wildlife in Canada, 111 recs.
10	Klymko, J.J.D. 2016. 2015 field data. Atlantic Canada Conservation Data Centre.
10	McMullin, R.T. 2015. Prince Edward Island's lichen biodiversity and proposed conservation status in a report prepared for the province of PEI. Biodiversity Institute of Ontario Herbarium, University of Guelph, 776 records.
10	Zahavich, J. 2018. Canada Warbler and Olive-sided Flycatcher records 2018. Island Nature Trust, 14 recs.
10	Zahavich, J.L. 2020. Canada Warbler, Olive-sided Flycatcher and Eastern Wood-Pewee observations, Prince Edward Island, 2017-2019. Island Nature Trust.
9	Benjamin, L.K. 2011. NSDNR fieldwork & consultant reports 1997, 2009-10. Nova Scotia Dept Natural Resources, 85 recs.
9	Blaney, C.S. 2019. Sean Blaney 2019 field data. Atlantic Canada Conservation Data Centre, 4407 records.
9	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
9	Cameron-MacMillan, Maureen. 2020. Northern Goshawk Nests in Eastern Nova Scotia, as of November, 2020. Nova Scotia Department of Lands and Forestry.
9	Cameron, R.P. 2005. Erioderma pedicellatum unpublished data. NS Dept of Environment, 9 recs.
9	Cameron, R.P. 2006. Erioderma pedicellatum 2006 field data. NS Dept of Environment, 9 recs.
9	Cameron, R.P. 2017. 2017 rare species field data. Nova Scotia Environment, 64 recs.
9	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.
9	Stewart, J.I. 2010. Peregrine Falcon Surveys in New Brunswick, 2002-09. Canadian Wildlife Service, Sackville, 58 recs.
9	Webster, R.P. Atlantic Forestry Centre Insect Collection, Maritimes butterfly records. Natural Resources Canada. 2014.
8	Cameron, R.P. 2012. Rob Cameron 2012 vascular plant data. NS Department of Environment, 30 recs.
8	Curley, F.R. 2007. PEF&W Collection. PEI Fish & Wildlife Div., 199 recs.
8	Klymko, J.J.D.; Robinson, S.L. 2014. 2013 field data. Atlantic Canada Conservation Data Centre.

# recs	CITATION
8	MacArthur, M.E.L. 1976. An Ecological Study of the Greenwich Sand Dune System, M.Sc. Thesis. Department of Biology, Acadia University, Wolfville NS, 98 recs.
8	MacQuarrie, K.E., H. Schaefer, and K. Schoenrank. 2001. A Floral inventory of the Central and Schooner Pond Areas of Greenwich, Prince Edward Island National Park. Parks Canada Agency, Parks Canada Technical Reports in Ecosystem Science, No 030.
8	Manthorne, A. 2019. Incidental aerial insectivore observations. Birds Canada.
8	Mersey Tobetic Research Institute. 2021. 2020 Monarch records from the MTRI monitoring program. Mersey Tobetic Research Institute, 72 records.
8	Porter, Caitlin. 2021. Field data for 2020 in various locations across the Maritimes. Atlantic Canada Conservation Data Centre, 3977 records.
7	Basquill, S.P. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre, Sackville NB, 69 recs.
7	Belland, R.J. 2012. PEI moss records from Devonian Botanical Garden. DBG Cryptogam Database, Web site: https://secure.devonian.ualberta.ca/bryo_search.php 748 recs.
7	Benjamin, L.K. 2009. Boreal Felt Lichen, Mountain Avens, Orchid and other recent records. Nova Scotia Dept Natural Resources, 105 recs.
7	Brazner, J. 2016. Nova Scotia Forested Wetland Bird Surveys. Nova Scotia Department of Lands and Forestry.
7	Cameron, B. 2006. Hepatica americana 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	Harding, R.W. 2008. Harding Personal Insect Collection 1999-2007. R.W. Harding, 309 recs.
7	Hill, N.M. 1994. Status report on the Long's bulrush Scirpus longii in Canada. Committee on the Status of Endangered Wildlife in Canada, 7 recs.
7	Hubley, Nicole. 2022. Monarch (Danaus plexippus) records submitted to MTRI from the 2021 field season. Mersey Tobeatic Research Institute.
7	Hughes, Cory. 2020. Atlantic Forestry Centre Coccinella transversoguttata collections. Canadian Forest Service, Atlantic Forestry Centre.
7	Klymko, J. Dataset of butterfly records at the New Brunswick Museum not yet accessioned by the museum. Atlantic Canada Conservation Data Centre. 2016.
7	McLelland, Don. 2022. Orchid records for Prince Edward Island. Pers. comm.
7	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-05-25]. Mersey Tobeatic Research Institute, 668 recs.
7	Neily, T.H. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. T.H. Neily, Atlantic Canada Conservation Data Centre.
7	Neily, Tom. 2020. Lichen surveys for PEI Forested Landscapes Priority Place. Chapman, C.J. (ed.) Atlantic Canada Conservation Data Centre, 158 records.
7	Robinson, S.L. 2011. 2011 ND dune survey field data. Atlantic Canada Conservation Data Centre, 2715 recs.
7	Sabine, D.L. 2013. Dwaine Sabine butterfly records, 2009 and earlier.
7	Taylor, B.R., and Tam, J.C. 2012. Local distribution of the rare plant Triosteum aurantiacum in northeastern Nova Scotia, Canada. Rhodora, 114(960): 366-382.
6	Blaney, C.S.; Mazerolle, D.M. 2009. Fieldwork 2009. Atlantic Canada Conservation Data Centre. Sackville NB, 13395 recs.
6	Doucet, D.A. 2007. Lepidopteran Records, 1988-2006. Doucet, 700 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	Kelly, G. 2005. Fraxinus nigra. Dept of Agricuture, Fisheries, Aquaculture & Forestry. Pers. comm. to C.S. Blaney, Mar. 2, 11 recs.
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	Spicer, C.D. 2004. Specimens from CWS Herbarium, Mount Allison Herbarium Database. Mount Allison University, 5939 recs.
6	Stevens, C. 1999. Cam Stevens field data from PEI vegetation plots. Sent along with specimens to C.S. Blaney. UNB masters research project, 732 recs.
6	White, S. 2019. Notable species sightings, 2018. East Coast Aquatics.
5	Amirault, D.L. 1997-2000. Unpublished files. Canadian Wildlife Service, Sackville, 470 recs.
5	Blaney, C.S. 2017. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
5	Bryson, I. 2020. Nova Scotia and Newfoundland rare species observations, 2018-2020. Nova Scotia Environment.
5	Daury, R.W. & Bateman, M.C. 1996. The Barrow's Goldeneye (Bucephala islandica) in the Atlantic Provinces and Maine. Canadian Wildlife Service, Sackville, 47pp.
5	Dibblee, R.L. 1999. PEI Cormorant Survey. Prince Edward Island Fisheries, Aquaculture & Environment, 1p. 21 recs.
5	Erskine, A.J. 1999. Maritime Nest Records Scheme (MNRS) 1937-1999. Canadian Wildlife Service, Sackville, 313 recs.
5	Feltham, Carter. 2022. Monarch (Danaus plexippus) and Milkweed MTRI records from the 2022 Field Season. Mersey Tobeatic Research Institute.
5	Giberson, D. 2008. UPEI Insect Collection. University of Prince Edward Island, 157 recs.
5	Holder, M.L.; Kingsley, A.L. 2000. Kinglsey and Holder observations from 2000 field work.
5	Klymko, J.J.D. 2018. 2017 field data. Atlantic Canada Conservation Data Centre.
5	Majka, C.G. 2008. Lepidoptera at St Patricks, 1993-2007. Pers. comm. to R. Curley, 8 Jan. 29 recs, 29 recs.
5	Ogden, K. Nova Scotia Museum butterfly specimen database. Nova Scotia Museum. 2017.
5	Prince Edward Island National Park. 2014. Prince Edward Island National Park Herbarium. Parks Canada Agency, PEINP, 39 recs.
5	Richardson, D., Anderson, F., Cameron, R, Pepper, C., Clayden, S. 2015. Field Work Report on the Wrinkled Shingle lichen (Pannaria lurida). COSEWIC.
5	Smith, M.E.M. 2008. AgCan Collection. Agriculture Canada, Charlottetown PE, 44 recs.
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	Blaney, C.S. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2016. Atlantic Canada Conservation Data Centre, 6719 recs.
4	Bredin, K.A. 2002. NS Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centere, 30 recs.
4	Clayden, S.R. 1998. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 19759 recs.
4	e-Butterfly. 2019. Export of Maritimes records and photos. McFarland, K. (ed.) e-butterfly.org.
4	MacQuarrie, K. 1991-1999. Site survey files, maps. Island Nature Trust, Charlottetown PE, 60 recs.
4	Mazerolle, D.M. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
4	McNeil, J.A. 2020. Snapping Turtle and Eastern Painted Turtle records, 2020. Mersey Tobeatic Research Institute.
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.
4	Olsen, R. Herbarium Specimens. Nova Scotia Agricultural College, Truro. 2003.

# recs	CITATION
4	Sollows, M.C,. 2009. NBM Science Collections databases: molluscs. New Brunswick Museum, Saint John NB, download Jan. 2009, 6951 recs (2957 in Atlantic Canada).
3	Bagnell, B.A. 2001. New Brunswick Bryophyte Occurrences. B&B Botanical, Sussex, 478 recs.
3	Belliveau, A.G. 2018. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2018. E.C. Smith Herbarium, 6226 recs.
3	Benedict, B. Connell Herbarium Specimens (Data) . University New Brunswick, Fredericton. 2003.
3	Benjamin, L.K. 2006. Cypripedium arietinum. Pers. comm. to D. Mazerolle. 9 recs, 9 recs.
3	Blaney, C.S. Miscellaneous specimens received by ACCDC (botany). Various persons. 2001-08.
3	Boyne, A.W. & Grecian, V.D. 1999. Tern Surveys. Canadian Wildlife Service, Sackville, unpublished data. 23 recs.
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	Clayden, S.R. 2007. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, download Mar. 2007, 6914 recs.
3	Gagnon, J. 2004. Specimen data from 2002 visit to Prince Edward Island. , 104 recs.
3	Klymko, J.J.D. 2011. Insect fieldwork & submissions, 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 742 recs.
3	Mersey Tobeatic Research Institute. 2022. Nova Scotia Bobolink observations. pers. comm. to J. Churchill.
3	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database Update. Mersey Tobeatic Research Institute, 14 recs.
3	Neily, T.H. 2016. Email communication (May 6, 2016) to Sean Blaney regarding Fissidens exilis observations made in 2016 in Nova Scotia. Pers. Comm., 3 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	Standley, L.A. 2002. Carex haydenii in Nova Scotia. , Pers. comm. to C.S. Blaney. 4 recs.
3	Thompson, R. 2018. Williamsdale Quarry Expansion Project, NS, Environmental Assessment rare plants. Dexter Construction Company Limited.
2	Amirault, D.L. 2003. 2003 Peregrine Falcon Survey. Canadian Wildlife Service, Sackville, unpublished data. 7 recs.
2	Basquill, S.P. 2012. 2012 Bryophyte specimen data. Nova Scotia Department of Natural Resources, 37 recs.
2	Basquill, S.P., Porter, C. 2019. Bryophyte and lichen specimens submitted to the E.C. Smith Herbarium. NS Department of Lands and Forestry.
2	Benjamin, L.K. 2009. NSDNR Fieldwork & Consultants Reports. Nova Scotia Dept Natural Resources, 143 recs.
2	Cameron, B. 2005. C. palmicola, E. pedicellatum records from Sixth Lake. Pers. comm. to C.S. Blaney. 3 recs, 3 recs.
2	Cameron, R.P. 2012. Additional rare plant records, 2009. , 7 recs.
2	Chapman, Cody. Unreported Species at Risk Records across Nova Scotia. Chapman, Cody, 5 records.
2	COSEWIC (Committee on the Status of Wildlife in Canada). 2013. COSEWIC Assessment and Status Report on the Eastern Waterfan Peltigera hydrothyria in Canada. COSEWIC, 46 pp.
2	Curley, F.R. 2003. Glen Kelly records for Betula pumila & Asclepias syriaca on PEI. , Pers. comm. to C.S. Blaney. 9 recs.
2	de Graaf, M.; Miller, D. 2020. Records of Cypripedium reginae and Equisetum variegatum from CFI property at Scoudouc Road and Symplocarpus foetidus from CFI properties at Upper Cape, Westmorland County, NB. pers. comm. (ed.) Community Forests International, 4 records.
2	Frittaion, C. 2012. NSNT 2012 Field Observations. Nova Scotia Nature Trust, Pers comm. to S. Blaney Feb. 7, 34 recs.
2	Giroux, P. 2013. Personal communication concerning species at risk in and around PEI NP, PE. Winter 2013. Pers. comm.
2	Hill, N. 2003. Floerkea proserpinacoides at Heatherdale, Antigonish Co. 2002. , Pers. comm. to C.S. Blaney. 2 recs.
2	Layberry, R.A. 2012. Lepidopteran records for the Maritimes, 1974-2008. Layberry Collection, 1060 recs.
2	Macaulay, M. Notes on newly discovered Hepatica nobilis var. obtusa population in Cumberland Co. NS. Pers. comm. to S. Blaney, 1 rec.
2	Neily, T.H.; Smith, C.; Whitman, E. 2011. NCC Logging Lake (Halifax Co. NS) properties baseline survey data. Nature Conservancy of Canada, 2 recs.
2	Speers, L. 2001. Butterflies of Canada database. Agriculture & Agri-Food Canada, Biological Resources Program, Ottawa, 190 recs.
2	Thomas, H.H., Jones, G.S. & Diblee, R.L. 1980. Sorex palustris on Prince Edward Island. Can. Field Nat., vol 94:329-331. 2 recs.
2	Webster, R.P. & Edsall, J. 2007. 2005 New Brunswick Rare Butterfly Survey. Environmental Trust Fund, unpublished report, 232 recs.
2	Whittam, R.M. 1999. Status Report on the Roseate Tern (update) in Canada. Committee on the Status of Endangered Wildlife in Canada, 36 recs.
2	Zahavich, J. 2017. Canada Warbler and Olive-sided Flycatcher records 2017. Island Nature Trust, 14 recs.
1	Amirault, D.L. 2005. 2005 Peregrine Falcon Survey. Canadian Wildlife Service, Sackville, unpublished data. 27 recs.
1	Amiro, Peter G. 1998. Atlantic Salmon: Inner Bay of Fundy SFA 22 & part of SFA 23. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-12. 4 recs.
1	Atlantic Canada Bank Swallow Working Group. 2022. 2021 Bank Swallow colony records. Birds Canada.
1	Basquill, S.P. 2009. 2009 field observations. Nova Scotia Dept of Natural Resources.
1	Bateman, M.C. & Prescott, W.H. 1984. The Mammals of Prince Edward Island National Park. Canadian Wildife Service, vol 2:5. 3 recs.
1	Belland, R.J. 2012. PEI moss records from New York Botanical Garden. NYBG Virtual Herbarium, Web site: http://sciweb.nybg.org/science2/vii2.asp 135 recs.
1	Belliveau, A.G. E.C. Smith Herbarium Specimen Database 2019. E.C. Smith Herbarium, Acadia University. 2019.
1	Benedict, B. Connell Herbarium Specimens. University New Brunswick, Fredericton. 2003.
1	Blaney, C.S. & Mazerolle, D.M. 2011. Field data from NCC properties at Musquash Harbour NB & Goose Lake NS. Atlantic Canada Conservation Data Centre, 1739 recs.
1	Bonnyman, Vanessa. 2021. Eastern Wood-Pewee Observation on Bonshaw Trail, PEI.
1	Bruce, J. 2014. 2014 Wood Turtle email report, Nine Mile River, NS. NS Department of Natural Resources.
1	Cairns, D. 1998. Atlantic Salmon: Prince Edward Island SFA 17. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-07. 1 rec.
1	Cameron, R.P. 2009. Nova Scotia nonvascular plant observations, 1995-2007. Nova Scotia Dept Natural Resources, 27 recs.
1	Christie, D.S. 2000. Christmas Bird Count Data, 1997-2000. Nature NB, 54 recs.
1	Churchill, J.L. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2018. Atlantic Canada Conservation Data Centre, 907 recs.
1	Clayden, S.R. 2006. Pseudevernia cladonia records. NB Museum. Pers. comm. to S. Blaney, Dec, 4 recs.
1	Clayden, S.R. 2020. Email to Sean Blaney regarding Pilophorus cereus and P. fibula at Fidele Lake area, Charlotte County, NB. pers. comm., 2 records.
1	Curley, F.R. 2021. Nymphalis l-album record from near Belfast PEI. Pers. comm. to J. Klymko.
1	Doucet, D.A. 2007. PEI National Park Odonata Survey. Parks Canada, PEI National Park, 1 rec.

# recs	CITATION
1	Doucet, D.A. ACCDC Reference Collection. Atlantic Canada Conservation Data Centre, Sackville NB. 2008.
1	Eastman, A. 2019. Snapping Turtle observation at Brookfield, Colchester Co. NS. Halifax Field Naturalists Nova Scotia Nature Archive Facebook Page, 1 record.
1	Edsall, J. 2001. Lepidopteran records in New Brunswick, 1997-99. , Pers. comm. to K.A. Bredin. 91 recs.
1	Gagnon, J. 2003. Prince Edward Island plant records. Societe de la faune et des parcs Quebec, 13 recs.
1	Golder Associates Ltd. 2021. Black Ash location from Goff's Quarry Expansion Environment Assessment, 2017. Golder Associates Ltd., 1 record.
1	Harling, L. & Silva, M. 2004. Abundance & species richness of shrews within forested habitats on PEI. Am. Midl. Nat., 151:399-407. 2 recs.
1	Harris, Megan. 2018. Miscellaneous Sorex palustris record. Pers. comm. to S. Blaney.
1	Haughian, S.R. 2018. Description of Fuscopannaria leucosticta field work in 2017. New Brunswick Museum, 314 recs.
1	Hill, N.M. 2021. Observation of Carex haydenii and black ash near Marshy Hope and Ponhook Lake. pers. comm.
1	Hinds, H.R. 1989. Greenwich, Blooming Point plant collections in Plant locations. Pers. Comm. to Robin Day (Ag. Can). 2pp, 8 recs, 8 recs.
1	Honeyman, K. 2019. Unique Areas Database, 2018. J.D. Irving Ltd.
1	Jacques Whitford Ltd. 2003. Cananda Lily location. Pers. Comm. to S. Blaney. 2pp, 1 rec, 1 rec.
1	Jardine, Don. 2022. Email to AC CDC reporting an Evening Grosbeak Sighting in Winsloe South, PEI. pers. comm.
1	Kelly, Glen 2004. Botanical records from 2004 PEI Forestry fieldwork. Dept of Environment, Energy & Forestry, 71 recs.
1	Klymko, J. Henry Hensel's Butterfly Collection Database. Atlantic Canada Conservation Data Centre. 2016.
1	Klymko, J. Partial database of the Agriculture Canada Charlottetown Research Station Insect Collection butterfly specimens. Atlantic Canada Conservation Data Centre. 2016.
1	Klymko, J.J.D. 2010. Miscellaneous observations reported to ACCDC (zoology). Pers. comm. from various persons, 3 recs.
1	Klymko, J.J.D. 2012. Insect field work & submissions. Atlantic Canada Conservation Data Centre, 852 recs.
1	Macauley, M. 2008. Email to Sean Blaney regarding rich hardwood floodplain site at Howards Pool, Wallace River, NS.
1	MacAuley, M. 2020. Email to Sean Blaney regarding Agalinis paupercula var. parviflora at Malagash Station, NS. pers. comm., 2 records.
1	MacPhail, V. Bee and syrphid specimens from MSc research. Pers. comm., J. Klymko. 2006.
1	MacQuarrie, K. and R. Sharkie. 2004. Plant lists for selected areas at Brackley and Dalvay, Prince Edward Island National Park. Island Nature Trust, 168 recs.
1	Mazerolle, D.M. 2005. Bouctouche Irving Eco-Centre rare coastal plant fieldwork results 2004-05. Irving Eco-centre, la Dune du Bouctouche, 174 recs.
1	McAlpine, D.F. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB, 241 recs.
1	McNeil, J.A. 2019. Snapping Turtle records, 2019. Mersey Tobeatic Research Institute.
1	Neily, P.D. Plant Specimens. Nova Scotia Dept Natural Resources, Truro. 2006.
1	Neily, T.H. & Pepper, C.; Toms, B. 2019. Boreal Felt Lichen Observation, April 2019. Mersey Tobeatic Research Institute.
1	Neily, T.H. 2013. Email communication to Sean Blaney regarding Agalinis paupercula observations made in 2013 in Nova Scotia. , 1 rec.
1	Oehlke, W. 1999. Record of Polygonia satyrus from Prince Edward Island. http://www.silkmoths.bizland.com/ppsatyr.htm.
1	Parker, M. 2018. East Coast Aquatics ACCDC 2018 Report. East Coast Aquatics, 12 records.
1	Parks Canada. 2010. Specimens in or near National Parks in Atlantic Canada. Canadian National Museum, 3925 recs.
1	Payzant, P. 2018. Satyr Comma record from Bible Hill, NS. https://novascotiabutterflies.ca.
1	Quigley, E.J. 2021. Email to Sean Blaney regarding Eastern White Cedar (Thuja occidentalis) stand near Shinimicas Bridge. NSDLF, 1 record.
1	Robinson, C.B. 1907. Early intervale flora of eastern Nova Scotia. Transactions of the Nova Scotia Institute of Science, 10:502-506. 1 rec.
1	Sabine, M. 2016. NB DNR staff incidental Black Ash observations. New Brunswick Department of Natural Resources.
1	Shortt, R. UNB specimen data for various tracked species formerly considered secure. Connell Memorial Herbarium, UNB, Fredericton NB. 2019.
1	Skevington, Jeffrey H. 2020. Syrphid records used for the Field Guide to the Flower Flies of Northeastern North America. Canadian National Collection of Insects.
1	Stephen Freeman. 2022. New location for Black Ash in Queens County, NS. Personal communication, 2.
1	te Raa, J. 2016. Island Naturalist. Nature PEI, 219.
1	WIlliams, M. Cape Breton University Digital Herbarium. Cape Breton University Digital Herbarium. 2013.
1	Wilson, G. 2013. 2013 Snapping Turtle email report, Wentworth, NS. Pers. comm.

APPENDIX D. MARITIME BREEDING BIRD ATLAS SQUARE

ATLAS DES OISEAUX NICHEURS DES MARITIMES
BREEDING BIRD ATLAS

Square Summary (20NR04)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
0	0	1	1	26	32	27	85	1	45.8	0	0

Region summary (#21: Cobequid)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
67	62	65	146	167	508	251

Target number of point counts in this square: 13 road side, 2 off road (2 in Mature deciduous). 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			0	53	Northern Harrier			46	76	North Saw-whet Owl			11	36
Wood Duck			20	52	Sharp-shinned Hawk		H	22	38	Common Nighthawk †			29	55
Gadwall ‡			0	3	Northern Goshawk			12	20	Chimney Swift †			32	23
Eurasian Wigeon ‡			0	0	Broad-winged Hawk			32	55	Ruby-thr Hummingbird		T	61	100
American Wigeon			12	26	Red-tailed Hawk		T	46	72	Belted Kingfisher		AE	51	93
American Black Duck		P	66	81	Virginia Rail †			6	9	Yellow-bellied Sapsucker		NY	50	83
Mallard			9	60	Sora			16	52	Downy Woodpecker		NY	48	89
Blue-winged Teal			27	26	Common Gallinule †			3	1	Hairy Woodpecker		NY	54	87
Northern Shoveler ‡			3	4	American Coot †			4	0	Am Three-toed Woodpecker †			0	0
Northern Pintail			8	1	Semipalmated Plover †			6	0	Black-back Woodpecker	NY	NY	20	26
Green-winged Teal		P	24	56	Piping Plover †			3	3	Northern Flicker		T	80	98
Ring-necked Duck			32	72	Killdeer		DD	56	64	Pileated Woodpecker		P	45	80
Greater Scaup †			0	0	Spotted Sandpiper		H	50	70	American Kestrel		T	50	75
Common Eider ‡§			0	1	Greater Yellowlegs †			0	3	Merlin			16	47
Hooded Merganser		FY	9	50	Willet			14	24	Olive-sided Flycatcher †		T	38	66
Common Merganser		P	25	55	Wilson's Snipe		D	62	73	Eastern Wood-Pewee		T	56	70
Red-breast Merganser			4	7	American Woodcock		S	22	81	Yellow-bellied Flycatcher		S	30	56
Gray Partridge			6	4	Ring-billed Gull ‡§			0	0	Alder Flycatcher		T	79	100
Ring-necked Pheasant		S	20	69	Herring Gull §			8	10	Willow Flycatcher †			1	1
Ruffed Grouse		S	58	86	Great Black-backed Gull §			8	6	Least Flycatcher		T	59	84
Spruce Grouse		T	20	30	Common Tern §			9	12	Eastern Phoebe		AE	12	58
Common Loon			29	35	Arctic Tern ‡§			1	0	Gr Crested Flycatcher			6	4
Pied-billed Grebe			24	30	Black Guillemot ‡§			0	3	Eastern Kingbird			45	47
Double-crest Cormorant §			8	12	Rock Pigeon		P	59	78	Blue-headed Vireo		CF	61	92
American Bittern			22	55	Mourning Dove		S	27	95	Philadelphia Vireo ‡			1	3
Great Blue Heron §			29	13	Black-billed Cuckoo			9	26	Red-eyed Vireo		CF	82	100
Turkey Vulture ‡¤			0	0	Great Horned Owl			40	63	Gray Jay		T	45	58
Osprey			22	50	Barred Owl		T	35	69	Blue Jay		T	70	96
Bald Eagle ¤		H	27	83	Short-eared Owl †			1	1	American Crow		NY	87	100

next page >>