

**Peggy's Cove Infrastructure Improvements  
Peggy's Cove, Halifax County, Nova Scotia  
PIDs 40038424 & 40038333**

**WETLAND ALTERATION APPLICATION**

**Prepared by:**



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## EXECUTIVE SUMMARY

McCallum Environmental Ltd. (MEL) was retained by Develop Nova Scotia (Develop NS) to prepare a wetland alteration application and supporting technical document for a proposed development in Peggy's Cove, NS. The Study Area is defined by portions of property identification numbers (PIDs) 40038424 & 40038333. Develop NS intends to enhance the Study Area with a new breakwater, washroom facilities, and a public green space in late summer 2020. COVID relief stimulus funding will be used to construct this community improvement. This funding is intended to support construction activities with an end date no later than March 31st, 2021.

As part of the planning process associated with the proposed activities, wetlands were delineated by MEL in July 2020. Wetland assessments included characterization, functional assessment, and Species at Risk surveys. During these evaluations, MEL identified two wetlands and no watercourses.

The objective of this application is to provide supporting information as required by the Nova Scotia Wetland Conservation Policy 2011, for approval to alter wetland habitat within the two identified wetlands. In support of this process, the following information is included in this report:

- Desktop review analysis including wetland inventories and species at risk review;
- Wetland boundary delineation methodology and results;
- Wetland characteristics;
- Wetland functional assessment results;
- Mitigation sequence for wetland conservation;
- Proposed post construction wetland monitoring; and
- Proposed wetland compensation methods.

Wetland characteristics and completion of a functions assessment within the wetlands proposed for alteration resulted in the following:

- The wetlands exist within the Shore Direct Secondary watershed (1EJ-SD19);
- One barn swallow (*Hirundo rustica*; SARA Threatened; NSESA Endangered) was observed feeding within WL1. Breeding habitat for the barn swallow does not exist within either wetland.
- Both wetlands proposed for alteration are marshes.
- None of the wetlands provide fish habitat potential.
- Overall functional assessment scores were Moderate, indicating that these wetlands are not significantly different in function as compared to others within the broader landscape.

The proponent is seeking approval to alter a total area of 739 m<sup>2</sup> (0.0739 hectares) of wetland habitat. Best management practices and mitigation methods provided in this document will be implemented during the construction process to prevent indirect effects to unpermitted wetlands. A post construction monitoring program is presented within. Additionally, the proponent has signed a Letter of Intent (LOI) to perform wetland compensation associated with the Project. The LOI, included with this report, confirms the proponents' intention of signing a Letter of Understanding (LOU) with a recognized wetland restoration professional at the time of alteration. Lastly, post-construction wetland monitoring is proposed for both wetlands.

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## 1.0 INTRODUCTION

In support of the proposed development at Peggy's Cove by Develop Nova Scotia (Develop NS), McCallum Environmental Ltd. (MEL) was retained to prepare a wetland alteration application and supporting technical report. Peggy's Cove is located on the south shore coastline of Nova Scotia (Figure 1, Appendix A). Peggy's Cove is partially located within the Atlantic Coastal Ecoregion and the Eastern Shore ecodistrict as defined by Neily et al. (2003). Under the ecological land classification, granite barrens define this extent of the Ecodistrict and the forest is largely influenced by coastal proximity. The concept behind the development proposed at the Peggy's Cove Preservation Area is to balance the needs of the residents, workers and visitors at Peggy's Cove by making the area safer and by improving facilities. A community breakwater is proposed to be elevated from the existing elevation. This elevation was analyzed from coastal study models, including off-shore and coastal analysis. This breakwater will be raised as high as practical to mitigate the impacts of stormwater on the area. The intent is to reduce the amount of water overtopping the current breakwater during storm events. This will improve the current condition for residents and businesses in the low-lying areas that the breakwater is meant to serve.

Every year large numbers of visitors enjoy Peggy's Cove, making it critical to update infrastructure and provide public safety. Develop NS is proposing to enhance the current breakwater south of Peggy's Point Road to protect the cove from future storms. The area will benefit further from the proposed washroom facility and green space proposed by Develop NS. There are currently no public washrooms in the vicinity, which poses a health and safety threat to the environment, residents, and visitors. The proposed washroom facility and green space will allow wastewater to be properly managed. The project has received COVID relief stimulus funding, which requires construction completion by March 31, 2021.

As part of the planning process associated with the proposed activities, MEL completed wetland delineation and functional assessment at the Study Area (as defined in Section 1.2) in July 2020, in order to collect pertinent information required for the submission of a wetland alteration application.

The following tasks (known as the Study) were completed as part of this scope of work:

1. Wetland delineation, characterization, and functional assessment; and
2. Confirmation of the presence, lack of detection, and/or habitats of protected species.

The Study resulted in the identification of two wetlands within the Study Area, both of which are proposed for partial alteration. The proposed wetland alteration includes the following:

- Updating of an existing breakwater within wetland 1 (WL1; total wetland area of 2,709 m<sup>2</sup> (0.2709 ha) resulting in an alteration of 465 m<sup>2</sup> (0.0465 ha), representing 17% of WL1 by area within the Study Area. WL1 extends beyond the Study Area.
- Construction of a washroom and green space within Wetland 2 (WL2; total wetland area of 597 m<sup>2</sup> (0.0597 ha)) resulting in an alteration of 274 m<sup>2</sup> (0.0274 ha), representing 46% of WL2 by area.

The total impact area associated with the alteration of the wetlands requiring approval is 739 m<sup>2</sup> (0.0739 ha).

The objective of this technical report is to provide supporting information as required by the Nova Scotia Wetland Conservation Policy 2011, for approval to alter wetland habitat. In support of this process, the following information is included in this report:

- Desktop review analysis including wetland inventories and species at risk review;
- Wetland boundary delineation methodology and results;
- Wetland characteristics;
- Wetland functional assessment results;
- Mitigation sequence for wetland conservation;
- Proposed post construction wetland monitoring; and
- Proposed wetland compensation methods.

Figure 1 (Appendix A) presents the Study Area location.

### 1.1 Proponent Information

The proponent contact information is summarized in Table 1.

**Table 1: Proponent Contact Information**

<b>Name of Proponent</b>	Develop Nova Scotia
<b>Mailing/Civic Address</b>	1875 Upper Water St Suit 301, Halifax, NS, B3J 1S5
<b>Property Identification #</b>	PIDs 40038424 & 40038333
<b>Application Contact</b>	Melanie MacDonald, McCallum Environmental Ltd.
<b>Phone Number</b>	(902) 817-2444
<b>Email Address</b>	Melanie@mccallumenvironmental.com
<b>Mailing Address</b>	2 Bluewater Rd, Suite 115, Bedford NS, B4B 1G7
<b>NTS Map Sheet</b>	11D05
<b>Site Grid Reference</b>	UTM 20N 427264 m E, 4927067 m N.

### 1.2 Project Property Information

The Study Area includes portions of PIDs 40038424 and 40038333 and is located west of Clam Pond, east of Peggy's Cove, and south of Highway 333. The wetlands proposed for alteration are on partially developed, private property.

Property details related to the alteration of Wetlands 1 and 2 are provided in Table 2 below. Alteration locations are presented in Figure 2, Appendix A.

**Table 2: Property Details**

<b>Wetland ID</b>	<b>PID</b>	<b>Property Owner</b>	<b>Location</b>
WL1	40038333	NS Transportation & Public Works	109 Peggys Point Road, Peggy's Cove, Parcel A
WL2	40038424	Robert Neil Raycraft	130 Peggys Point Road, Peggy's Cove

Landowner permission associated with the proposed wetland alterations are provided by way of a signed letter from the above landowners (Appendix H).

### 1.3 Project Team

A Study Team was assembled for the completion of this study. The team was selected based on level of proficiency in their respective roles. The team members and their individual roles are presented in Table 3.

**Table 3: Project Team**

Team Member	Role
Melanie MacDonald, MREM	Senior Ecologist, Project Manager, Wetland Specialist
John Gallop, BSc, P.Biol	Environmental Scientist, Report Writer, Wetland Specialist
Emma Posluns, MSc.	Report Writer

*Curriculum Vitae* for the above-mentioned team members are provided in Appendix B.

## 2.0 METHODOLOGY

The Study Team carried out the scope of work via the completion of desktop review analysis and implementation of field assessments.

### 2.1 Desktop Review

A background information review of wetlands and watercourses was completed on July 14, 2020 using the Nova Scotia Topographic Watercourse and Wet Areas databases and the Nova Scotia Environment (NSE) Wetlands database. In addition, the NSE “Wetlands of Special Significance” (WSS) database was reviewed as part of this process.

In support of the assessment of priority species occurrence and use of the wetlands proposed for alteration, a priority species list was created. The purpose of the priority species list is to identify a broad list of species that have the potential to be present within the wetlands proposed for alteration and to inform field programs.

Development of a priority list of species for birds, fish, lichen, plants, and mammals was completed based on a compilation of listed species from the following sources:

1. Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Federal Species-at Risk Act (SARA 2003). All species listed as Endangered, Threatened, or of Special Concern;
2. Nova Scotia Endangered Species Act (NESA 1999). All species listed as Endangered, Threatened, or Vulnerable; and,
3. Conservation Rank: All Species designated as S1, S2, or S3 as defined by Atlantic Canada Conservation Data Center (ACCDC 2020).

Collectively, this group of species is known as priority species. This umbrella grouping includes Species of Conservation Interest (SOCI) that are not listed species under provincial or federal legislation (i.e. COSEWIC species and/or ACCDC S1, S2 and S3 species or any combination thereof (i.e. S3S4 is considered a SOCI)), and Species at Risk (SAR) which are listed on SARA or NSESA.

The priority species list was built using sub-national (provincial) conservation ranks defined by the ACCDC (SRanks S1, S2, and S3). The priority list of species was first narrowed by broad geographic area (central mainland Nova Scotia, HRM) and habitat types (coastal barrens, bogs).

Data was requested from the ACCDC to obtain records of rare species existing or historically found within the general location of the Study Area. The results of the database search were also reviewed to identify priority species that could be potentially located within the Study Area (based on recorded sightings within or in close proximity to the Study Area, and general geographic and habitat requirements).

The Provincial Landscape Viewer (<https://nsgi.novascotia.ca/plv/>) was also reviewed to determine whether the proposed alterations are within, or adjacent to special features, such as protected areas, Atlantic Coastal Plain Flora buffer, Mainland Moose Concentration Areas, and Significant Habitats. To ensure the Study Area is not located within any ecologically sensitive regions, the following databases were also checked: boreal felt lichen predictive layer, critical SAR habitats, protected water areas, parks and protected areas, RAMSAR sites, Important Bird Areas (IBAs), and Canada Wildlife Service (CWS) migratory bird sanctuaries.

The final list of priority species was used to guide the field evaluation and is attached in Appendix C. The ACCDC report is also included in Appendix C. An in-text short list of SAR from the priority species list is provided in Section 3.1.2; this includes SAR with potential suitable habitat within the wetlands proposed for alteration.

## 2.2 Field Assessment

Field surveys were completed on July 17, 2020 to delineate and assess the wetlands, complete functional assessments, and analyze the presence, or potential presence for priority species. The following definitions were used to confirm all wetlands and watercourse boundaries:

Wetlands are:

*Land referred to as a marsh, swamp, fen, or bog that either periodically or permanently has water table at, near, or above the land surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation, and biological activities adapted to wet conditions.*

Watercourses are:

*The bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not, and all groundwater.*



Wetland determination data forms were completed in accordance with the Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (United States Army Corps of Engineers 2012). Wetland determination data forms are in Appendix D. Wetland boundaries were walked and any inlet and outlet streams or other features associated with each wetland were marked. Observations were made on wetland types, water flow path, dominant vegetation communities, presence of SAR/SOCI or SAR/SOCI habitat potential, fish habitat potential and characterizations, and wetland functions.

### 2.2.1 Wetland Functional Assessment

Wetland functional assessment was completed for each wetland using the Wetland Ecosystem Services Protocol - Atlantic Canada (WESP-AC) wetland evaluation technique. The WESP-AC process involves the completion of three forms; a desktop review portion that examines the landscape level aerial conditions to which the wetland is situated, and two field forms. The process serves as a rapid method for assessing individual wetland functions and values. WESP-AC addresses 17 specific functions wetlands may provide (Table 4). The specific wetland functions are individually allocated into grouped wetland functions and measured for “functional” and “benefit” scores. Wetland function relates to what a wetland does naturally (i.e., water storage), whereas wetland benefits are benefits of the function, whether it is ecological, social, or economic. The highest functioning wetlands are those that have both high ‘function’ and ‘benefit’ scores for a given function. WESP-AC enables a comparison to be made between individual wetlands within a province to gain a sense of the importance each has in providing ecosystem services.

**Table 4: WESP-AC Wetland Function Parameters**

<b>Grouped Wetland Function</b>	<b>Specific Wetland Functions</b>
Hydrologic Function	Surface Water Storage
Aquatic Support	Aquatic Invertebrate Habitat
	Stream Flow Support
	Organic Nutrient Export
	Water Cooling
Water Quality	Sediment Retention & Stabilization
	Phosphorus Retention
	Nitrate Removal & Retention
	Carbon Sequestration
Aquatic Habitat	Anadromous Fish Habitat
	Resident Fish Habitat
	Waterbird Feeding Habitat
	Waterbird Nesting Habitat
	Amphibian and Turtle Habitat
Terrestrial Habitat	Songbird, Raptor, & Mammal Habitat
	Pollinator Habitat
	Native Plant Habitat

In addition to the grouped wetland functions above, WESP-AC also measures the following groups, however these are only evaluated by their benefit scores:

- Wetland Condition; and
- Wetland Risk.

The following individual functions are assessed to determine the benefit scores associated with these groups:

- Public Use & Recognition;
- Wetland Sensitivity;
- Wetland Ecological Condition; and
- Wetland Stressors.

For each wetland evaluated, WESP-AC process calculates the overall score for the seven grouped wetland functions and the 17 specific wetland functions listed in Table 4 above. One score each is provided for function and benefit. Scores are ranked as 'Lower', 'Moderate', or 'Higher', allowing for analysis of the wetland as compared to baseline wetland scores in Nova Scotia. A 'Higher' WESP-AC score means that wetland has a greater capacity to support those processes as compared to other wetlands in the province. A 'Higher' WESP-AC score in both the function and benefits category means the wetland supports the natural ecosystem functions and provides services potentially important to society. For our analysis, MEL weighted the WESP-AC scores to quantitatively compare wetlands. The following weights were applied to scores for grouped wetland functions and specific wetland functions:

- Lower score = 1 point
- Moderate score = 2 points
- Higher score = 3 points

For the purposes of the WESP evaluation an Assessment Area (AA) was determined for each wetland as described below:

- Wetland 1: the freshwater portion of the wetland; and,
- Wetland 2: the entire wetland

### **3.0 RESULTS**

The following sections provide the desktop review results (including aquatic features, priority species and special areas), and results of field surveys.

#### **3.1 Desktop Review Results**

##### 3.1.1 Wetlands and Watercourses

A review of the NSE Wetlands Inventory Database did not identify any mapped wetlands or watercourses within the Study Area (Figure 3, Appendix A). The closest predicted WSS is located approximately 500m northeast of the Study Area. The Study Area lies within the Shore Direct Secondary Watershed (1EJ-SD19).

### 3.1.2 Priority Species and Special Areas

The Study Area does not contain nor is it contained within any of the following: Atlantic Coastal Plain Flora buffers, Significant Habitats, boreal felt lichen predictive layers, critical SAR habitats, protected water areas, RAMSAR sites, Important Bird Areas, and CWS migratory bird sanctuaries. The Study Area is located within a Mainland Moose significant population concentration area and the Peggy's Cove Parkway. The Peggy's Cove Preservation Area is located approximately 250 m north of the Study Area.

A review of the ACCDC report confirms the presence of several priority species in proximity to the Study Area. The ACCDC identified the following records of SAR, SOCI and Special Areas within 5km:

- 6 managed area (Peggy's Cove Preservation Area, Peggy's Cove Parkway, West Dover Provincial Park, West Dover SES, Swiss Air Memorial and Burial Site Peggy's Cove and William E. DeGarthe Memorial Provincial Park);
- 2 biologically significant sites (West Dover IBP, West Dover SES);
- 52 records of 28 vertebrate fauna;
- No records of invertebrate fauna;
- 28 records of 8 vascular flora; and
- 3 records of 3 nonvascular flora.

Of those identified records, 4 SAR were identified within 5km of the Study Area by the ACCDC, one of which, a barn swallow, was observed during field surveys:

- Barn Swallow (*Hirundo rustica*)
- Rusty Blackbird (*Euphagus carolinus*)
- Harlequin Duck (*Histrionicus histrionicus*)
- Evening Grosbeak (*Coccothraustes vespertinus*)

The Nova Scotia Department of Lands & Forests (NSL&F) considers a number of species "location sensitive". Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in an ACCDC report. These include Wood Turtle, Blandings Turtle, Peregrine Falcon, Black Ash, and Bat Hibernacula. None of these location sensitive species has been documented within 5km of the Site by the ACCDC. The ACCDC report is provided in Appendix C along with the priority species list.

All species on the priority species list were considered during the field evaluations. For the purpose of this wetland alteration application, a short list of SAR from the Priority species List (Appendix C) and their habitat requirements were evaluated.

Below are the habitat requirements for the SAR listed above:

#### Barn Swallow

Barn Swallows are medium-sized songbirds that are easily recognized by its steely-blue upperparts, cinnamon underparts, chestnut throat and forehead, and by its deeply forked tail. This species is closely associated with human rural settlements and breeds in all Canadian provinces and territories (COSEWIC 2011). Barn Swallows prefer various types of open habitats for foraging, including grassy fields, pastures,

lake and river shorelines and wetlands, and will nest in and on artificial structures, including barns, bridges and road culverts (COSEWIC 2011). Barn Swallow is listed as threatened and endangered under SARA and NSESA, respectively. Barn swallow was observed feeding within WL1.

#### Rusty Blackbird

The Rusty Blackbird is a medium-sized songbird with pale yellow eyes and a black, slightly curved bill. Rusty Blackbirds breed in boreal wetland habitats in every Canadian province and territory, and can be found in forested wetlands throughout much of the eastern United States in the winter (COSEWIC 2006). Rusty Blackbirds prefer breeding sites with a combination of freshwater bodies with shallow water and emergent vegetation for foraging. Rusty Blackbird is listed as special concern and endangered under SARA and NSESA, respectively. Habitat for this species was not observed within the Study Area.

#### Harlequin Duck

Harlequin Ducks are small, subarctic seaducks. There are four populations of the Harlequin Duck found world-wide. The eastern population is found along the Atlantic Coast. This species breeds on inland rivers and streams, including fast flowing river systems (COSEWIC 2013). The Harlequin Duck is listed as threatened and endangered under SARA and NSESA, respectively. The primary cause of decline is not known but may have been caused by over-hunting. Habitat for this species was not identified within the Study Area.

#### Olive-sided Flycatcher

The olive-sided flycatcher is a songbird with deep brownish olive-grey colouring and a stout, black bill. This species breeds throughout most of forested Canada and is most often associated with open areas containing tall trees or snags (Environment Canada 2016). The Olive-sided Flycatcher is listed as special concern and threatened by SARA and NSE, respectively. The primary cause of decline is likely due to habitat loss, changes in insect food base and climate change (Environment Canada 2016). Habitat for this species was not identified within the Study Area.

Any SAR and SOCI (and their preferred habitats) identified during field surveys within wetlands proposed for alteration, are discussed further in Section 4.1.

### **3.2 Field Assessment Results**

The field evaluation confirmed the presence of two wetlands within the Study Area, see Figure 2 (Appendix A). No watercourses are present within the Study Area.

#### 3.2.1 Wetlands

Two wetlands were confirmed during the field assessment. The delineated portion of WL1 incorporates a total of 2,709 m<sup>2</sup>/0.2709 ha, that contains both freshwater and saltwater portions (2142 m<sup>2</sup> of freshwater marsh, and 642 m<sup>2</sup> of saltmarsh habitat). WL1 extends beyond the Study Area to the northwest and the southeast. WL2 is a freshwater marsh (597 m<sup>2</sup>/0.0597 ha).

Data points were completed at wetland/upland boundaries of each wetland as per the requirements of the Army Corps of Engineers methodologies (United States Army Corps of Engineers 2012). The results of

the wetland data point analysis recorded for the two delineated wetlands are presented in Table 5 below. Original field forms are also provided in Appendix D.

**Table 5: Data Point Results**

Data Point	Hydric Soil Indicator	Indicators of Wetland Hydrology	Hydrophytic Vegetation Present / Prevalence Index	Positive Test for Wetland Habitat
WL1	A1 – Histosol	High Water Table (A2) Saturation (A3)	Yes / 2.48	Yes
WL2	A1 - Histosol	High Water Table (A2)	Yes/ 1.94	Yes

Prevalence indices equal to or less than 3.0 indicate hydrophytic vegetation. The following information provides an overview of the conditions within WL1 and WL2. Table 6 presents the characteristics of each wetland and representative photos are provided herein.

**Table 6. Wetland Characteristics**

Wetland ID	Wetland Type	Landscape Position	Landform	Water Flow	Dominant Vegetation	Potential for Fish Presence
WL1*	Marsh	Lentic – Tidal in south; Terrene in north	Basin	Inflow in south; isolated in north	<i>Calamagrostis canadensis</i> , <i>Juncus balticus</i> , <i>Convolvulus arvensis</i> , <i>Agrostis scabra</i>	None in wetland
WL2	Marsh	Terrene	Basin	Isolated	<i>Calamagrostis canadensis</i> , <i>Dryopteris cristata</i> , <i>Rosa nitida</i>	None in wetland

\*WL1 extends beyond the Study Area

### Wetland 1

WL1 exists as a marsh comprised of predominantly freshwater habitat in the northern section and a tidal basin marsh in the southern section. WL1 continues to the northwest and southeast beyond the Study Area boundary. WL1 currently has a breakwater within the freshwater marsh section. Histosol soils at a depth of 35 cm were observed, underlain by bedrock. Hydrological indicators included a high water table (within 25 cm of the surface) and saturation at the surface. Water is sourced to the northern portion of the wetland via groundwater discharge from surrounding bedrock and surface water run-off. Although the current breakwater impeded the flow of water from north to south to some extent, water is expected to drain beneath the breakwater into the lower lying portions of the wetland toward the ocean.

The herbaceous vegetative community in the freshwater portion of WL1 is dominated by bluejoint reed grass (*Calamagrostis canadensis*), cattail (*Typha*), field bindweed (*Convolvulus arvensis*), and rough bent grass (*Agrostis scabra*). A trace amount of Baltic rush (*Juncus balticus*) was identified in the freshwater extent of the wetland. No plants existed within the shrub or tree layers.



The southern saltwater marsh section of WL1 is tidally influenced by sea water that seeps into it via cracks in rocky outcrops, making it unlikely that fish can access this or any portion of the wetland. Fish access is not present in the northern freshwater portion of WL1 subject to alteration. This southern portion of the wetland contains two surface water pools with salinity values of 0.25 ppt and 0.76 ppt, however the tidal effect is sufficient to influence the vegetative community towards a saltmarsh species assemblage. The assessor identified the difference between freshwater and saltwater influence by a noticeable shift in the vegetative community. Soil and hydrology indicators in this portion of WL1 were consistent with the freshwater portion. No alteration is proposed in this portion of Wetland 1.



**Photograph 1: WL1 looking north towards breakwater within wetland**



**Photograph 2: Current breakwater within WL1, wetland to the north (left side of photo) and south (east side of photo).**

## Wetland 2

WL2 exists as a freshwater marsh that is not tidally influenced; this wetland is a basin marsh, isolated from surface water flow in a terrene landscape position. Hydric soil is evidenced within this wetland by histosol (100 cm of organic), underlain by bedrock. Wetland hydrology was evidenced by a high water table (at a depth of 10 cm from the surface) and saturation at the surface.

The vegetation community within WL2 lacked shrub and tree strata. The herb stratum was dominated by bluejoint grass, crested wood fern (*Dryopteris cristata*), and shining rose (*Rosa nitida*).



**Photograph 3: Representative photo of WL2 showing marsh vegetation**

### 3.2.2 Watercourses

No watercourses were observed within the Study Area.

## **4.0 WETLAND CHARACTERISTICS AND FUNCTIONS**

### **4.1 Priority Species in Wetlands**

A barn swallow was observed feeding within WL1. Barn swallow nesting habitat was not identified within the Study Area, however, they may use nearby buildings to nest. No other SAR/SOCI species were observed, nor were any potential SAR/SOCI habitat identified.

## 4.2 Wetland Functional Assessment

Table 1 (Appendix E), provides the overall numerically weighted scores for the evaluation of the two wetlands identified within the Study Area. As previously discussed, the AA used for the WESP evaluation was completed for the entirety of WL2, but only the freshwater portion of WL1. This represents the area of WL1 subject to alteration.

It should be noted that function scores are not provided for the Wetland Condition and Wetland Risk Functional groups, as the WESP-AC calculator only considers these as benefits. Of the two wetlands evaluated, the average accumulated *function* score per wetland was 2 (Moderate, see Table 1 in Appendix E). Based on the same analysis, the average accumulated *benefit* score per wetland was 2 (Moderate, see Table 1 in Appendix E). WESP-AC guidance states that the most valuable wetlands are those possessing high functions and benefits. Benefits relate to the perceived worth of the wetland function to societal needs (Adamus & Verble 2016).

All wetlands had very similar scores across categories. Only one category scored High in both function and benefit for both wetlands: WL1 and WL2 scored High/High in nitrate removal & retention. WL1 also scored High/High in songbird, raptor, & mammal habitat, likely due to the identification of a barn swallow.

Additional analysis was completed on the grouped wetland functions provided by the wetlands present within the Study Area (see Table 2, Appendix E).

- **Hydrologic Group:** The hydrological wetland service group evaluates the effectiveness of a wetland to store or delay the downslope movement of surface water. Wetlands that have the highest functions within this group include those that do not have surface water outlets, and instead are isolated from flowing surface water. The model does not account for wetland size, and in turn, does not account for larger wetlands having the ability to store more water than smaller wetlands. WL1 scored Low for function and Moderate for benefit, whereas WL2 scored High (function) and Moderate (benefit). The Low score in WL1 is indicative of its continuous outflow to the ocean and inability to store water for long duration. In comparison, WL2 is isolated and stores water. However, due to the relatively shallow bedrock beneath both wetlands, and the proximity to the coast, neither wetland is likely to play an extremely significant role in terms of flood control.
- **Water Quality Group:** This wetland functional group is compiled from four different functions: Sediment Retention and Stabilization; Phosphorus Retention; Nitrate Removal; and Carbon Sequestration. The main function of this group is to evaluate each wetland's potential to intercept, retain, and filter sediments, particulates, and organic matter. WL1 scored Low in function and Moderate in benefit due to its inability to store water for a long duration. WL2, which can store water for a longer duration scored High in function and in benefits, meaning they perform well in this category, and play an important role within the larger landscape.
- **Aquatic Support Group:** The aquatic support group comprises four individual functions: Stream Flow Support; Aquatic Invertebrate Habitat; Organic Nutrient Export; and Water Cooling. The main function of this group is to determine the wetlands' ability to support ecological stream functions that promote habitat health. Therefore, wetlands lying adjacent to or containing flowing



water score higher than those that do not (i.e. isolated wetlands). In addition, headwater wetlands are crucial for supporting stream flow during the dry season by contributing to water flow via groundwater input and storage capacity. Neither wetland had a High score within this category; these wetlands likely have minimal affect on overall watercourse health within the region.

- Aquatic Habitat Group: The aquatic habitat group comprises of five different functions: Anadromous Fish Habitat; Resident Fish Habitat; Amphibian and Turtle Habitat; Waterbird Feeding Habitat; and Waterbird Nesting Habitat. Wetlands that have the highest functions within this group include those that are adjacent to or contain water. WL1 scored Moderate and WL2 scored Low (function and benefit) due to their minimal surface water and distance from ponded water bodies.
- Terrestrial Habitat Group: The terrestrial habitat group comprises of three different functions: Songbird, Raptor, and Mammal Habitat; Native Plant Habitat; and Pollinator Habitat. The main function of the collective group is to evaluate the wetland's ability to support healthy habitat for birds, mammals, pollinators and native plants. Both wetlands scored Moderate (function) and Moderate (benefit) for Terrestrial Habitat Group. In general, these wetlands provide moderate habitat, which includes prevalent ground cover, varied microtopography, herbaceous cover in and around the wetlands, and mostly naturally vegetated buffer zones. As marshes with no shrub or tree cover, these wetlands likely offer a niche environment to animals that use them. As such, these wetlands generally provide habitat for songbirds, mammals, pollinators and potentially rare plants. The Moderate benefit scores indicate that these functional benefits are likely also provided by other wetlands within the surrounding landscape.
- Wetland Condition: Wetland Condition refers to the integrity or health of a wetland as defined by its vegetative composition and richness of native species. Scores are derived from the similarity between the wetland being evaluated and reference wetlands of the same type and landscape setting (Adamus 1996). WL1 scored Low and WL2 scored Moderate for Wetland Condition (benefit only) which indicates that currently, these wetlands carry moderate-poor vegetative communities. Neither wetland had extensive amounts of invasive plant cover, however, both are very close to human influenced areas such as roads, residences, and tourist attractions. Currently, they may both be influenced by these factors.
- Wetland Risk: Wetland Risk takes sensitivity and stressors into account by averaging the two. Sensitivity is the lack of intrinsic resistance and resilience of the wetland to human or naturally caused stress (Niemi *et al.* 1990). The model uses five metrics to measure sensitivity: abiotic resistance, biotic resistance, site fertility, availability of colonizers, and growth rate. Stress relates to the degree to which the wetland is or has recently been altered by humans in a way that degrades its ecological condition. The model applies four stress groups: hydrologic stress, water quality stress, fragmentation stress, and general disturbance stress. Wetlands that are highly resilient may have lower risk scores despite their exposure to multiple stressors. Additionally, wetlands exposed to fewer threats, but with low resilience may have high risk scores. Wetland resilience is tied to multiple factors, such as size, proximity to natural land cover, and presence of invasive species. All wetlands had High risk scores for Wetland Risk benefit, likely due to their close proximity to roads and development.

WESP-AC scores can be found in Appendix E.

#### 4.2.1 Functional Assessment Summary

The functional assessment did not identify any wetland functions that are specifically unique or significant.

A portion of WL1 exists as a salt marsh. As per the Nova Scotia Wetland Conservation Policy (2011) salt marshes are considered WSS. The policy goes on to state that alterations will not be approved for WSS that “*pose a substantial risk to a WSS, except alterations deemed to provide necessary public function, based on an Environmental Assessment (if required) with public review or other approvals (e.g., Wetland Alteration Approval) as appropriate*”.

Alteration to the freshwater portion of WL1 is not expected to cause a substantial risk to the salt marsh portion of WL1. Furthermore, the proposed alteration (a breakwater) is considered an installation of necessary for public function (i.e. to prevent storm surge protection to up-gradient development).

### **5.0 PROPOSED WETLAND ALTERATION**

Two wetlands were identified across the Study Area, of which 739 m<sup>2</sup> (0.0739 ha) is proposed to be directly altered to allow for the updating of an existing breakwater and the construction of a washroom and green space in Peggy’s Cove. These developments are part of a community lead initiative to enhance the sustainability of this world-renowned attraction. A community breakwater is proposed to be elevated from the existing elevation. This elevation was analyzed from coastal study models, including off-shore and coastal analysis. This breakwater will be raised as high as practical to mitigate the impacts of stormwater on the area. The intent is to reduce the amount of water overtopping the current breakwater during storm events. This will improve the current condition for residents and businesses in the low-lying areas that the breakwater is meant to serve. The mitigation sequence for wetland conservation is described below.

#### **5.1 Avoidance**

Avoidance is the first step in the hierarchical process for wetland conservation. Avoidance of wetland alteration was achieved during the initial design for the Comprehensive Master Plan for Peggy’s Cove. As one of Nova Scotia’s most iconic attractions, Peggy’s Cove offers visitors a unique coastal experience. The draw of visitors to this unique place has created issues for safety and services. Updating the breakwater and installing washrooms and a green space are needed to allow all to enjoy this treasured area. Situated on the edge of the Atlantic coastline, space for such necessary pieces of infrastructure is limited and thus avoidance of wetland impact was difficult to achieve. Impacts were designed to affect the smallest feasible area of wetland possible.

#### **5.2 Minimization**

As described in the Nova Scotia Wetland Conservation Policy, avoidance of impacts to wetland habitat is the preferred mitigation approach. Where wetland avoidance is not possible, a proponent must implement mitigation measures and a wetland compensation plan, along with wetland monitoring where appropriate/necessary.

To mitigate and reduce overall loss of function of wetland habitat, the following actions will be implemented within wetlands where direct impacts and potential indirect impacts to wetland habitat are expected. Mitigation measures include:

- Adhere to wetland alteration permit conditions;
- Protect wetland habitat from accidental spills by using spill control and contingency planning, communicate procedures fully to construction contract staff;
- Monitor wetlands as directed in regulatory approvals;
- Avoid entering unpermitted wetlands by machinery and personnel;
- Complete pre-construction site meeting for all relevant contractors related to working around wetlands and watercourses to minimize unauthorized disturbance;
- Ensure all wetland edges are visually delineated (e.g. flagged) including flagging the edge of saltmarsh habitat within WL1;
- Implement methods to reduce the potential to drain or flood surrounding wetlands. This will be ensured by maintaining natural flow directions within the altered wetlands;
- Direct all construction site and roadway runoff through natural vegetation or through erosion and sediment control devices, wherever practicable, including before it reaches watercourses and/or wetlands;
- Implement erosion and sediment control;
- Incorporate drainage structures where necessary, to dissipate hydraulic energy and maintain flow velocities sufficiently low to prevent erosion of native soil material. Examples include:
  - Avoid frequent or unnecessary travel over erosion prone areas
  - Holding/sediment retention ponds
  - Silt fencing
  - Grubbing berms
  - Cut off drainage channels
  - Rock berms and hay bales to filter water
  - Rock lined channels
  - Covering of exposed soils
- Ensure all development related activity (*i.e.* construction areas, access roads etc.) are located within areas where biophysical field evaluations have been completed (*i.e.* the Study Area) and approvals/written authorizations are in place as required.

### **5.3 Wetland Compensation**

Where wetland avoidance and mitigation are not possible, a proponent must provide a wetland compensation plan along with wetland monitoring where appropriate/necessary.

The proponent is seeking approval to alter a total area of 739 m<sup>2</sup> (0.0739 ha) within two wetlands and will offer a compensation at a 2:1 ratio, resulting in 1,478 m<sup>2</sup> (0.1478 ha) of restoration. Please see the Letter of Intent (LOI) in Appendix F for details. The proponent will sign a Letter of Understanding (LOU) with a designated wetland restoration professional (WRP) for all wetlands subject to direct impact at the time of wetland alteration.

## 6.0 POST-CONSTRUCTION MONITORING

Partial alteration is proposed for Wetlands 1 and 2. Post-construction monitoring is proposed within these wetlands to ensure the mitigation strategies are appropriate. Monitoring will include a site visit within the year of alteration (i.e. Year 1), followed by subsequent visits during Year 3 and 5 post-construction. Visits will take place during a seasonally appropriate time for a visual assessment within the unaltered wetland portions. A General Visual Observation technique will be followed, which will consist of visual observations from the edge of the wetland (in these cases, from the breakwater within the altered wetland portion). Visual observations will include notes on hydrological indicators, vegetative information, wetland observation, and a photo log. A brief update to NSE outlining conditions will be provided following monitoring events. Wherever possible, general monitoring will be completed during the same month each year to allow for direct comparison of observed conditions. All data will be collected using a standardized General Visual Observation field form to ensure repeatability and consistency (see Appendix G). Should conditions suggest that wetland characteristics are changing or being indirectly altered, additional mitigation and/or an increased level of monitoring maybe recommended. A functional assessment using WESP-AC will be completed within the altered wetlands in Year 5 post-construction. Indirect effects to unaltered wetlands are not anticipated, provided the mitigation measures outlined above are adhered to.

## 7.0 SUMMARY

The proponent is seeking approval to alter a total area of 739 m<sup>2</sup> (0.0739 ha) within two wetlands. The proponent has followed the mitigation sequence to ensure wetland conservation by first avoiding and minimizing impacts to wetlands wherever possible and outlining mitigation strategies to be followed should this application for alteration be approved. The proponent will sign a LOU for wetland compensation at the time of alteration with a Wetland Restoration Professional (WRP). Wetland compensation activities will be completed at a ratio of 2:1 (1,478 m<sup>2</sup>/0.1478 ha), to be completed by an NSE recognized third-party WRP.

We look forward to your attention to this application. Please do not hesitate to contact the undersigned with any questions you might have.

Sincerely,



Emma Posluns, MSc.  
Environmental Scientist  
McCallum Environmental Ltd.



Melanie MacDonald, MREM  
Senior Ecologist & Project Manager  
McCallum Environmentla Ltd.

## 8.0 REFERENCES

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## Appendix A: Figures




Prepared For:



FIGURE 1

**Peggys Cove  
Halifax County, NS**

 Study Area



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



0 365 730 1,460 m

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

Drawn By: EP

Date: 2020-07-26



**McCallum Environmental Ltd.**









Prepared For:



FIGURE 2

**Peggys Cove  
Halifax County, NS**

**Field Delineated Wetlands  
and Proposed Impact Areas**

-  Proposed Impact Area - Breakwater
-  Current Breakwater Footprint
-  Proposed Impact Area - Public Washroom & Green Space
-  Study Area
- Field Delineated Wetland**
-  Freshwater Marsh
-  Saltwater Marsh



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



0 15 30 60 m

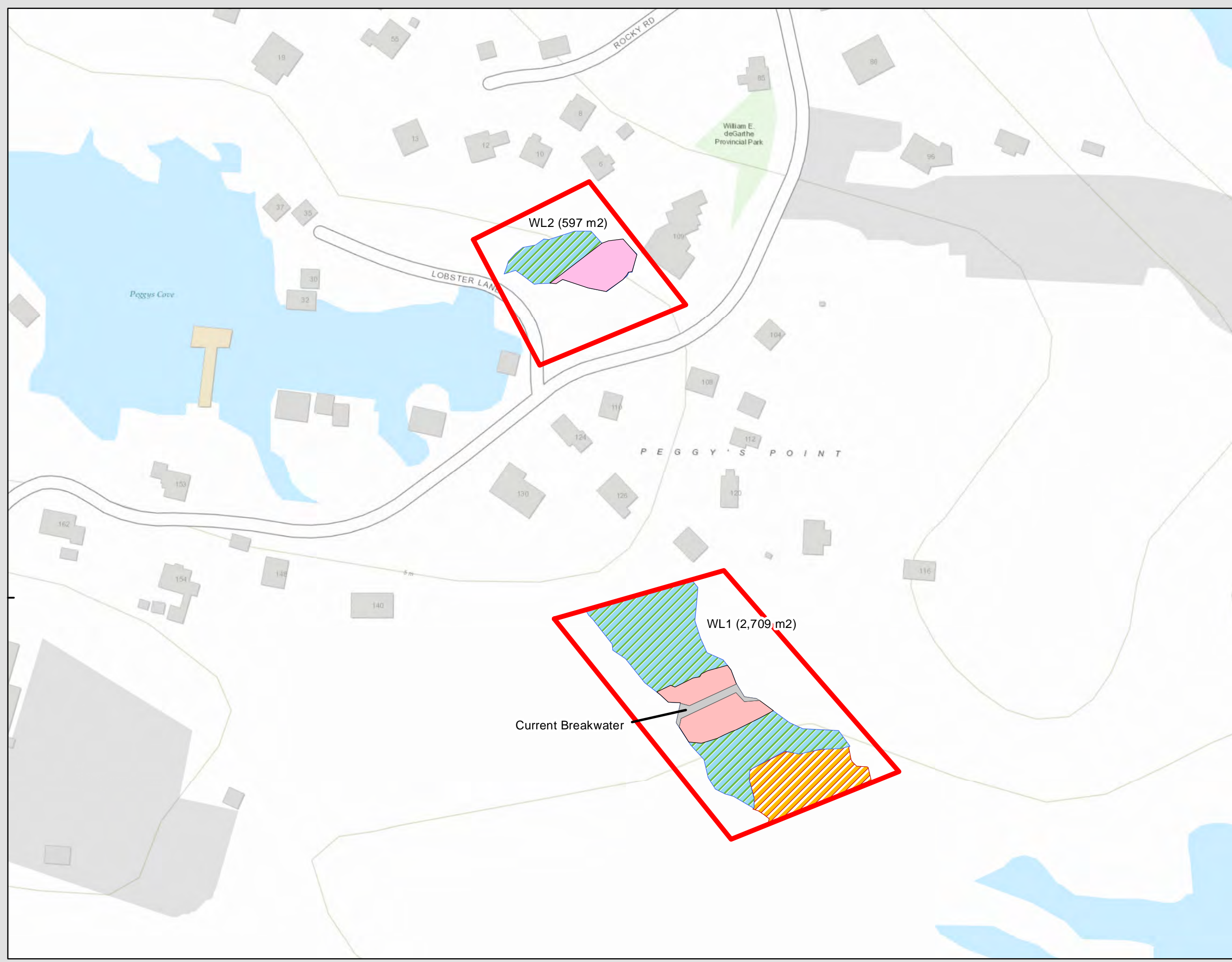
1:1,200 Scale when printed @ 11" x 17"

Drawn By: EP

Date: 2020-07-26



McCallum Environmental Ltd.



Current Breakwater

WL2 (597 m<sup>2</sup>)

WL1 (2,709 m<sup>2</sup>)







Prepared For:



FIGURE 3

Peggys Cove  
Halifax County, NS

Desktop Results

-  NSE Watercourse
-  NSE Wetland of Special Significance
-  NSE Wetland
-  Study Area



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



0 250 500 1,000 m

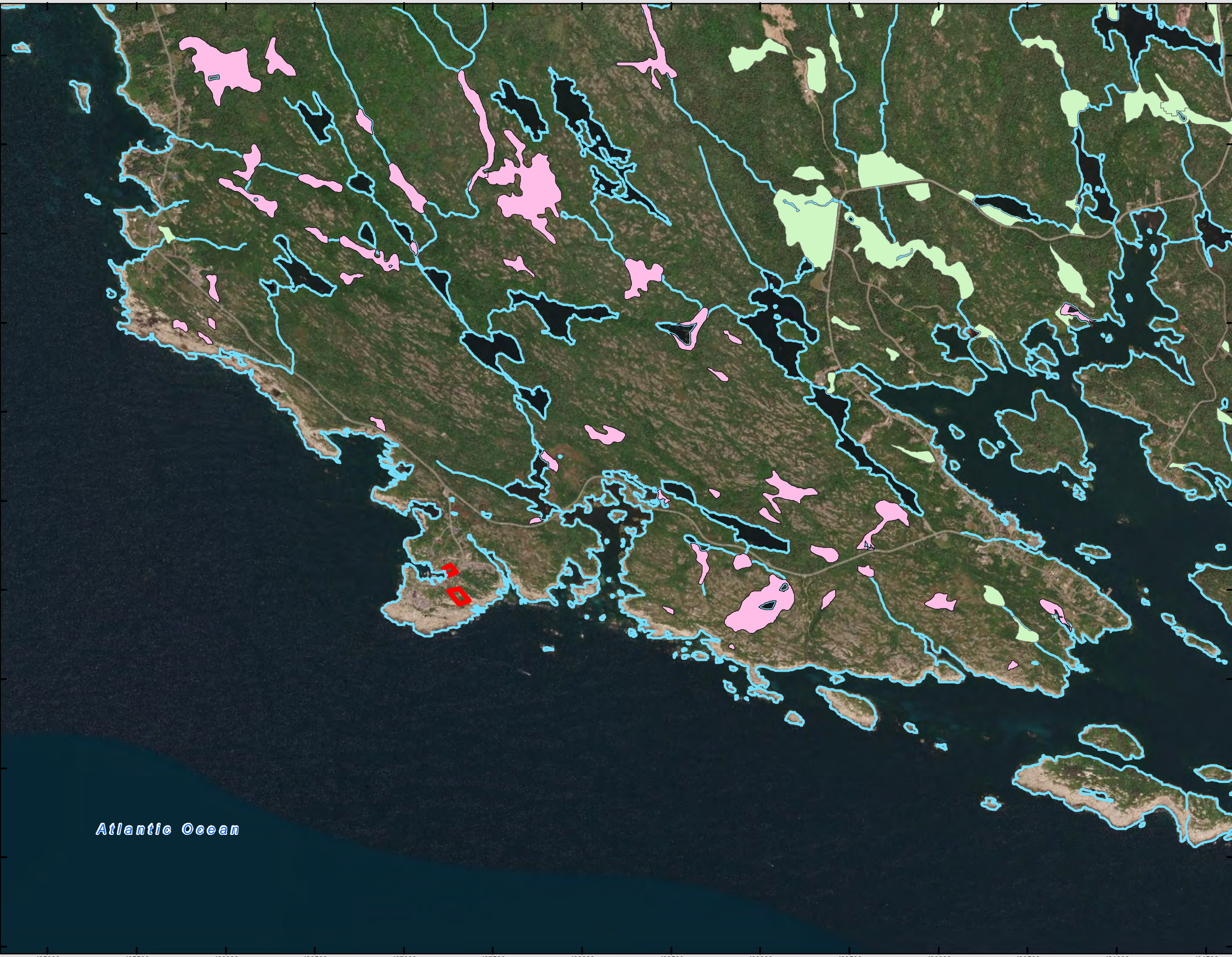
1:20,000 Scale when printed @ 11" x 17"

Drawn By: EP

Date: 2020-07-26



McCallum Environmental Ltd.



Atlantic Ocean



## **Appendix B: Curriculum Vitae**

## Years in Practice

15

## Education

Masters of Resource and Environmental Management, Dalhousie University, 2009-2011

B.Sc. Advanced Major in Biology & Interdisciplinary Studies in Aquatic Resources, St. Francis Xavier University, 2001-2005

## Training

- ◆ Technical Writing Workshop, 2019
- ◆ Fish Habitat Assessments, 2019
- ◆ eDNA Methods, 2019
- ◆ Freshwater & Diadromous Fishes of New England, 2019
- ◆ Saint John Ambulance Standard First Aid, AED, CPR(C), 2019
- ◆ Field Hike Leader Certification, Basic and Winter modules, Outdoor Council of Canada, 2015 & 2018
- ◆ Wetland Ecosystem Services Protocol (WESP-AC) training, 2017
- ◆ WHMIS, 2017
- ◆ Electrofishing Crew Leader, 2015
- ◆ Wetland Delineation Certification, 2013
- ◆ Small Vessel Operator Proficiency & Marine Emergency Duties A3 certified, 2006
- ◆ Bear Awareness & ATV training – Alberta Safety Council, 2006

## Summary

Ms. MacDonald has been in the environmental consulting profession since 2005. She has worked on both project and research related field assessments primarily in Nova Scotia and Alberta. She is responsible for completing biophysical assessments and ecological inventories, including flora and fauna surveys, avian surveys, and species at risk evaluations, primarily for clients in the energy, mining, and commercial development sectors.

Ms. MacDonald is an ecologist, and is highly skilled at completing ecological habitat assessments via geo-spatial desktop review (GIS), and implementation of field studies. During the past eight years of her career, Ms. MacDonald has gained extensive experience completing habitat and ecological integrity studies across the Nova Scotia landscape. Her in-depth knowledge of Nova Scotia flora and fauna has provided her with the tools to effectively determine habitat uniqueness, and ecological sensitivity.

Ms. MacDonald coordinates all McCallum field biologists required to complete all environmental baseline and ecological inventory programs for Provincial and Federal Environmental Assessment registration. Ms. MacDonald has been responsible for the implementation of more than ten environmental baseline programs for mining, quarry development and energy sector development projects in Nova Scotia in advance of environmental assessment registration. In addition, Ms. MacDonald has been largely responsible for communicating the results of baseline environmental conditions to industry and project related stakeholders. Her effective communication skills, broad technical knowledge and personable demeanor has furthered her involvement in multiple community liaison committees, and other community organizations.

## Selected Project Experience

- Completion of environmental baseline surveys for the federal environmental assessment process for proposed development of four separate gold mines in eastern Nova Scotia from 2015-2020.
- Completed baseline fish and fish habitat survey study design and analysis for four proposed gold mines in eastern Nova Scotia. Three of these projects have triggered the federal EIS process, and three will require authorization for Harmful Alteration, Disruption and Destruction of fish habitat under the *Fisheries Act*, and associated offsetting. The evaluations completed at each of these sites involved detailed evaluations of fish passage barriers, and detailed evaluation of the Projects potential direct and indirect effects on fish and fish habitat.
- Completed baseline studies on 125 wetlands across the province to implement a new wetland functional assessment technique (WESP-AC) to the Nova Scotian regulatory landscape.

## Experience

### **McCallum Environmental Ltd., Halifax, Nova Scotia**

#### Senior Environmental Specialist & Field Coordinator

May-Aug 2011, Jan 2012-Present

- Completing biophysical assessments, including flora and fauna surveys, with emphasis on species at risk.
- Leading a team to complete wetland and watercourse delineations and functions assessments.
- Extensive fish and fish habitat assessments to support *Fisheries Act* authorization applications and associated offsetting programs.
- Communicating field survey results and effects assessments for Environmental Assessments and other Provincial regulatory applications.
- Instructed Wetland Delineation course with Fern Hills Institute, Summer 2016-2019.

### **Amec Colt, Shell/Albian Sands Expansion 1 - Fort McMurray, Alberta.**

#### Environmental Specialist and Area Environmental Lead

July 2008 – October 2009.

- Proactively monitored construction activities via inspections, audits and Environmental Work Permits & Protection Plans to ensure compliance with regulatory approvals, the projects' Environmental Control Plan, and best management practices. Investigated and reported incidents, and liaised between contractors and project owners. Implemented Environmental Awareness training programs and communicated issues via weekly newsletters.

### **Canadian Natural Resources Ltd. - Fort McMurray, Alberta**

#### Regulatory and Environmental Specialist October 2005 – July 2008

- Conducted extensive field work in various fish and wildlife programs. Communicated issues with government agencies, contractors and external stakeholders. Performed on-call duties, spill response, and non-compliance reporting and response. Expanded upon site wide procedures for protection of water, wildlife and waterbirds.
- Chaired the regional 'Oil Sands Bird and Wildlife Protection Committee.
- Played a pivotal role in planning & completion of a fish salvage of 38 km of the Tar River, and in construction of a 77 hectare fish habitat compensation lake (Horizon Lake). Horizon Lake earned the CAPP Steward of Excellence Award for Environmental Performance (2009).

## **Years in Practice**

6

## **Education**

B.Sc. (Honours,  
Biology), Waterloo  
University, 2008-2011.

## **Designations**

A professional  
Biologist (P.Biol) with  
the Alberta Society of  
Professional Biologists  
(ASPB)

## **Training**

- ◆ Old Growth Lichens  
with a Focus on  
Calicioids
- ◆ Common Lichens of  
North East North  
America
- ◆ Alberta Wetlands:  
From Classification  
to Policy by Aquality  
Environmental  
Consulting
- ◆ Saint John  
Ambulance Standard  
First Aid, AED,  
CPR(C), 2018
- ◆ Electrofishing Online  
Training Course and  
Field Practicum by  
Canadian River  
Institute and College  
of Extended Learning  
at University of New  
Brunswick.

## **Summary**

Mr. Gallop has been in the environmental consulting profession since 2014. He has worked on both project and research related field assessments in Nova Scotia, Alberta and Saskatchewan and is a well-rounded ecologist with strengths in vascular flora, lichens, avian and aquatic ecology.

Mr. Gallop is responsible for survey design/implementation, and project management of biophysical assessments/reporting, including flora and fauna surveys, aquatic surveys (wetlands, watercourses and fish surveys), avian surveys, and Species at Risk evaluations, primarily for clients in the energy, mining, and commercial development sectors.

## **Selected Project Experience**

- 6 years of experience delineating wetlands throughout Atlantic Canada and Western Canada.
- Lead Ecologist and report writer for several proposed wind and solar projects in Alberta and Saskatchewan. Responsible of survey design, Environmental Assessment writing and project management.
- Completion of ungulate and other wildlife surveys for a variety of projects.
- Four years experience surveying rare lichens and lichen diversity for industry and not for profit organizations.
- Completion of environmental baseline surveys for the federal environmental assessment process for proposed development of several gold mine projects in eastern Nova Scotia in 2016 - 2020 in Nova Scotia
  - Lichen surveys
  - Rare vascular plant surveys
  - Wetland delineation and functional assessment
  - Fish habitat surveys and electrofishing
  - Wildlife surveys
  - Avian surveys
- Completion of wetland delineation, watercourse identification and vegetation assessments of several large-scale developments (wind and mining) in Saskatchewan and Nova Scotia in 2015 - present.

## **Experience**

### **McCallum Environmental Ltd., Halifax, Nova Scotia**

#### Intermediate Environmental Scientist:

April 2016-Present

- Completing biophysical assessments, including flora (vascular plants and lichens) and fauna surveys, with emphasis on species at risk. Completing wetland and watercourse delineations and assessments and coordinating migratory bird monitoring.

**John R. Gallop, B.Sc., P. Biol**  
[john@mccallumenvironmental.com](mailto:john@mccallumenvironmental.com)

- Communicating field survey results and methodologies for Environmental Assessments and other Provincial regulatory applications.
- Project Coordination and responsible of survey design for a variety of projects throughout Canada. Responsible for authoring Environmental Assessment documents, Technical Proposals, Wetland Alteration Applications and project budgeting.

**Basin Environmental LTD., - Edmonton, Alberta.**

Environmental Technologist

September 2014 – February 2016.

- Utilized the Alberta Wetland Classification system to assess wetlands and the Wetland Rapid Evaluation Tool to determine compensation required for impacts to classified wetlands.
- Aerially interpreted and delineated wetlands.
- Conducted species at risk background searches and field visits.
- Conducted pre-disturbance assessments for oil and gas activities, road improvements and residential developments, including: watercourses/waterbodies, soil profiling, vegetation, wildlife, eco-sites and timber volumes.
- Prepared reports for a variety of assessments, including: wetlands, pre-disturbance, bio-physicals, fish habitats for access road watercourse crossings, EAP/EFR supplements and applications.
- Monitored the water quality of horizontal directional drilling on fish bearing permanent watercourses.
- Assisted surveyors and construction engineers on-site in the design of oil and gas well leases and facilities, pipelines and access roads to ensure compliance with EAP Standards and Guidelines.

## Years in Practice

5

## Education

B.Sc. (Geography),  
University of Victoria,  
2005-2009.

M.Sc. (Environmental  
Science), Memorial  
University of  
Newfoundland and  
Labrador, 2010-2013.

## Training

- ◆ Gender Based Analysis+ Training, 2020
- ◆ Watercourse Identification, 2019
- ◆ Technical Writing, 2019
- ◆ Backpack Electrofishing Certification, 2018
- ◆ At-Risk Landbird Identification Workshop, 2018
- ◆ Saint John Ambulance Standard First Aid, AED, CPR(C), 2017
- ◆ Wildlife Awareness training – 2015
- ◆ W.H.M.I.S – 2015
- ◆ Geographic Information System (GIS) Training, ESRI – 2013
- ◆ Facilitation Skills for Technical Professionals, Dalhousie University – 2017

## Summary

Ms. Posluns has been in the environmental consulting profession since 2015. She has worked on both project related and research related field assessments in Nova Scotia.

Ms. Posluns is responsible for completing biophysical assessments, including wetland delineation, characterization, and functional assessment, flora and fauna surveys, avian surveys, aquatic surveys, wetland monitoring and species at risk evaluations, primarily for clients in the energy sector, mining sector, and commercial development sector. Ms. Posluns has been responsible for the management of field data for multiple, large-scale initiatives in Nova Scotia, including a provincial infrastructure project and a mining development.

## Selected Project Experience

- Responsible for technical writing for multiple federal and provincial level Environmental Assessments.
- Conducted migratory bird surveys, winter wildlife assessments, and species at risk searches for federal and provincial infrastructure projects.
- Lead wetland delineation programs, conducted functional wetland assessments, completed watercourse identification and vegetation assessments for multiple large-scale developments in Nova Scotia.
- Trained staff in the use of provincially recognized wetland functional assessment tool, Wetland Ecosystem Services Protocol – Atlantic Canada (WESP-AC).
- Coordinated spatial data organization, performed GIS analysis, and created dynamic maps for a variety of projects.

## Experience

### McCallum Environmental Ltd., Halifax, Nova Scotia

#### Environmental Scientist:

June 2017-Present

- Completing avian surveys and other biophysical assessments, with emphasis on species at risk.
- Completing wetland and watercourse delineations and assessments and coordinating data management and Geographical Information Systems (GIS).
- Communicating field survey results and methodologies for federal and provincial Environmental Assessments and provincial regulatory applications.
- Preparing Phase 1 Environmental Site Assessments.



**CBCL LTD., Halifax, Nova Scotia**

Environmental Scientist

September 2015 – April 2017.

- Completed migratory bird point count surveys and nocturnal owl surveys, while efficiently and effectively following protocols.
- Created GIS maps for over 20 projects, including six 100-page map books, effectively visualizing contaminated sites, ecologically sensitive habitats, and urban development.
- Aerially interpreted and delineated wetlands.
- Conducted species at risk background searches and field visits.
- Prepared reports for a variety of assessments, including permit applications and Environmental Management Plans.
- Assisted with marine water quality sampling.

**OceanCanada Partnership, Halifax, Nova Scotia**

Environmental Scientist

September 2015 – April 2017.

- Facilitated community meetings and provided expertise to help a group with local area development planning.
- Conducted interviews and community-wide surveys of a rural fishing village to create a database of local assets.
- Summarized findings of community assets into an accessible written document.
- Lead a marine-monitoring program in an ecologically sensitive bay, coordinating 15 volunteers in fieldwork, identifying and assessing eelgrass health and distribution, sample collection, and data entry.
- Investigated social, ecological, and economic changes within coastal communities to make suggestions on future development.

**Saint Mary's University, Halifax, Nova Scotia**

Professor of Geography

August 2015 – April 2016.

- Explained technical environmental information clearly and concisely to Canadian and International students, ensuring all students had a supportive learning atmosphere.
- Designed new course material that engaged students and enhanced their learning experience.
- Worked with students one-on-one to solve conflicts.

**Regional District of North Okanagan, Vernon, British Columbia**

Water Sustainability Coordinator

2013 – 2014.

- Worked under the BC Water Act and maintained a comprehensive understanding of provincial and local policy, regulations, and bylaws.
- Compiled and analysed large datasets, assessing trends, and informing local policy.
- Effectively communicated with team members.

## **Appendix C: Priority Species List & ACCDC**

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<b>VASCULAR PLANTS</b>						
<i>Drosera filiformis</i>	Thread-leaved Sundew	Endangered	Endangered	Endangered	S1	This Atlantic Coastal Plain plant species is found in Swaines's Road, Quinn's Meadow, Port laTour, Villagedale and West Baccaro bogs
<i>Vaccinium ovalifolium</i>	Oval-leaved Bilberry				S1	Sterile and dry soils in barrens, thickets and coniferous woods
<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry				S1	Found in disturbed habitats such as roadsides, fields, sandplains, riparian meadows and barrens. Its NS distribution is limited to Cumberland, Shelburne and Halifax counties. No collection for the Halifax Co. locality.
<i>Rhynchospora macrostachya</i>	Tall Beakrush	No status	Endangered	Endangered	S1	Coastal plain marshes, sandy lake edges, dune swales, seepages, sandy marshes, sandy and peaty edges of wetlands, and intermittent wetlands. Carrigan Lake and Molega Lake, Queens Co.
<i>Iris prismatica</i>	Slender Blue Flag				S1	beach or coastal shore. Annapolis, Guysborough and Inverness counties
<i>Juncus vaseyi</i>	Vasey Rush				S1	Acidic substrates on lakeshore and bogs. Linden Cumberland Co.
<i>Triantha glutinosa</i>	Sticky False-Asphodel				S1	beach or coastal shore, bog, swamp. Black river bog, Inverness Co. Cheticamp area
<i>Dichanthelium xanthophysum</i>	Slender Panic Grass				S1	exposed rock or sand, dry soils. Only collected from Bridgewater area
<i>Solidago hispida</i>	Hairy Goldenrod				S1?	Grows in wooded banks and rocky shores. In frequent, occasionally seen from Yarmouth to Colchester counties.
<i>Carex lapponica</i>	Lapland Sedge				S1?	Sphagnum bogs, wet, nutrient-poor areas, mostly lowlands

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Eleocharis fallax</i>	Creeping Spikerush				S1?	Grows on coastal sites near fresh or brackish waters. Only known from Cape Breton.
<i>Carex vacillans</i>	Estuarine Sedge				S1S3	Brackish or salt marshes and flats, intertidal, subtidal or open ocean, shores of rivers or lakes.
<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2	Limited to saltmarshes. Cumberland, Colchester and along the Atlantic coast from Halifax to Cape Breton County. It is possibly more common than the collections indicate.
<i>Chenopodium rubrum</i>	Red Pigweed				S2	Coastal only: saltmarshes, beaches in saline soils. Can form extensive colonies on newly-reclaimed dykelands. Common on Sable Island and collected from Northumberland region and Cape Breton.
<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	Sand barrens and other areas where the soil is dry and rocky, as at Jack Pine barrens at Williams Lake, Halifax Co. Ranges from Shelburne to Halifax counties along the Atlantic shore and known from several localities through the centre of the Annapolis Valley. Only a single Cape Breton locality.
<i>Crassula aquatica</i>	Water Pygmyweed				S2	brackish muddy shores, sand flats. Atlantic coastal localities from Shelburne to Cape Breton.
<i>Rumex salicifolius</i>	Triangular-valve Dock				S2	beach or coastal shore, river or stream. Few localities only: Sweet Corner, Hants Co., Cornwallis river, Kentville, Kings Co. and the river Inhabitants, Inerness Co.
<i>Salix pedicellaris</i>	Bog Willow				S2	Grows in acidic substrate as in bogs; nutrient-rich marshes and in sphagnous lacustrine habitats.
<i>Carex hystericina</i>	Porcupine Sedge				S2	Frequents seeps, marshes and shoreline fens. Scattered in Kings and Annapolis Co and in Victoria and Inverness Co.

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Carex longii</i>	Long's Sedge				S2	Found in swamps, bogs and other peaty sites near the coast. Limited to Yarmouth and Shelburne counties.
<i>Carex scirpoidea</i>	Scirpuslike Sedge				S2	Streamsides in rock crevices or riparian cliffs. Locally abundant along some of the rivers of northern Cape Breton: Cheticamp, Margaree and Lockhart Brook and Corney Brook. Near two small ponds in Jim Campbell Barren.
<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	bog, swamp. Widely scattered localities in province
<i>Spiranthes casei</i>	Case's Ladies'-Tresses				S2	Look for this species in acidic, sandy soils on rock barrens or even roadsides. So far restricted to southwestern counties, Jordan Falls to Pubnico, Belleville and the Annapolis Valley.
<i>Piptatherum canadense</i>	Canada Rice Grass				S2	Grows in dry sandy soils. Local and scattered from Shelburne to Halifax and Colchester counties.
<i>Piptatherum pungens</i>	Slender Rice Grass				S2	open areas in dry (or occasionally moist), sandy or very rocky, nutrient-poor soils. Openings in coniferous forests. Shelburne and Queens counties
<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	Low-lying coastal areas, often seen parasitizing <i>Symphytotrichum novi-begii</i> . Locally abundant at Loch Broom, Pictou Co. Known from Hubbards and Antigonish as well as Tusket River, Yarmouth Co. Louis Head Beach, Shelburne Co.
<i>Iva frutescens</i>	Big-leaved Marsh-elder				S2S3	Disturbed and elevated areas around saltmarshes - Yarmouth, Kings Co., and Cape Breton
<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S2S3	Found only on gravelly seashores. Scattered along the entire Atlantic coast.
<i>Betula michauxii</i>	Michaux's Dwarf Birch				S2S3	Limited to peat bogs. Scattered localities from Brier Island, Digby Co., east to Guysborough, Cape Breton and Inverness counties.

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Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Sagina nodosa</i>	Knotted Pearlwort				S2S3	Coastal cliffs, sand flats and dune slopes - Scattered from Annapolis to Guysborough counties
<i>Empetrum eamesii</i>	Pink Crowberry				S3	barrens, beach or coastal shore, bog, exposed rock or sand, headland
<i>Halenia deflexa</i>	Spurred Gentian				S2S3	Exposed shorelines and headlands along coast. Rare and local on the mainland: Hall's Harbour, King's Co.; Sherbrooke, Guysborough Co. Common in norther Cape Breton
<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	Coastal in stony soils on open sites. In Annapolis, Cumberland & Colchester.
<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	Found on dry rock barrens and other open areas in Yarmouth, Halifax, Kings, Shelburne and Hants Co.
<i>Minuartia groenlandica</i>	Greenland Stitchwort				S3	Granite ledges, crevices and gravels, coastal headlands. Halifax and Lunenburg counties; French Mountain, Inverness County. Recently collected from White's Cove, Digby Co.
<i>Vaccinium boreale</i>	Northern Blueberry				S3	Grows on the windswept headlands and barrens. Scattered at several Cape Breton localities, rare on the mainland.
<i>Vaccinium uliginosum</i>	Alpine Bilberry				S3	Wide tolerance of moisture and fertility, but generally acidic soils in Halifax, Digby & Cape Breton
<i>Bartonia virginica</i>	Yellow Bartonia				S3	Dry barrens, sandy or peaty soils, bogs, lakeshores. Common in southwestern counties becoming scarcer east to Annapolis and Halifax; St. Peter's area of Cape Breton
<i>Epilobium strictum</i>	Downy Willowherb				S3	Bogs and other peatlands; Scattered throughout Cape Breton, infrequent elsewhere.
<i>Amelanchier stolonifera</i>	Running Serviceberry				S3	Frequents sandy, stony areas as on barrens and in boggy depressions. Scattered in southwestern counties. Common across Annapolis and Kings counties and

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
						possibly northern Cape Breton.
<i>Cephalanthus occidentalis</i>	Common Buttonbush				S3	Grows amidst boulders at waterline and overflow marshes of lakes. Rare from Queens to Yarmouth Co. Locally abundant in suitable habitat from Medway to Roseway Riers Lunenburg Co. Part of our coastal plain floral community.
<i>Limosella australis</i>	Southern Mudwort				S3	beach or coastal shore, coastal island, lake or pond shore, river or stream. Yarmouth, Shelburne, Queens and Cumberland counties; Sable Island; Cape Breton and likely elsewhere
<i>Carex foenea</i>	Fernald's Hay Sedge				S3	Preferred habitat is dry and sandy soils as on barrens. Scattered from Yarmouth to northern Cape Breton.
<i>Carex swanii</i>	Swan's Sedge				S3	Barrens, pastures and clearings where soils are acidic. Yarmouth Co. east only to Kings Co.
<i>Juncus dudleyi</i>	Dudley's Rush				S3	A habitat generalist; known from Annapolis, Hants and Lunenburg counties.
<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3	barrens, disturbed sites, field meadow. Western half of Province, northwest to Hants County
<i>Panicum rigidulum</i>	Redtop Panic Grass				S3	Grows in sand and peat substrates and gravelly lakeshores. A coastal plain species. Found from Yarmouth Co. to Lake Kejimikujik National Park, where it is common along the Mersey River at the outlet to the lake.
<i>Equisetum variegatum</i>	Variegated Horsetail				S3	wetlands or wet seeps. Wide ranging in NS, with disjunct localities: Halifax County, Cumberland Co., Victoria Co.
<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	Found on damp acidic granite as on talus slopes or exposed cliffs in Cumberland, Kings & Voctoria Co, and Fundy Coast
<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	Limited to bogs, rock barrens and lakeshores. Distinctly coastal plain in distribution, from Digby to Queens counties.

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Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3S4	brackish shallows or ponds. Cumberland county east to Cape Breton Co.
<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S3S4	Grows in acidic soils in damp locations where there is little competition from shrubs, lakeshores and woods roads Found from Annapolis County around the coast to Queens Co.
<i>Triglochin gaspensis</i>	Gaspé Arrowgrass				S3S4	Brackish or salt marshes and flats, marshes, intertidal, subtidal or open ocean.
<i>Trisetum spicatum</i>	Narrow False Oats				S3S4	Grows in rocky soils on outcrops, cliffs, streamsides. Found on Cape Blomidon Cape d'Or and scattered from Halifax and Hants counties to northern Cape Breton.
<b>LICHENS</b>						
<i>Xanthoparmelia mougeotii</i>	Powdered Rock-shield Lichen				S2?	Usually on acidic rocks and rarely on tree bases, often in open habitats
<i>Sphaerophorus fragilis</i>	Fragile Coral Lichen				S3S4	Commonly found on siliceous rock/outcrops in coastal barren and alpine habitats.
<b>VERTEBRATES</b>						
<i>Salvelinus fontinalis</i>	Brook Trout				S3	Inhabit a wide range of cool, freshwater environments, from small headwater streams to large lakes. Spawning sites are usually near groundwater upwelling or spring seeps and within a lake or stream with a gravel substrate.
<i>Anguilla rostrata</i>	American Eel		T		S2	Found throughout Nova Scotia, the catadromous American Eel spends most of its lifecycle in freshwater, returning to the Sargasso Sea to spawn. American Eel are habitat generalists, showing no consistent preference for particular stream morphologies, physical characteristics, or temperatures in freshwater streams.



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Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Margariscus margarita</i>	Pearl Dace				S3	Cool, clear headwater streams in the south, bog drainage streams, ponds and small lakes in the north, and in stained, peaty waters of beaver ponds" (Scott and Crossman 1973). Usually over sand or gravel (Page and Burr 1991). Spawns in clear water over sand or gravel in weak or moderate current (Scott and Crossman 1973).
<i>Culaea inconstans</i>	Brook Stickleback				S3	This species generally occupies cool, clear, heavily weeded, spring-fed creeks, small rivers, lakes, and ponds, usually in shallow, quiet to flowing pools and backwaters over sand or mud. Sometimes it burrows into soft bottoms. Occasionally this fish can be found in brackish water. In a lake in Manitoba, adults were most abundant at the outer margin of emergent vegetation (Moodie 1986). Eggs are deposited in a nest made of plant material by the male just above the bottom in shallow water
<i>Alces americanus</i>	Mainland Moose			Endangered	S1	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.
<b>INVERTEBRATES</b>						
<i>Papilio brevicauda</i>	Short-tailed Swallowtail				S1	Within its limited range it can be found in a variety of habitats. Some of these such as gardens are mainly nectaring areas for adults but apparently at least in Newfoundland almost any kind of open habitat with suitable umbellifers can be breeding habitat. Most often seen in rocky coastal situations such as sea cliffs, rocky beaches, headlands etc. Also occurs occasionally in inland meadows and near or above treeline such as on the upper slopes of Mont-Albert.

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Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Somatochlora albicincta</i>	Ringed Emerald				S1	pond breeding- range 3km from pond
<i>Somatochlora brevicincta</i>	Quebec Emerald				S1	Pools in sphagnum bogs
<i>Epithea princeps</i>	Prince Baskettail				S2	pond breeding- range 3km from pond
<i>Somatochlora septentrionalis</i>	Muskeg Emerald				S2	pond breeding- range 3km from pond
<i>Somatochlora williamsoni</i>	Williamson's Emerald				S2	pond breeding- range 3km from pond
<i>Erythrodiplax berenice</i>	Seaside Dragonlet				S2S3	This species occurs in salt marshes and mangrove swamps along the eastern shores of the United States; and in saline lakes in the southwestern United States. It is the only small dragonfly occurring in salt water habitats
<i>Gomphus descriptus</i>	Harpoon Clubtail				S2S3	river- breeding dragonfly. 5 km range
<i>Ophiogomphus aspersus</i>	Brook Snaketail				S2S3	Even minor increases in the silt or mud content in streams can alter dissolved oxygen levels and harm or kill snaketail larvae. Like most odonates, snaketails also need undisturbed fields and wooded uplands adjacent to breeding waters. It is here that critical foraging and breeding occurs. This species inhabits clean, relatively quiet or slow moving streams with an abundance of sandy sediments.
<i>Ophiogomphus mainensis</i>	Maine Snaketail				S2S3	streams and small rivers. May through July - dragonfly
<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S2S3	Inhabits flowing clear streams and rivers in the northeastern third of the U.S., and parts of southeast Canada-- dragonfly
<i>Boyeria grafiana</i>	Ocellated Darner				S3	Prefers swiftly flowing rocky forest streams and rivers; also rocky-shored lakes.
<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	pond breeding- range 3km from pond

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S3	river- breeding dragonfly. 5 km range
<i>Lanthus parvulus</i>	Northern Pygmy Clubtail				S3S4	Lotic. Overall habitat is clear streams and brooks with strong current over clean gravel, cobbles or bedrock, on comparatively unproductive soils ("trout stream"). Landform required to promote a strong current in small running waters generally has moderate to considerable relief, from hills to mountains. The microhabitat (sub-EO) is areas proximal to surface-breaking structure such as cobbles, boulders or deadwood in full current and proximal to sun-lit marginal vegetation
<i>Papilio brevicauda</i>	Short-tailed Swallowtail				S1	Within its limited range it can be found in a variety of habitats. Some of these such as gardens are mainly nectaring areas for adults but apparently at least in Newfoundland almost any kind of open habitat with suitable umbellifers can be breeding habitat. Most often seen in rocky coastal situations such as sea cliffs, rocky beaches, headlands etc. Also occurs occasionally in inland meadows and near or above treeline such as on the upper slopes of Mont-Albert.
<i>Somatochlora albicineta</i>	Ringed Emerald				S1	pond breeding- range 3km from pond
<i>Somatochlora brevicincta</i>	Quebec Emerald				S1	Pools in sphagnum bogs
<i>Epithea princeps</i>	Prince Baskettail				S2	pond breeding- range 3km from pond
<i>Somatochlora septentrionalis</i>	Muskeg Emerald				S2	pond breeding- range 3km from pond
<i>Somatochlora williamsoni</i>	Williamson's Emerald				S2	pond breeding- range 3km from pond
<i>Erythrodiplax berenice</i>	Seaside Dragonlet				S2S3	This species occurs in salt marshes and mangrove swamps along the eastern shores of the United States; and in saline lakes in the southwestern United States. It is the only small dragonfly occurring in salt water habitats

Peggys Cove Priority Species List



Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Gomphus descriptus</i>	Harpoon Clubtail				S2S3	river- breeding dragonfly. 5 km range
<i>Ophiogomphus aspersus</i>	Brook Snaketail				S2S3	Even minor increases in the silt or mud content in streams can alter dissolved oxygen levels and harm or kill snaketail larvae. Like most odonates, snaketails also need undisturbed fields and wooded uplands adjacent to breeding waters. It is here that critical foraging and breeding occurs. This species inhabits clean, relatively quiet or slow moving streams with an abundance of sandy sediments.
<i>Ophiogomphus mainensis</i>	Maine Snaketail				S2S3	streams and small rivers. May through July - dragonfly
<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S2S3	Inhabits flowing clear streams and rivers in the northeastern third of the U.S., and parts of southeast Canada-- dragonfly
<i>Boyeria grafiana</i>	Ocellated Darner				S3	Prefers swiftly flowing rocky forest streams and rivers; also rocky-shored lakes.
<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	pond breeding- range 3km from pond
<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S3	river- breeding dragonfly. 5 km range
<i>Lanthus parvulus</i>	Northern Pygmy Clubtail				S3S4	Lotic. Overall habitat is clear streams and brooks with strong current over clean gravel, cobbles or bedrock, on comparatively unproductive soils ("trout stream"). Landform required to promote a strong current in small running waters generally has moderate to considerable relief, from hills to mountains. The microhabitat (sub-EO) is areas proximal to surface-breaking structure such as cobbles, boulders or deadwood in full current and proximal to sun-lit marginal vegetation
<b>AVIFAUNA</b>						
<i>Uria aalge</i>	Common Murre				S1?B,S5N	Ocean, large bays; colonies on sea cliffs. Favors cool ocean waters, both offshore and rather near coast, generally over continental shelf. Unlike Thick-billed

Peggys Cove Priority Species List



Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
						Murre, tends to avoid areas of pack ice. Nests on coasts and islands, on ledges of cliffs and on flat bare rock atop sea stacks.
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1B	The few colonies of black-crowned night-herons in the Maritimes represent easterly outliers of a more continuous range along the Atlantic coast and in the St. Lawrence Valley. Except near Edmundston, all known breeding here is coastal, usually on islands and often with Great Blue Herons, the only common colonial heron in the Maritimes. Most colonies are in spruce or fir, the common trees in coastal areas.
<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	The piping plover nests and rears its young on open sandy shores. Generally, favor wide, sparsely vegetated sand or gravel beaches adjacent to vast alkali lakes.
<i>Haematopus palliatus</i>	American Oystercatcher				S1B	The American Oystercatcher is tied to coastal areas during breeding and non-breeding intervals, bound by prey specialization on shellfish and other marine invertebrates. Nests primarily on sand and shell beaches, dunes, salt marsh, and occasionally rock or other surfaces. Typical nests are placed in areas with little to no vegetation, although substrate varies greatly and depends on site. During spring and fall migration, American Oystercatchers typically concentrate in areas of abundant food, oyster beds, or reefs; clam flats and suitable roosting places; open ground without vegetation near suitable feeding habitat. Feed in intertidal mud or sand flats, or on shellfish beds; roost on adjacent beaches, dunes, or marsh islands, rarely venturing inland.

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Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	Northeastern roseate terns nest exclusively in association with common terns, but occupy only a small fraction of the sites used by that species. They nest on nearshore islands composed of rocks or glacial till, barrier islands or barrier beaches, rarely on salt marsh islands, but they are less flexible in their choice of nesting sites than common terns are. Most roseate colonies are close to fishing areas with shallow water and sandy bottoms, sandbars, or shoals. Northeastern Roseates characteristically select dense vegetation, rocks, or other shelter and conceal their nests under cover, but they occasionally nest in the open. They readily occupy artificial sites such as nest boxes or half-buried tires, which provide concealed nest sites and are often preferred to all natural sites. Some nest among beach grass ( <i>Ammophila breviligulata</i> ) on barrier islands or beaches above high-tide line; nests are seldom flooded. European birds likewise nest in denser cover, and also at higher elevations than Common Terns.
<i>Calidris minutilla</i>	Least Sandpiper				S1B,S3M	Least sandpiper breed mainly in sedge meadows and bogs of the subarctic zone from Alaska to Newfoundland, but a few nest farther south along cool coasts, in the Magdalen Islands (QC) and Nova Scotia. Occur commonly in the maritimes as migrants.
<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	The Maritimes is the southernmost breeding area of the semipalmated plover. It's breeding habitat is gravel beaches. During spring and fall migration, it uses mudflats, salt marshes with mussel beds, low-energy beach areas lacking surface film of water.

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Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Falco peregrinus</i> <i>pop. 1</i>	Peregrine Falcon - anatum/tundrius	Special Concern	Not at Risk	Vulnerable	S1B,SNAM	Peregrine falcons breed from Alaska and the Canadian arctic south locally through the mountainous west, and sparingly in the east. Spends winters on coasts north to British Columbia, along the east coast of the US and along the Gulf Coast. Preferred habitats include tundra, savannas, coasts, mountains, and tall buildings.
<i>Bucephala islandica</i> ( <i>Eastern pop.</i> )	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern		S1N	During the breeding period, Barrow's Goldeneye use small lakes (< 15 ha) located at high altitudes (> 500 m) in areas characterized by rugged terrain for mating and rearing their young. They prefer fishless lakes and lakes at the head of watershed. They seldom make their nests near water and their breeding range is restricted to areas with suitable nest sites, thus nest cavities in dead or dying trees, including conifers, and deciduous trees. In the winter, it is closely associated with large rocky intertidal areas that support dense populations of brown algae. During moulting they congregate in areas similar to those they use in the winter.
<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S2B	Common nighthawks nest on sparsely vegetated or bare ground in open "wastelands" such as pine barrens, forest cut-overs, or burns, and secondarily on flat roofs of buildings.
<i>Alca torda</i>	Razorbill				S2B,S4N	In the Maritimes, this species is at the southern limit of the range. Colonies in Nova Scotia are adjacent to cool coastal waters on the outer coast of the province, and around northern Cape Breton Island.
<i>Branta bernicla</i>	Brant				S2M	The breeding range of the brant is in the low arctic, thus it does not breed in Nova Scotia. The most important staging areas for Brant are found in shallow marine waters along indented shorelines, within lagoons, or behind barrier beaches. In addition, most are characterized by the presence of tidal or subtidal eelgrass meadows, the preferred staging habitat for

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
						Brant. Isolated bays with high eelgrass abundance support the highest numbers of staging Brant
<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered	Endangered	Endangered	S2M	Not breeding in the Maritimes. During migration, knots use marine habitats in both South and North America, generally preferring sandy coastal habitats at or near tidal inlets or the mouths of bays and estuaries (BAH). On spring migration northwards from “wintering” areas in TdF, knots use sandy intertidal areas, but are also found on restinga habitats -- rocky intertidal platforms that support a variety of invertebrates.
<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	The harlequin duck frequents rocky shores in winter, but usually breed by rapid, rocky rivers inland from the coast. Scarce throughout the Maritimes.
<i>Tringa semipalmata</i>	Willet				S2S3B	In the Maritimes and other eastern areas, willets feed mainly in vegetated salt marshes and nest in fields and other open areas nearby. Their distribution is strictly coastal, including barrier-beach ponds, tidal estuaries, and fringing salt marshes.
<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2S3B	The Bank Swallow breeds wherever suitable nesting sites in banks and cliffs are available. Nesting colonies are usually found near open areas, and often close to water. Bank Swallows will also nest in artificial banks, such as road cuttings and gravel pits. Found in all regions of the Maritimes, but scarce in many inland forested areas.
<i>Numenius phaeopus hudsonicus</i>	Hudsonian Whimbrel				S2S3M	The Hudsonian whimbrel breeds in subarctic tundra and taiga, ranging from dry heath uplands to poorly drained hummocky, grass-sedge, dwarf shrub, and mossy lowlands. On fall migration, uses a variety of terrestrial and coastal habitats: ericaceous heaths in e.



Peggys Cove Priority Species List



Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
						Canada; also meadows, fields, intertidal flats, oyster banks, sandy beaches, rocky shores, river mouths and estuaries, salt marshes, lagoons, and upper beaches and dunes.
<i>Phalaropus fulicarius</i>	Red Phalarope				S2S3M	The red phalarope does not breed in Nova Scotia. Spring migration in offshore waters, probably in association with oceanic fronts. Near breeding grounds, associated with leads in ice or edge of pack ice, where prey abundant. May use littoral waters during storms. Fall migration preceded by onshore movement toward ocean. Females gather in loose flocks on fresh-water ponds, gradually moving seaward. Form larger flocks in brackish ponds near coast, and in littoral waters. Males, then juveniles, follow same pattern. Southbound migration using similar habitats as northbound, often well offshore, associated with main currents.
<i>Phalaropus lobatus</i>	Red-necked Phalarope	No Status	Special Concern		S2S3M	Red-necked phalaropes typically nest in vegetation containing sedge. Distance to water varies, but sometimes builds thick nest bowl in sedge above standing water; rarely in dry tussocks >20 m from water. In the Maritimes, this species would be observed as a migrant coastally and offshore as they move towards their breeding grounds in the Nearctic.
<i>Calidris maritima</i>	Purple Sandpiper				S3?N	The purple sandpiper does not breed in Nova Scotia. On migration (in North America or elsewhere), mainly exposed, rocky coastal shores with considerable wave action. Less often, tidal flats and muddy pools. Inland migrants (rare in North America) usually found along rocky shores of large inland bodies of water, or along breakwaters or other natural or human-made rocky surfaces.

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Charadrius vociferus</i>	Killdeer				S3B	The killdeer is found throughout Nova Scotia, but scarce on the Atlantic slope and on Cape Breton Island. Breed in farmlands, gravel pits, forest clear-cut areas, and open lands along the coast.
<i>Sterna hirundo</i>	Common Tern		Not at Risk		S3B	The range of the common tern includes inland as well as coastal areas, where shallow waters for fishing occur near sandy or gravelly shores for nesting; it does not forage far out to sea.
<i>Sterna paradisaea</i>	Arctic Tern				S3B	The Arctic Tern breeds across the low arctic and subarctic regions of the Earth, and south along coasts cooled by ocean currents flowing from the arctic. Nearly all maritimes breeding areas are on islands, facing the open sea, with foraging at all seasons typically offshore.
<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	Black-bellied Plovers breed in the northernmost reaches of North America and Eurasia, in dry heath tundra as well as wet tundra. They nest in lowlands, never in high mountainous areas, but they do use ridges and foothills.
<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	Ruddy Turnstones breed in the tundra of northern North America. During migration they use freshwater shorelines, mudflats, rocky shorelines, and sandy beaches. On the wintering grounds they occur along coastal areas with mudflats, sandy beaches, and rocky shores.
<i>Calidris fuscicollis</i>	White-rumped Sandpiper				S3M	During migration in North America, White-rumped Sandpipers frequent a remarkable variety of freshwater habitats, including wet agricultural fields, sod farms, freshwater impoundments, and marshes with muddy margins. They also use brackish habitats including upper portions of tidal mudflats, lagoons, and estuaries.

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	The semipalmated sandpiper breeds in low and sub-arctic tundra, near water. During spring and fall migration, they stage (flock in preparation for migration) in areas of shallow fresh or salt water and little vegetation, muddy intertidal zones, or along edges of lakes, usually on soft silt/clay mudflats, or at junction of short-grass ( <i>Puccinellia phryganodes</i> ) marsh and tidal flats. In fall, often roost in large numbers on exposed beaches during high tide when marshlands are flooded .
<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	Wintering Short-billed Dowitchers are most common in saltwater and brackish environments (in contrast to Long-billed, which prefer freshwater), especially estuaries and lagoons with tidal activity and abundant shallows for feeding. Migrants are opportunistic in their choice of habitat, turning up in manmade 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 and occasionally feed in such places, but they forage mostly where there is a fine muddy bottom covered by a few inches of water.
<i>Tringa flavipes</i>	Lesser Yellowlegs				S3M	Breeds in open boreal forest with scattered shallow wetlands. Winters in wide variety of shallow fresh and saltwater habitats.
<i>Calidris alba</i>	Sanderling				S3M,S2N	Sanderlings stop on hard-packed sand beaches, tidal mudflats, rocky coastlines, and inland bodies of water—including ponds, streams, reservoirs, and shallow prairie lakes.
<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S3S4M	During migration, the greater yellowlegs is a familiar sight in salt marshes and around ponds and rivers, but their breeding habitat is very different. Yellowlegs breed in wooded bogs and muskegs across the boreal

## Peggys Cove Priority Species List

Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
						forest from northern British Columbia and Mackenzie to Labrador, Newfoundland and eastern Nova Scotia.
<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	Breeds along lakes, rivers, bogs, moors, grasslands, swamps, and coastal marshes. In winter, found primarily along seacoasts, estuaries, and bays.
<i>Somateria mollissima</i>	Common Eider				S3S4	Breeds on coastal islands or along ponds and lagoons near the ocean. Winters offshore near marine shoals.
<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B	In the Maritimes, the most familiar habitat of the spotted sandpiper is open, gravelly shores and rivers, streams, and lakes, but they also breed around pools in other open habitats, near the sea-coasts and on islands, in gravel pits and quarries, and even in farmland. In the Maritimes, they are found sparsely in forested regions, with the most obvious gaps in headwater areas between river systems. During spring and fall migration, they occur anywhere there is water, but typically prefer freshwater habitat such as lakes, rivers, and marshes over estuaries.
<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5N	Red-breasted mergansers breed in the boreal to low arctic zones across North America and Eurasia, with only local or irregular breeding farther south. It is a ground nester and so is not restricted to forested regions like the other mergansers. Its largest numbers in the Maritimes nest amid low brush and driftwood on coastal islands and sandbars, sometimes in loose groups with up to 5 nests on one island, usually in association with gulls or terns.

**Peggys Cove Priority Species List**



Scientific Name	Common Name	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Bucephala albeola</i>	Bufflehead				S3S4N	<p>Bufflehead breed near ponds and lakes in boreal forest and aspen parkland of Canada and Alaska, with isolated populations in the western United States. The Bufflehead’s breeding range is limited by the distribution of Northern Flickers, which are their main source of nesting cavities. Bufflehead are North America’s smallest diving duck; they benefit by using old flicker nests that larger ducks such as goldeneyes and mergansers cannot fit into. In winter they occur mainly near the coast (although they can be found in smaller numbers inland). They use shallow, sheltered coves, harbors, estuaries, or beaches, avoiding open coastlines. Inland, they use ponds, lakes, impoundments, or bays along slow-moving rivers. During spring migration they spend time on major rivers or valley lakes, often in the first spots to become free of ice.</p>

# DATA REPORT 6496: Peggy's Cove, NS

Prepared 11 September 2019  
by C. Robicheau, Data Manager

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Map 1. A 100 km buffer around the study area

## 1.0 PREFACE

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

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

### 1.1 DATA LIST

Included datasets:

Filename	Contents
PeggysCvNS_6496ob.xls	All Rare and legally protected <i>Flora and Fauna</i> in your study area
PeggysCvNS_6496ob100km.xlsx	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area
PeggysCvNS_6496ma.xls	All <i>Managed Areas</i> in your study area
PeggysCvNS_6496sa_py.xls	All <i>Significant Natural Areas</i> in your study area
PeggysCvNS_6496wf.xls	Rare and common <i>Waterfowl</i> in your study area (CWS database)

## 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

Tel: (506) 364-2658

[sean.blaney@accdc.ca](mailto:sean.blaney@accdc.ca)

### Animals (Fauna)

John Klymko, Zoologist

Tel: (506) 364-2660

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Sarah Robinson, Community Ecologist

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### Data Management, GIS

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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:** Duncan Bayne  
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[Terrance.Power@novascotia.ca](mailto:Terrance.Power@novascotia.ca)

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



## 2.0 RARE AND ENDANGERED SPECIES

### 2.1 FLORA

The study area contains 28 records of 8 vascular and 3 records of 3 nonvascular flora (Map 2 and attached: \*ob.xls).

### 2.2 FAUNA

The study area contains 52 records of 28 vertebrate and no records of invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if "location-sensitive" species occur near your study site.

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



#### RESOLUTION

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

#### HIGHER TAXON

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

### 3.0 SPECIAL AREAS

#### 3.1 MANAGED AREAS

The GIS scan identified 6 managed areas in the vicinity of the study area (Map 3 and attached file: \*ma\*.xls).

#### 3.2 SIGNIFICANT AREAS

The GIS scan identified 2 biologically significant sites in the vicinity of the study area (Map 3 and attached file: \*sa\*.xls).

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



#### MANAGED AREAS SIGNIFIANT AREAS



## 4.0 RARE SPECIES LISTS

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

### 4.1 FLORA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
N	<i>Campyllum polygamum</i>	a Moss				S2?	5 Undetermined	1	0.4 $\pm$ 2.0
N	<i>Limprichtia revolvens</i>	a Moss				S2S3	3 Sensitive	1	0.4 $\pm$ 2.0
P	<i>Cardamine parviflora</i>	Small-flowered Bittercress				S2	3 Sensitive	2	1.7 $\pm$ 1.0
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	3 Sensitive	11	0.2 $\pm$ 1.0
P	<i>Crassula aquatica</i>	Water Pygmyweed				S2	3 Sensitive	1	0.6 $\pm$ 0.0
P	<i>Mononeuria groenlandica</i>	Greenland Stitchwort				S3	3 Sensitive	5	0.6 $\pm$ 0.0
P	<i>Empetrum eamesii</i>	Pink Crowberry				S3	3 Sensitive	4	0.2 $\pm$ 2.0
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3	4 Secure	1	0.5 $\pm$ 0.0
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	3	0.4 $\pm$ 2.0
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S3S4	4 Secure	1	0.3 $\pm$ 1.0

### 4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened	Threatened	Endangered	S2S3B	1 At Risk	3	3.4 $\pm$ 7.0
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	2	1.5 $\pm$ 0.0
A	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	1	2.9 $\pm$ 2.0
A	<i>Coccythraustes vespertinus</i>	Evening Grosbeak	Special Concern		Vulnerable	S3S4B,S3N	4 Secure	1	3.4 $\pm$ 7.0
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4		1	1.3 $\pm$ 1.0
A	<i>Circus hudsonius</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	1	3.4 $\pm$ 7.0
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	4 Secure	2	0.1 $\pm$ 0.0
A	<i>Bucephala clangula</i>	Common Goldeneye				S2B,S5N	4 Secure	1	1.4 $\pm$ 7.0
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3	3 Sensitive	1	1.4 $\pm$ 7.0
A	<i>Spinus pinus</i>	Pine Siskin				S2S3	3 Sensitive	1	3.4 $\pm$ 7.0
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	5	1.1 $\pm$ 0.0
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	2	3.4 $\pm$ 7.0
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	3 Sensitive	3	3.4 $\pm$ 7.0
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	3	3.4 $\pm$ 7.0
A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	1	3.4 $\pm$ 7.0
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	2	1.1 $\pm$ 0.0
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	2	3.4 $\pm$ 7.0
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	3	1.1 $\pm$ 0.0
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	4 Secure	1	1.1 $\pm$ 0.0
A	<i>Tringa flavipes</i>	Lesser Yellowlegs				S3M	4 Secure	1	0.1 $\pm$ 0.0
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	1	1.1 $\pm$ 0.0
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	4 Secure	1	1.1 $\pm$ 0.0
A	<i>Somateria mollissima</i>	Common Eider				S3S4	4 Secure	5	1.4 $\pm$ 7.0
A	<i>Actitis macularia</i>	Spotted Sandpiper				S3S4B	3 Sensitive	1	0.1 $\pm$ 0.0
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	2	3.4 $\pm$ 7.0
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	1	3.4 $\pm$ 7.0
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B	4 Secure	3	1.1 $\pm$ 0.0

### 4.3 LOCATION SENSITIVE SPECIES

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

#### Nova Scotia

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

<sup>1</sup> *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
30	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
13	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
10	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
7	Hicks, Andrew. 2009. Coastal Waterfowl Surveys Database, 2000-08. Canadian Wildlife Service, Sackville, 46488 recs (11149 non-zero).
6	Staff, DNR 2007. Restricted & Limited Use Land Database (RLUL).
4	iNaturalist. 2018. iNaturalist Data Export 2018. iNaturalist.org and iNaturalist.ca, Web site: 11706 recs.
3	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
3	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
3	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: <a href="http://luxor.acadiau.ca/library/Herbarium/project/">http://luxor.acadiau.ca/library/Herbarium/project/</a> . 582 recs.
2	
2	Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
2	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.
1	Basquill, S.P. 2011. Field observations & specimen collections, 2010. Nova Scotia Department of Natural Resources, Pers. comm. , 8 Recs.
1	Benjamin, L.K. (compiler) 2001. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources. 15 spp, 224 recs.
1	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
1	Clayden, S.R. 1998. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 19759 recs.
1	Hill, N.M. 1994. Status report on the Long's bulrush <i>Scirpus longii</i> in Canada. Committee on the Status of Endangered Wildlife in Canada, 7 recs.
1	NS DOE. Protected Areas
1	Porter, K. 2013. 2013 rare and non-rare vascular plant field data. St. Mary's University, 57 recs.
1	Sollows, M.C., 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.

### 5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 35,305 records of 146 vertebrate and 1015 records of 57 invertebrate fauna; 13,243 records of 292 vascular and 1318 records of 169 nonvascular flora (attached: \*ob100km.xls).

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

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
x	x	x	x	Special Concern	x	x	x	x	x	
A	<i>Coregonus huntsmani</i>	Atlantic Whitefish	Endangered	Endangered	Endangered	S1	7 Exotic	32	52.6 ± 1.0	NS
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	79	15.9 ± 0.0	NS
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	4	53.2 ± 0.0	NS
A	<i>Perimyotis subflavus</i>	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	7	53.2 ± 0.0	NS
A	<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Endangered	Endangered	S1	1 At Risk	4841	65.3 ± 0.0	NS
A	<i>Salmo salar pop. 1</i>	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered		S1	2 May Be At Risk	18	30.2 ± 0.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	1178	12.4 ± 0.0	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	1 At Risk	61	13.2 ± 0.0	NS
A	<i>Morone saxatilis pop. 2</i>	Striped Bass- Bay of Fundy pop.	Endangered			S1B	2 May Be At Risk	4	56.6 ± 0.0	NS
A	<i>Dermodochelys coriacea (Atlantic pop.)</i>	Leatherback Sea Turtle - Atlantic pop.	Endangered	Endangered		S1S2N		3	16.8 ± 1.0	NS
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered	Endangered	Endangered	S2M	1 At Risk	580	37.2 ± 0.0	NS
A	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Endangered	Threatened		SNA	8 Accidental	1	100.0 ± 0.0	NS
A	<i>Colinus virginianus</i>	Northern Bobwhite	Endangered	Endangered				6	34.7 ± 7.0	NS
A	<i>Antrostomus vociferus</i>	Eastern Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	1 At Risk	15	27.7 ± 0.0	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit	Threatened			S1S2M	3 Sensitive	84	38.2 ± 0.0	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	3 Sensitive	1092	27.9 ± 0.0	NS
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened			S2	2 May Be At Risk	5	58.3 ± 0.0	NS
A	<i>Anguilla rostrata</i>	American Eel	Threatened			S2	4 Secure	9	46.1 ± 0.0	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2B,S1M	1 At Risk	253	18.0 ± 7.0	NS
A	<i>Thamnophis sauritus pop. 3</i>	Eastern Ribbonsnake - Atlantic pop.	Threatened	Threatened	Threatened	S2S3	1 At Risk	725	57.0 ± 0.0	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2S3B	2 May Be At Risk	249	7.8 ± 7.0	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened	Threatened	Endangered	S2S3B	1 At Risk	658	3.4 ± 7.0	NS
A	<i>Cardellina canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3B	1 At Risk	558	7.8 ± 7.0	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Vulnerable	S3S4B	3 Sensitive	322	28.8 ± 7.0	NS
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened	Threatened		SHB	3 Sensitive	2	12.7 ± 7.0	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened	Threatened		SUB	5 Undetermined	26	57.7 ± 7.0	NS
A	<i>Passerculus sandwichensis princeps</i>	Savannah Sparrow princeps ssp	Special Concern	Special Concern		S1B	3 Sensitive	1	45.6 ± 0.0	NS
A	<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Vulnerable	S1B,SNAM	3 Sensitive	41	6.6 ± 0.0	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern		S1S2B	2 May Be At Risk	9	12.7 ± 7.0	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	166	1.5 ± 0.0	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S2B	1 At Risk	369	18.0 ± 7.0	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S2B	1 At Risk	442	7.8 ± 7.0	NS
A	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	18	2.9 ± 2.0	NS
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S2S3M	3 Sensitive	5	37.5 ± 0.0	NS
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	159	32.8 ± 10.0	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	3 Sensitive	577	10.8 ± 7.0	NS
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern			S3S4B,S3N	4 Secure	341	3.4 ± 7.0	NS
A	<i>Phocoena phocoena (NW Atlantic pop.)</i>	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		4	27.4 ± 1.0	NS
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern			S4N	4 Secure	2	51.8 ± 10.0	NS
A	<i>Chrysemys picta picta</i>	Eastern Painted Turtle	Special Concern			S4S5	4 Secure	201	18.6 ± 0.0	NS
A	<i>Calidris subruficollis</i>	Buff-breasted Sandpiper	Special Concern			SNA	8 Accidental	40	37.2 ± 0.0	NS
A	<i>Lynx canadensis</i>	Canadian Lynx	Not At Risk		Endangered	S1	1 At Risk	2	44.2 ± 1.0	NS
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B	5 Undetermined	2	32.8 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1B	5 Undetermined	5	82.5 ± 7.0	NS
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	1	89.9 ± 0.0	NS
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S2?B	5 Undetermined	2	74.7 ± 7.0	NS
A	<i>Glaucomys volans</i>	Southern Flying Squirrel	Not At Risk	Special Concern		S2S3	3 Sensitive	7	64.2 ± 0.0	NS
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3		1	91.4 ± 100.0	NS
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	4 Secure	29	24.4 ± 0.0	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	186	7.8 ± 7.0	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	40	28.4 ± 0.0	NS
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	4 Secure	102	12.7 ± 7.0	NS
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4		1	1.3 ± 1.0	NS
A	<i>Circus hudsonius</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	177	3.4 ± 7.0	NS
A	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	92	7.8 ± 7.0	NS
A	<i>Morone saxatilis</i>	Striped Bass	E,E,SC			S2S3	2 May Be At Risk	1	88.8 ± 1.0	NS
A	<i>Martes americana</i>	American Marten			Endangered	S1	1 At Risk	4	68.7 ± 0.0	NS
A	<i>Alces americanus</i>	Moose			Endangered	S1	1 At Risk	9	16.6 ± 0.0	NS
A	<i>Salmo salar</i>	Atlantic Salmon				S1	2 May Be At Risk	23	14.5 ± 0.0	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B	5 Undetermined	9	21.1 ± 0.0	NS
A	<i>Anas acuta</i>	Northern Pintail				S1B	2 May Be At Risk	14	31.0 ± 7.0	NS
A	<i>Gallinula galeata</i>	Common Gallinule				S1B	5 Undetermined	2	57.5 ± 7.0	NS
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S1B	2 May Be At Risk	28	24.9 ± 7.0	NS
A	<i>Cistothorus palustris</i>	Marsh Wren				S1B	5 Undetermined	2	37.1 ± 0.0	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	4 Secure	37	19.1 ± 7.0	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	5 Undetermined	10	27.6 ± 7.0	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1B	5 Undetermined	19	24.9 ± 7.0	NS
A	<i>Setophaga pinus</i>	Pine Warbler				S1B	5 Undetermined	14	30.8 ± 0.0	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S3M	4 Secure	1016	24.2 ± 0.0	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	4 Secure	1360	0.1 ± 0.0	NS
A	<i>Vespertilionidae sp.</i>	bat species				S1S2		165	9.5 ± 0.0	NS
A	<i>Lasiurus cinereus</i>	Hoary Bat				S1S2B, S1M	2 May Be At Risk	4	30.8 ± 0.0	NS
A	<i>Pluvialis dominica</i>	American Golden-Plover				S1S2M	3 Sensitive	216	29.5 ± 0.0	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B	5 Undetermined	10	37.3 ± 0.0	NS
A	<i>Spatula clypeata</i>	Northern Shoveler				S2B	2 May Be At Risk	5	50.7 ± 7.0	NS
A	<i>Mareca strepera</i>	Gadwall				S2B	2 May Be At Risk	19	32.7 ± 7.0	NS
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	3 Sensitive	25	32.7 ± 7.0	NS
A	<i>Setophaga tigrina</i>	Cape May Warbler				S2B	3 Sensitive	50	8.2 ± 7.0	NS
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B	5 Undetermined	40	14.7 ± 7.0	NS
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S2B	2 May Be At Risk	27	38.5 ± 7.0	NS
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	4 Secure	132	12.7 ± 7.0	NS
A	<i>Alca torda</i>	Razorbill				S2B,S4N	3 Sensitive	17	16.5 ± 0.0	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S2B,S5N	4 Secure	97	1.4 ± 7.0	NS
A	<i>Branta bernicla</i>	Brant				S2M	3 Sensitive	1	77.4 ± 0.0	NS
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3	3 Sensitive	23	1.4 ± 7.0	NS
A	<i>Asio otus</i>	Long-eared Owl				S2S3	2 May Be At Risk	21	24.9 ± 7.0	NS
A	<i>Spinus pinus</i>	Pine Siskin				S2S3	3 Sensitive	285	3.4 ± 7.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B	3 Sensitive	18	7.5 ± 0.0	NS
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	5 Undetermined	12	37.3 ± 0.0	NS
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	1294	1.1 ± 0.0	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	2 May Be At Risk	177	12.7 ± 7.0	NS



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A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	Risk 3 Sensitive	230	3.4 ± 7.0	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B	2 May Be At Risk	62	12.7 ± 7.0	NS
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	100	7.8 ± 7.0	NS
A	<i>Numenius phaeopus hudsonicus</i>	Hudsonian Whimbrel				S2S3M	3 Sensitive	217	29.5 ± 0.0	NS
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S2S3M	4 Secure	276	37.2 ± 0.0	NS
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S2S3M	3 Sensitive	2	38.2 ± 0.0	NS
A	<i>Perisoreus canadensis</i>	Canada Jay				S3	3 Sensitive	356	7.8 ± 7.0	NS
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	3 Sensitive	340	3.4 ± 7.0	NS
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	764	3.4 ± 7.0	NS
A	<i>Alosa pseudoharengus</i>	Alewife				S3	3 Sensitive	14	24.2 ± 0.0	NS
A	<i>Salvelinus fontinalis</i>	Brook Trout				S3	3 Sensitive	13	14.5 ± 0.0	NS
A	<i>Salvelinus namaycush</i>	Lake Trout				S3	3 Sensitive	1	66.1 ± 0.0	NS
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3	4 Secure	1	89.9 ± 0.0	NS
A	<i>Pekania pennanti</i>	Fisher				S3	3 Sensitive	6	47.1 ± 5.0	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3?N	3 Sensitive	170	6.2 ± 8.0	NS
A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	183	3.4 ± 7.0	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	423	1.1 ± 0.0	NS
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B	3 Sensitive	277	7.8 ± 7.0	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	2 May Be At Risk	48	8.2 ± 7.0	NS
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	2 May Be At Risk	39	25.6 ± 7.0	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	3 Sensitive	167	19.1 ± 7.0	NS
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	326	3.4 ± 7.0	NS
A	<i>Cardellina pusilla</i>	Wilson's Warbler				S3B	3 Sensitive	56	19.1 ± 7.0	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	1345	1.1 ± 0.0	NS
A	<i>Oceanodroma leucorhoa</i>	Leach's Storm-Petrel				S3B,S5M	4 Secure	27	11.7 ± 0.0	NS
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S3B,S5N	3 Sensitive	7	16.5 ± 0.0	NS
A	<i>Fratercula arctica</i>	Atlantic Puffin				S3B,S5N	3 Sensitive	18	16.5 ± 0.0	NS
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	4 Secure	1587	1.1 ± 0.0	NS
A	<i>Tringa flavipes</i>	Lesser Yellowlegs				S3M	4 Secure	582	0.1 ± 0.0	NS
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	662	37.2 ± 0.0	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	1226	1.1 ± 0.0	NS
A	<i>Calidris fuscicollis</i>	White-rumped Sandpiper				S3M	4 Secure	722	37.2 ± 0.0	NS
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	4 Secure	955	1.1 ± 0.0	NS
A	<i>Calidris alba</i>	Sanderling				S3M,S2N	4 Secure	1161	26.4 ± 0.0	NS
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	4 Secure	1	63.8 ± 7.0	NS
A	<i>Somateria mollissima</i>	Common Eider				S3S4	4 Secure	360	1.4 ± 7.0	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	94	8.2 ± 7.0	NS
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	4 Secure	174	8.2 ± 7.0	NS
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B	3 Sensitive	107	32.7 ± 7.0	NS
A	<i>Spatula discors</i>	Blue-winged Teal				S3S4B	2 May Be At Risk	47	22.6 ± 7.0	NS
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B	3 Sensitive	590	0.1 ± 0.0	NS
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	273	7.8 ± 7.0	NS
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	733	3.4 ± 7.0	NS
A	<i>Catharus fuscescens</i>	Veery				S3S4B	4 Secure	365	14.7 ± 7.0	NS
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	617	3.4 ± 7.0	NS
A	<i>Oreothlypis peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	173	7.8 ± 7.0	NS
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B	3 Sensitive	188	8.2 ± 7.0	NS
A	<i>Setophaga striata</i>	Blackpoll Warbler				S3S4B	3 Sensitive	59	7.8 ± 7.0	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B	4 Secure	52	1.1 ± 0.0	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5N	4 Secure	56	7.1 ± 8.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Bucephala albeola</i>	Bufflehead				S3S4N	4 Secure	21	1.4 ± 7.0	NS
A	<i>Leucophaeus atricilla</i>	Laughing Gull				SHB	4 Secure	2	62.4 ± 0.0	NS
A	<i>Progne subis</i>	Purple Martin				SHB	2 May Be At Risk	2	87.1 ± 7.0	NS
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N	4 Secure	6	46.7 ± 7.0	NS
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M	4 Secure	2	29.4 ± 12.0	NS
I	<i>Gomphus ventricosus</i>	Skillet Clubtail	Endangered			S1	2 May Be At Risk	2	45.2 ± 1.0	NS
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Endangered	S2B	3 Sensitive	155	7.8 ± 7.0	NS
I	<i>Danaus plexippus plexippus</i>	Monarch	Endangered			S2B	3 Sensitive	1	53.2 ± 0.0	NS
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Threatened	S1S2	3 Sensitive	5	52.0 ± 0.0	NS
I	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern		Vulnerable	S3	3 Sensitive	7	56.8 ± 0.0	NS
I	<i>Cicindela formosa</i>	Big Sand Tiger Beetle				S1	2 May Be At Risk	1	77.5 ± 1.0	NS
I	<i>Erora laeta</i>	Early Hairstreak				S1	2 May Be At Risk	1	27.1 ± 1.0	NS
I	<i>Ophiogomphus anomalus</i>	Extra-Striped Snaketail				S1	6 Not Assessed	8	70.7 ± 0.0	NS
I	<i>Somatochlora brevicincta</i>	Quebec Emerald				S1	2 May Be At Risk	1	53.9 ± 0.0	NS
I	<i>Polygonia comma</i>	Eastern Comma				S1?	1 At Risk	9	26.9 ± 2.0	NS
I	<i>Polygonia satyrus</i>	Satyr Comma				S1?	3 Sensitive	6	23.7 ± 2.0	NS
I	<i>Strymon melinus</i>	Grey Hairstreak				S1S2	4 Secure	10	24.0 ± 2.0	NS
I	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S1S2	4 Secure	15	26.3 ± 0.0	NS
I	<i>Somatochlora kennedyi</i>	Kennedy's Emerald				S1S2	2 May Be At Risk	7	36.0 ± 1.0	NS
I	<i>Coenagrion resolutum</i>	Taiga Bluet				S1S2	2 May Be At Risk	1	42.1 ± 1.0	NS
I	<i>Stylurus scudderii</i>	Zebra Clubtail				S1S2	2 May Be At Risk	6	57.0 ± 0.0	NS
I	<i>Lycaena hyllus</i>	Bronze Copper				S2	4 Secure	7	53.6 ± 1.0	NS
I	<i>Satyrrium calanus</i>	Banded Hairstreak				S2	5 Undetermined	54	26.8 ± 0.0	NS
I	<i>Aglais milberti</i>	Milbert's Tortoiseshell				S2	4 Secure	11	26.9 ± 2.0	NS
I	<i>Epiteca princeps</i>	Prince Baskettail				S2	3 Sensitive	14	42.1 ± 1.0	NS
I	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S2	2 May Be At Risk	3	83.8 ± 0.0	NS
I	<i>Enallagma signatum</i>	Orange Bluet				S2	2 May Be At Risk	9	26.2 ± 0.0	NS
I	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	3 Sensitive	36	52.0 ± 0.0	NS
I	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	3 Sensitive	6	28.2 ± 1.0	NS
I	<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper				S2S3	4 Secure	25	26.9 ± 2.0	NS
I	<i>Satyrrium liparops</i>	Striped Hairstreak				S2S3	5 Undetermined	25	26.9 ± 1.0	NS
I	<i>Euphydryas phaeton</i>	Baltimore Checkerspot				S2S3	4 Secure	9	32.9 ± 2.0	NS
I	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S2S3	2 May Be At Risk	2	21.9 ± 0.0	NS
I	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S2S3	2 May Be At Risk	9	56.0 ± 0.0	NS
I	<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S2S3	2 May Be At Risk	29	55.1 ± 0.0	NS
I	<i>Somatochlora forcipata</i>	Forcipate Emerald				S2S3	2 May Be At Risk	5	30.2 ± 1.0	NS
I	<i>Somatochlora franklini</i>	Delicate Emerald				S2S3	3 Sensitive	1	45.2 ± 1.0	NS
I	<i>Erythrodiplax berenice</i>	Seaside Dragonlet				S2S3	3 Sensitive	4	32.9 ± 0.0	NS
I	<i>Enallagma vesperum</i>	Vesper Bluet				S2S3	3 Sensitive	8	48.4 ± 1.0	NS
I	<i>Alasmidonta undulata</i>	Triangle Floater				S2S3	4 Secure	16	34.9 ± 0.0	NS
I	<i>Hippodamia parenthesis</i>	Parenthesis Lady Beetle				S3	5 Undetermined	1	57.6 ± 0.0	NS
I	<i>Naemia seriata</i>	a Ladybird beetle				S3	3 Sensitive	1	72.9 ± 1.0	NS
I	<i>Chilocorus stigma</i>	Twice-stabbed Lady Beetle				S3	4 Secure	2	33.1 ± 0.0	NS
I	<i>Calliphrys henrici</i>	Henry's Elfin				S3	4 Secure	34	9.3 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
I	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	2 May Be At Risk	19	20.2 ± 0.0	NS
I	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	15	30.7 ± 0.0	NS
I	<i>Polygonia faunus</i>	Green Comma				S3	4 Secure	7	26.9 ± 2.0	NS
I	<i>Megisto cymela</i>	Little Wood-satyr				S3	4 Secure	5	33.4 ± 2.0	NS
I	<i>Oeneis jutta</i>	Jutta Arctic				S3	2 May Be At Risk	4	45.2 ± 2.0	NS
I	<i>Aeshna clepsydra</i>	Mottled Darner				S3	4 Secure	17	21.3 ± 0.0	NS
I	<i>Aeshna constricta</i>	Lance-Tipped Darner				S3	4 Secure	12	33.3 ± 1.0	NS
I	<i>Boyeria grafiana</i>	Ocellated Darner				S3	3 Sensitive	9	56.3 ± 1.0	NS
I	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	3 Sensitive	21	33.4 ± 1.0	NS
I	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S3	4 Secure	21	21.7 ± 0.0	NS
I	<i>Nannothemis bella</i>	Elfin Skimmer				S3	4 Secure	30	21.8 ± 1.0	NS
I	<i>Enallagma vernale</i>	Vernal Bluet				S3	5 Undetermined	5	13.7 ± 1.0	NS
I	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3?		19	38.5 ± 7.0	NS
I	<i>Polygonia interrogationis</i>	Question Mark				S3B	4 Secure	124	21.2 ± 0.0	NS
I	<i>Erynnis juvenalis</i>	Juvenal's Duskywing				S3S4	4 Secure	101	20.7 ± 5.0	NS
I	<i>Amblyscirtes vialis</i>	Common Roadside-Skipper				S3S4	4 Secure	37	37.9 ± 2.0	NS
I	<i>Polygonia progne</i>	Grey Comma				S3S4	4 Secure	15	23.7 ± 2.0	NS
I	<i>Lampsilis radiata</i>	Eastern Lamppussel				S3S4	3 Sensitive	8	68.3 ± 0.0	NS
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	1 At Risk	135	14.0 ± 0.0	NS
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered		Endangered	S1S2	2 May Be At Risk	14	14.8 ± 0.0	NS
N	<i>Peltigera hydrothyria</i>	Eastern Waterfan	Threatened		Threatened	S1	2 May Be At Risk	1	91.3 ± 0.0	NS
N	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened		Threatened	S1S2	2 May Be At Risk	135	41.1 ± 0.0	NS
N	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen	Threatened			S2S3	2 May Be At Risk	55	30.1 ± 6.0	NS
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened		Threatened	S3	3 Sensitive	8	31.5 ± 0.0	NS
N	<i>Sclerophora peronella</i> (Nova Scotia pop.)	Frosted Glass-whiskers Lichen - Nova Scotia pop.	Special Concern	Special Concern		S1?		19	53.5 ± 0.0	NS
N	<i>Pectenium plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	4 Secure	85	13.9 ± 0.0	NS
N	<i>Fissidens exilis</i>	Pygmy Pocket Moss	Not At Risk			S1S2	1 At Risk	3	59.6 ± 1.0	NS
N	<i>Fissidens exilis</i>	Pygmy Pocket Moss	Not At Risk			S1S2	1 At Risk	8	54.8 ± 0.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	3 Sensitive	15	14.9 ± 0.0	NS
N	<i>Aloina brevirostris</i>	Short-Beaked Rigid Screw Moss				S1		1	52.9 ± 2.0	NS
N	<i>Umbilicaria vellea</i>	Grizzled Rocktripe Lichen				S1	5 Undetermined	2	23.1 ± 5.0	NS
N	<i>Heterodermia leucomela</i>	Elegant Fringe Lichen				S1		1	92.8 ± 0.0	NS
N	<i>Collema cristatum</i>	Fingered Tarpaper Lichen				S1	5 Undetermined	3	60.2 ± 0.0	NS
N	<i>Ephebe hispidula</i>	Dryside Rockshag Lichen				S1	5 Undetermined	1	94.7 ± 1.0	NS
N	<i>Fuscopannaria praetermissa</i>	Moss Shingles Lichen				S1	2 May Be At Risk	1	55.3 ± 0.0	NS
N	<i>Leptogium schraderi</i>	Schrader's Jellyskin Lichen				S1		1	88.5 ± 0.0	NS
N	<i>Pseudevernia consocians</i>	Common Antler Lichen				S1	2 May Be At Risk	1	44.0 ± 0.0	NS
N	<i>Usnea substerilis</i>	Embossed Beard Lichen				S1	2 May Be At Risk	1	76.1 ± 0.0	NS
N	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen				S1	2 May Be At Risk	2	54.6 ± 0.0	NS
N	<i>Bryoria nitidula</i>	Tundra Horsehair Lichen				S1	5 Undetermined	1	30.9 ± 2.0	NS
N	<i>Calypogeia fissa</i>	Common Pouchwort				S1?		1	81.6 ± 0.0	NS
N	<i>Moerckia hibernica</i>	Irish Ruffwort				S1?		1	80.2 ± 0.0	NS
N	<i>Aloina rigida</i>	Aloe-Like Rigid Screw Moss				S1?	2 May Be At Risk	3	52.9 ± 2.0	NS
N	<i>Bryum muehlenbeckii</i>	Muehlenbeck's Bryum Moss				S1?	5 Undetermined	2	55.6 ± 0.0	NS

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N	<i>Campylostelium saxicola</i>	a Moss				S1?	3 Sensitive	1	97.4 ± 1.0	NS
N	<i>Conardia compacta</i>	Coast Creeping Moss				S1?	3 Sensitive	1	0.4 ± 2.0	NS
N	<i>Didymodon tophaceus</i>	Olive Beard Moss				S1?		1	79.5 ± 0.0	NS
N	<i>Paludella squarrosa</i>	Tufted Fen Moss				S1?	3 Sensitive	2	57.7 ± 0.0	NS
N	<i>Schistostega pennata</i>	Luminous Moss				S1?	3 Sensitive	1	58.9 ± 0.0	NS
N	<i>Collema crispum</i>	Crinkled Pulp Lichen				S1?		1	79.6 ± 0.0	NS
N	<i>Lichina confinis</i>	Marine Seaweed Lichen				S1?	6 Not Assessed	3	27.8 ± 1.0	NS
N	<i>Polychidium muscicola</i>	Eyed Mossthorns Woollybear Lichen				S1?	2 May Be At Risk	1	96.1 ± 0.0	NS
N	<i>Parmeliella parvula</i>	Poor-man's Shingles Lichen				S1?	2 May Be At Risk	1	13.9 ± 0.0	NS
N	<i>Aulacomnium heterostichum</i>	One-sided Groove Moss				S1S2	3 Sensitive	3	52.9 ± 2.0	NS
N	<i>Hypnum pratense</i>	Meadow Plait Moss				S1S2	3 Sensitive	1	85.1 ± 3.0	NS
N	<i>Mnium thomsonii</i>	Thomson's Leafy Moss				S1S2	3 Sensitive	1	56.9 ± 2.0	NS
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1S2	3 Sensitive	1	25.9 ± 5.0	NS
N	<i>Platydictya confervoides</i>	a Moss				S1S2	3 Sensitive	1	54.6 ± 0.0	NS
N	<i>Sematophyllum demissum</i>	a Moss				S1S2	3 Sensitive	2	43.2 ± 2.0	NS
N	<i>Sphagnum platyphyllum</i>	Flat-leaved Peat Moss				S1S2		2	47.5 ± 3.0	NS
N	<i>Timmia megapolitana</i>	Metropolitan Timmia Moss				S1S2	3 Sensitive	1	99.5 ± 1.0	NS
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S1S2	3 Sensitive	1	93.1 ± 3.0	NS
N	<i>Bryohaplocladium microphyllum</i>	Tiny-leaved Haplocladium Moss				S1S2		1	97.1 ± 5.0	NS
N	<i>Collema bachmanianum</i>	Bachman's Tarpaper Lichen				S1S2	6 Not Assessed	1	60.4 ± 0.0	NS
N	<i>Rhizoplaca subdiscrepans</i>	Scattered Rock-posy Lichen				S1S2		1	16.1 ± 1.0	NS
N	<i>Sticta limbata</i>	Powdered Moon Lichen				S1S2	2 May Be At Risk	4	13.9 ± 0.0	NS
N	<i>Metzgeria crassipilis</i>	Hairy Veilwort				S1S3		1	99.6 ± 0.0	NS
N	<i>Porella pinnata</i>	Pinnate Scalewort				S1S3	5 Undetermined	1	77.7 ± 0.0	NS
N	<i>Heterodermia galactophylla</i>	Branching Fringe Lichen				S1S3	5 Undetermined	1	15.8 ± 0.0	NS
N	<i>Melanelia culbersonii</i>	Appalachian Camouflage Lichen				S1S3	5 Undetermined	1	15.7 ± 0.0	NS
N	<i>Usnea fragilesceus</i>	Inflationary Beard Lichen				S1S3	5 Undetermined	1	97.5 ± 2.0	NS
N	<i>Stereocaulon intermedium</i>	Pacific Brain Foam Lichen				S1S3		1	28.2 ± 0.0	NS
N	<i>Nephroma resupinatum</i>	a lichen				S2	2 May Be At Risk	3	32.5 ± 0.0	NS
N	<i>Parmotrema reticulatum</i>	Netted Ruffle Lichen				S2	3 Sensitive	1	42.6 ± 0.0	NS
N	<i>Riccardia multifida</i>	Delicate Germanderwort				S2?	5 Undetermined	1	87.2 ± 0.0	NS
N	<i>Anacamptodon splachnoides</i>	a Moss				S2?	3 Sensitive	1	29.9 ± 30.0	NS
N	<i>Weissia muhlenbergiana</i>	a Moss				S2?	3 Sensitive	5	56.9 ± 1.0	NS
N	<i>Bryum algovicum</i>	a Moss				S2?	3 Sensitive	1	52.9 ± 2.0	NS
N	<i>Campyllum polygamum</i>	a Moss				S2?	5 Undetermined	3	0.4 ± 2.0	NS
N	<i>Campyllum radicale</i>	Long-stalked Fine Wet Moss				S2?	5 Undetermined	1	85.1 ± 3.0	NS
N	<i>Dicranum condensatum</i>	Condensed Broom Moss				S2?	5 Undetermined	2	29.5 ± 0.0	NS
N	<i>Ditrichum rhynchostegium</i>	a Moss				S2?	3 Sensitive	1	28.1 ± 1.0	NS
N	<i>Fissidens taxifolius</i>	Yew-leaved Pocket Moss				S2?	3 Sensitive	6	52.9 ± 2.0	NS
N	<i>Fontinalis sullivantii</i>	a Moss				S2?	3 Sensitive	1	99.2 ± 0.0	NS
N	<i>Grimmia anomala</i>	Mountain Forest Grimmia				S2?	3 Sensitive	1	36.0 ± 1.0	NS
N	<i>Kiaeria starkei</i>	Starke's Fork Moss				S2?	3 Sensitive	1	73.7 ± 10.0	NS
N	<i>Orthotrichum anomalum</i>	Anomalous Bristle Moss				S2?	3 Sensitive	1	54.8 ± 2.0	NS
N	<i>Platydictya jungermannioides</i>	False Willow Moss				S2?	3 Sensitive	1	74.6 ± 0.0	NS
N	<i>Racomitrium affine</i>	a Moss				S2?	5 Undetermined	3	41.8 ± 2.0	NS
N	<i>Sematophyllum marylandicum</i>	a Moss				S2?	3 Sensitive	2	43.3 ± 3.0	NS
N	<i>Sphagnum subnitens</i>	Lustrous Peat Moss				S2?	3 Sensitive	1	85.2 ± 2.0	NS
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S2?	3 Sensitive	2	85.2 ± 2.0	NS
N	<i>Plagiomnium rostratum</i>	Long-beaked Leafy Moss				S2?	5 Undetermined	1	100.0 ± 2.0	NS

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N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S2?	3 Sensitive	1	92.6 ± 0.0	NS
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2?	3 Sensitive	1	33.0 ± 5.0	NS
N	<i>Platylomella lescurii</i>	a Moss				S2?	3 Sensitive	5	21.4 ± 1.0	NS
N	<i>Phyllicum demangeonii</i>	Black Rock-wafer Lichen				S2?	5 Undetermined	4	45.2 ± 2.0	NS
N	<i>Usnea flavocardia</i>	Blood-splattered Beard Lichen				S2?	3 Sensitive	1	18.9 ± 4.0	NS
N	<i>Leptogium teretiusculum</i>	Beaded Jellyskin Lichen				S2?	3 Sensitive	6	51.6 ± 0.0	NS
N	<i>Leptogium imbricatum</i>	Scaly Jellyskin Lichen				S2?	5 Undetermined	1	41.1 ± 0.0	NS
N	<i>Placynthium flabellosum</i>	Scaly Ink Lichen				S2?	5 Undetermined	2	72.0 ± 17.0	NS
N	<i>Xanthoparmelia mougeotii</i>	Powdered Rock-shield Lichen				S2?	2 May Be At Risk	1	66.6 ± 0.0	NS
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S2?	3 Sensitive	3	55.4 ± 2.0	NS
N	<i>Ephemerum serratum</i>	a Moss				S2S3	3 Sensitive	2	57.5 ± 5.0	NS
N	<i>Eurhynchium hians</i>	Light Beaked Moss				S2S3	3 Sensitive	3	40.2 ± 5.0	NS
N	<i>Platydictya subtilis</i>	Bark Willow Moss				S2S3	3 Sensitive	2	91.4 ± 0.0	NS
N	<i>Tortula truncata</i>	a Moss				S2S3	3 Sensitive	3	73.5 ± 0.0	NS
N	<i>Limprichtia revolvens</i>	a Moss				S2S3	3 Sensitive	2	0.4 ± 2.0	NS
N	<i>Collema leptaleum</i>	Crumpled Bat's Wing Lichen				S2S3	3 Sensitive	38	21.3 ± 1.0	NS
N	<i>Solorina saccata</i>	Woodland Owl Lichen				S2S3	2 May Be At Risk	7	60.4 ± 0.0	NS
N	<i>Ahtiana aurescens</i>	Eastern Candlewax Lichen				S2S3	5 Undetermined	7	26.4 ± 0.0	NS
N	<i>Usnocetraria oakesiana</i>	Yellow Band Lichen				S2S3	2 May Be At Risk	4	67.6 ± 0.0	NS
N	<i>Cladonia incrassata</i>	Powder-foot British Soldiers Lichen				S2S3	5 Undetermined	1	97.7 ± 3.0	NS
N	<i>Cladonia mateocyatha</i>	Mixed-up Pixie-cup				S2S3		3	27.1 ± 5.0	NS
N	<i>Cladonia parasitica</i>	Fence-rail Lichen				S2S3	5 Undetermined	1	99.1 ± 1.0	NS
N	<i>Hypotrachyna catawbiensis</i>	Powder-tipped Antler Lichen				S2S3	2 May Be At Risk	3	16.6 ± 0.0	NS
N	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen				S2S3	3 Sensitive	8	42.3 ± 0.0	NS
N	<i>Leptogium tenuissimum</i>	Birdnest Jellyskin Lichen				S2S3	6 Not Assessed	3	33.0 ± 1.0	NS
N	<i>Melanohalea septentrionalis</i>	Northern Camouflage Lichen				S2S3		1	76.3 ± 0.0	NS
N	<i>Myelochroa aurulenta</i>	Powdery Axil-bristle Lichen				S2S3	5 Undetermined	1	73.4 ± 2.0	NS
N	<i>Hypotrachyna minarum</i>	Hairless-spined Shield Lichen				S2S3	3 Sensitive	2	42.8 ± 0.0	NS
N	<i>Parmeliopsis ambigua</i>	Green Starburst Lichen				S2S3	3 Sensitive	1	73.6 ± 2.0	NS
N	<i>Racodium rupestre</i>	Rockhair Lichen				S2S3	5 Undetermined	3	14.0 ± 0.0	NS
N	<i>Umbilicaria polyphylla</i>	Petalled Rocktripe Lichen				S2S3	3 Sensitive	1	73.6 ± 2.0	NS
N	<i>Usnea cavernosa</i>	Pitted Beard Lichen				S2S3	3 Sensitive	2	76.1 ± 2.0	NS
N	<i>Usnea ceratina</i>	Warty Beard Lichen				S2S3	3 Sensitive	1	43.9 ± 0.0	NS
N	<i>Usnea mutabilis</i>	Bloody Beard Lichen				S2S3	3 Sensitive	1	76.0 ± 0.0	NS
N	<i>Usnea rubicunda</i>	Red Beard Lichen				S2S3	3 Sensitive	4	76.1 ± 0.0	NS
N	<i>Physcia subtilis</i>	Slender Rosette Lichen				S2S3	3 Sensitive	1	75.4 ± 0.0	NS
N	<i>Cetraria arenaria</i>	Sand-loving Icelandmoss Lichen				S2S3	5 Undetermined	13	28.7 ± 0.0	NS
N	<i>Cladonia coccifera</i>	Eastern Boreal Pixie-cup Lichen				S2S3	3 Sensitive	2	30.9 ± 2.0	NS
N	<i>Cladonia deformis</i>	Lesser Sulphur-cup Lichen				S2S3	5 Undetermined	2	46.8 ± 4.0	NS
N	<i>Cladonia phyllophora</i>	Felt Lichen				S2S3	5 Undetermined	2	82.5 ± 4.0	NS
N	<i>Usnea flammea</i>	Coastal Bushy Beard Lichen				S2S3	3 Sensitive	1	28.2 ± 1.0	NS
N	<i>Ramalina thrausta</i>	Angelhair Ramalina Lichen				S3	3 Sensitive	1	88.4 ± 0.0	NS
N	<i>Collema tenax</i>	Soil Tarpaper Lichen				S3		4	57.6 ± 0.0	NS
N	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen				S3	3 Sensitive	24	15.9 ± 0.0	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3	3 Sensitive	35	14.8 ± 0.0	NS
N	<i>Leptogium subtile</i>	Appressed Jellyskin Lichen				S3	3 Sensitive	13	19.8 ± 0.0	NS
N	<i>Fuscopannaria ahneri</i>	Corrugated Shingles Lichen				S3	4 Secure	39	14.7 ± 0.0	NS



Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3	4 Secure	18	34.1 ± 0.0	NS
N	<i>Heterodermia squamulosa</i>	Scaly Fringe Lichen				S3	3 Sensitive	2	42.3 ± 0.0	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3	3 Sensitive	62	15.0 ± 0.0	NS
N	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen				S3	2 May Be At Risk	8	54.5 ± 0.0	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	3 Sensitive	5	18.9 ± 4.0	NS
N	<i>Placynthium nigrum</i>	Common Ink Lichen				S3	5 Undetermined	1	81.5 ± 3.0	NS
N	<i>Punctelia appalachensis</i>	Appalachian Speckleback Lichen				S3	3 Sensitive	8	91.9 ± 0.0	NS
N	<i>Moelleropsis nebulosa ssp. frullaniae</i>	Blue-gray Moss Shingle Lichen				S3	4 Secure	1	92.7 ± 0.0	NS
N	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen				S3	4 Secure	28	14.5 ± 0.0	NS
N	<i>Fuscopannaria soorediata</i>	a Lichen				S3	3 Sensitive	3	14.7 ± 0.0	NS
N	<i>Ephebe lanata</i>	Waterside Rockshag Lichen				S3	3 Sensitive	1	72.0 ± 17.0	NS
N	<i>Usnea macaronesica</i>	Beard Lichen				S3	5 Undetermined	3	15.7 ± 1.0	NS
N	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss				S3?	5 Undetermined	2	54.6 ± 0.0	NS
N	<i>Calliergon giganteum</i>	Giant Spear Moss				S3?	3 Sensitive	2	52.7 ± 3.0	NS
N	<i>Drummondia prorepens</i>	a Moss				S3?	3 Sensitive	2	51.0 ± 5.0	NS
N	<i>Anomodon tristis</i>	a Moss				S3?	3 Sensitive	5	82.5 ± 15.0	NS
N	<i>Helodium blandowii</i>	Wetland-plume Moss				S3?	4 Secure	5	37.8 ± 7.0	NS
N	<i>Mnium stellare</i>	Star Leafy Moss				S3?	5 Undetermined	3	54.4 ± 0.0	NS
N	<i>Sphagnum riparium</i>	Streamside Peat Moss				S3?	3 Sensitive	1	76.0 ± 0.0	NS
N	<i>Phaeophyscia pusilloides</i>	Pompom-tipped Shadow Lichen				S3?	5 Undetermined	2	30.8 ± 0.0	NS
N	<i>Cladina stygia</i>	Black-footed Reindeer Lichen				S3?	3 Sensitive	3	68.2 ± 0.0	NS
N	<i>Anomodon rugelii</i>	Rugel's Anomodon Moss				S3S4	3 Sensitive	3	91.4 ± 0.0	NS
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S3S4	4 Secure	3	36.0 ± 1.0	NS
N	<i>Dicranella varia</i>	a Moss				S3S4	5 Undetermined	2	66.4 ± 0.0	NS
N	<i>Sphagnum lindbergii</i>	Lindberg's Peat Moss				S3S4	4 Secure	1	98.8 ± 0.0	NS
N	<i>Splachnum ampullaceum</i>	Cruet Dung Moss				S3S4	4 Secure	1	75.2 ± 0.0	NS
N	<i>Thamnobryum alleghaniense</i>	a Moss				S3S4	3 Sensitive	3	68.6 ± 1.0	NS
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S3S4	4 Secure	3	36.0 ± 1.0	NS
N	<i>Hylocomiastrum pyrenaicum</i>	a Feather Moss				S3S4	3 Sensitive	1	29.2 ± 0.0	NS
N	<i>Arctoparmelia incurva</i>	Finger Ring Lichen				S3S4	4 Secure	5	28.2 ± 1.0	NS
N	<i>Hypogymnia vittata</i>	Slender Monk's Hood Lichen				S3S4	4 Secure	22	27.7 ± 0.0	NS
N	<i>Cladonia floerkeana</i>	Gritty British Soldiers Lichen				S3S4	5 Undetermined	2	30.9 ± 0.0	NS
N	<i>Vahlia leucophaea</i>	Shelter Shingle Lichen				S3S4	4 Secure	1	96.0 ± 0.0	NS
N	<i>Leptogium acadense</i>	Acadian Jellyskin Lichen				S3S4	6	13.6 ± 0.0	NS	
N	<i>Melanohalea olivacea</i>	Spotted Camouflage Lichen				S3S4	5 Undetermined	2	76.1 ± 0.0	NS
N	<i>Parmotrema chinense</i>	Powdered Ruffle Lichen				S3S4	4 Secure	2	42.4 ± 0.0	NS
N	<i>Peltigera hymenina</i>	Cloudy Pelt Lichen				S3S4	4 Secure	1	30.9 ± 2.0	NS
N	<i>Physconia detersa</i>	Bottlebrush Frost Lichen				S3S4	3 Sensitive	5	30.9 ± 0.0	NS
N	<i>Sphaerophorus fragilis</i>	Fragile Coral Lichen				S3S4	4 Secure	3	28.2 ± 1.0	NS
N	<i>Coccocarpia palmicola</i>	Salted Shell Lichen				S3S4	4 Secure	167	14.8 ± 0.0	NS
N	<i>Physcia caesia</i>	Blue-gray Rosette Lichen				S3S4	5 Undetermined	1	28.2 ± 1.0	NS
N	<i>Physcia tenella</i>	Fringed Rosette Lichen				S3S4	6 Not Assessed	2	28.2 ± 1.0	NS
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	4 Secure	20	42.3 ± 0.0	NS
N	<i>Bryoria pikei</i>	Pike's Horsehair Lichen				S3S4	5 Undetermined	2	44.4 ± 5.0	NS
N	<i>Evernia prunastri</i>	Valley Oakmoss Lichen				S3S4	3 Sensitive	8	28.3 ± 1.0	NS
N	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen				S3S4	4 Secure	6	32.1 ± 5.0	NS
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	4 Secure	38	14.9 ± 0.0	NS
P	<i>Rhynchospora macrostachya</i>	Tall Beakrush	Endangered		Endangered	S1	2 May Be At Risk	57	72.3 ± 0.0	NS
P	<i>Juglans cinerea</i>	Butternut	Endangered	Endangered		SNA	7 Exotic	1	56.9 ± 0.0	NS

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P	<i>Liatris spicata</i>	Dense Blazing Star	Threatened	Threatened		SNA		1	31.3 ± 0.0	NS
P	<i>Clethra alnifolia</i>	Coast Pepper-Bush	Special Concern	Special Concern	Vulnerable	S1	1 At Risk	171	33.0 ± 0.0	NS
P	<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	149	44.5 ± 0.0	NS
P	<i>Eleocharis tuberculosa</i>	Tuberclad Spike-rush	Special Concern	Threatened	Vulnerable	S2	1 At Risk	1	84.5 ± 0.0	NS
P	<i>Lachnanthes caroliniana</i>	Redroot	Special Concern	Threatened	Vulnerable	S2	1 At Risk	1460	71.1 ± 0.0	NS
P	<i>Lophiola aurea</i>	Goldencrest	Special Concern	Threatened	Vulnerable	S2	1 At Risk	765	53.3 ± 1.0	NS
P	<i>Scirpus longii</i>	Long's Bulrush	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	430	67.8 ± 0.0	NS
P	<i>Floerkea proserpinacoides</i>	False Mermaidweed	Not At Risk			S2	3 Sensitive	24	83.1 ± 1.0	NS
P	<i>Smilax rotundifolia</i>	Round-leaved Greenbrier	Not At Risk			S3	4 Secure	167	72.8 ± 0.0	NS
P	<i>Crocianthemum canadense</i>	Long-branched Frostweed			Endangered	S1	1 At Risk	67	20.8 ± 1.0	NS
P	<i>Cypripedium arietinum</i>	Ram's-Head Lady's-Slipper			Endangered	S1	1 At Risk	153	52.4 ± 2.0	NS
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S1	1 At Risk	25	32.9 ± 7.0	NS
P	<i>Acer saccharinum</i>	Silver Maple				S1	5 Undetermined	11	81.5 ± 0.0	NS
P	<i>Toxicodendron vernix</i>	Poison Sumac				S1	2 May Be At Risk	34	92.0 ± 0.0	NS
P	<i>Osmorhiza depauperata</i>	Blunt Sweet Cicely				S1	2 May Be At Risk	1	75.1 ± 5.0	NS
P	<i>Sanicula odorata</i>	Clustered Sanicle				S1	2 May Be At Risk	10	55.9 ± 0.0	NS
P	<i>Antennaria parlinii</i>	a Pussytoes				S1	2 May Be At Risk	18	46.1 ± 0.0	NS
P	<i>Andersonglossum boreale</i>	Northern Wild Comfrey				S1	2 May Be At Risk	5	56.3 ± 1.0	NS
P	<i>Turritis glabra</i>	Tower Mustard				S1	5 Undetermined	1	60.5 ± 0.0	NS
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	1	93.9 ± 0.0	NS
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	2 May Be At Risk	5	84.3 ± 7.0	NS
P	<i>Silene antirrhina</i>	Sleepy Catchfly				S1	2 May Be At Risk	5	95.5 ± 0.0	NS
P	<i>Stellaria crassifolia</i>	Fleshy Stitchwort				S1	2 May Be At Risk	1	82.5 ± 2.0	NS
P	<i>Desmodium canadense</i>	Canada Tick-trefoil				S1	2 May Be At Risk	2	71.7 ± 7.0	NS
P	<i>Hylodesmum glutinosum</i>	Large Tick-trefoil				S1	2 May Be At Risk	32	58.5 ± 0.0	NS
P	<i>Ribes americanum</i>	Wild Black Currant				S1	5 Undetermined	3	57.4 ± 3.0	NS
P	<i>Trichostema dichotomum</i>	Forked Bluecurls				S1	2 May Be At Risk	5	71.9 ± 0.0	NS
P	<i>Fraxinus pennsylvanica</i>	Red Ash				S1	2 May Be At Risk	11	44.9 ± 0.0	NS
P	<i>Polygala polygama</i>	Racemed Milkwort				S1	5 Undetermined	1	30.5 ± 1.0	NS
P	<i>Persicaria careyi</i>	Carey's Smartweed				S1	5 Undetermined	1	93.5 ± 3.0	NS
P	<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed				S1	2 May Be At Risk	4	60.6 ± 0.0	NS
P	<i>Montia fontana</i>	Water Blinks				S1	2 May Be At Risk	1	29.0 ± 1.0	NS
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	5 Undetermined	1	23.9 ± 0.0	NS
P	<i>Salix myrtilifolia</i>	Blueberry Willow				S1	2 May Be At Risk	1	80.7 ± 0.0	NS
P	<i>Salix serissima</i>	Autumn Willow				S1	2 May Be At Risk	2	80.5 ± 0.0	NS
P	<i>Scrophularia lanceolata</i>	Lance-leaved Figwort				S1	5 Undetermined	2	91.6 ± 1.0	NS
P	<i>Dirca palustris</i>	Eastern Leatherwood				S1	2 May Be At Risk	49	52.8 ± 0.0	NS
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S1	2 May Be At Risk	48	50.6 ± 0.0	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S1	2 May Be At Risk	2	60.4 ± 0.0	NS

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P	<i>Carex digitalis</i>	Slender Wood Sedge				S1	Risk 2 May Be At Risk	2	80.8 ± 0.0	NS
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S1	2 May Be At Risk	2	80.8 ± 0.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1	2 May Be At Risk	3	71.1 ± 0.0	NS
P	<i>Carex laxiflora</i>	Loose-Flowered Sedge				S1	2 May Be At Risk	2	85.1 ± 7.0	NS
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S1	2 May Be At Risk	1	84.7 ± 5.0	NS
P	<i>Carex prairea</i>	Prairie Sedge				S1	2 May Be At Risk	2	86.3 ± 1.0	NS
P	<i>Carex viridula</i> var. <i>saxillitoralis</i>	Greenish Sedge				S1	2 May Be At Risk	2	98.7 ± 2.0	NS
P	<i>Scirpus atrovirens</i>	Dark-green Bulrush				S1		2	56.4 ± 0.0	NS
P	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush				S1	2 May Be At Risk	8	69.7 ± 0.0	NS
P	<i>Iris prismatica</i>	Slender Blue Flag				S1	2 May Be At Risk	1	78.2 ± 100.0	NS
P	<i>Sisyrinchium fuscatum</i>	Coastal Plain Blue-eyed-grass				S1	2 May Be At Risk	3	57.2 ± 0.0	NS
P	<i>Juncus secundus</i>	Secund Rush				S1	2 May Be At Risk	2	80.1 ± 1.0	NS
P	<i>Allium tricoccum</i>	Wild Leek				S1	2 May Be At Risk	20	84.1 ± 0.0	NS
P	<i>Trillium grandiflorum</i>	White Trillium				S1	5 Undetermined	3	86.2 ± 1.0	NS
P	<i>Malaxis monophyllos</i> var. <i>brachypoda</i>	North American White Adder's-mouth				S1	2 May Be At Risk	4	84.3 ± 10.0	NS
P	<i>Spiranthes casei</i> var. <i>casei</i>	Case's Ladies'-Tresses				S1	2 May Be At Risk	2	60.3 ± 0.0	NS
P	<i>Dichanthelium xanthophyllum</i>	Slender Panic Grass				S1	2 May Be At Risk	9	51.1 ± 1.0	NS
P	<i>Elymus wiegandii</i>	Wiegand's Wild Rye				S1	2 May Be At Risk	1	32.7 ± 7.0	NS
P	<i>Elymus hystrix</i>	Spreading Wild Rye				S1	2 May Be At Risk	11	55.8 ± 0.0	NS
P	<i>Torreyochloa pallida</i> var. <i>pallida</i>	Pale False Manna Grass				S1	0.1 Extirpated	1	96.5 ± 1.0	NS
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S1	2 May Be At Risk	10	39.4 ± 1.0	NS
P	<i>Equisetum palustre</i>	Marsh Horsetail				S1	2 May Be At Risk	1	79.6 ± 5.0	NS
P	<i>Botrychium lunaria</i>	Common Moonwort				S1	2 May Be At Risk	4	46.1 ± 0.0	NS
P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1	2 May Be At Risk	1	55.7 ± 0.0	NS
P	<i>Solidago hispida</i>	Hairy Goldenrod				S1?	2 May Be At Risk	1	32.7 ± 7.0	NS
P	<i>Suaeda rolandii</i>	Roland's Sea-Blite				S1?	2 May Be At Risk	5	56.5 ± 2.0	NS
P	<i>Carex pensylvanica</i>	Pennsylvania Sedge				S1?	2 May Be At Risk	3	50.7 ± 10.0	NS
P	<i>Juncus antheratus</i>	Greater Poverty Rush				S1?	2 May Be At Risk	1	99.9 ± 0.0	NS
P	<i>Dichanthelium lindheimeri</i>	Lindheimer's Panicgrass				S1?	5 Undetermined	3	50.2 ± 5.0	NS
P	<i>Panicum dichotomiflorum</i> ssp. <i>puritanorum</i>	Spreading Panicgrass				S1?	2 May Be At Risk	1	86.9 ± 0.0	NS

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P	<i>Fraxinus nigra</i>	Black Ash			Threatened	S1S2	1 At Risk	244	21.9 ± 0.0	NS
P	<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	10	37.9 ± 7.0	NS
P	<i>Arabis pycnocarpa</i>	Cream-flowered Rockcress				S1S2	2 May Be At Risk	1	99.8 ± 0.0	NS
P	<i>Cornus suecica</i>	Swedish Bunchberry				S1S2	3 Sensitive	2	98.4 ± 0.0	NS
P	<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				S1S2	2 May Be At Risk	5	68.6 ± 1.0	NS
P	<i>Conopholis americana</i>	American Cancer-root				S1S2	2 May Be At Risk	22	48.0 ± 7.0	NS
P	<i>Hepatica americana</i>	Round-lobed Hepatica				S1S2	2 May Be At Risk	45	50.8 ± 1.0	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1S2	2 May Be At Risk	22	33.2 ± 2.0	NS
P	<i>Gratiola neglecta</i>	Clammy Hedge-Hyssop				S1S2	3 Sensitive	2	98.0 ± 2.0	NS
P	<i>Carex livida</i>	Livid Sedge				S1S2	2 May Be At Risk	1	57.4 ± 10.0	NS
P	<i>Juncus greenei</i>	Greene's Rush				S1S2	2 May Be At Risk	5	19.8 ± 0.0	NS
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S1S2	5 Undetermined	1	57.8 ± 10.0	NS
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1S2	2 May Be At Risk	35	50.8 ± 0.0	NS
P	<i>Festuca subverticillata</i>	Nodding Fescue				S1S2	2 May Be At Risk	6	68.9 ± 7.0	NS
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S1S2	2 May Be At Risk	2	57.5 ± 0.0	NS
P	<i>Carex vacillans</i>	Estuarine Sedge				S1S3	5 Undetermined	1	88.3 ± 0.0	NS
P	<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S2	3 Sensitive	3	75.6 ± 0.0	NS
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2	2 May Be At Risk	14	58.7 ± 0.0	NS
P	<i>Eutrochium dubium</i>	Coastal Plain Joe Pye Weed				S2	2 May Be At Risk	2	78.3 ± 0.0	NS
P	<i>Lactuca hirsuta</i>	Hairy Lettuce				S2	3 Sensitive	5	55.0 ± 7.0	NS
P	<i>Symphotrichum undulatum</i>	Wavy-leaved Aster				S2	3 Sensitive	130	32.7 ± 1.0	NS
P	<i>Symphotrichum ciliolatum</i>	Fringed Blue Aster				S2	3 Sensitive	17	60.0 ± 0.0	NS
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2	3 Sensitive	2	85.8 ± 7.0	NS
P	<i>Caulophyllum thalictroides</i>	Blue Cohosh				S2	2 May Be At Risk	28	39.8 ± 7.0	NS
P	<i>Boechea stricta</i>	Drummond's Rockcress				S2	3 Sensitive	4	90.0 ± 1.0	NS
P	<i>Cardamine parviflora</i>	Small-flowered Bittercress				S2	3 Sensitive	12	1.7 ± 1.0	NS
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S2	3 Sensitive	10	90.0 ± 1.0	NS
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2	3 Sensitive	2	88.9 ± 0.0	NS
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	2	68.6 ± 5.0	NS
P	<i>Oxybasis rubra</i>	Red Goosefoot				S2	2 May Be At Risk	2	98.7 ± 2.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	3 Sensitive	63	0.2 ± 1.0	NS
P	<i>Hypericum majus</i>	Large St John's-wort				S2	3 Sensitive	5	19.5 ± 10.0	NS
P	<i>Crassula aquatica</i>	Water Pygmyweed				S2	3 Sensitive	1	0.6 ± 0.0	NS
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2	3 Sensitive	6	44.9 ± 1.0	NS
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S2	3 Sensitive	2	64.5 ± 3.0	NS
P	<i>Utricularia resupinata</i>	Inverted Bladderwort				S2	3 Sensitive	11	68.4 ± 0.0	NS
P	<i>Oenothera fruticosa ssp. tetragona</i>	Narrow-leaved Evening Primrose				S2	5 Undetermined	9	19.1 ± 7.0	NS
P	<i>Persicaria arifolia</i>	Halberd-leaved Tearthumb				S2	3 Sensitive	14	43.3 ± 0.0	NS
P	<i>Rumex triangulivalvis</i>	Triangular-valve Dock				S2	3 Sensitive	8	50.1 ± 1.0	NS
P	<i>Anemonastrum canadense</i>	Canada Anemone				S2	2 May Be At Risk	7	47.8 ± 7.0	NS
P	<i>Anemone quinquefolia</i>	Wood Anemone				S2	3 Sensitive	17	82.3 ± 0.0	NS

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P	<i>Anemone virginiana</i>	Virginia Anemone				S2	3 Sensitive	12	56.5 ± 1.0	NS
P	<i>Anemone virginiana</i> var. <i>virginiana</i>	Virginia Anemone				S2	3 Sensitive	2	57.8 ± 7.0	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2	3 Sensitive	2	74.5 ± 5.0	NS
P	<i>Galium boreale</i>	Northern Bedstraw				S2	2 May Be At Risk	4	84.3 ± 7.0	NS
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2	3 Sensitive	59	77.8 ± 0.0	NS
P	<i>Salix pedicellaris</i>	Bog Willow				S2	3 Sensitive	102	68.6 ± 0.0	NS
P	<i>Salix sericea</i>	Silky Willow				S2	2 May Be At Risk	126	50.4 ± 0.0	NS
P	<i>Saxifraga paniculata</i> ssp. <i>laestadii</i>	Laestadius' Saxifrage				S2	3 Sensitive	2	84.3 ± 7.0	NS
P	<i>Tiarella cordifolia</i>	Heart-leaved Foamflower				S2	3 Sensitive	12	75.4 ± 0.0	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S2	3 Sensitive	3	70.5 ± 1.0	NS
P	<i>Carex bebbii</i>	Bebb's Sedge				S2	3 Sensitive	20	54.7 ± 0.0	NS
P	<i>Carex castanea</i>	Chestnut Sedge				S2	2 May Be At Risk	26	73.2 ± 0.0	NS
P	<i>Carex comosa</i>	Bearded Sedge				S2	3 Sensitive	5	54.6 ± 5.0	NS
P	<i>Carex hystericina</i>	Porcupine Sedge				S2	2 May Be At Risk	7	84.7 ± 0.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S2	3 Sensitive	4	50.9 ± 0.0	NS
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S2	3 Sensitive	23	54.2 ± 0.0	NS
P	<i>Vallisneria americana</i>	Wild Celery				S2	2 May Be At Risk	13	56.6 ± 0.0	NS
P	<i>Lilium canadense</i>	Canada Lily				S2	2 May Be At Risk	38	49.4 ± 7.0	NS
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2	3 Sensitive	21	49.1 ± 0.0	NS
P	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Yellow Lady's-slipper				S2	3 Sensitive	15	41.6 ± 7.0	NS
P	<i>Cypripedium parviflorum</i> var. <i>makasin</i>	Small Yellow Lady's-Slipper				S2	3 Sensitive	13	54.6 ± 1.0	NS
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	2 May Be At Risk	30	57.2 ± 0.0	NS
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2	3 Sensitive	28	53.0 ± 0.0	NS
P	<i>Platanthera flava</i>	Southern Rein-Orchid				S2	3 Sensitive	37	50.9 ± 0.0	NS
P	<i>Platanthera flava</i> var. <i>flava</i>	Southern Rein Orchid				S2	3 Sensitive	19	50.7 ± 0.0	NS
P	<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchid				S2	5 Undetermined	23	64.2 ± 1.0	NS
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	3 Sensitive	1	54.9 ± 1.0	NS
P	<i>Spiranthes casei</i>	Case's Ladies'-Tresses				S2	3 Sensitive	1	76.2 ± 0.0	NS
P	<i>Spiranthes casei</i> var. <i>novaescotiae</i>	Case's Ladies'-Tresses				S2	3 Sensitive	1	98.0 ± 0.0	NS
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2	2 May Be At Risk	9	57.7 ± 1.0	NS
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	8	56.4 ± 0.0	NS
P	<i>Piptatheropsis canadensis</i>	Canada Ricegrass				S2	3 Sensitive	16	53.0 ± 1.0	NS
P	<i>Piptatheropsis pungens</i>	Slender Ricegrass				S2	3 Sensitive	8	36.6 ± 10.0	NS
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S2	2 May Be At Risk	8	81.3 ± 1.0	NS
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S2	2 May Be At Risk	7	75.4 ± 0.0	NS
P	<i>Dryopteris fragrans</i>	Fragrant Wood Fern				S2	3 Sensitive	1	99.4 ± 0.0	NS
P	<i>Symphotrichum boreale</i>	Boreal Aster				S2?	3 Sensitive	5	50.8 ± 5.0	NS
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	5 Undetermined	2	18.1 ± 0.0	NS
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2?	3 Sensitive	6	26.5 ± 2.0	NS
P	<i>Rumex persicarioides</i>	Peach-leaved Dock				S2?	2 May Be At Risk	2	25.8 ± 0.0	NS
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S2?	5 Undetermined	4	14.7 ± 7.0	NS



Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Carex peckii</i>	White-Tinged Sedge				S2?	2 May Be At Risk	3	57.3 ± 5.0	NS
P	<i>Eleocharis ovata</i>	Ovate Spikerush				S2?	3 Sensitive	4	18.1 ± 0.0	NS
P	<i>Scirpus pedicellatus</i>	Stalked Bulrush				S2?	3 Sensitive	4	67.7 ± 0.0	NS
P	<i>Potamogeton pulcher</i>	Spotted Pondweed			Vulnerable	S2S3	3 Sensitive	25	46.3 ± 0.0	NS
P	<i>Iva frutescens</i>	Big-leaved Marsh-elder				S2S3	3 Sensitive	22	58.7 ± 1.0	NS
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S2S3	3 Sensitive	12	8.1 ± 0.0	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S2S3	3 Sensitive	50	48.2 ± 0.0	NS
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S2S3	4 Secure	44	7.6 ± 0.0	NS
P	<i>Sagina nodosa ssp. borealis</i>	Knotted Pearlwort				S2S3	4 Secure	8	16.7 ± 0.0	NS
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	4	51.7 ± 0.0	NS
P	<i>Hypericum x dissimulatum</i>	Disguised St. John's-wort				S2S3	3 Sensitive	5	32.7 ± 10.0	NS
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S2S3	3 Sensitive	13	55.7 ± 0.0	NS
P	<i>Shepherdia canadensis</i>	Soapberry				S2S3	3 Sensitive	85	47.8 ± 7.0	NS
P	<i>Empetrum atropurpureum</i>	Purple Crowberry				S2S3	3 Sensitive	5	8.3 ± 7.0	NS
P	<i>Euphorbia polygonifolia</i>	Seaside Spurge				S2S3	3 Sensitive	6	32.3 ± 3.0	NS
P	<i>Halenia deflexa</i>	Spurred Gentian				S2S3	3 Sensitive	3	7.6 ± 0.0	NS
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	3 Sensitive	17	10.2 ± 5.0	NS
P	<i>Polygonum aviculare ssp. buxiforme</i>	Box Knotweed				S2S3	5 Undetermined	4	23.8 ± 7.0	NS
P	<i>Polygonum oxyspermum ssp. raii</i>	Ray's Knotweed				S2S3	5 Undetermined	6	22.1 ± 1.0	NS
P	<i>Amelanchier fernaldii</i>	Fernald's Serviceberry				S2S3	5 Undetermined	1	52.6 ± 7.0	NS
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	3 Sensitive	3	70.3 ± 5.0	NS
P	<i>Galium aparine</i>	Common Bedstraw				S2S3	3 Sensitive	11	31.1 ± 0.0	NS
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2S3	3 Sensitive	3	70.3 ± 0.0	NS
P	<i>Salix pellita</i>	Satiny Willow				S2S3	3 Sensitive	2	87.9 ± 4.0	NS
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	3 Sensitive	4	27.1 ± 0.0	NS
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S2S3	3 Sensitive	13	55.9 ± 0.0	NS
P	<i>Carex houghtoniana</i>	Houghton's Sedge				S2S3	3 Sensitive	3	80.2 ± 0.0	NS
P	<i>Eleocharis flavescens var. olivacea</i>	Bright-green Spikerush				S2S3	3 Sensitive	11	39.2 ± 0.0	NS
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S2S3	3 Sensitive	4	50.3 ± 1.0	NS
P	<i>Coeloglossum viride</i>	Long-bracted Frog Orchid				S2S3	2 May Be At Risk	12	66.5 ± 1.0	NS
P	<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper				S2S3	3 Sensitive	517	51.1 ± 1.0	NS
P	<i>Poa glauca</i>	Glaucous Blue Grass				S2S3	3 Sensitive	6	60.8 ± 1.0	NS
P	<i>Botrychium lanceolatum ssp. angustisegmentum</i>	Narrow Triangle Moonwort				S2S3	3 Sensitive	2	77.5 ± 0.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	3 Sensitive	6	57.7 ± 1.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	7	28.2 ± 50.0	NS
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	3 Sensitive	15	49.4 ± 7.0	NS
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S3	4 Secure	27	24.8 ± 0.0	NS
P	<i>Bidens beckii</i>	Water Beggarticks				S3	4 Secure	20	60.4 ± 0.0	NS
P	<i>Packera paupercula var. paupercula</i>	Balsam Groundsel				S3	4 Secure	1	53.2 ± 0.0	NS
P	<i>Packera paupercula</i>	Balsam Groundsel				S3	4 Secure	50	51.4 ± 1.0	NS
P	<i>Alnus serrulata</i>	Smooth Alder				S3	3 Sensitive	678	52.8 ± 0.0	NS
P	<i>Betula pumila</i>	Bog Birch				S3	3 Sensitive	3	78.1 ± 0.0	NS
P	<i>Campanula aparinoides</i>	Marsh Bellflower				S3	3 Sensitive	5	64.4 ± 1.0	NS
P	<i>Mononeuria groenlandica</i>	Greenland Stitchwort				S3	3 Sensitive	112	0.6 ± 0.0	NS
P	<i>Empetrum eamesii</i>	Pink Crowberry				S3	3 Sensitive	88	0.2 ± 2.0	NS
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3	3 Sensitive	2	36.9 ± 0.0	NS
P	<i>Vaccinium cespitosum</i>	dwarf bilberry				S3	4 Secure	41	28.3 ± 0.0	NS
P	<i>Vaccinium uliginosum</i>	Alpine Bilberry				S3	3 Sensitive	3	28.5 ± 0.0	NS
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3	4 Secure	43	0.5 ± 0.0	NS
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	15	49.9 ± 5.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Proserpinaca palustris</i>	Marsh Mermaidweed				S3	4 Secure	47	46.7 ± 1.0	NS
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3	4 Secure	52	28.1 ± 1.0	NS
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	48	18.1 ± 0.0	NS
P	<i>Decodon verticillatus</i>	Swamp Loosestrife				S3	4 Secure	69	76.7 ± 0.0	NS
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	3 Sensitive	7	71.4 ± 0.0	NS
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	3 Sensitive	10	17.3 ± 120.0	NS
P	<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed				S3	4 Secure	20	57.3 ± 1.0	NS
P	<i>Fallopia scandens</i>	Climbing False Buckwheat				S3	3 Sensitive	7	47.0 ± 2.0	NS
P	<i>Plantago rugelii</i>	Rugel's Plantain				S3	4 Secure	7	28.2 ± 0.0	NS
P	<i>Primula laurentiana</i>	Laurentian Primrose				S3	4 Secure	15	80.0 ± 7.0	NS
P	<i>Samolus parviflorus</i>	Seaside Brookweed				S3	3 Sensitive	58	29.0 ± 1.0	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3	4 Secure	5	67.4 ± 1.0	NS
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	3 Sensitive	1	85.8 ± 7.0	NS
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	46	54.4 ± 0.0	NS
P	<i>Endotropis alnifolia</i>	alder-leaved buckthorn				S3	4 Secure	142	57.6 ± 0.0	NS
P	<i>Agrimonia gryposepala</i>	Hooked Agrimony				S3	4 Secure	118	47.7 ± 5.0	NS
P	<i>Amelanchier spicata</i>	Running Serviceberry				S3	4 Secure	55	50.8 ± 3.0	NS
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S3	3 Sensitive	1541	61.8 ± 0.0	NS
P	<i>Geocaulon lividum</i>	Northern Comandra				S3	4 Secure	1	95.5 ± 1.0	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	14	35.4 ± 3.0	NS
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	4 Secure	9	45.5 ± 3.0	NS
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	3 Sensitive	36	54.6 ± 0.0	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3	4 Secure	99	41.5 ± 7.0	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3	4 Secure	13	53.3 ± 6.0	NS
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	3 Sensitive	5	88.4 ± 0.0	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	44	50.6 ± 0.0	NS
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	18	52.8 ± 2.0	NS
P	<i>Carex swanii</i>	Swan's Sedge				S3	3 Sensitive	6	28.1 ± 0.0	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3	4 Secure	13	54.8 ± 0.0	NS
P	<i>Carex wiegandii</i>	Wiegand's Sedge				S3	3 Sensitive	3	68.9 ± 0.0	NS
P	<i>Carex foenea</i>	Fernald's Hay Sedge				S3	4 Secure	11	20.7 ± 0.0	NS
P	<i>Eleocharis nitida</i>	Quill Spikerush				S3	4 Secure	5	63.0 ± 5.0	NS
P	<i>Elodea canadensis</i>	Canada Waterweed				S3	4 Secure	6	60.4 ± 0.0	NS
P	<i>Juncus marginatus</i>	Grassleaf Rush				S3	3 Sensitive	6	68.4 ± 0.0	NS
P	<i>Juncus subcaudatus</i>	Woods-Rush				S3	3 Sensitive	21	20.4 ± 0.0	NS
P	<i>Juncus dudleyi</i>	Dudley's Rush				S3	4 Secure	20	22.1 ± 1.0	NS
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3	3 Sensitive	6	70.8 ± 0.0	NS
P	<i>Neottia bifolia</i>	Southern Twayblade				S3	4 Secure	117	16.7 ± 1.0	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	4 Secure	12	33.2 ± 0.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	4 Secure	16	49.1 ± 0.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3	4 Secure	38	56.2 ± 4.0	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3	4 Secure	31	19.3 ± 7.0	NS
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3	4 Secure	6	71.8 ± 0.0	NS
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3	4 Secure	266	34.2 ± 0.0	NS
P	<i>Coleataenia longifolia</i>	Long-leaved Panicgrass				S3	4 Secure	1037	66.8 ± 0.0	NS
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	1	79.6 ± 0.0	NS
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S3	3 Sensitive	2	79.2 ± 1.0	NS
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S3	3 Sensitive	13	68.9 ± 5.0	NS
P	<i>Sparganium natans</i>	Small Burreed				S3	4 Secure	7	59.1 ± 1.0	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3	4 Secure	14	70.9 ± 0.0	NS
P	<i>Asplenium viride</i>	Green Spleenwort				S3	3 Sensitive	1	98.6 ± 7.0	NS
P	<i>Lorinseria areolata</i>	netted chain fern				S3	4 Secure	4	95.2 ± 7.0	NS
P	<i>Equisetum pratense</i>	Meadow Horsetail				S3	3 Sensitive	6	55.9 ± 0.0	NS
P	<i>Equisetum variegatum</i>	Variiegated Horsetail				S3	4 Secure	24	31.1 ± 0.0	NS
P	<i>Isoetes acadensis</i>	Acadian Quillwort				S3	3 Sensitive	8	21.0 ± 0.0	NS
P	<i>Diphasiastrium sitchense</i>	Sitka Ground-cedar				S3	4 Secure	1	75.3 ± 1.0	NS
P	<i>Huperzia appressa</i>	Mountain Firmoss				S3	3 Sensitive	8	92.0 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Sceptridium dissectum</i>	Dissected Moonwort				S3	4 Secure	2	49.0 ± 0.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	5 Undetermined	12	66.2 ± 0.0	NS
P	<i>Bidens vulgata</i>	Tall Beggarticks				S3?	7 Exotic	1	29.7 ± 0.0	NS
P	<i>Persicaria amphibia</i> var. <i>emersa</i>	Long-root Smartweed				S3?	5 Undetermined	26	51.0 ± 0.0	NS
P	<i>Solidago latissimifolia</i>	Elliott's Goldenrod				S3S4	4 Secure	28	72.4 ± 0.0	NS
P	<i>Atriplex glabruscula</i> var. <i>franktonii</i>	Frankton's Saltbush				S3S4	4 Secure	13	58.7 ± 0.0	NS
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	7	31.4 ± 1.0	NS
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	4 Secure	4	29.4 ± 5.0	NS
P	<i>Rhexia virginica</i>	Virginia Meadow Beauty				S3S4	4 Secure	946	52.6 ± 0.0	NS
P	<i>Nuphar microphylla</i>	Small Yellow Pond-lily				S3S4	4 Secure	1	98.8 ± 2.0	NS
P	<i>Sanguinaria canadensis</i>	Bloodroot				S3S4	4 Secure	34	52.8 ± 0.0	NS
P	<i>Rumex fueginus</i>	Tierra del Fuego Dock				S3S4	4 Secure	15	58.8 ± 0.0	NS
P	<i>Crataegus succulenta</i>	Fleshy Hawthorn				S3S4	5 Undetermined	1	35.5 ± 0.0	NS
P	<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry				S3S4	4 Secure	55	54.7 ± 0.0	NS
P	<i>Salix petiolaris</i>	Meadow Willow				S3S4	4 Secure	5	56.9 ± 1.0	NS
P	<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S3S4	4 Secure	40	19.8 ± 0.0	NS
P	<i>Viola sagittata</i> var. <i>ovata</i>	Arrow-Leaved Violet				S3S4	4 Secure	25	25.9 ± 1.0	NS
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	4 Secure	13	26.8 ± 1.0	NS
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	8	0.4 ± 2.0	NS
P	<i>Sisyrinchium atlanticum</i>	Eastern Blue-Eyed-Grass				S3S4	4 Secure	111	36.0 ± 0.0	NS
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	5 Undetermined	9	7.6 ± 0.0	NS
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	4 Secure	10	35.7 ± 0.0	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	4 Secure	6	24.0 ± 0.0	NS
P	<i>Panicum philadelphicum</i>	Philadelphia Panicgrass				S3S4	4 Secure	21	47.1 ± 0.0	NS
P	<i>Trisetum spicatum</i>	Narrow False Oats				S3S4	4 Secure	9	53.4 ± 0.0	NS
P	<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern				S3S4	4 Secure	63	37.8 ± 1.0	NS
P	<i>Equisetum hyemale</i> ssp. <i>affine</i>	Common Scouring-rush				S3S4	4 Secure	65	34.3 ± 2.0	NS
P	<i>Equisetum scirpoides</i>	Dwarf Scouring-Rush				S3S4	4 Secure	48	54.7 ± 0.0	NS
P	<i>Diphasiastrum complanatum</i>	Northern Ground-cedar				S3S4	4 Secure	13	28.9 ± 1.0	NS
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S3S4	4 Secure	82	0.3 ± 1.0	NS
P	<i>Viola canadensis</i>	Canada Violet				SH	0.1 Extirpated	1	60.0 ± 0.0	NS
P	<i>Calamagrostis cinnoides</i>	Small Reedgrass				SH	0.1 Extirpated	1	26.7 ± 6.0	NS

## 5.1 SOURCE BIBLIOGRAPHY (100 km)

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

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40	Cameron, E. 2007. Canadian Gypsum Co. survey 2005-07. Dillon Consulting Ltd, 40 recs.
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37	Churchill, J.L. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre, 2318 recs.
37	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.
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8	Gilhen, J. 1984. Amphibians & Reptiles of Nova Scotia, 1st Ed. Nova Scotia Museum, 164pp.
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6	Benjamin, L.K. 2006. <i>Cypripedium arietinum</i> . Pers. comm. to D. Mazerolle. 9 recs, 9 recs.
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5	Chapman, C.J. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 11171 recs.
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4	Cameron, R.P. 2012. Rob Cameron 2012 vascular plant data. NS Department of Environment, 30 recs.
4	Cameron, R.P. 2017. 2017 rare species field data. Nova Scotia Environment, 64 recs.
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4	Cody, W.J. 2003. Nova Scotia specimens of <i>Equisetum pratense</i> at the DAO herbarium in Ottawa. , Pers. comm. to C.S. Blaney. 4 recs.
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3	Cameron, R.P. 2005. <i>Erioderma pedicellatum</i> unpublished data. NS Dept of Environment, 9 recs.
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3	Klymko, J. 2019. Atlantic Canada Conservation Data Centre zoological fieldwork 2018. Atlantic Canada Conservation Data Centre.
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3	Sabine, M. 2016. NB DNR staff incidental Black Ash observations. New Brunswick Department of Natural Resources.
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2	Goltz, J.P. & Bishop, G. 2005. Confidential supplement to Status Report on Prototype Quillwort ( <i>Isoetes prototypus</i> ). Committee on the Status of Endangered Wildlife in Canada, 111 recs.
2	Hill, N.M. 2013. email communications to Sean Blaney and David Mazerolle regarding the discovery of <i>Listera australis</i> populations at Black River Lake and Middlewood. , 2.
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2	Lock, A.R., Brown, R.G.B. & Gerriets, S.H. 1994. Gazetteer of Marine Birds in Atlantic Canada. Canadian Wildlife Service, Atlantic Region, 137 pp.
2	McAlpine, D.F. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB, 241 recs.
2	Mills, P. 2016. Email communication to S. Blaney, re: <i>Scirpus longii</i> at Upper Great Brook, Queens Co. NS. NS DNR, 2 recs.
2	Munro, M. 2003. <i>Caulophyllum thalictroides</i> & <i>Carex hirtifolia</i> at Herbert River, Brooklyn, NS. , Pers. comm. to C.S. Blaney. 2 recs.
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1	Basquill, S. P. 2008. Nova Scotia Dept of Natural Resources.
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1	Basquill, S.P. 2012. 2012 Bryophyte specimen data. Nova Scotia Department of Natural Resources, 37 recs.
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1	Blaney, C.S. 2017. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
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## **Appendix D : Wetland Field Forms**

**WETLAND DETERMINATION DATA FORM – NOVA SCOTIA**

Project/Site: Peggy's Cove WL Alteration Municipality/County: HRM Sampling Date: July 17  
 Applicant/Owner: \_\_\_\_\_ Sampling Point: W11  
 Investigator(s): JRG Affiliation: MFC  
 Landform (hillslope, terrace, etc.): barrier Local relief (concave/convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 0427308 Long: 4926956 Datum: NAD 97  
 Soil Map Unit Name/Type: \_\_\_\_\_ Wetland Type: fresh water marsh  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____				Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
2. _____				Total Number of Dominant Species Across All Strata _____ (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
4. _____				
5. _____				
_____ = Total Cover				
Shrub/Strat. (Plot size: <u>5</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. _____				Total % Cover of: _____ Multiply by: _____
2. _____				OBL species _____ x 1 = _____
3. _____				FACW species <u>85</u> x 2 = <u>170</u>
4. _____				FAC species <u>5</u> x 3 = <u>15</u>
5. _____				FACU species _____ x 4 = _____
_____ = Total Cover				UPL species <u>15</u> x 5 = <u>75</u>
				Column Totals: <u>105</u> (A) <u>260</u> (B)
				Prevalence Index = B/A = <u>2.48</u>
Herb Stratum (Plot size: <u>1</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Calla nictitans canadensis</u>	<u>80</u>	<u>Y</u>		<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2. <u>Juncus balticus</u>	<u>5</u>			<input type="checkbox"/> Dominance Test is >50%
3. <u>Carex lasiocarpa</u>	<u>15</u>			<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
4. <u>Agrostis scabra</u>	<u>5</u>			<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
105 _____ = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. _____				Yes <u>Y</u> No _____
2. _____				
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

low diversity in WL



## SOIL

Sampling Point: W1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
35							Clay	on

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Histosol (A1)          | <input type="checkbox"/> Stripped Matrix (S6)         |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Polyvalue Below Surface (S8) |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Thin Dark Surface (S9)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)     |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)     |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Redox Dark Surface (F6)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)       |
| <input type="checkbox"/> Depleted Dark Surface (F7)        | <input type="checkbox"/> Red Parent Material (TF2)    |
| <input type="checkbox"/> Sandy Redox (S5)                  |   |

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |   |
|---|
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)     |
| <input type="checkbox"/> Coast Prairie Redox (A16)    |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) |
| <input type="checkbox"/> Iron-Manganese Masses (F12)  |
| <input type="checkbox"/> Other (Explain in Remarks)   |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: Bedrock  
Depth (inches): 35Hydric Soil Present? Yes  No 

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (minimum of one is required; check all that apply)

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Surface Water (A1)             | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input checked="" type="checkbox"/> High Water Table (A2)          | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> Marl Deposits (B15)                        |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   |

## Secondary Indicators (minimum of two required)

- |  |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Microtopographic Relief (D4)              |
| <input type="checkbox"/> FAC-Neutral Test (D5)                     |

## Field Observations:

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): 25  
 Saturation Present? Yes  No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No 

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Peggys Cove Municipality/County: \_\_\_\_\_ Sampling Date: July 17  
 Applicant/Owner: \_\_\_\_\_ Sampling Point: WL2  
 Investigator(s): JRG Affiliation: MEL  
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 0427251 Long: 4927108 Datum: NAD83  
 Soil Map Unit Name/Type: \_\_\_\_\_ Wetland Type: Fresh water moss  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation  Soil  or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil  or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

### VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____				Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
2. _____				Total Number of Dominant Species Across All Strata: _____ (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
4. _____				
5. _____				
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. _____				Total % Cover of: _____ Multiply by: _____
2. _____				OBL species <u>5</u> x 1 = <u>5</u>
3. _____				FACW species <u>80</u> x 2 = <u>160</u>
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
6. _____				UPL species _____ x 5 = _____
_____ = Total Cover				Column Totals: <u>85</u> (A) <u>165</u> (B)
_____ = Total Cover				Prevalence Index = B/A = <u>1.94</u>
Herb Stratum (Plot size: <u>1</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Calla macrostegis canadensis</u>	<u>75</u>	<u>Y</u>		<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2. <u>Najas cristata</u>	<u>5</u>			<input type="checkbox"/> Dominance Test is >50%
3. <u>Potamogeton nodosus</u>	<u>5</u>			<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
4. _____				<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
_____ = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. _____				Yes <u>Y</u> No _____
2. _____				
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

Low diversity in plot

## SOIL

Sampling Point: W2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type	Loc <sup>1</sup>		
0 - 0							hemic	organic

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix

## Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Stripped Matrix (S6)	Indicators for Problematic Hydric Soils <sup>2</sup> :	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)		<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)		
<input type="checkbox"/> Sandy Redox (S5)			

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: Bedrock  
Depth (inches): 100 cm

Hydric Soil Present? Yes  No 

Remarks:

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)  
 High Water Table (A2)  
 Saturation (A3)  
 Water Marks (B1)  
 Sediment Deposits (B2)  
 Drift Deposits (B3)  
 Algal Mat or Crust (B4)  
 Iron Deposits (B5)  
 Inundation Visible on Aerial Imagery (B7)  
 Sparsely Vegetated Concave Surface (B8)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)  
 Drainage Patterns (B10)  
 Moss Trim Lines (B16)  
 Dry-Season Water Table (C2)  
 Saturation Visible on Aerial Imagery (C9)  
 Stunted or Stressed Plants (D1)  
 Geomorphic Position (D2)  
 Shallow Aquitard (D3)  
 Microtopographic Relief (D4)  
 FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
Water Table Present? Yes  No  Depth (inches): 10  
Saturation Present? Yes  No  Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes  No 

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## **Appendix E: WESP-AC Results**



**Table 1: WESP Evaluation Results - Specific Wetland Functions**

Wetland	WL1		WL2	
	Function Rating	Benefits Rating	Function Rating	Benefits Rating
Surface Water Storage (WS)	1	2	3	2
Stream Flow Support (SFS)	2	2	1	1
Streamwater Cooling (WC)	2	2	1	1
Sediment & Toxicant Retention & Stabilization (SR)	1	2	2	2
Phosphorus Retention (PR)	1	2	1	2
Nitrate Removal & Retention (NR)	1	3	3	3
Carbon Sequestration (CS)	1		2	
Organic Nutrient Export (OE)	1		3	
Anadromous Fish Habitat (FA)	1	1	1	1
Resident & Other Fish Habitat (FR)	1	1	1	1
Aquatic Invertebrate Habitat (INV)	1	2	2	1
Amphibian Habitat (AM)	3	2	2	1
Waterbird Feeding Habitat (WBF)	2	2	1	1
Waterbird Nesting Habitat (WBN)	2	1	1	1
Songbird, Raptor, & Mammal Habitat (SBM)	3	3	2	2
Pollinator Habitat (POL)	3	2	2	2
Native Plant Habitat (PH)	1	2	1	1
Public Use & Recognition (PU)		2		2
Wetland Sensitivity (Sens)		3		3
Wetland Ecological Condition (EC)		1		2
Wetland Stressors (STR) (higher score means more)		3		3
Average Function/Benefit	2	2	2	2

1= Lower Average Accumulated Score
2= Moderate Average Accumulated Score
3 = High Average Accumulated Score

**Table 2: WESP Evaluation Results - Grouped Wetland Functions**

WL ID	HYDROLOGIC Group		WATER Quality Group		AQUATIC SUPPORT Group		AQUATIC HABITAT Group		TERRESTRIAL HABITAT Group		WETLAND CONDITION		WETLAND RISK		Average Function	Average Benefits
	Function	Benefits	Function	Benefits	Function	Benefits	Function	Benefits	Function	Benefits	Function	Benefits	Function	Benefits		
WL1	1	2	1	2	1	1	2	2	2	2	N/A	1	N/A	3	1	2
WL2	3	2	3	3	2	1	1	1	2	2	N/A	2	N/A	3	2	2
<b>Total Average (all wetlands)</b>	2	2	2	3	2	1	2	2	2	2	N/A	2	N/A	3	2	2

1= Lower Average Accumulated Score
2= Moderate Average Accumulated Score
3 = High Average Accumulated Score



Attribute	Site	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Surface Water Storage (WS)	1	0.02	Lower	4.51	Moderate	1.96	2.00
Stream Flow Support (SFS)	1	2.48	Moderate	1.55	Moderate	2.00	1.03
Streamwater Cooling (WC)	1	2.29	Moderate	4.56	Moderate	1.53	2.47
Sediment & Toxicant Retention & Stabilization (SR)	1	1.54	Lower	1.61	Moderate	3.40	0.79
Phosphorus Retention (PR)	1	2.53	Lower	1.52	Moderate	5.33	1.18
Nitrate Removal & Retention (NR)	1	1.66	Lower	10.00	Higher	3.97	10.00
Carbon Sequestration (CS)	1	2.07	Lower			6.18	
Organic Nutrient Export (OE)	1	10.00	Higher			6.57	
Anadromous Fish Habitat (FA)	1	0.00	Lower	0.00	Lower	0.00	0.00
Resident & Other Fish Habitat (FR)	1	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	1	2.91	Lower	4.55	Moderate	4.68	3.69
Amphibian Habitat (AM)	1	7.09	Higher	3.71	Moderate	6.84	4.82
Waterbird Feeding Habitat (WBF)	1	4.98	Moderate	5.00	Moderate	3.79	5.00
Waterbird Nesting Habitat (WBN)	1	5.78	Moderate	0.00	Lower	4.19	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	1	8.44	Higher	10.00	Higher	7.34	10.00
Pollinator Habitat (POL)	1	8.96	Higher	3.33	Moderate	7.42	3.33
Native Plant Habitat (PH)	1	2.59	Lower	6.03	Moderate	4.94	6.03
Public Use & Recognition (PU)	1			2.33	Moderate		1.89
Wetland Sensitivity (Sens)	1			5.39	Moderate		3.71
Wetland Ecological Condition (EC)	1			3.62	Lower		6.94
Wetland Stressors (STR) (higher score means more)	1			6.79	Higher		3.44
<b>Summary Ratings for Grouped Functions:</b>	1						
HYDROLOGIC Group (WS)	1	0.02	Lower	4.51	Moderate	1.96	2.00
WATER PURIFICATION Group	1	1.40	Lower	8.09	Higher	5.45	6.99
AQUATIC SUPPORT Group	1	5.48	Moderate	4.23	Moderate	5.13	3.05
AQUATIC HABITAT Group	1	5.75	Moderate	2.79	Moderate	4.90	3.48
TERRESTRIAL HABITAT Group	1	7.65	Higher	8.23	Moderate	6.99	8.23
WETLAND CONDITION	1			3.62	Lower		6.94
WETLAND RISK	1			7.13	Higher		3.58
Surface Water Storage (WS)	2	7.97	Higher	5.87	Moderate	7.89	2.60
Stream Flow Support (SFS)	2	0.00	Lower	0.00	Lower	0.00	0.00
Streamwater Cooling (WC)	2	0.00	Lower	0.00	Lower	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	2	4.30	Moderate	2.17	Moderate	5.56	1.06
Phosphorus Retention (PR)	2	1.72	Lower	2.05	Moderate	4.82	1.60
Nitrate Removal & Retention (NR)	2	10.00	Higher	10.00	Higher	10.00	10.00
Carbon Sequestration (CS)	2	3.55	Moderate			6.88	
Organic Nutrient Export (OE)	2	9.15	Higher			5.98	
Anadromous Fish Habitat (FA)	2	0.00	Lower	0.00	Lower	0.00	0.00
Resident & Other Fish Habitat (FR)	2	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	2	4.53	Moderate	0.58	Lower	5.34	1.56
Amphibian Habitat (AM)	2	4.54	Moderate	0.77	Lower	5.50	2.39
Waterbird Feeding Habitat (WBF)	2	0.00	Lower	0.00	Lower	0.00	0.00
Waterbird Nesting Habitat (WBN)	2	0.00	Lower	0.00	Lower	0.00	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	2	4.42	Moderate	3.33	Moderate	3.85	3.33
Pollinator Habitat (POL)	2	7.09	Moderate	3.33	Moderate	5.88	3.33
Native Plant Habitat (PH)	2	0.00	Lower	4.35	Lower	3.76	4.35
Public Use & Recognition (PU)	2			3.17	Moderate		2.47
Wetland Sensitivity (Sens)	2			9.59	Higher		4.90
Wetland Ecological Condition (EC)	2			4.78	Moderate		7.50
Wetland Stressors (STR) (higher score means more)	2			9.43	Higher		4.71
<b>Summary Ratings for Grouped Functions:</b>	2						
HYDROLOGIC Group (WS)	2	7.97	Higher	5.87	Moderate	7.89	2.60
WATER PURIFICATION Group	2	7.84	Higher	8.22	Higher	8.41	7.11
AQUATIC SUPPORT Group	2	3.65	Moderate	0.40	Lower	4.41	1.04
AQUATIC HABITAT Group	2	2.71	Lower	0.00	Lower	3.30	1.44
TERRESTRIAL HABITAT Group	2	4.34	Moderate	4.01	Lower	5.19	4.01
WETLAND CONDITION	2			4.78	Moderate		7.50
WETLAND RISK	2			10.00	Higher		4.81

## **Appendix F: Letter of Intent**



July 22, 2020

**Sherri Kasten**

Nova Scotia Environment  
30 Damascus Road, Suite #115  
Bedford, NS  
B4A 0C1

**Re: Peggy's Cove, Halifax County, NS  
Wetland Compensation LETTER OF INTENT – PIDs 4003824 & 40038333**

In association with submission of a wetland alteration on PIDs 40038424 and 40038333 in Peggy's Cove, Halifax County, NS, Develop Nova Scotia (Develop NS) are proposing to complete the following wetland alterations as a result of the project development:

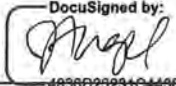
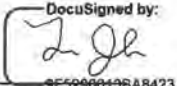
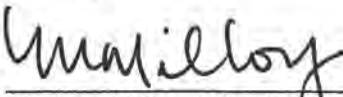
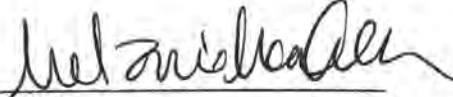
- WL 1: 465 m<sup>2</sup> (0.046 ha)
- WL 2: 274 m<sup>2</sup> (0.027 ha)

This Letter of Intent (LOI) has been developed between Develop NS and McCallum Environmental Ltd. (MEL) to confirm wetland compensation commitments related to the alterations noted above. Wetland alterations will be completed in phases concurrent with development activities.

MEL provides services to clients to perform Primary and Secondary Wetland Compensation to allow the Proponent to meet their wetland compensation requirements as determined by Nova Scotia Environment (NSE). Primary Wetland Compensation includes on-the-ground projects which restore, expand, enhance or create wetland habitat (as defined by NSE), and Secondary Wetland Compensation includes wetland research, wetland education, wetland conservation and other projects which NSE consider a viable method of wetland compensation.




By way of this LOI, Develop NS commits to signing a Letter of Understanding (LOU) for wetland compensation with MEL to fulfill the wetland compensation requirements associated with the Project. Separate Lou's will be provided to NSE at the time of each individual wetland alteration noted above.

**SIGNED AND DELIVERED**

DocuSigned by:  Jennifer Angel Name: Develop NS	7/28/2020   10:34 AM PDT DATE	DocuSigned by:  Jordan WITNESS
 Meghan Milloy, Vice President McCallum Environmental Ltd.	July 28/20 DATE	 WITNESS

**Appendix G: General Visual Observation Field Form Template**

General Observation Data Form - TEMPLATE

Location ID						Wetland Observation Details	B: XXXX	PCM: XXXX	PCM: XXXX	PCM: XXXX				
Date of Assessment/Assessor														
Hydrological Indicator Present Y/N?	B: XXX	PCM: XXXX	PCM: XXXX	PCM: XXXX										
Surface water					Siltation/Sedimentation	N	Y	N	N					
Dry season water table					Flooding	N	N	N	N					
Saturated at surface					Drying	N	N	N	N					
Saturated within 20cm					Ground disturbance/rutting	N	Y	N	N					
Water stained leaves					Artificial channelization	N	N	N	N					
H <sub>2</sub> SO <sub>4</sub>					Invasive/Exotic Species	N	N	N	N					
Other					Dying Vegetation	N	N	N	N					
					<b>NOTES:</b> Describe all instances of Y noted above including coordinates, photos, potential cause.									
<b>Photo Coordinates/Direction Facing</b>														
Ph#														
Ph#														
Ph#														
<b>Preceding Rainfall</b>														
<b>24 Hrs</b>	mm	mm	mm	mm										
<b>5 days prior</b>	mm	mm	mm	mm										
														
<b>Sample Baseline Monitoring Photo</b>					<b>Sample Year 2 PCM Photo</b>					<b>Sample Year 5 PCM Photo</b>				

Note: B=Baseline, PCM = Post Construction Monitoring

## **Appendix H: Landowner Permission Letters**



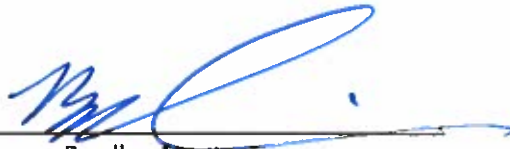
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July 24, 2020

To whom it may concern,

Please be advised that as owner of WL2, 109 Peggys Point Rd., Peggy's Cove, Parcel A, PID 40038333 I grant permission to Develop Nova Scotia (Develop NS) to make application for a Wetland Alteration on this property. Develop NS will be responsible to cover all expenses with respect to said application.

Signature: \_\_\_\_\_



Bradley MacInnis,  
Construction Manager

Date: July 24, 2020

Neil Raycraft  
35 Cedar Drive  
Turkey Point., ON  
N0E 1T0

To whom it may concern,

Please be advised that as owner of 130 Peggy's Point Road, Peggy's Cove, PID 40038424, I grant permission to Develop Nova Scotia (Develop NS) to make application for a Wetland Alteration on this property. Develop NS will be responsible to cover all expenses with respect to said application.

Signature: \_\_\_\_\_



Neil Raycraft

Date: July 23, 2020