

**Mount Uniacke Business Park
Mount Uniacke, Nova Scotia**

WETLAND ALTERATION APPLICATION

Prepared for:
The Municipality of East Hants

Prepared by:



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EXECUTIVE SUMMARY

In support of future commercial development at the Mount Uniacke Business Park, The Municipality of East Hants (MEH) retained McCallum Environmental Ltd. (MEL) to prepare a supplemental report to support a request for wetland alteration for the construction of an access road into the Project lands.

As part of the planning process associated with the proposed activities, in August 2018, MEL completed wetland delineation and functional assessment within the Mount Uniacke Business Park lands (known as the Study Area), 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 and functional assessment;
2. Watercourse identification; and
3. Confirm the presence/absence of rare and species-at-risk.

The Study resulted in the identification of sixteen (16) wetlands within the Study Area, of which two (Wetlands 2, and 3) are currently proposed for alteration.

The proposed wetland alteration includes complete alteration within the two wetlands for the purposes of access road construction (infilling). The impact areas associated with the alteration of the wetlands requiring approval is; Wetland 2 (WL2): 512 m² and Wetland 3 (WL3): 3,719m².

The objective of this application is to provide the required 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 delineation methodology and results;
- Wetland characteristics;
- Wetland functional assessment results;
- Proposed post construction wetland monitoring; and
- Proposed wetland compensation methods.

Wetland characteristics and completion of a functions assessment within Wetland 2 and Wetland 3 resulted in the following:

- Wetlands 2 and 3 both exist as small, isolated mixed-wood treed swamps;
- Both wetlands share similar vegetative and hydrological characteristics typical of treed swamps in Nova Scotia (i.e. saturated surfaces and dominated by Cinnamon Fern and Three-Seeded-sedge herbs and Black Spruce, Speckled Alder, Balsam Fir and Yellow Birch shrubs and trees;
- Wetlands 2 and 3 are not located within protected areas, nor do they classify as a Wetland of Special Significance (WSS);
- There is suitable habitat present within and adjacent to Wetlands 2 and 3 to support five Species At Risk; the Rusty Blackbird, Canada Warbler, Eastern Wood-Pewee Evening Grosbeak and Black Ash.

- No Species at Risk were identified during the 2018 field evaluation;
- Due to their non-connectivity with surface water features, Wetlands 2 and 3 do not comprise fish habitat;
- A wetland functional assessment was completed using the Wetland Ecosystem Services Protocol (WESP). Neither of the wetlands scored high for functions and benefits for any wetland functional group evaluated;

Best management practices provided in this document will be implemented during the construction process, however, due to the nature of the alteration (i.e. complete infill), protective measures will be focussed on the un-permitted wetlands and forested lands located outside of wetland alteration areas.

The proponent is seeking approval to alter a total area of 4,231m²/0.42 hectares of wetland habitat. MEH will procure the services of a wetland restoration specialist to compensate for the wetland loss associated with the activities discussed in this application.

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1 INTRODUCTION

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- 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

Name of Proponent	Derek Normanton (Project Engineer) Municipality of East Hants
Mailing/Civic Address	230-15 Commerce Court Elmsdale, NS B2S 3K5 Phone: 902 883 7098 (ex 252)
Application Contact	Andy Walter

	McCallum Environmental Ltd.
Phone Number	902-446-8252
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Mailing Address	Suite 115, 2 Bluewater Road Bedford, Nova Scotia B4B 1G7
Name of Proponent	Derek Normanton (Project Engineer) Municipality of East Hants
Mailing/Civic Address	230-15 Commerce Court Elmsdale, NS B2S 3K5 Phone: 902 883 7098 (ex 252)

1.2 Project Property Information

This application pertains to alteration of two wetlands as a result of access road construction within Lots 1-4 of the Mount Uniacke Business Park. No additional infrastructure has been designed within these lots at this time. Lots 1-4 are located in undisturbed land situated in-between James Boyle Drive and Highway 101 in Mount Uniacke, NS. Proposed lot locations are provided on Figure 2 (Appendix A). The 2018 wetland assessment Study Area encompassed Lots 1-4 as well as Lots 7-9 as indicated on Figure 1 (Appendix A). The Study Area comprises undeveloped forested lands, although some anthropogenic disturbances have occurred historically alongside Highway 101 in connection with the highway construction.

Property details related to the alteration of the Wetlands 2 and 3 are provided in Table 2 below.

Table 2: Property Details

Wetland ID	PID	Property Owner	Civic Address
WL2 and WL3	45367521	The Municipality of the District of East Hants	James Boyle Drive, Mount Uniacke, Lot 1.

1.3 Project Team

A project 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
Andy Walter, BSc. (Hort)	Senior Project Manager
Amber Stoffer, MREM	Wetland Delineator, Species at Risk Evaluator, Report Writer

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

2 METHODOLOGY

The Study Team completed 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 using the Nova Scotia Topographic Watercourse and Wet Areas databases, the Nova Scotia Environment Wetlands database, Nova Scotia Wet Areas Mapping (WAM) database and the provincial Tertiary Watershed database. In addition, the Nova Scotia Environment (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 wetlands proposed for alteration, a Priority Species list was created. The purposes of the Priority Species list are to identify a broad list of species which have the potential to be present within the wetland proposed for alteration, and to inform the field programs.

Development of a priority list of species for birds, fish, lichen, plants, and vertebrates 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 (NSES 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 2015).

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 (COSEWIC species and ACCDC S1, S2 and S3 [or any combination thereof]), and Species at Risk (SAR) which are listed on SARA or NSES.

The Priority Species list was built using sub-national (provincial) conservation ranks defined by the ACCDC (SRanks, S1, S2, S3) rather than the formerly used general status ranks (GS Ranks Red and Yellow). Priority Species based on SRanks include those ranked S1-S3 or any combination thereof (i.e. S3S4 is considered a Priority Species). For birds, breeding status qualifiers are used to determine whether a species is a Priority Species, based on the time of year in which the species was observed. For instance, Pine Grosbeak has an SRank of S2S3B, S5N. If observed during breeding season, this species would be considered a Priority Species. Outside of breeding season, this species would not be considered a Priority Species. The desktop priority list was based on general species habitat requirements and the broad geographic area that individual species are known to occur.

The priority list of species was first narrowed by broad geographic area. The priority list of species was then further narrowed by identifying specific habitat requirements for each species. For example, if a listed species on the Nova Scotia Endangered Species Act (NSES) required open water lake habitat, and

no open water lake habitat is present inside the wetlands proposed for alteration, this species was not carried forward to the final list of Priority Species.

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

An in-text short list of SAR from the Priority Species List with suitable habitat within the wetland proposed for alteration is provided in Section 3.1.

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.

The ACCDC report is included as Appendix C.

2.2 Field Assessment

During field assessments, the Study Team surveyed the Study Area to confirm the presence of mapped wetlands and watercourses.

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.

The wetland delineation and field assessment was completed on August 22nd and 23rd, 2018 by MEL wetland delineators Amber Stoffer and Louis Charron. Meandering transects were completed within the Study Area to confirm the potential presence of wetlands and watercourses.

Wetland delineation was conducted 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, 2011). In each wetland, vegetation, hydrology, and soils data were recorded at both wetland and upland data points on either side of the wetland boundary in accordance with the Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987).

Wetland boundaries and watercourse routes were recorded on a Garmin GPSMAP 64s. The delineated wetlands were flagged with pink flagging tape and the identified watercourses were flagged with blue flagging tape.

In keeping with the Corps of Engineers methodologies for wetland delineation, three criteria are required in order for a wetland determination to be made:

- Presence of hydrophytic (adapted to growing in water) vegetation;
- Presence of hydrologic conditions that result in periods of flooding, ponding, or saturation during the growing season; and
- Presence of hydric soils.

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory, 1987). Hydrophytic vegetation should be the dominant plant type in wetland habitat (Environmental Laboratory, 1987). Dominant plant species observed at each data point were classified according to their indicator status (probability of occurrence in wetlands) in accordance with the Nova Scotia Wetland Indicator Plant List. Further relevant information was reviewed in Flora of Nova Scotia (Roland, 1998). If the majority (greater than 50%) of the dominant vegetation at a data point is classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC; excluding FAC-), then the location of the data point is considered to be dominated by hydrophytic vegetation.

A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (United States Department of Agriculture, 2003). Indicators that a hydric soil is present include soil colour (gleyed soils and soils with bright mottles and/or low matrix chroma), aquic or pre-aquic moisture regime, reducing soil conditions, sulfidic material (odour), soils listed on the hydric soils list, iron and manganese concretions, organic soils (histosols), histic epipedon, high organic content in surface layer in sandy soils, and organic streaking in sandy soils. A soil pit was completed at each data point. These pits were excavated to a maximum depth of 50 cm or refusal. The soil in each pit was then examined for hydric soil indicators. The matrix colour and mottle colour (if present) of the soil were determined using the Munsell Soil Colour Charts.

Wetland habitat, by definition, either periodically or permanently, has a water table at, near, or above the land surface or is saturated with water. To be classified as a wetland, a site should have at least one primary indicator or two secondary indicators of wetland hydrology. Examples of primary indicators of wetland hydrology include watermarks, drift lines, sediment deposition, and water stained leaves. Examples of secondary indicators of wetland hydrology include oxidized root channels, dry season water table, and stunted or stressed plants.

2.3 Wetland Functional Assessment

A wetland functional assessment was completed for Wetlands 2 and 3 using the Wetland Ecosystem Services Protocol - Atlantic Canada (WESP) wetland evaluation technique. The WESP 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 benefits.

3 RESULTS

The following section provides the results of the desktop review (Priority Species and special areas), and results of field surveys including the locations of wetlands and watercourses.

3.1 Desktop Review Results

3.1.1 Aquatic Features

According to the database searches, and as indicated in Figure 1 (below), the desktop resources identified one wetland within the Study Area; located adjacent to Highway 101 at the southern extent of the Study Area. The database search also identified one mapped watercourse initiating from Highway infrastructure to the east of the Study Area, extending across the southern portion of the Study Area and exiting beyond the southern Study Area boundary beneath Highway 101. One waterbody (area of pooled water) was also observed at the southern Study Area boundary.

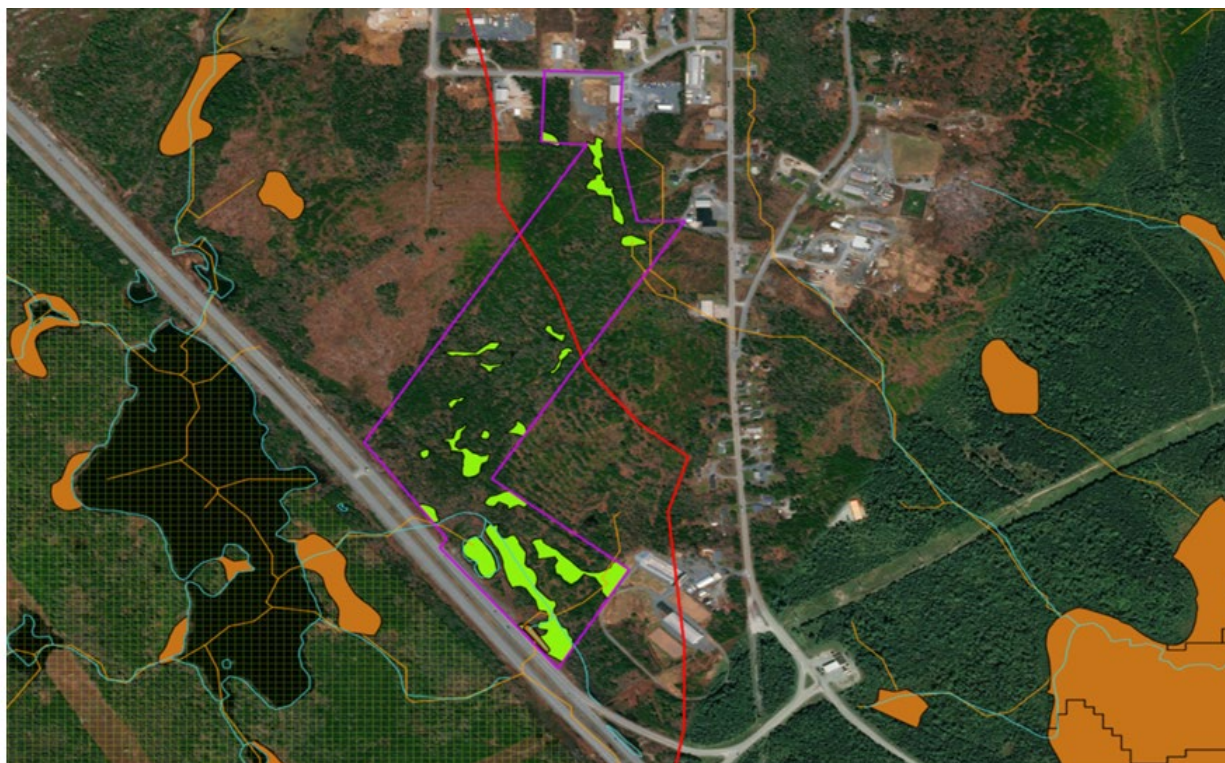


Figure 1: Mapped and Field Identified Aquatic Features

Legend:

- Green polygons – Delineated wetlands
- Orange polygons – Desktop mapped wetlands
- Blue line – Desktop mapped watercourses
- Yellow Hatch– Protected Water Supply Area
- Red Line – Secondary Watershed Boundary
- Orange Line – Flow Accumulation Channels

The desktop review process also confirmed that the Study Area does not exist within or contain the following:

- Ramsar site, Provincial Wildlife Management Area (Crown and Provincial lands only), Provincial Park, Nature Reserve, Wilderness Area or lands owned or legally protected by non-government charitable conservation land trusts;
- Wetlands in designated protected water areas as described within Section 106 of the Environment Act; or,
- A designated wetland of special significance (WSS).

The Study Area is situated within two secondary watersheds. Wetlands 1 and 3 are located in the Sackville River Secondary Watershed, while the remaining 14 wetlands remain in the Northeast River Secondary Watershed. The NSDNR modelled flow accumulation flows indicated on Figure 1 (above) provide a sense of the localized water flow within the Study Area. Surface water in northern portions of the Study Area drains southeast toward a large wetland complex located approximately 1km southeast of the Study Area. Surface water in the southern half of the Study Area drains southward, beneath Highway 101 and into Lacey Lake (Figure 1, attached).

Due to its headwater location within each of the Secondary Watershed discussed above, there are no major sources of surface water into the Study Area other than surface water run-off and no anthropogenic discharges of water were identified.

3.1.2 Species At Risk and Species of Conservation Interest

A review of the ACCDC Report (Appendix C) 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 of the Study Area including:

- 5 managed areas:
 - Bell PPR located approximately 2.9km northwest of the Study Area;
 - Uniacke House located approximately 4.9km from the Study Area;
 - The Study Area is located within the Halifax Water Supply Area;
 - The Tomahawk Lake Watershed is located approximately 3.4km southeast of the Study Area; and
 - The East Hants Regional Municipal Water Supply located approximately 4.3km east of the Study Area.
- no biologically significant sites;
- 1 record of 1 vascular flora;
- 31 records of 9 vertebrate; and,
- no records of invertebrates.

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 an ACCDC report. No location sensitive species were documented within 5km of the wetlands proposed for alteration at the Mount Uniacke Business Park by the ACCDC report.

ACCDC records indicate that four SAR are present within 5km of the Study Area and suitable habitat is present within the wetlands proposed for alteration including: Canada Warbler (SARA: Threatened), Eastern Wood-Pewee (SARA: Threatened), Evening Grosbeak (NSES: Special Concern) and Rusty Blackbird (SARA: Special Concern).

For the purpose of this wetland alteration application, a short list of SAR from the Priority Species List and their habitat requirements were evaluated during the wetland field evaluation.

The short list of SAR from the Priority Species List with suitable habitat within WL's 2 and 3 (proposed for alteration) is provided below:

- Canada Warbler (*Wilsonia canadensis*)
- Rusty Blackbird (*Euphagus carolinus*)
- Eastern Wood-Pewee (*Contopus virens*)
- Evening Grosbeak (*Coccothraustes vespertinus*)
- Black Ash (*Fraxinus nigra*)

Below are the habitat requirements for the SAR listed above.

Canada Warbler

Canada Warbler (SARA Threatened; NSES: Endangered) breed in a variety of forested habitats with dense understory vegetation (Environment Canada, 2016a).

Rusty Blackbird

Rusty Blackbirds (SARA Special Concern, NSES: Endangered) breeding habitat consists of riparian habitats, including wetlands, peatlands, marshes, alder and willow thickets. They also require freshwater bodies with shallow water and emergent vegetation (COSEWIC, 2006).

Eastern Wood-Pewee

Breeding habitat for the Eastern Wood-Pewee includes mature and intermediate-age deciduous and mixed forests, with an open understory. They are often associated with edge habitats and forest clearings (COSEWIC, 2012)

Evening Grosbeak

Breeding habitat for this species consists of open, mature mixed wood forest, where fir species or White Spruce are dominant (COSEWIC, 2016). The Evening Grosbeak often builds nests high in trees; nests are typically 10-15 cm in diameter (Cornell University, 2017).

Black Ash

Typical Black Ash habitat includes poorly drained soils and swampy woods.

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

3.2 Field Assessment

Sixteen (16) wetlands were identified during the field assessment.

Table 1 (Appendix D) provides a summary of characteristics associated with wetlands identified within the Study Area. Locations of watercourses and wetlands are provided on Figure 1 (Appendix A).

Representative photos are attached (Appendix E).

The majority of the wetlands identified exist as isolated mixed-wood treed swamps (n= 11). These wetlands play a role in intercepting and storing surface water run-off, but do not possess surface water connectivity to additional wetlands and/or watercourses. None of the wetlands identified across the Study Area provide any access to fish.

Only one wetland complex exists (WL10 which comprises swamp and marsh habitat), and one isolated bog (WL7) which is located in southern portions of PID 45367521. One shallow open water wetland was identified in the same place as the desktop mapped waterbody in southern portions of the Study Area.

Hydrological conditions with wetlands are very consistent throughout. Nine of the wetlands exhibit saturated surfaces, and four wetlands comprise groundwater within 30cm of the surface. Standing water was only observed within four wetlands; Wetland 10 comprises 15cm of water across 30% of the wetland surface, whereas Wetlands 13 and 15 only comprise standing water across 5% and 2% of the wetland surface respectively. The lack of evidence suggesting water is retained at surface within wetlands across the Study Area indicates that they are not high functioning water storage wetlands.

Wetland 16 is entirely comprised of open water (<2m deep). Wetland 16 was observed to be surrounded by rock impoundments and exists at a much lower elevation than the adjacent Highway 101. There was no evidence to suggest that WL10 sources water to WL16, and there is no fish access present. Visual observations suggest that the wetland may have been created, or a natural system was altered as part of Highway construction in the past, resulting in the creation of the lower lying basin feature from which a shallow open water wetland has formed.

Vegetation across all wetlands is also very consistent and typical for swamp habitats within the province and region generally. The exception is the treed bog (WL7) which comprises nutrient poor ericaceous species typical of bog type habitats in NS and the shallow open water wetland which comprises aquatic vegetation. Dominant species across all swamp wetlands include Balsam Fir, Black Spruce, Yellow Birch, and Red Maple trees with an understory consisting of Speckled Alder, Yellow Birch, Red Maple and Black Spruce shrubs and saplings. Three-seeded Sedge, Cinnamon Fern, Sensitive Fern and Cattails are common to the herb layer within swamp habitats. The ericaceous species found in WL7 (bog) include Leatherleaf, Rhodora, Sweet Gale and Cottongrass herbs, and Balsam Fir and Black Spruce shrubs and trees. Wetland 16 comprises aquatic species including lily pads, Eastern Purple Bladderwort and Potamogeton species.

No Species At Risk (SAR) (vegetation or wildlife) were identified during the field evaluation.

No watercourses are present within the Study Area.

Table 4 below provides wetland areas within the Study Area. It should be noted that some of the wetlands extend beyond the wetland Study Area boundary and are marked with a *.

Table 4: Wetland Area Within the Study Area

Wetland	Area Within Study Area (m ²)
1	615*
2	512
3	3,719
4	570*
5	220
6	440
7	2,444
8	1,469*
9	5,315*
10	10,920*
11	663*
12	830
13	232
14	263
15	316
16	2,834

4 WETLAND CHARACTERISTICS AND FUNCTIONS

The following sections provide an overview of wetland characteristics and functions including the presence of Priority Species and their habitats, as well as potential fish habitat within the wetlands proposed for alteration.

4.1 Wetland Characteristics

The two wetlands proposed for alteration both exist as terrene basin mixed-wood swamps with no connectivity to watercourses.

Wetland 2 is characterized by a dense covering of Cinnamon Fern (*Osmunda cinnamomea*) with intermixed Three-seeded Sedge (*Carex tripteris*) and Canada Mayflower (*Maianthemum canadensis*). The shrub layer is dominated by Yellow Birch (*Betula alleghaniensis*) and Balsm Fir (*Abies balsamea*), while in the tree layer, Balsam Fir and Yellow Birch also dominate, in combination with Red Maple (*Acer rubrum*).

Hydric soils present within WL2 were observed to be histosols (A1) and saturated soils within 20cm were observed indicating a positive indicator of wetland hydrology.

Wetland 3, which also exists as an isolated feature (albeit with a seasonal drainage outflow) comprises two separate portions which are connected to each other via surface drainage. Dominant herbs within

WL3 comprise Cattail (*Typha latifolia*), Three-seeded Sedge, Cinnamon Fern, Shallow Sedge (*Carex lurida*), while the shrub stratum is dominated by Speckled Alder (*Alder incana*) and Black Spruce (*Picea mariana*)., Balsam Fir, Red Maple and Yellow Birch dominate the tree stratum which is consistent with WL2.

WL3 also comprise Histosol hydric soils, and saturated surface soils within 20cm.

4.2 Priority Species in Wetlands

An assessment for SAR and SOCI was completed in all wetlands during the August 2018 field evaluation. As well, the potential utilization of the wetlands proposed for alteration by Species At Risk was completed in Wetlands 2 and 3. Priority species potential has been evaluated based on available habitat within the wetlands evaluated.

4.2.1 Potential Priority Species Habitat

An evaluation of habitat suitability for species listed in the short list from Section 3.1 was evaluated within the wetlands proposed for alteration and is discussed below.

Apart from Black Ash (which was not encountered in either wetland), the short list of Priority Species consists of only birds. Potential habitat for all birds exists in and adjacent to the wetlands, but the species were not observed during the 2018 evaluation.

No fish or specific turtle habitat are present within either wetland due to their hydrological isolation and lack of surface water.

4.3 Wetland Functions

The WESP process calculates the overall scores for the seven wetland functional groups including a functional and benefit rating for five of the groups (Hydrologic, Water Quality Support, Aquatic Support, Aquatic Habitat and Terrestrial Habitat) and the benefit rating for the Wetland Condition and Wetland Risk wetland functional groups. The WESP calculator utilized the responses from desktop, field and stressor questions (included in the WESP calculator) to determine whether the functions and benefits for each group are Lower, Moderate or Higher in comparison to baseline wetland scores in Nova Scotia.

Appendix F provides the results of the WESP evaluation for Wetlands 2 and 3. WESP guidance states that the most valuable wetlands are those that possess high functions and benefits. Benefits relate to the perceived worth of the wetland function to societal needs. Based on the tables provided in Appendix F, the following overview for the seven wetland functional groups is provided below:

- Hydrologic Group: The hydrological wetland service group evaluates the effectiveness of a wetland to store or delay the downslope movement of surface water. WL2 scored Moderate in function and Low in benefits compared to WL3 which scored Low in Function and Low in benefit. This difference is predominantly attributable to an observable surficial seasonal drainage outflow from WL3 compared to WL2 which is completely isolated.
- Water Quality Support 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 the wetland's potential to intercept, retain, and filter sediments, particulates, and organic matter. WL2 scored high for

functions but low for benefit, while WL3 scored low for both function and benefit. The seasonal outflow discharge from WL3 and the small areas of bare ground within it reduces the wetlands ability to perform these functions in comparison to WL2. Surface water is provided to both wetlands naturally from small catchment areas, and there is no evidence of degraded water being provided to each wetland which may require improving; hence the reasons for the low benefits scores.

- **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. Both wetlands scored low in function and low in benefits as a result of their lack of surface water and association with a watercourse.
- **Aquatic Habitat Group:** This 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 flowing water. Both wetlands scored moderately for both functions and benefits. Although there is a lack of fish habitat present, the wetlands are both reasonably proximal to a larger open body of water (Lacey Lake), and conditions within the wetlands are suitable for amphibians (i.e. adjacent to large tracts of land, fishless, and an intermix of vegetation and height classes).
- **Transition Habitat Group:** The transition habitat group comprises 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, and native plants. Both wetlands scored high in function and low in benefits indicating that good habitat is present, but that it is also readily present in surrounding lands which reduced its benefits value.
- **Wetland Condition:** Wetland conditions refer to the integrity or health of a wetland as defined by its vegetative composition and richness of native species. Both wetlands scored high in benefits indicating the presence of a healthy vegetative community.
- **Wetland Risk:** Wetland risk considers both the sensitivity of the wetland potential stressors and existing and/or past stressors to the wetland. WL2 scored moderate whereas WL3 scored a low risk. This difference is a result of WL2 and its catchment being smaller and comprising less vegetative diversity; factors which make WL2 more susceptible to stressors than WL3.

Wetlands 2 or 3 do not exist as a WSS, nor are they located within areas designated as protected.

5 PROPOSED WETLAND ALTERATION

The proposed wetland alteration involves infilling both Wetlands 2 and 3 for the purposes of access road construction. MEH intend to infill both wetlands to accommodate flexibility in access route routing and design. Figure 2 (Appendix A) outlines the proposed route of the access road and its interaction with Wetlands 2 and 3.

The total proposed area of infill within the wetlands is 4,231m²/0.42 hectares.

5.1 Mitigation

The following section outlines the mitigation methods specific to Priority Species for the proposed alteration activity. General best management practices during alteration is also provided.

5.1.1 Priority Species

Potential Rusty Blackbird, Canada Warbler, Eastern Wood-Pewee, Evening Grosbeak and Black Ash habitat is present within the wetlands proposed for alteration. None of these species were identified during field surveys.

Clearing of vegetation within the proposed alteration activity will be required prior to the infilling occurring. Clearing is expected to occur in Fall 2019 and will therefore avoid the breeding bird season. Therefore, impacts to priority bird species is not expected. In the unlikely event that clearing takes place within the breeding season for birds, a breeding bird/nest survey will be completed by an experienced birder to ensure impacts to breeding birds does not occur.

5.1.2 Best Management Practices

Wetlands 2 and 3 are proposed to be entirely altered by future development and access road construction hence best management practices will focus on minimization and mitigation against potential impacts to additional aquatic features existing within the Mount Uniacke Business Park lands. Neither of the wetlands are hydrologically connected by a permanent surface water connection to other wetlands or watercourses, therefore indirect impacts as a result of the activity are not expected.

During development of the Mount Uniacke Business Park the following best management practices will be employed:

- Machinery and personnel will be instructed not to enter unpermitted wetlands;
- In order to protect wetland habitat from accidental spills, spill control and contingency planning will be in effect, and its procedures fully communicated to staff;
- Silt laden water is not to be drained or pumped directly into wetlands or watercourses (unless for the purposes of maintaining hydrological inputs). Instead water should be directed to heavily vegetated areas, settling ponds trenches, or similar area, with erosion control at the outlet, and the outlet must be monitored regularly by the contractor;
- Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance. Also, ensure contractors minimize travel across areas of exposed soils. Maintaining existing vegetation cover is the best and most cost-effective erosion control practice;
- All construction site and roadway runoff shall be directed through natural vegetation or through erosion and sediment control devices before it reaches watercourses or wetlands;
- Erosion control and infilling materials shall be clean, non-ore-bearing, non-watercourse derived and non-toxic materials; and,
- Install all erosion and sediment control practices for adjacent, unpermitted aquatic features prior to any soil disturbing activities, when applicable;
- Drainage structures will be incorporated, 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
- Construction monitoring audits will be completed to ensure protection measures are in place and effective; and,
- 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, including work within 30m of a wetland or watercourse.

6 6.0 POST-CONSTRUCTION MONITORING

This application is seeking approval to alter Wetlands 2 and 3 in their entirety, hence post-construction monitoring to evaluate wetland health post construction is not required.

7 WETLAND COMPENSATION

MEH is seeking approval to alter a total area of 4,231m²/0.42 hectares of two wetlands (WL's 2 and 3). Wetland loss will be satisfied at a replacement ratio of 2:1 (total area 0.84ha / 48,462m²).

A LOU (Letter of Understanding) between MEH and a wetland restoration specialist will be signed and provided to NSE prior to the alteration of wetland habitat taking place.

A letter detailing this commitment is provided in Appendix G.

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

Sincerely,



Andy Walter
Senior Project Manager
McCallum Environmental Ltd.

8 REFERENCES

- ACCDC - Atlantic Canada Conservation Data Centre. 2019. Species Ranks. Accessed from: <http://www.accdc.com/en/ranks.html>
- Cornell University. 2017. All About Birds. Retrieved from: <https://www.allaboutbirds.org/>
- COSEWIC. 2006. COSEWIC assessment and status report on the Rusty Blackbird (*Euphagus carolinus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 28 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2012. COSEWIC assessment and status report on the Eastern Wood-Pewee in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp.
- Environment Canada. 2016a. Recovery Strategy for the Canada Warbler (*Cardellina canadensis*) in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. vii + 56 pp.
- COSEWIC. 2016 COSEWIC assessment and status report on the Evening Grosbeak *Coccothraustes vespertinus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 64 pp.
- Environmental Laboratory. 1987. Corp of Engineers Wetlands Delineation Manual. Available online at: <http://www.lrh.usace.army.mil/Portals/38/docs/USACE%2087%20Wetland%20Delineation%20Manual.pdf>
- Nova Scotia Endangered Species Act (NSES). 1999. c.11, <https://novascotia.ca/just/regulations/regs/eslist.htm>.
- Roland, A. E. Flora of Nova Scotia. 1998. 3rd Edition. Province of Nova Scotia
- Species at Risk Act (SARA), SC 2003, c 29, <<http://canlii.ca/t/52lpn>> Retrieved on 2016-04-13
- U.S. Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region. Available online at: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/NCNE_supp2.pdf
- United States Department of Agriculture. 2003. Hydric Soils- Introduction. Retrieved online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/hydric/?cid=nrcs142p2_053961

Appendix A: Figures

Prepared For:



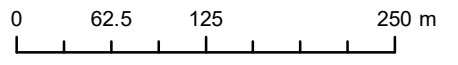
FIGURE 1

Mount Uniacke Business Park
Field Identified Wetlands

- Study Area
- Field Identified Wetland
- Mapped Wetland (NSE)
- Mapped Waterbody (NSHN)
- Mapped Watercourse (NSHN)
- Drainage



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

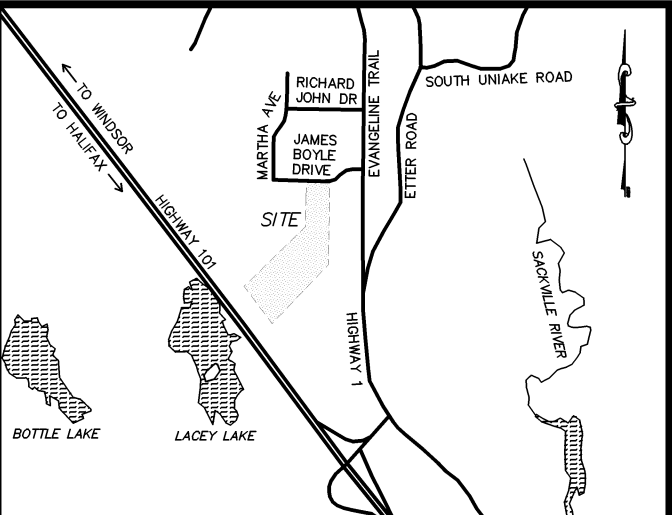
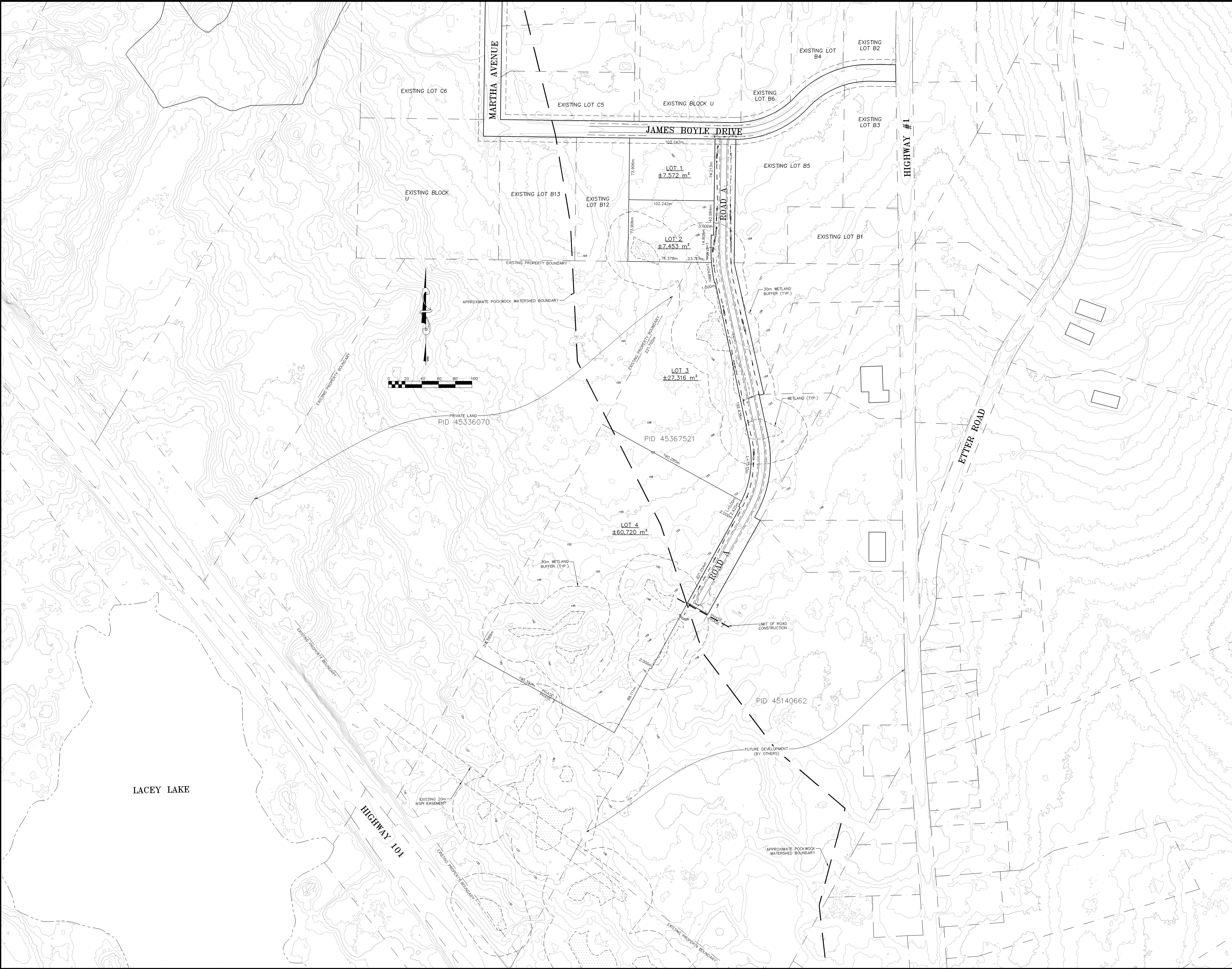


1:5,000 Scale when printed @ 11" x 17"

Drawn By: LC Date: 2018-09-18



McCallum Environmental Ltd.



Key Plan NOT TO SCALE

LEGEND	
	SANITARY M.H. & SEWER
	STORM M.H. & SEWER
	HYDRANT
	GATE VALVE & WATERMAIN
	CATCHBASIN
	STREET TREE
	POWER POLE
	POWER POLE WITH LIGHT FIXTURE
	ANCHOR ON LIGHT POLE
	ALCANT PEDESTAL
	ALCANT FLUSH BOX
	N.S.P.I. URD BOX
	CONCRETE CURB & GUTTER
	SIDEWALK
	DRIVEWAY
	PEDESTRIAN RAMP
	PROPOSED & FINISHED GRADE
	EXISTING CENTERLINE GRADE
	EXISTING GRADE (RT. SIDE R.O.W.)
	EXISTING GRADE (LEFT SIDE R.O.W.)
	PROPOSED U/G ELEC. LINES
	PROPERTY LINE
	EXISTING PROPERTY LINE
	LATERALS, SAN., STM. & WM.

- NOTES:
- Contour interval is 1.0 metre, based on Lidar mapping.
 - For additional notes and details see drawing 18-6683-F05.

Figure 2

0. XXXXXXXX	XXXXXX	XXX
No	Date	By

Revision or Issue



Project
MOUNT UNIACKE BUSINESS
PARK EXPANSION

Drawing
SITE PLAN

Scale 1:250

Date	XXXX	Drawn	RAW
Design Check	CNB	Approv.	CNB
Project No.	18-6683	Sheet	1 Of 5
Drawing No.	F01	Rev.	0

DRAFT
NOT FOR CONSTRUCTION
PRINTED AUG-21-19

Appendix B: Curriculum Vitae

Years in Practice

10

Certifications

Nova Scotia Advanced
Wetlands Delineator and
Evaluator

Memberships

Nova Scotia Wetlands
Delineation, Maritime
College of Forest
Technology

Education

- BSc. (Horticulture),
Essex University (UK),
2003-2005

Training

- Wetland Functional
Assessment Training
Workshop, NSE 2013
- Urban Wetland
Restoration: A
Watershed Approach,
2012
- Nova Scotia Advanced
Wetlands Delineation
and Evaluation Course,
2010;
- Water Management and
Wetland Restoration
Training Course, 2014;
- Identifying and
Delineating Wetlands
for Nova Scotia, 2009
- Watercourse Alteration
Certification (Nova
Scotia Environment)
(2008)
- Saint John Ambulance
Emergency First Aid,
AED, CPR(C). 2016

Summary

Mr. Walter is a trained biologist and wetland specialist, and has extensive experience managing technical biophysical projects within Atlantic Canada. Mr. Walter is knowledgeable in federal, provincial, and municipal environmental regulations and guidelines applicable to Atlantic Canada, and works closely with all necessary regulatory agencies to facilitate project implementation. As senior project manager, Mr. Walter ensures biophysical field programs are tailored to the needs of the client and project, while meeting regulatory standards. Mr. Walter has provided environmental support to the planning process in a wide range of project types including residential development, industrial projects (mining, pit and quarry), transmission line and hydro dam infrastructure and highway construction to name a few. Mr. Walter has managed the environmental processes associated with multiple wind energy developments in Nova Scotia, including compilation of provincial environmental assessment (EA) documents, and implementation of associated EA biophysical field surveys, as well as acquiring pertinent environmental information required for regulatory permitting.

As a trained field biologist, Mr. Walter has completed terrestrial and stream habitat assessments, and flora and fauna surveys, including desktop reviews and characterization of biophysical environments. Mr. Walter also completes numerous fish habitat/watercourse assessments for effects monitoring, watercourse alteration, and HADD authorization projects. Assessments have also included water quality sampling, benthic sampling, and biophysical characterization (channel depth and width, stream velocity, fish habitat assessment) of water bodies.

As a qualified wetland delineator and wetland function evaluator for Atlantic Canada, Andy has completed delineation of hundreds of wetlands. Projects often involve the completion of species at risk assessments, functions assessments, and detailed wetland characterization in support of provincial wetland alteration applications. In addition, Mr. Walter assists in the identification of potential wetland restoration and creation sites for wetland and fish habitat alterations, reviews databases, mapping, and aerial imagery, completes ground truthing and consults with local environmental groups and government to identify potential sites. Following alteration approval, Mr. Walter supervises construction activities for numerous construction projects in wetland habitat ensuring that erosion and sedimentation control measures are implemented prior to construction, and monitors activities during construction to ensure wetland protection measures are effective.

Project Experience

- Managing, and currently in the process of implementing a new wetland functional assessment tool for use in Nova Scotia. This Project included the collection of baseline wetland information across Nova Scotia by completing 120 wetland functional assessments using the Wetland Ecosystem Services Protocol (WESP). Ongoing collaboration with Nova Scotia Environment to support the rolling out of this method to wetland practitioners.
- Management and implementation of a 18 hectare agricultural wetland restoration project in Middle Stewiacke, NS.
- Management and completion of terrestrial habitat mapping, wetland delineation and vegetation surveys in support of EA and regulatory permitting for the South Canoe Wind Project (80MW wind Project in Nova Scotia) 2011-2014.

Andy Walter, BSc. (Hort)
andy@mccallumenvironmental.com

Senior Project Manager

- Management of a multi-faceted avian study in support of a provincial EA at Aulds Cove, NS.
- Completion of six provincial environmental assessments and baseline surveys for community wind projects in Nova Scotia in 2012-2014.
- Terrestrial habitat mapping, wetland delineation and vegetation surveys in support of a 65km distribution transmission line in central Nova Scotia.
- Wetland delineation, species at risk, watercourses and flora surveys at the site of a proposed quarry in Nova Scotia. Subsequent facilitation of wetland alteration permit to alter in excess of 20 hectares of wetland.
- Implemented the passive wetland restoration strategy at a disturbed wetland on NSDNR property. Completed regular monitoring of vegetation, soil, and hydrology conditions and developed project recommendations accordingly (2009-2011).
- Wetland delineation, species at risk, watercourses and flora surveys at the site of a proposed 22km railway line and shipping container terminal in eastern Nova Scotia (2012-2014).
- Completion of wetland delineation and watercourse identification and associated regulatory permitting at multiple developments in Nova Scotia (2009-2016).

Work Experience

Strum Environmental Services Ltd., Nova Scotia 2008-2015

Environmental Specialist/Project Manager- provided project management expertise for development clients across Atlantic Canada. Projects included environmental assessment, large scale commercial, residential and wind power developments, wetland and watercourse alteration projects, wetland compensation planning and implementation, wetland restoration and creation projects, avian studies, and regulatory consultation.

Years in Practice

2

Education

B.Sc. (Honours, Biology),
University of Ottawa,
2009-2013.

Master of Resource and
Environmental
Management, Dalhousie
University, 2013-2015.

Training

- ♦ Fish Habitat
Restoration
Watercourse Alteration
Installer, 2017
- ♦ Saint John Ambulance
Standard First Aid,
AED, CPR(C), 2017
- ♦ Marine Emergency
Duties – A1, 2014
- ♦ W.H.M.I.S – 2013
- ♦ PADI Open Water
Certified Suba Diver -
2013

Summary

Ms. Stoffer has worked in environmental consulting and research since 2014. She has worked on both project related and research related field assessments in Nova Scotia and Quebec.

Experience

McCallum Environmental Ltd. - Halifax, Nova Scotia

Junior Environmental Scientist:

July 2017-Present

Completing biophysical assessments, including flora and fauna surveys, with emphasis on species at risk. Completing wetland and watercourse delineations and assessments. Communicating field survey results and methodologies for environmental assessments and other provincial regulatory applications.

Tasks:

- Flora and fauna field surveys
- Species at risk assessments
- Watercourse and wetland identification and assessment
- Wetland delineation
- Reporting of methodology and results for environmental assessment
- Provincial regulatory applications
- Construction monitoring
- GIS

Clean Annapolis River Project – Annapolis Royal, Nova Scotia

Project Leader and Fisheries Technician:

July 2016 – July 2017

Led the planning, coordination, and implementation of fish passage and in-stream restoration work within the Annapolis River watershed. Conducted data collection through field surveys, ecological monitoring, and stakeholder consultation.

Tasks:

- In-stream and culvert restoration
- Fish habitat, water quality, and fish passage assessments
- Watershed management planning
- Staff and student training
- Community and stakeholder engagement

Stantec – Dartmouth, Nova Scotia

Environmental Scientist:

April – September 2014 (Student Contract)

Conducted and coordinated field studies as part of environmental impact assessments, including on-shore and vessel-based marine mammal surveys. Compiled, processed, and analyzed data for technical reports. Developed project work plans and training documents for field surveys.

Tasks:

- Marine mammal population and habitat utilization surveys
- Statistical analysis using R software
- Reporting of methodology and results for environmental assessment

Appendix C: ACCDC Report

DATA REPORT 6483: Mount Uniacke, NS

Prepared 14 August 2019
by J. Churchill, Data Manager

CONTENTS OF REPORT

1.0 Preface

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

2.0 Rare and Endangered Species

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

3.0 Special Areas

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

4.0 Rare Species Lists

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

5.0 Rare Species within 100 km

- 5.1 Source Bibliography



Map 1. A 100 km buffer around the study area

1.0 PREFACE

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

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

1.1 DATA LIST

Included datasets:

Filename	Contents
MtUniackeNS_6483ob.xls	All Rare and legally protected <i>Flora and Fauna</i> in your study area
MtUniackeNS_6483ob100km.xls	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area
MtUniackeNS_6483ma.xls	All <i>Managed Areas</i> in your study area
MtUniackeNS_6483ff.xls	Rare and common <i>Freshwater Fish</i> in your study area (DFO 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

Animals (Fauna)

John Klymko, Zoologist

Tel: (506) 364-2660

john.klymko@accdc.ca

Plant Communities

Sarah Robinson, Community Ecologist

Tel: (506) 364-2664

sarah.robinson@accdc.ca

Data Management, GIS

James Churchill, Data Manager

Tel: (902) 679-6146

james.churchill@accdc.ca

Billing

Jean Breau

Tel: (506) 364-2657

jean.breau@accdc.ca

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

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Hubert Askanas, Energy and Resource Development: (506) 453-5873.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Donna Hurlburt, NS DLF: (902) 679-6886. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NS DLF Regional Biologist:

Western: Duncan Bayne

(902) 648-3536

Duncan.Bayne@novascotia.ca

Western: Sarah Spencer

(902) 634-7555

Sarah.Spencer@novascotia.ca

Central: Shavonne Meyer

(902) 893-6350

Shavonne.Meyer@novascotia.ca

Central: Kimberly George

(902) 890-1046

Kimberly.George@novascotia.ca

Eastern: Lisa Doucette

(902) 863-4513

Lisa.Doucette@novascotia.ca

Eastern: Terry Power

(902) 563-3370

Terrance.Power@novascotia.ca

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

2.0 RARE AND ENDANGERED SPECIES

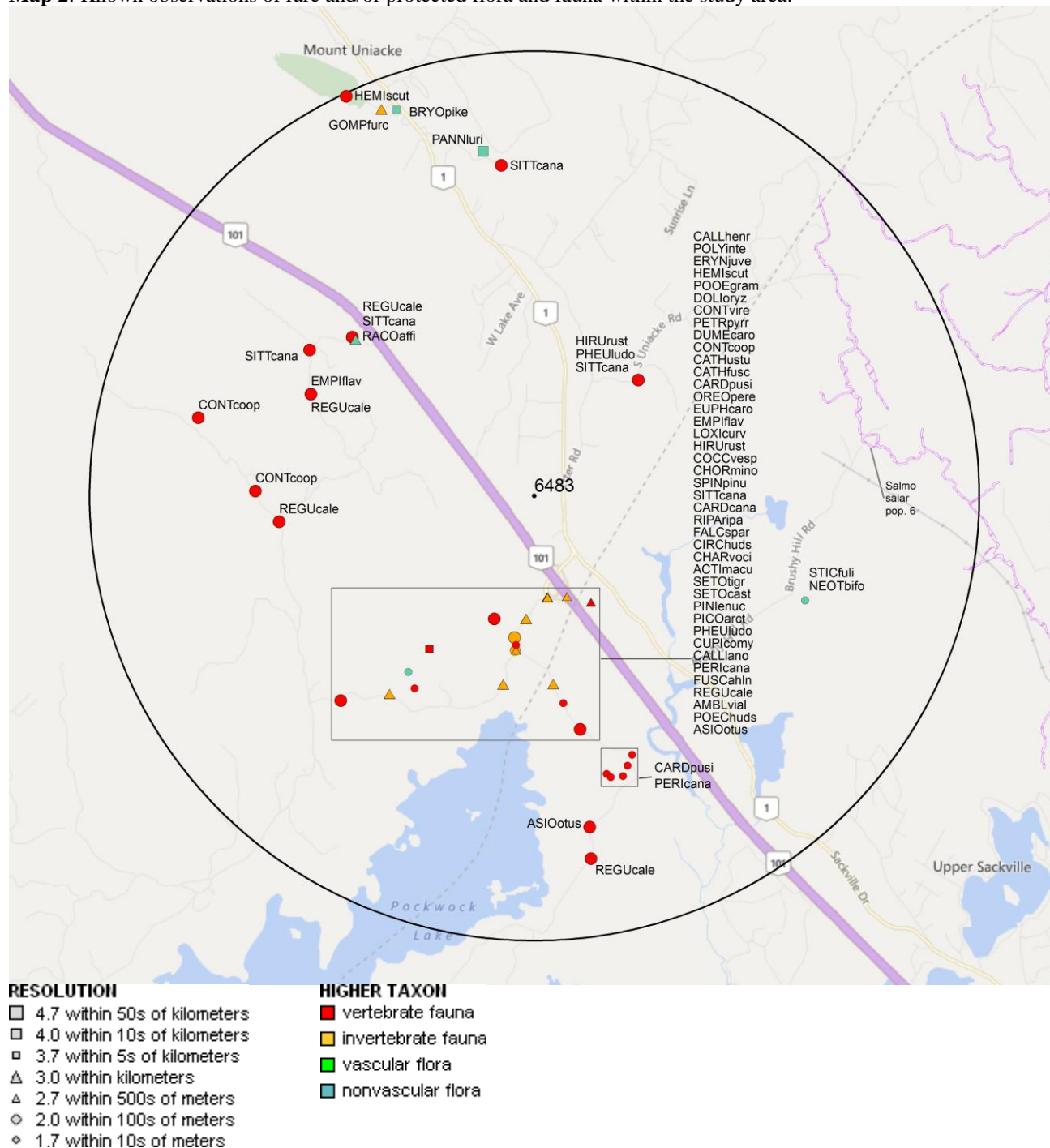
2.1 FLORA

The study area contains 1 record of 1 vascular, 5 records of 5 nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA

The study area contains 107 records of 34 vertebrate, 29 records of 7 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.



3.0 SPECIAL AREAS

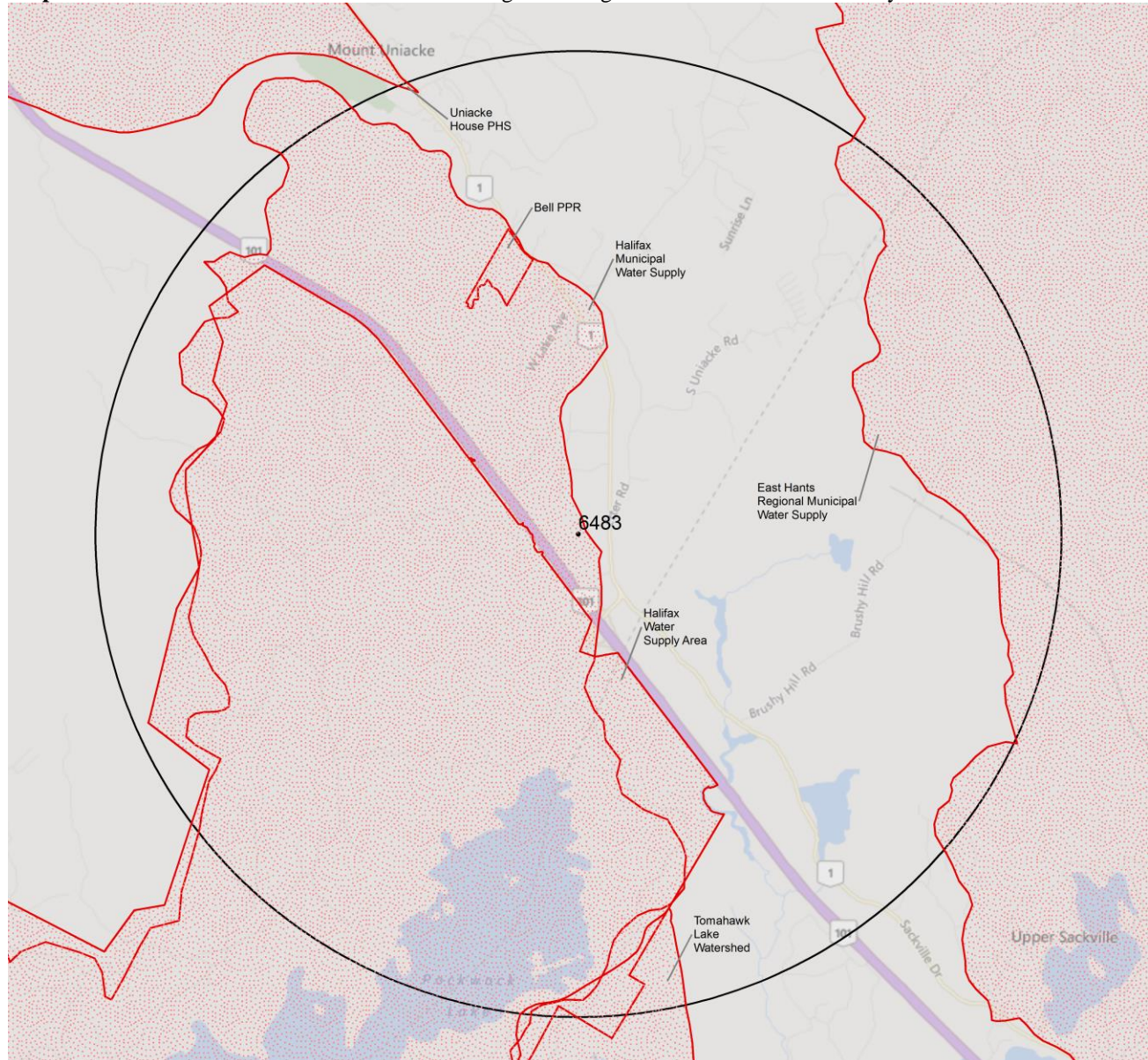
3.1 MANAGED AREAS

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

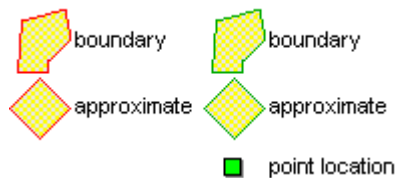
3.2 SIGNIFICANT AREAS

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

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



MANAGED AREAS SIGNIFICANT 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>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened		Threatened	S1S2	2 May Be At Risk	1	3.9 \pm 13.0
N	<i>Racomitrium affine</i>	a Moss				S2?	5 Undetermined	1	2.7 \pm 2.0
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3	3 Sensitive	1	3.3 \pm 0.0
N	<i>Fuscopannaria ahlneri</i>	Corrugated Shingles Lichen				S3	4 Secure	1	2.4 \pm 0.0
N	<i>Bryoria pikei</i>	Pike's Horsehair Lichen				S3S4	5 Undetermined	1	4.6 \pm 5.0
P	<i>Neottia bifolia</i>	Southern Twayblade				S3	4 Secure	1	3.3 \pm 0.0

4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2S3B	2 May Be At Risk	2	2.1 \pm 7.0
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened	Threatened	Endangered	S2S3B	1 At Risk	8	1.7 \pm 0.0
A	<i>Cardellina canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3B	1 At Risk	7	1.7 \pm 0.0
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Vulnerable	S3S4B	3 Sensitive	1	2.1 \pm 7.0
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	1	2.1 \pm 7.0
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S2B	1 At Risk	3	2.1 \pm 7.0
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S2B	1 At Risk	5	2.1 \pm 7.0
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	3 Sensitive	1	2.1 \pm 7.0
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern		Vulnerable	S3S4B,S3N	4 Secure	3	2.1 \pm 7.0
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	4 Secure	2	1.4 \pm 0.0
A	<i>Circus hudsonius</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	1	2.1 \pm 7.0
A	<i>Setophaga tigrina</i>	Cape May Warbler				S2B	3 Sensitive	1	2.1 \pm 7.0
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S2B	2 May Be At Risk	1	2.1 \pm 7.0
A	<i>Asio otus</i>	Long-eared Owl				S2S3	2 May Be At Risk	5	2.1 \pm 7.0
A	<i>Spinus pinus</i>	Pine Siskin				S2S3	3 Sensitive	6	2.1 \pm 7.0
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	2 May Be At Risk	1	2.1 \pm 7.0
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	2	1.7 \pm 0.0
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	1	2.1 \pm 7.0
A	<i>Perisoreus canadensis</i>	Canada Jay				S3	3 Sensitive	4	2.1 \pm 7.0
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	3 Sensitive	3	2.1 \pm 7.0
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	12	1.5 \pm 0.0
A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	1	2.1 \pm 7.0
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	2	2.1 \pm 7.0
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	1	2.1 \pm 7.0
A	<i>Cardellina pusilla</i>	Wilson's Warbler				S3B	3 Sensitive	2	2.1 \pm 7.0
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	2	2.1 \pm 7.0
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	4 Secure	2	2.1 \pm 7.0
A	<i>Actitis macularia</i>	Spotted Sandpiper				S3S4B	3 Sensitive	1	2.1 \pm 7.0
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	4	2.1 \pm 7.0
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	11	2.1 \pm 7.0
A	<i>Catharus fuscescens</i>	Veery				S3S4B	4 Secure	2	2.1 \pm 7.0
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	4	2.1 \pm 7.0
A	<i>Oreothlypis peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	1	2.1 \pm 7.0
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B	3 Sensitive	4	1.5 \pm 0.0
I	<i>Callophrys henrici</i>	Henry's Elfin				S3	4 Secure	4	1.4 \pm 1.0

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
I	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	2 May Be At Risk	4	1.2 ± 1.0
I	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	3 Sensitive	1	4.7 ± 1.0
I	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3?		2	1.4 ± 1.0
I	<i>Polygonia interrogatoris</i>	Question Mark				S3B	4 Secure	3	1.2 ± 0.0
I	<i>Erynnis juvenalis</i>	Juvenal's Duskywing				S3S4	4 Secure	1	1.4 ± 1.0
I	<i>Amblyscirtes vialis</i>	Common Roadside-Skipper				S3S4	4 Secure	14	1.2 ± 1.0

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</i> pop. 1	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
<i>Bat Hibernaculum</i>		[Endangered] ¹	[Endangered] ¹	No

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

4.4 SOURCE BIBLIOGRAPHY

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

# recs	CITATION
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5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 35692 records of 145 vertebrate and 1208 records of 65 invertebrate fauna; 9350 records of 311 vascular, 1545 records of 172 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
A	<i>Coregonus huntsmani</i>	Atlantic Whitefish	Endangered	Endangered	Endangered	S1	7 Exotic	9	77.6 \pm 1.0	NS
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	87	9.5 \pm 0.0	NS
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	5	21.1 \pm 0.0	NS
A	<i>Perimyotis subflavus</i>	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	7	21.1 \pm 0.0	NS
A	<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Endangered	Endangered	S1	1 At Risk	1901	84.0 \pm 0.0	NS
A	<i>Salmo salar</i> pop. 1	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered		S1	2 May Be At Risk	33	13.1 \pm 0.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	927	35.3 \pm 0.0	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	1 At Risk	62	27.9 \pm 0.0	NS
A	<i>Morone saxatilis</i> pop. 2	Striped Bass- Bay of Fundy pop.	Endangered			S1B	2 May Be At Risk	4	20.7 \pm 0.0	NS
A	<i>Dermochelys coriacea</i> (Atlantic pop.)	Leatherback Sea Turtle - Atlantic pop.	Endangered	Endangered		S1S2N		3	29.7 \pm 5.0	NS
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered	Endangered	Endangered	S2M	1 At Risk	583	29.7 \pm 0.0	NS
A	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Endangered	Threatened		SNA	8 Accidental	2	93.0 \pm 7.0	NS
A	<i>Colinus virginianus</i>	Northern Bobwhite	Endangered	Endangered				6	36.1 \pm 7.0	NS
A	<i>Antrostomus vociferus</i>	Eastern Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	1 At Risk	14	9.0 \pm 7.0	NS
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Special Concern	Endangered	S1S2B	1 At Risk	1	99.9 \pm 7.0	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit	Threatened			S1S2M	3 Sensitive	86	29.7 \pm 0.0	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	3 Sensitive	1209	12.7 \pm 0.0	NS
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened			S2	2 May Be At Risk	5	27.3 \pm 0.0	NS
A	<i>Anguilla rostrata</i>	American Eel	Threatened			S2	4 Secure	10	27.8 \pm 0.0	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2B,S1M	1 At Risk	254	11.3 \pm 7.0	NS
A	<i>Thamnophis sauritus</i> pop. 3	Eastern Ribbonsnake - Atlantic pop.	Threatened	Threatened	Threatened	S2S3	1 At Risk	381	87.3 \pm 0.0	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2S3B	2 May Be At Risk	331	2.1 \pm 7.0	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened	Threatened	Endangered	S2S3B	1 At Risk	809	1.7 \pm 0.0	NS
A	<i>Cardellina canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3B	1 At Risk	743	1.7 \pm 0.0	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Vulnerable	S3S4B	3 Sensitive	424	2.1 \pm 7.0	NS
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened	Threatened		SHB	3 Sensitive	2	42.1 \pm 7.0	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened	Threatened		SUB	5 Undetermined	35	29.6 \pm 7.0	NS
A	<i>Passerculus sandwichensis princeps</i>	Savannah Sparrow princeps ssp	Special Concern	Special Concern		S1B	3 Sensitive	2	41.0 \pm 0.0	NS
A	<i>Falco peregrinus</i> pop. 1	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Vulnerable	S1B,SNAM	3 Sensitive	95	34.9 \pm 0.0	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern		S1S2B	2 May Be At Risk	11	28.7 \pm 7.0	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	214	2.1 \pm 7.0	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S2B	1 At Risk	386	2.1 \pm 7.0	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S2B	1 At Risk	637	2.1 \pm 7.0	NS
A	<i>Histrionicus histrionicus</i> pop. 1	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	19	38.9 \pm 2.0	NS
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S2S3M	3 Sensitive	6	37.6 \pm 0.0	NS
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	127	8.4 \pm 10.0	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	3 Sensitive	654	2.1 \pm 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>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern		Vulnerable	S3S4B,S3N	4 Secure	371	2.1 ± 7.0	NS
A	<i>Phocoena phocoena</i> (NW Atlantic pop.)	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		4	41.8 ± 1.0	NS
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern			S4N	4 Secure	2	85.5 ± 10.0	NS
A	<i>Chrysemys picta picta</i>	Eastern Painted Turtle	Special Concern			S4S5	4 Secure	201	8.4 ± 10.0	NS
A	<i>Calidris subruficollis</i>	Buff-breasted Sandpiper	Special Concern			SNA	8 Accidental	40	40.6 ± 0.0	NS
A	<i>Lynx canadensis</i>	Canadian Lynx	Not At Risk		Endangered	S1	1 At Risk	2	78.6 ± 1.0	NS
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B	5 Undetermined	2	11.9 ± 0.0	NS
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1B	5 Undetermined	5	42.7 ± 7.0	NS
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	3	62.1 ± 0.0	NS
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S2?B	5 Undetermined	4	42.7 ± 7.0	NS
A	<i>Glaucomys volans</i>	Southern Flying Squirrel	Not At Risk	Special Concern		S2S3	3 Sensitive	6	47.5 ± 0.0	NS
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3		1	65.9 ± 100.0	NS
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	4 Secure	28	1.4 ± 0.0	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	186	9.0 ± 7.0	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	79	20.6 ± 7.0	NS
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	4 Secure	125	6.8 ± 0.0	NS
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4		1	41.8 ± 1.0	NS
A	<i>Circus hudsonius</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	258	2.1 ± 7.0	NS
A	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	94	20.6 ± 7.0	NS
A	<i>Alces americanus</i>	Moose			Endangered	S1	1 At Risk	31	30.1 ± 0.0	NS
A	<i>Salmo salar</i>	Atlantic Salmon				S1	2 May Be At Risk	34	17.0 ± 0.0	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B	5 Undetermined	21	40.4 ± 7.0	NS
A	<i>Anas acuta</i>	Northern Pintail				S1B	2 May Be At Risk	18	22.4 ± 7.0	NS
A	<i>Gallinula galeata</i>	Common Gallinule				S1B	5 Undetermined	2	28.0 ± 7.0	NS
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S1B	2 May Be At Risk	29	22.2 ± 7.0	NS
A	<i>Cistothorus palustris</i>	Marsh Wren				S1B	5 Undetermined	2	73.6 ± 0.0	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	4 Secure	42	14.7 ± 7.0	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	5 Undetermined	11	28.7 ± 7.0	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1B	5 Undetermined	20	22.2 ± 7.0	NS
A	<i>Setophaga pinus</i>	Pine Warbler				S1B	5 Undetermined	17	18.3 ± 7.0	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S3M	4 Secure	1012	16.3 ± 0.0	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	4 Secure	1387	29.7 ± 0.0	NS
A	<i>Vespertilionidae</i> sp.	bat species				S1S2		166	11.6 ± 0.0	NS
A	<i>Lasiurus cinereus</i>	Hoary Bat				S1S2B, S1M	2 May Be At Risk	3	34.6 ± 0.0	NS
A	<i>Pluvialis dominica</i>	American Golden-Plover				S1S2M	3 Sensitive	218	29.7 ± 0.0	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B	5 Undetermined	32	28.9 ± 7.0	NS
A	<i>Spatula clypeata</i>	Northern Shoveler				S2B	2 May Be At Risk	7	39.7 ± 7.0	NS
A	<i>Mareca strepera</i>	Gadwall				S2B	2 May Be At Risk	19	28.7 ± 7.0	NS
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	3 Sensitive	33	24.5 ± 0.0	NS
A	<i>Setophaga tigrina</i>	Cape May Warbler				S2B	3 Sensitive	118	2.1 ± 7.0	NS
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B	5 Undetermined	39	14.7 ± 7.0	NS
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S2B	2 May Be At Risk	52	2.1 ± 7.0	NS
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	4 Secure	144	13.9 ± 7.0	NS
A	<i>Alca torda</i>	Razorbill				S2B,S4N	3 Sensitive	17	55.3 ± 0.0	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S2B,S5N	4 Secure	92	18.1 ± 0.0	NS
A	<i>Branta bernicla</i>	Brant				S2M	3 Sensitive	1	48.6 ± 0.0	NS
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3	3 Sensitive	28	25.6 ± 8.0	NS
A	<i>Asio otus</i>	Long-eared Owl				S2S3	2 May Be At Risk	25	2.1 ± 7.0	NS
A	<i>Spinus pinus</i>	Pine Siskin				S2S3	3 Sensitive	380	2.1 ± 7.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B	3 Sensitive	21	18.3 ± 0.0	NS
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	5 Undetermined	21	25.7 ± 0.0	NS
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	1220	24.4 ± 7.0	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	2 May Be At Risk	235	2.1 ± 7.0	NS
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	313	1.7 ± 0.0	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B	2 May Be At Risk	64	20.6 ± 7.0	NS
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	122	2.1 ± 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>Numerius phaeopus hudsonicus</i>	Hudsonian Whimbrel				S2S3M	3 Sensitive	212	37.6 ± 0.0	NS
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S2S3M	4 Secure	276	29.7 ± 0.0	NS
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S2S3M	3 Sensitive	2	40.6 ± 0.0	NS
A	<i>Perisoreus canadensis</i>	Canada Jay				S3	3 Sensitive	474	2.1 ± 7.0	NS
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	3 Sensitive	517	2.1 ± 7.0	NS
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	904	1.5 ± 0.0	NS
A	<i>Alosa pseudoharengus</i>	Alewife				S3	3 Sensitive	17	18.0 ± 1.0	NS
A	<i>Salvelinus fontinalis</i>	Brook Trout				S3	3 Sensitive	19	26.0 ± 0.0	NS
A	<i>Salvelinus namaycush</i>	Lake Trout				S3	3 Sensitive	2	39.0 ± 0.0	NS
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3	4 Secure	1	62.1 ± 0.0	NS
A	<i>Pekania pennanti</i>	Fisher				S3	3 Sensitive	5	56.2 ± 5.0	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3?N	3 Sensitive	163	31.5 ± 8.0	NS
A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	282	2.1 ± 7.0	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	488	2.1 ± 7.0	NS
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B	3 Sensitive	353	11.8 ± 7.0	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	2 May Be At Risk	54	20.4 ± 7.0	NS
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	2 May Be At Risk	48	18.9 ± 7.0	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	3 Sensitive	206	13.9 ± 7.0	NS
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	397	2.1 ± 7.0	NS
A	<i>Cardellina pusilla</i>	Wilson's Warbler				S3B	3 Sensitive	82	2.1 ± 7.0	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	1378	11.8 ± 7.0	NS
A	<i>Oceanodroma leucorhoa</i>	Leach's Storm-Petrel				S3B,S5M	4 Secure	28	30.2 ± 0.0	NS
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S3B,S5N	3 Sensitive	8	55.3 ± 0.0	NS
A	<i>Fratercula arctica</i>	Atlantic Puffin				S3B,S5N	3 Sensitive	18	52.3 ± 0.0	NS
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	4 Secure	1597	29.7 ± 0.0	NS
A	<i>Tringa flavipes</i>	Lesser Yellowlegs				S3M	4 Secure	583	29.7 ± 0.0	NS
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	658	29.7 ± 0.0	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	1255	29.7 ± 0.0	NS
A	<i>Calidris fuscicollis</i>	White-rumped Sandpiper				S3M	4 Secure	724	29.7 ± 0.0	NS
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	4 Secure	943	29.7 ± 0.0	NS
A	<i>Calidris alba</i>	Sanderling				S3M,S2N	4 Secure	1175	29.7 ± 0.0	NS
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	4 Secure	1	50.2 ± 7.0	NS
A	<i>Somateria mollissima</i>	Common Eider				S3S4	4 Secure	356	24.4 ± 7.0	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	149	2.1 ± 7.0	NS
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	4 Secure	186	2.1 ± 7.0	NS
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B	3 Sensitive	140	9.0 ± 7.0	NS
A	<i>Spatula discors</i>	Blue-winged Teal				S3S4B	2 May Be At Risk	61	22.2 ± 7.0	NS
A	<i>Actitis macularia</i>	Spotted Sandpiper				S3S4B	3 Sensitive	657	2.1 ± 7.0	NS
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	461	2.1 ± 7.0	NS
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	1056	2.1 ± 7.0	NS
A	<i>Catharus fuscescens</i>	Veery				S3S4B	4 Secure	399	2.1 ± 7.0	NS
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	970	2.1 ± 7.0	NS
A	<i>Oreothlypis peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	283	2.1 ± 7.0	NS
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B	3 Sensitive	356	1.5 ± 0.0	NS
A	<i>Setophaga striata</i>	Blackpoll Warbler				S3S4B	3 Sensitive	93	13.9 ± 7.0	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B	4 Secure	60	21.8 ± 7.0	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5N	4 Secure	62	24.4 ± 7.0	NS
A	<i>Bucephala albeola</i>	Bufflehead				S3S4N	4 Secure	23	31.5 ± 8.0	NS
A	<i>Leucophaeus atricilla</i>	Laughing Gull				SHB	4 Secure	2	74.4 ± 0.0	NS
A	<i>Progne subis</i>	Purple Martin				SHB	2 May Be At Risk	5	77.6 ± 7.0	NS
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N	4 Secure	9	18.9 ± 7.0	NS
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M	4 Secure	2	50.0 ± 12.0	NS
I	<i>Gomphus ventricosus</i>	Skillet Clubtail	Endangered			S1	2 May Be At Risk	2	7.2 ± 1.0	NS
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Endangered	S2B	3 Sensitive	133	6.4 ± 0.0	NS
I	<i>Danaus plexippus plexippus</i>	Monarch	Endangered			S2B	3 Sensitive	1	21.2 ± 0.0	NS
I	<i>Barnea truncata</i>	Atlantic Mud-piddock	Threatened			S1	1 At Risk	1	61.0 ± 1.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Threatened	S1S2	3 Sensitive	11	38.6 ± 0.0	NS
	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern		Vulnerable	S3	3 Sensitive	8	29.5 ± 0.0	NS
	<i>Cicindela formosa</i>	Big Sand Tiger Beetle				S1	2 May Be At Risk	1	57.9 ± 1.0	NS
	<i>Satyrus acadica</i>	Acadian Hairstreak				S1	5 Undetermined	5	70.0 ± 2.0	NS
	<i>Erora laeta</i>	Early Hairstreak				S1	2 May Be At Risk	1	26.8 ± 1.0	NS
	<i>Somatochlora brevicincta</i>	Quebec Emerald				S1	2 May Be At Risk	2	41.4 ± 0.0	NS
	<i>Leptodea ochracea</i>	Tidewater Mucket				S1	3 Sensitive	10	84.8 ± 1.0	NS
	<i>Strophitus undulatus</i>	Creeper				S1	2 May Be At Risk	6	96.4 ± 0.0	NS
	<i>Polygonia comma</i>	Eastern Comma				S1?	1 At Risk	9	27.8 ± 2.0	NS
	<i>Polygonia satyrus</i>	Satyr Comma				S1?	3 Sensitive	7	27.3 ± 2.0	NS
	<i>Strymon melinus</i>	Grey Hairstreak				S1S2	4 Secure	9	27.8 ± 1.0	NS
	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S1S2	4 Secure	16	16.9 ± 2.0	NS
	<i>Somatochlora kennedyi</i>	Kennedy's Emerald				S1S2	2 May Be At Risk	4	7.2 ± 1.0	NS
	<i>Coenagrion resolutum</i>	Taiga Bluet				S1S2	2 May Be At Risk	2	17.3 ± 1.0	NS
	<i>Stylurus scudderi</i>	Zebra Clubtail				S1S2	2 May Be At Risk	7	23.4 ± 0.0	NS
	<i>Lycaena hyllus</i>	Bronze Copper				S2	4 Secure	8	19.0 ± 1.0	NS
	<i>Satyrus calanus</i>	Banded Hairstreak				S2	5 Undetermined	55	17.2 ± 2.0	NS
	<i>Boloria chariclea</i>	Arctic Fritillary				S2	3 Sensitive	3	73.4 ± 2.0	NS
	<i>Aglaia milberti</i>	Milbert's Tortoiseshell				S2	4 Secure	20	26.4 ± 2.0	NS
	<i>Epithia princeps</i>	Prince Baskettail				S2	3 Sensitive	20	15.6 ± 0.0	NS
	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S2	2 May Be At Risk	1	97.1 ± 0.0	NS
	<i>Enallagma signatum</i>	Orange Bluet				S2	2 May Be At Risk	6	15.2 ± 0.0	NS
	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	3 Sensitive	108	26.0 ± 0.0	NS
	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	3 Sensitive	7	30.8 ± 1.0	NS
	<i>Thorybes pylades</i>	Northern Cloudywing				S2S3	3 Sensitive	5	64.9 ± 2.0	NS
	<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper				S2S3	4 Secure	27	16.0 ± 0.0	NS
	<i>Satyrus liparops</i>	Striped Hairstreak				S2S3	5 Undetermined	28	10.4 ± 0.0	NS
	<i>Euphydryas phaeton</i>	Baltimore Checkerspot				S2S3	4 Secure	24	16.9 ± 2.0	NS
	<i>Gomphus desertus</i>	Harpoon Clubtail				S2S3	3 Sensitive	4	90.1 ± 0.0	NS
	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S2S3	2 May Be At Risk	6	21.9 ± 0.0	NS
	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S2S3	2 May Be At Risk	8	78.9 ± 0.0	NS
	<i>Ophiogomphus rupinulensis</i>	Rusty Snaketail				S2S3	2 May Be At Risk	21	23.1 ± 0.0	NS
	<i>Somatochlora forcipata</i>	Forcipate Emerald				S2S3	2 May Be At Risk	4	27.7 ± 1.0	NS
	<i>Somatochlora franklini</i>	Delicate Emerald				S2S3	3 Sensitive	4	7.2 ± 1.0	NS
	<i>Erythrodiplex berenice</i>	Seaside Dragonlet				S2S3	3 Sensitive	3	59.7 ± 0.0	NS
	<i>Enallagma vesperum</i>	Vesper Bluet				S2S3	3 Sensitive	3	67.6 ± 1.0	NS
	<i>Alasmidonta undulata</i>	Triangle Floater				S2S3	4 Secure	33	14.4 ± 0.0	NS
	<i>Hippodamia parenthesis</i>	Parenthesis Lady Beetle				S3	5 Undetermined	1	75.5 ± 0.0	NS
	<i>Naemia seriata</i>	a Ladybird beetle				S3	3 Sensitive	1	45.2 ± 1.0	NS
	<i>Chilocorus stigma</i>	Twice-stabbed Lady Beetle				S3	4 Secure	1	52.8 ± 0.0	NS
	<i>Callophrys henrici</i>	Henry's Elfin				S3	4 Secure	34	1.4 ± 2.0	NS
	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	2 May Be At Risk	20	1.2 ± 1.0	NS
	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	42	7.1 ± 2.0	NS
	<i>Polygonia faunus</i>	Green Comma				S3	4 Secure	15	7.0 ± 2.0	NS
	<i>Megisto cymela</i>	Little Wood-satyr				S3	4 Secure	9	28.0 ± 2.0	NS
	<i>Oeneis jutta</i>	Jutta Arctic				S3	2 May Be At Risk	10	7.1 ± 2.0	NS
	<i>Aeshna clepsydra</i>	Mottled Darner				S3	4 Secure	12	17.4 ± 1.0	NS
	<i>Aeshna constricta</i>	Lance-Tipped Darner				S3	4 Secure	18	7.2 ± 1.0	NS
	<i>Boyeria grafiana</i>	Ocellated Darner				S3	3 Sensitive	6	20.8 ± 1.0	NS
	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	3 Sensitive	7	4.7 ± 1.0	NS
	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S3	4 Secure	15	7.2 ± 1.0	NS
	<i>Nannothemis bella</i>	Elfin Skimmer				S3	4 Secure	18	7.2 ± 1.0	NS
	<i>Enallagma vernale</i>	Vernal Bluet				S3	5 Undetermined	6	7.2 ± 1.0	NS
	<i>Amphiagrion saucium</i>	Eastern Red Damsel				S3	4 Secure	2	70.1 ± 1.0	NS
	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3?		21	1.4 ± 1.0	NS
	<i>Polygonia interrogationis</i>	Question Mark				S3B	4 Secure	146	1.2 ± 0.0	NS
	<i>Erynnis juvenalis</i>	Juvenal's Duskywing				S3S4	4 Secure	74	1.4 ± 1.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
I	<i>Amblyscirtes vialis</i>	Common Roadside-Skipper				S3S4	4 Secure	35	1.2 ± 1.0	NS
I	<i>Polygonia progne</i>	Grey Comma				S3S4	4 Secure	37	10.3 ± 0.0	NS
I	<i>Lanthus parvulus</i>	Northern Pygmy Clubtail				S3S4	4 Secure	4	72.4 ± 5.0	NS
I	<i>Lampsilis radiata</i>	Eastern Lampmussel				S3S4	3 Sensitive	41	38.6 ± 0.0	NS
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	1 At Risk	222	26.2 ± 0.0	NS
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered		Endangered	S1S2	2 May Be At Risk	10	41.6 ± 0.0	NS
N	<i>Peltigera hydrothyria</i>	Eastern Waterfan	Threatened		Threatened	S1	2 May Be At Risk	5	58.8 ± 0.0	NS
N	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened		Threatened	S1S2	2 May Be At Risk	106	3.9 ± 13.0	NS
N	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen	Threatened			S2S3	2 May Be At Risk	16	37.1 ± 6.0	NS
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened		Threatened	S3	3 Sensitive	4	37.3 ± 0.0	NS
N	<i>Sclerophora peronella</i> (Nova Scotia pop.)	Frosted Glass-whiskers Lichen - Nova Scotia pop.	Special Concern	Special Concern		S1?		16	22.3 ± 0.0	NS
N	<i>Pectenaria plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	4 Secure	91	9.8 ± 0.0	NS
N	<i>Fissidens exilis</i>	Pygmy Pocket Moss	Not At Risk			S1S2	1 At Risk	3	23.2 ± 1.0	NS
N	<i>Fissidens exilis</i>	Pygmy Pocket Moss	Not At Risk			S1S2	1 At Risk	8	23.5 ± 0.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	3 Sensitive	15	31.4 ± 0.0	NS
N	<i>Aloina brevirostris</i>	Short-Beaked Rigid Screw Moss				S1		1	21.8 ± 2.0	NS
N	<i>Umbilicaria vellea</i>	Grizzled Rocktripe Lichen				S1	5 Undetermined	1	17.3 ± 5.0	NS
N	<i>Leptogium azureum</i>	Blue Jellyskin Lichen				S1		1	92.6 ± 1.0	NS
N	<i>Leptogium dactylinum</i>	Brown-buttoned Jellyskin Lichen				S1	2 May Be At Risk	1	99.8 ± 0.0	NS
N	<i>Collema cristatum</i>	Fingered Tarpaper Lichen				S1	5 Undetermined	3	29.0 ± 0.0	NS
N	<i>Fuscopannaria praetermissa</i>	Moss Shingles Lichen				S1	2 May Be At Risk	1	27.1 ± 0.0	NS
N	<i>Leptogium schraderi</i>	Schrader's Jellyskin Lichen				S1		1	48.9 ± 0.0	NS
N	<i>Pseudevernia consocians</i>	Common Antler Lichen				S1	2 May Be At Risk	1	75.2 ± 0.0	NS
N	<i>Usnea substerilis</i>	Embossed Beard Lichen				S1	2 May Be At Risk	1	44.1 ± 0.0	NS
N	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen				S1	2 May Be At Risk	2	25.6 ± 0.0	NS
N	<i>Bryoria nitidula</i>	Tundra Horsehair Lichen				S1	5 Undetermined	1	44.8 ± 2.0	NS
N	<i>Calypogeia fissa</i>	Common Pouchwort				S1?		1	43.1 ± 0.0	NS
N	<i>Moerckia hibernica</i>	Irish Ruffwort				S1?		1	43.8 ± 0.0	NS
N	<i>Aloina rigida</i>	Aloe-Like Rigid Screw Moss				S1?	2 May Be At Risk	4	21.8 ± 2.0	NS
N	<i>Bryum muehlenbeckii</i>	Muehlenbeck's Bryum Moss				S1?	5 Undetermined	2	41.1 ± 0.0	NS
N	<i>Conardia compacta</i>	Coast Creeping Moss				S1?	3 Sensitive	1	40.2 ± 2.0	NS
N	<i>Tortula obtusifolia</i>	a Moss				S1?	5 Undetermined	3	70.9 ± 1.0	NS
N	<i>Didymodon tophaceus</i>	Olive Beard Moss				S1?		1	43.3 ± 0.0	NS
N	<i>Paludella squarrosa</i>	Tufted Fen Moss				S1?	3 Sensitive	2	22.0 ± 0.0	NS
N	<i>Schistostega pennata</i>	Luminous Moss				S1?	3 Sensitive	1	19.7 ± 0.0	NS
N	<i>Trichodon cylindricus</i>	Cylindric Hairy-teeth Moss				S1?		1	83.1 ± 3.0	NS
N	<i>Collema crispum</i>	Crinkled Pulp Lichen				S1?		1	43.4 ± 0.0	NS
N	<i>Lichina confinis</i>	Marine Seaweed Lichen				S1?	6 Not Assessed	4	46.7 ± 0.0	NS
N	<i>Polychidium muscicola</i>	Eyed Mossthorns Woollybear Lichen				S1?	2 May Be At Risk	1	93.5 ± 0.0	NS
N	<i>Parmeliella parvula</i>	Poor-man's Shingles Lichen				S1?	2 May Be At Risk	1	47.3 ± 0.0	NS
N	<i>Aulacomnium heterostichum</i>	One-sided Groove Moss				S1S2	3 Sensitive	3	21.8 ± 2.0	NS
N	<i>Brachythecium turgidum</i>	Thick Ragged Moss				S1S2	3 Sensitive	3	83.1 ± 3.0	NS
N	<i>Hypnum pratense</i>	Meadow Plait Moss				S1S2	3 Sensitive	1	69.3 ± 3.0	NS
N	<i>Mnium thomsonii</i>	Thomson's Leafy Moss				S1S2	3 Sensitive	1	27.5 ± 2.0	NS
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1S2	3 Sensitive	2	45.7 ± 5.0	NS
N	<i>Platydictya confervoides</i>	a Moss				S1S2	3 Sensitive	1	25.7 ± 0.0	NS
N	<i>Sematophyllum demissum</i>	a Moss				S1S2	3 Sensitive	2	16.0 ± 2.0	NS
N	<i>Sphagnum platyphyllum</i>	Flat-leaved Peat Moss				S1S2		2	18.8 ± 3.0	NS
N	<i>Timmia megapolitana</i>	Metropolitan Timmia Moss				S1S2	3 Sensitive	3	62.1 ± 1.0	NS
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S1S2	3 Sensitive	1	62.7 ± 3.0	NS
N	<i>Bryohaplcladium microphyllum</i>	Tiny-leaved Haplcladium Moss				S1S2		1	57.3 ± 5.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
N	<i>Collema bachmanianum</i>	Bachman's Tarpaper Lichen				S1S2	6 Not Assessed	1	29.2 ± 0.0	NS
N	<i>Catapyrenium squamulosum</i>	Limy Soil Stipplescale Lichen				S1S2		1	74.0 ± 6.0	NS
N	<i>Rhizoplaca subdiscrepans</i>	Scattered Rock-posy Lichen				S1S2		1	41.9 ± 1.0	NS
N	<i>Sticta limbata</i>	Powdered Moon Lichen				S1S2	2 May Be At Risk	4	35.8 ± 3.0	NS
N	<i>Heterodermia galactophylla</i>	Branching Fringe Lichen				S1S3	5 Undetermined	1	42.2 ± 0.0	NS
N	<i>Melanelia culbersonii</i>	Appalachian Camouflage Lichen				S1S3	5 Undetermined	1	40.2 ± 0.0	NS
N	<i>Stereocaulon grande</i>	Grand Foam Lichen				S1S3	5 Undetermined	1	76.4 ± 0.0	NS
N	<i>Stereocaulon intermedium</i>	Pacific Brain Foam Lichen				S1S3		2	20.9 ± 0.0	NS
N	<i>Nephroma resupinatum</i>	a lichen				S2	2 May Be At Risk	2	35.6 ± 0.0	NS
N	<i>Parmotrema reticulatum</i>	Netted Ruffle Lichen				S2	3 Sensitive	3	71.9 ± 0.0	NS
N	<i>Riccardia multifida</i>	Delicate Germanderwort				S2?	5 Undetermined	1	63.4 ± 0.0	NS
N	<i>Anacamptodon splachnoides</i>	a Moss				S2?	3 Sensitive	2	26.9 ± 30.0	NS
N	<i>Anomodon viticulosus</i>	a Moss				S2?	3 Sensitive	1	93.0 ± 5.0	NS
N	<i>Weissia muhlenbergiana</i>	a Moss				S2?	3 Sensitive	5	27.5 ± 1.0	NS
N	<i>Atrichum angustatum</i>	Lesser Smoothcap Moss				S2?	3 Sensitive	2	66.8 ± 5.0	NS
N	<i>Bryum algovicum</i>	a Moss				S2?	3 Sensitive	1	21.8 ± 2.0	NS
N	<i>Campyllum polygamum</i>	a Moss				S2?	5 Undetermined	3	16.0 ± 2.0	NS
N	<i>Campyllum radicale</i>	Long-stalked Fine Wet Moss				S2?	5 Undetermined	1	69.3 ± 3.0	NS
N	<i>Dicranum condensatum</i>	Condensed Broom Moss				S2?	5 Undetermined	2	63.9 ± 0.0	NS
N	<i>Ditrichum rhynchostegium</i>	a Moss				S2?	3 Sensitive	1	19.5 ± 1.0	NS
N	<i>Fissidens taxifolius</i>	Yew-leaved Pocket Moss				S2?	3 Sensitive	6	21.8 ± 2.0	NS
N	<i>Grimmia anomala</i>	Mountain Forest Grimmia				S2?	3 Sensitive	1	53.6 ± 1.0	NS
N	<i>Kiaeria starkei</i>	Starke's Fork Moss				S2?	3 Sensitive	1	58.8 ± 10.0	NS
N	<i>Orthotrichum anomalum</i>	Anomalous Bristle Moss				S2?	3 Sensitive	1	29.9 ± 2.0	NS
N	<i>Philonotis marchica</i>	a Moss				S2?	5 Undetermined	2	79.1 ± 0.0	NS
N	<i>Physcomitrium collenchymatum</i>	a Moss				S2?	3 Sensitive	1	83.2 ± 0.0	NS
N	<i>Platydictya jungermannioides</i>	False Willow Moss				S2?	3 Sensitive	1	40.7 ± 0.0	NS
N	<i>Racomitrium affine</i>	a Moss				S2?	5 Undetermined	3	2.7 ± 2.0	NS
N	<i>Saellania glaucescens</i>	Blue Dew Moss				S2?	3 Sensitive	1	97.6 ± 0.0	NS
N	<i>Sematophyllum marylandicum</i>	a Moss				S2?	3 Sensitive	2	15.8 ± 3.0	NS
N	<i>Sphagnum subnitens</i>	Lustrous Peat Moss				S2?	3 Sensitive	1	72.7 ± 2.0	NS
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S2?	3 Sensitive	2	72.7 ± 2.0	NS
N	<i>Plagiomnium rostratum</i>	Long-beaked Leafy Moss				S2?	5 Undetermined	1	82.1 ± 2.0	NS
N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S2?	3 Sensitive	2	81.1 ± 0.0	NS
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2?	3 Sensitive	2	27.0 ± 5.0	NS
N	<i>Platylomella lescurii</i>	a Moss				S2?	3 Sensitive	5	18.8 ± 0.0	NS
N	<i>Phylliscum demangeonii</i>	Black Rock-wafer Lichen				S2?	5 Undetermined	4	32.1 ± 0.0	NS
N	<i>Usnea flavocardia</i>	Blood-splattered Beard Lichen				S2?	3 Sensitive	1	23.7 ± 4.0	NS
N	<i>Leptogium teretiusculum</i>	Beaded Jellyskin Lichen				S2?	3 Sensitive	6	24.2 ± 0.0	NS
N	<i>Leptogium imbricatum</i>	Scaly Jellyskin Lichen				S2?	5 Undetermined	1	78.0 ± 0.0	NS
N	<i>Placynthium flabelliforme</i>	Scaly Ink Lichen				S2?	5 Undetermined	2	46.1 ± 17.0	NS
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S2?	3 Sensitive	3	22.9 ± 2.0	NS
N	<i>Ephemerum serratum</i>	a Moss				S2S3	3 Sensitive	4	29.6 ± 5.0	NS
N	<i>Eurhynchium hians</i>	Light Beaked Moss				S2S3	3 Sensitive	4	18.0 ± 5.0	NS
N	<i>Platydictya subtilis</i>	Bark Willow Moss				S2S3	3 Sensitive	3	71.4 ± 3.0	NS
N	<i>Tortula truncata</i>	a Moss				S2S3	3 Sensitive	3	49.9 ± 0.0	NS
N	<i>Limprichtia revolvens</i>	a Moss				S2S3	3 Sensitive	2	22.0 ± 0.0	NS
N	<i>Collema leptaleum</i>	Crumpled Bat's Wing Lichen				S2S3	3 Sensitive	37	22.4 ± 1.0	NS
N	<i>Solorina saccata</i>	Woodland Owl Lichen				S2S3	2 May Be At Risk	7	29.0 ± 0.0	NS
N	<i>Ahtiana aurescens</i>	Eastern Candlewax Lichen				S2S3	5 Undetermined	7	25.8 ± 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>Usnocetraria oakesiana</i>	Yellow Band Lichen				S2S3	2 May Be At Risk	4	35.0 ± 0.0	NS
N	<i>Cladonia mateocyatha</i>	Mixed-up Pixie-cup				S2S3		3	22.1 ± 5.0	NS
N	<i>Cladonia parasitica</i>	Fence-rail Lichen				S2S3	5 Undetermined	2	67.2 ± 1.0	NS
N	<i>Hypotrachyna catawbiensis</i>	Powder-tipped Antler Lichen				S2S3	2 May Be At Risk	3	41.2 ± 0.0	NS
N	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen				S2S3	3 Sensitive	6	55.1 ± 0.0	NS
N	<i>Leptogium tenuissimum</i>	Birdnest Jellyskin Lichen				S2S3	6 Not Assessed	4	25.6 ± 0.0	NS
N	<i>Melanchalea septentrionalis</i>	Northern Camouflage Lichen				S2S3		1	44.1 ± 0.0	NS
N	<i>Myelochroa aurulenta</i>	Powdery Axil-bristle Lichen				S2S3	5 Undetermined	2	51.9 ± 2.0	NS
N	<i>Hypotrachyna minarum</i>	Hairless-spined Shield Lichen				S2S3	3 Sensitive	2	61.1 ± 0.0	NS
N	<i>Parmeliopsis ambigua</i>	Green Starburst Lichen				S2S3	3 Sensitive	1	52.7 ± 2.0	NS
N	<i>Racodium rupestre</i>	Rockhair Lichen				S2S3	5 Undetermined	3	10.6 ± 1.0	NS
N	<i>Umbilicaria polyphylla</i>	Petalled Rocktripe Lichen				S2S3	3 Sensitive	1	52.7 ± 2.0	NS
N	<i>Usnea cavernosa</i>	Pitted Beard Lichen				S2S3	3 Sensitive	2	44.1 ± 0.0	NS
N	<i>Usnea ceratina</i>	Warty Beard Lichen				S2S3	3 Sensitive	2	63.7 ± 0.0	NS
N	<i>Usnea mutabilis</i>	Bloody Beard Lichen				S2S3	3 Sensitive	1	44.1 ± 0.0	NS
N	<i>Usnea rubicunda</i>	Red Beard Lichen				S2S3	3 Sensitive	2	44.1 ± 0.0	NS
N	<i>Physcia subtilis</i>	Slender Rosette Lichen				S2S3	3 Sensitive	1	52.1 ± 0.0	NS
N	<i>Cetraria arenaria</i>	Sand-loving Icelandmoss Lichen				S2S3	5 Undetermined	1	62.8 ± 0.0	NS
N	<i>Cladonia coccifera</i>	Eastern Boreal Pixie-cup Lichen				S2S3	3 Sensitive	3	32.9 ± 4.0	NS
N	<i>Cladonia deformis</i>	Lesser Sulphur-cup Lichen				S2S3	5 Undetermined	3	37.2 ± 4.0	NS
N	<i>Cladonia phyllophora</i>	Felt Lichen				S2S3	5 Undetermined	2	64.5 ± 4.0	NS
N	<i>Usnea flammea</i>	Coastal Bushy Beard Lichen				S2S3	3 Sensitive	1	46.6 ± 1.0	NS
N	<i>Ramalina thrausta</i>	Angelhair Ramalina Lichen				S3	3 Sensitive	1	68.7 ± 0.0	NS
N	<i>Collema tenax</i>	Soil Tarpaper Lichen				S3		4	22.0 ± 0.0	NS
N	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen				S3	3 Sensitive	13	13.8 ± 0.0	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3	3 Sensitive	24	3.3 ± 0.0	NS
N	<i>Leptogium subtile</i>	Appressed Jellyskin Lichen				S3	3 Sensitive	11	25.5 ± 0.0	NS
N	<i>Fuscopannaria ahlneri</i>	Corrugated Shingles Lichen				S3	4 Secure	36	2.4 ± 0.0	NS
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3	4 Secure	22	34.0 ± 0.0	NS
N	<i>Heterodermia squamulosa</i>	Scaly Fringe Lichen				S3	3 Sensitive	49	71.7 ± 0.0	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3	3 Sensitive	54	11.9 ± 0.0	NS
N	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen				S3	2 May Be At Risk	8	25.5 ± 0.0	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	3 Sensitive	2	23.7 ± 4.0	NS
N	<i>Placynthium nigrum</i>	Common Ink Lichen				S3	5 Undetermined	1	75.3 ± 0.0	NS
N	<i>Punctelia appalachensis</i>	Appalachian Speckleback Lichen				S3	3 Sensitive	61	62.4 ± 0.0	NS
N	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen				S3	4 Secure	31	10.6 ± 1.0	NS
N	<i>Fuscopannaria soorediata</i>	a Lichen				S3		3	10.6 ± 1.0	NS
N	<i>Ephebe lanata</i>	Waterside Rockshag Lichen				S3	3 Sensitive	1	46.1 ± 17.0	NS
N	<i>Usnea macaronesica</i>	Beard Lichen				S3	5 Undetermined	3	40.7 ± 1.0	NS
N	<i>Metzgeria conjugata</i>	Rock Veilwort				S3?	5 Undetermined	1	91.6 ± 0.0	NS
N	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss				S3?	5 Undetermined	2	25.6 ± 0.0	NS
N	<i>Calliergon giganteum</i>	Giant Spear Moss				S3?	3 Sensitive	2	18.5 ± 3.0	NS
N	<i>Drummondia prorepens</i>	a Moss				S3?	3 Sensitive	1	29.5 ± 5.0	NS
N	<i>Anomodon tristis</i>	a Moss				S3?	3 Sensitive	9	62.5 ± 0.0	NS
N	<i>Helodium blandowii</i>	Wetland-plume Moss				S3?	4 Secure	5	22.0 ± 0.0	NS
N	<i>Mnium stellare</i>	Star Leafy Moss				S3?	5 Undetermined	3	22.3 ± 0.0	NS
N	<i>Sphagnum riparium</i>	Streamside Peat Moss				S3?	3 Sensitive	1	94.1 ± 1.0	NS
N	<i>Phaeophyscia pusilloides</i>	Pompom-tipped Shadow Lichen				S3?	5 Undetermined	2	29.2 ± 0.0	NS
N	<i>Cladina stygia</i>	Black-footed Reindeer Lichen				S3?	3 Sensitive	3	48.2 ± 0.0	NS

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N	<i>Anomodon rugelii</i>	Rugel's Anomodon Moss				S3S4	3 Sensitive	4	62.5 ± 0.0	NS
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S3S4	4 Secure	3	15.3 ± 3.0	NS
N	<i>Dicranella varia</i>	a Moss				S3S4	5 Undetermined	3	26.4 ± 0.0	NS
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	3 Sensitive	1	97.6 ± 0.0	NS
N	<i>Splachnum ampullaceum</i>	Cruet Dung Moss				S3S4	4 Secure	1	56.3 ± 0.0	NS
N	<i>Thamnobryum alleghaniense</i>	a Moss				S3S4	3 Sensitive	8	55.5 ± 4.0	NS
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S3S4	4 Secure	4	53.6 ± 1.0	NS
N	<i>Hylocomiastrum pyrenaicum</i>	a Feather Moss				S3S4	3 Sensitive	1	29.7 ± 0.0	NS
N	<i>Arctoparmelia incurva</i>	Finger Ring Lichen				S3S4	4 Secure	4	33.0 ± 1.0	NS
N	<i>Hypogymnia vittata</i>	Slender Monk's Hood Lichen				S3S4	4 Secure	22	10.6 ± 1.0	NS
N	<i>Cladonia floerkeana</i>	Gritty British Soldiers Lichen				S3S4	5 Undetermined	2	44.8 ± 0.0	NS
N	<i>Vahlia leucophaea</i>	Shelter Shingle Lichen				S3S4	4 Secure	1	93.5 ± 0.0	NS
N	<i>Leptogium acadense</i>	Acadian Jellyskin Lichen				S3S4		6	39.0 ± 0.0	NS
N	<i>Melanohalea olivacea</i>	Spotted Camouflage Lichen				S3S4	5 Undetermined	2	44.1 ± 0.0	NS
N	<i>Parmotrema chinense</i>	Powdered Ruffle Lichen				S3S4	4 Secure	11	71.8 ± 0.0	NS
N	<i>Peltigera hymenina</i>	Cloudy Pelt Lichen				S3S4	4 Secure	1	44.8 ± 2.0	NS
N	<i>Physconia detorsa</i>	Bottlebrush Frost Lichen				S3S4	3 Sensitive	8	29.2 ± 0.0	NS
N	<i>Sphaerophorus fragilis</i>	Fragile Coral Lichen				S3S4	4 Secure	3	44.8 ± 2.0	NS
N	<i>Coccocarpia palmicola</i>	Salted Shell Lichen				S3S4	4 Secure	229	10.6 ± 1.0	NS
N	<i>Physcia caesia</i>	Blue-gray Rosette Lichen				S3S4	5 Undetermined	1	46.6 ± 1.0	NS
N	<i>Physcia tenella</i>	Fringed Rosette Lichen				S3S4	6 Not Assessed	2	44.8 ± 2.0	NS
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	4 Secure	41	43.9 ± 0.0	NS
N	<i>Bryoria pikei</i>	Pike's Horsehair Lichen				S3S4	5 Undetermined	4	4.6 ± 5.0	NS
N	<i>Evernia prunastri</i>	Valley Oakmoss Lichen				S3S4	3 Sensitive	9	22.0 ± 0.0	NS
N	<i>Dermatocarpon luridum</i>	Brookside Stippleback Lichen				S3S4	4 Secure	25	18.1 ± 5.0	NS
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	4 Secure	40	10.6 ± 1.0	NS
P	<i>Rhynchospora macrostachya</i>	Tall Beakrush	Endangered		Endangered	S1	2 May Be At Risk	7	95.4 ± 0.0	NS
P	<i>Juglans cinerea</i>	Butternut	Endangered	Endangered		SNA	7 Exotic	1	19.8 ± 0.0	NS
P	<i>Liatris spicata</i>	Dense Blazing Star	Threatened	Threatened		SNA		1	30.5 ± 0.0	NS
P	<i>Bartonia paniculata</i> ssp. <i>paniculata</i>	Branched Bartonia	Threatened	Threatened		SNA		1	87.6 ± 10.0	NS
P	<i>Clethra alnifolia</i>	Coast Pepper-Bush	Special Concern	Special Concern	Vulnerable	S1	1 At Risk	2	34.4 ± 0.0	NS
P	<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	136	73.9 ± 1.0	NS
P	<i>Lachnanthes caroliniana</i>	Redroot	Special Concern	Threatened	Vulnerable	S2	1 At Risk	310	94.6 ± 0.0	NS
P	<i>Lophiola aurea</i>	Goldencrest	Special Concern	Threatened	Vulnerable	S2	1 At Risk	445	82.5 ± 1.0	NS
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	13	69.6 ± 0.0	NS
P	<i>Scirpus longii</i>	Long's Bulrush	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	62	87.3 ± 0.0	NS
P	<i>Floerkea proserpinacoides</i>	False Mermaidweed	Not At Risk			S2	3 Sensitive	25	63.2 ± 1.0	NS
P	<i>Smilax rotundifolia</i>	Round-leaved Greenbrier	Not At Risk			S3	4 Secure	18	97.5 ± 0.0	NS
P	<i>Crocianthemum canadense</i>	Long-branched Frostweed			Endangered	S1	1 At Risk	52	20.5 ± 1.0	NS
P	<i>Cypripedium arietinum</i>	Ram's-Head Lady's-Slipper			Endangered	S1	1 At Risk	153	19.4 ± 2.0	NS
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S1	1 At Risk	84	18.5 ± 1.0	NS
P	<i>Acer saccharinum</i>	Silver Maple				S1	5 Undetermined	11	62.3 ± 0.0	NS
P	<i>Osmorhiza depauperata</i>	Blunt Sweet Cicely				S1	2 May Be At Risk	1	51.4 ± 5.0	NS
P	<i>Sanicula odorata</i>	Clustered Sanicle				S1	2 May Be At Risk	10	21.5 ± 0.0	NS
P	<i>Zizia aurea</i>	Golden Alexanders				S1	2 May Be At Risk	35	62.9 ± 1.0	NS
P	<i>Antennaria rosea</i> ssp. <i>arida</i>	Rosy Pussytoes				S1	2 May Be At Risk	1	90.5 ± 0.0	NS
P	<i>Antennaria parlinii</i>	a Pussytoes				S1	2 May Be At Risk	17	21.6 ± 0.0	NS
P	<i>Ageratina altissima</i>	White Snakeroot				S1	2 May Be At Risk	11	91.0 ± 0.0	NS
P	<i>Andersonglossum boreale</i>	Northern Wild Comfrey				S1	2 May Be At Risk	5	24.6 ± 1.0	NS
P	<i>Turritis glabra</i>	Tower Mustard				S1	5 Undetermined	1	64.0 ± 0.0	NS
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	4	63.4 ± 0.0	NS
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	2 May Be At Risk	8	56.2 ± 7.0	NS
P	<i>Silene antirrhina</i>	Sleepy Catchfly				S1	2 May Be At Risk	5	87.4 ± 0.0	NS
P	<i>Astragalus robbinsii</i> var. <i>minor</i>	Robbins' Milkvetch				S1	2 May Be At Risk	25	90.5 ± 0.0	NS

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P	<i>Desmodium canadense</i>	Canada Tick-trefoil				S1	2 May Be At Risk	12	53.3 ± 1.0	NS
P	<i>Hylodesmum glutinosum</i>	Large Tick-trefoil				S1	2 May Be At Risk	32	23.8 ± 0.0	NS
P	<i>Ribes americanum</i>	Wild Black Currant				S1	5 Undetermined	4	23.5 ± 3.0	NS
P	<i>Trichostema dichotomum</i>	Forked Bluecurls				S1	2 May Be At Risk	3	92.8 ± 0.0	NS
P	<i>Fraxinus pennsylvanica</i>	Red Ash				S1	2 May Be At Risk	8	5.2 ± 5.0	NS
P	<i>Polygala polygama</i>	Racemed Milkwort				S1	5 Undetermined	1	28.3 ± 1.0	NS
P	<i>Persicaria careyi</i>	Carey's Smartweed				S1	5 Undetermined	1	58.8 ± 3.0	NS
P	<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed				S1	2 May Be At Risk	4	78.2 ± 0.0	NS
P	<i>Montia fontana</i>	Water Blinks				S1	2 May Be At Risk	3	29.6 ± 1.0	NS
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	5 Undetermined	1	17.5 ± 0.0	NS
P	<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup				S1	2 May Be At Risk	23	91.7 ± 0.0	NS
P	<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry				S1	2 May Be At Risk	1	75.1 ± 1.0	NS
P	<i>Salix myrtilifolia</i>	Blueberry Willow				S1	2 May Be At Risk	1	52.2 ± 0.0	NS
P	<i>Salix serissima</i>	Autumn Willow				S1	2 May Be At Risk	2	52.2 ± 0.0	NS
P	<i>Scrophularia lanceolata</i>	Lance-leaved Figwort				S1	5 Undetermined	2	84.7 ± 1.0	NS
P	<i>Dirca palustris</i>	Eastern Leatherwood				S1	2 May Be At Risk	49	18.6 ± 0.0	NS
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S1	2 May Be At Risk	48	32.4 ± 0.0	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S1	2 May Be At Risk	3	23.4 ± 0.0	NS
P	<i>Carex garberi</i>	Garber's Sedge				S1	2 May Be At Risk	4	80.6 ± 0.0	NS
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S1	2 May Be At Risk	2	52.2 ± 0.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1	2 May Be At Risk	4	58.0 ± 1.0	NS
P	<i>Carex pellita</i>	Woolly Sedge				S1	2 May Be At Risk	2	74.4 ± 10.0	NS
P	<i>Carex laxiflora</i>	Loose-Flowered Sedge				S1	2 May Be At Risk	2	62.0 ± 1.0	NS
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S1	2 May Be At Risk	1	72.8 ± 5.0	NS
P	<i>Carex plantaginea</i>	Plantain-Leaved Sedge				S1	2 May Be At Risk	4	74.5 ± 0.0	NS
P	<i>Carex prairea</i>	Prairie Sedge				S1	2 May Be At Risk	2	65.2 ± 1.0	NS
P	<i>Carex viridula</i> var. <i>saxillitoralis</i>	Greenish Sedge				S1	2 May Be At Risk	4	86.4 ± 2.0	NS
P	<i>Scirpus atrovirens</i>	Dark-green Bulrush				S1		2	23.6 ± 0.0	NS
P	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush				S1	2 May Be At Risk	6	90.6 ± 0.0	NS
P	<i>Iris prismatica</i>	Slender Blue Flag				S1	2 May Be At Risk	1	64.5 ± 100.0	NS
P	<i>Sisyrinchium fuscatum</i>	Coastal Plain Blue-eyed-grass				S1	2 May Be At Risk	1	77.0 ± 0.0	NS
P	<i>Juncus secundus</i>	Secund Rush				S1	2 May Be At Risk	1	68.7 ± 0.0	NS
P	<i>Juncus vaseyi</i>	Vasey Rush				S1	2 May Be At Risk	2	81.6 ± 0.0	NS
P	<i>Allium tricoccum</i>	Wild Leek				S1	2 May Be At Risk	41	60.5 ± 5.0	NS
P	<i>Trillium grandiflorum</i>	White Trillium				S1	5 Undetermined	3	65.2 ± 1.0	NS
P	<i>Malaxis monophyllos</i> var. <i>brachypoda</i>	North American White Adder's-mouth				S1	2 May Be At Risk	5	56.2 ± 10.0	NS
P	<i>Spiranthes casei</i> var. <i>casei</i>	Case's Ladies'-Tresses				S1	2 May Be At Risk	1	48.6 ± 0.0	NS
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S1	2 May Be At Risk	31	67.7 ± 0.0	NS
P	<i>Dichanthelium xanthophysum</i>	Slender Panic Grass				S1	2 May Be At Risk	9	76.9 ± 1.0	NS
P	<i>Elymus wiegandii</i>	Wiegand's Wild Rye				S1	2 May Be At Risk	13	28.7 ± 7.0	NS
P	<i>Elymus hystrix</i>	Spreading Wild Rye				S1	2 May Be At Risk	11	21.3 ± 0.0	NS
P	<i>Torreyochloa pallida</i> var. <i>pallida</i>	Pale False Manna Grass				S1	0.1 Extirpated	1	86.8 ± 1.0	NS
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S1	2 May Be At Risk	11	18.6 ± 0.0	NS
P	<i>Equisetum palustre</i>	Marsh Horsetail				S1	2 May Be At Risk	1	60.1 ± 5.0	NS
P	<i>Botrychium lunaria</i>	Common Moonwort				S1	2 May Be At Risk	4	41.5 ± 0.0	NS
P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1	2 May Be At Risk	1	23.7 ± 0.0	NS
P	<i>Solidago hispida</i>	Hairy Goldenrod				S1?	2 May Be At Risk	1	28.7 ± 7.0	NS
P	<i>Suaeda rolandii</i>	Roland's Sea-Blite				S1?	2 May Be At Risk	2	24.9 ± 2.0	NS
P	<i>Carex pensylvanica</i>	Pennsylvania Sedge				S1?	2 May Be At Risk	3	22.2 ± 0.0	NS
P	<i>Juncus antheratus</i>	Greater Poverty Rush				S1?	2 May Be At Risk	1	98.7 ± 0.0	NS
P	<i>Dichanthelium lindheimeri</i>	Lindheimer's Panicgrass				S1?	5 Undetermined	3	74.8 ± 1.0	NS
P	<i>Fraxinus nigra</i>	Black Ash			Threatened	S1S2	1 At Risk	236	12.2 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	18	11.3 ± 7.0	NS
P	<i>Arabis pycnocarpa</i>	Cream-flowered Rockcress				S1S2	2 May Be At Risk	1	63.2 ± 0.0	NS
P	<i>Cardamine maxima</i>	Large Toothwort				S1S2	2 May Be At Risk	2	73.0 ± 0.0	NS
P	<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				S1S2	2 May Be At Risk	2	43.4 ± 0.0	NS
P	<i>Conopholis americana</i>	American Cancer-root				S1S2	2 May Be At Risk	20	58.2 ± 1.0	NS
P	<i>Anemone virginiana</i> var. <i>alba</i>	Virginia Anemone				S1S2	3 Sensitive	5	70.0 ± 7.0	NS
P	<i>Hepatica americana</i>	Round-lobed Hepatica				S1S2	2 May Be At Risk	45	20.3 ± 0.0	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1S2	2 May Be At Risk	20	17.3 ± 0.0	NS
P	<i>Gratiola neglecta</i>	Clammy Hedge-Hyssop				S1S2	3 Sensitive	4	61.1 ± 2.0	NS
P	<i>Carex livida</i>	Livid Sedge				S1S2	2 May Be At Risk	12	30.0 ± 10.0	NS
P	<i>Juncus greenii</i>	Greene's Rush				S1S2	2 May Be At Risk	5	17.3 ± 0.0	NS
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S1S2	5 Undetermined	2	21.4 ± 10.0	NS
P	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	Slim-stemmed Reed Grass				S1S2	3 Sensitive	3	84.3 ± 7.0	NS
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1S2	2 May Be At Risk	54	65.0 ± 0.0	NS
P	<i>Festuca subverticillata</i>	Nodding Fescue				S1S2	2 May Be At Risk	13	35.3 ± 7.0	NS
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S1S2	2 May Be At Risk	3	30.1 ± 0.0	NS
P	<i>Carex vacillans</i>	Estuarine Sedge				S1S3	5 Undetermined	1	78.9 ± 0.0	NS
P	<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S2	3 Sensitive	8	35.2 ± 0.0	NS
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2	2 May Be At Risk	20	24.3 ± 0.0	NS
P	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				S2	3 Sensitive	2	74.6 ± 1.0	NS
P	<i>Lactuca hirsuta</i>	Hairy Lettuce				S2	3 Sensitive	4	40.6 ± 7.0	NS
P	<i>Symphyotrichum undulatum</i>	Wavy-leaved Aster				S2	3 Sensitive	117	14.6 ± 1.0	NS
P	<i>Symphyotrichum ciliolatum</i>	Fringed Blue Aster				S2	3 Sensitive	19	23.7 ± 0.0	NS
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2	3 Sensitive	2	63.2 ± 1.0	NS
P	<i>Caulophyllum thalictroides</i>	Blue Cohosh				S2	2 May Be At Risk	63	21.1 ± 1.0	NS
P	<i>Boechera stricta</i>	Drummond's Rockcress				S2	3 Sensitive	12	62.0 ± 1.0	NS
P	<i>Cardamine parviflora</i>	Small-flowered Bittercress				S2	3 Sensitive	15	31.2 ± 50.0	NS
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S2	3 Sensitive	16	62.0 ± 1.0	NS
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2	3 Sensitive	8	63.1 ± 1.0	NS
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	11	49.7 ± 5.0	NS
P	<i>Oxybasis rubra</i>	Red Goosefoot				S2	2 May Be At Risk	2	86.4 ± 2.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	3 Sensitive	60	28.7 ± 7.0	NS
P	<i>Hypericum majus</i>	Large St John's-wort				S2	3 Sensitive	9	17.9 ± 0.0	NS
P	<i>Crassula aquatica</i>	Water Pygmyweed				S2	3 Sensitive	1	40.8 ± 0.0	NS
P	<i>Oxytropis campestris</i> var. <i>johannensis</i>	Field Locoweed				S2	2 May Be At Risk	25	90.5 ± 0.0	NS
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2	3 Sensitive	10	6.1 ± 1.0	NS
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S2	3 Sensitive	3	27.4 ± 3.0	NS
P	<i>Utricularia resupinata</i>	Inverted Bladderwort				S2	3 Sensitive	1	87.9 ± 0.0	NS
P	<i>Oenothera fruticosa</i> ssp. <i>tetragona</i>	Narrow-leaved Evening Primrose				S2	5 Undetermined	8	22.7 ± 7.0	NS
P	<i>Persicaria arifolia</i>	Halberd-leaved Tearthumb				S2	3 Sensitive	13	49.7 ± 0.0	NS
P	<i>Rumex triangulivalvis</i>	Triangular-valve Dock				S2	3 Sensitive	9	21.5 ± 0.0	NS
P	<i>Primula mistassinica</i>	Mistassini Primrose				S2	3 Sensitive	16	70.0 ± 7.0	NS
P	<i>Anemonastrum canadense</i>	Canada Anemone				S2	2 May Be At Risk	3	13.9 ± 7.0	NS
P	<i>Anemone quinquefolia</i>	Wood Anemone				S2	3 Sensitive	29	46.8 ± 0.0	NS
P	<i>Anemone virginiana</i>	Virginia Anemone				S2	3 Sensitive	16	21.2 ± 5.0	NS
P	<i>Anemone virginiana</i> var. <i>virginiana</i>	Virginia Anemone				S2	3 Sensitive	2	21.4 ± 7.0	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2	3 Sensitive	2	51.1 ± 2.0	NS
P	<i>Galium boreale</i>	Northern Bedstraw				S2	2 May Be At Risk	7	56.2 ± 7.0	NS
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2	3 Sensitive	79	49.3 ± 0.0	NS
P	<i>Salix pedicellaris</i>	Bog Willow				S2	3 Sensitive	121	48.1 ± 0.0	NS
P	<i>Salix sericea</i>	Silky Willow				S2	2 May Be At Risk	122	20.6 ± 1.0	NS
P	<i>Saxifraga paniculata</i> ssp. <i>laestadii</i>	Laestadius' Saxifrage				S2	3 Sensitive	12	56.2 ± 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>Tiarella cordifolia</i>	Heart-leaved Foamflower				S2	3 Sensitive	42	45.7 ± 0.0	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S2	3 Sensitive	7	42.6 ± 1.0	NS
P	<i>Carex bebbii</i>	Bebb's Sedge				S2	3 Sensitive	15	21.7 ± 0.0	NS
P	<i>Carex capillaris</i>	Hairlike Sedge				S2	3 Sensitive	8	71.7 ± 0.0	NS
P	<i>Carex castanea</i>	Chestnut Sedge				S2	2 May Be At Risk	26	35.0 ± 0.0	NS
P	<i>Carex comosa</i>	Bearded Sedge				S2	3 Sensitive	9	28.0 ± 7.0	NS
P	<i>Carex hystericina</i>	Porcupine Sedge				S2	2 May Be At Risk	8	59.1 ± 0.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S2	3 Sensitive	8	23.2 ± 0.0	NS
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S2	3 Sensitive	38	21.6 ± 2.0	NS
P	<i>Carex atratiformis</i>	Scabrous Black Sedge				S2	3 Sensitive	3	73.4 ± 0.0	NS
P	<i>Vallisneria americana</i>	Wild Celery				S2	2 May Be At Risk	10	43.7 ± 1.0	NS
P	<i>Allium schoenoprasum</i> var. <i>sibiricum</i>	Wild Chives				S2	2 May Be At Risk	1	70.0 ± 7.0	NS
P	<i>Lilium canadense</i>	Canada Lily				S2	2 May Be At Risk	67	21.5 ± 0.0	NS
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2	3 Sensitive	2	13.2 ± 0.0	NS
P	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Yellow Lady's-slipper				S2	3 Sensitive	15	9.0 ± 7.0	NS
P	<i>Cypripedium parviflorum</i> var. <i>makasin</i>	Small Yellow Lady's-Slipper				S2	3 Sensitive	13	21.7 ± 0.0	NS
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	2 May Be At Risk	35	20.4 ± 0.0	NS
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2	3 Sensitive	11	19.9 ± 0.0	NS
P	<i>Platanthera flava</i>	Southern Rein-Orchid				S2	3 Sensitive	31	75.6 ± 0.0	NS
P	<i>Platanthera flava</i> var. <i>flava</i>	Southern Rein Orchid				S2	3 Sensitive	10	50.0 ± 7.0	NS
P	<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchid				S2	5 Undetermined	20	49.3 ± 1.0	NS
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	3 Sensitive	5	33.8 ± 1.0	NS
P	<i>Spiranthes casei</i>	Case's Ladies'-Tresses				S2	3 Sensitive	1	99.4 ± 0.0	NS
P	<i>Spiranthes casei</i> var. <i>novaescotiae</i>	Case's Ladies'-Tresses				S2	3 Sensitive	1	97.2 ± 0.0	NS
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2	2 May Be At Risk	13	24.0 ± 0.0	NS
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	16	28.0 ± 7.0	NS
P	<i>Piptatheropsis canadensis</i>	Canada Ricegrass				S2	3 Sensitive	20	28.9 ± 1.0	NS
P	<i>Piptatheropsis pungens</i>	Slender Ricegrass				S2	3 Sensitive	8	68.5 ± 10.0	NS
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S2	2 May Be At Risk	10	58.2 ± 1.0	NS
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S2	2 May Be At Risk	8	35.0 ± 0.0	NS
P	<i>Dryopteris fragrans</i>	Fragrant Wood Fern				S2	3 Sensitive	14	69.7 ± 0.0	NS
P	<i>Woodsia glabella</i>	Smooth Cliff Fern				S2	3 Sensitive	2	73.0 ± 1.0	NS
P	<i>Symphyotrichum boreale</i>	Boreal Aster				S2?	3 Sensitive	7	17.6 ± 5.0	NS
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	5 Undetermined	1	29.8 ± 0.0	NS
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2?	3 Sensitive	6	21.2 ± 0.0	NS
P	<i>Rumex persicarioides</i>	Peach-leaved Dock				S2?	2 May Be At Risk	1	44.6 ± 0.0	NS
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S2?	5 Undetermined	5	23.9 ± 1.0	NS
P	<i>Carex peckii</i>	White-Tinged Sedge				S2?	2 May Be At Risk	4	23.6 ± 5.0	NS
P	<i>Eleocharis ovata</i>	Ovate Spikerush				S2?	3 Sensitive	9	21.1 ± 0.0	NS
P	<i>Scirpus pedicellatus</i>	Stalked Bulrush				S2?	3 Sensitive	7	33.7 ± 0.0	NS
P	<i>Potamogeton pulcher</i>	Spotted Pondweed			Vulnerable	S2S3	3 Sensitive	13	73.6 ± 0.0	NS
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S2S3	3 Sensitive	3	70.0 ± 1.0	NS
P	<i>Iva frutescens</i>	Big-leaved Marsh-elder				S2S3	3 Sensitive	22	31.0 ± 1.0	NS
P	<i>Senecio pseudoamica</i>	Seabeach Ragwort				S2S3	3 Sensitive	18	39.5 ± 1.0	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S2S3	3 Sensitive	52	8.7 ± 0.0	NS
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S2S3	4 Secure	39	38.9 ± 0.0	NS
P	<i>Sagina nodosa</i> ssp. <i>borealis</i>	Knotted Pearlwort				S2S3	4 Secure	9	44.4 ± 0.0	NS
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	7	58.1 ± 3.0	NS
P	<i>Hypericum x dissimulatum</i>	Disguised St. John's-wort				S2S3	3 Sensitive	5	14.7 ± 0.0	NS
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S2S3	3 Sensitive	22	21.0 ± 2.0	NS
P	<i>Shepherdia canadensis</i>	Soapberry				S2S3	3 Sensitive	76	13.9 ± 7.0	NS

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P	<i>Empetrum atropurpureum</i>	Purple Crowberry				S2S3	3 Sensitive	5	28.6 ± 7.0	NS
P	<i>Euphorbia polygonifolia</i>	Seaside Spurge				S2S3	3 Sensitive	3	59.2 ± 3.0	NS
P	<i>Halenia deflexa</i>	Spurred Gentian				S2S3	3 Sensitive	3	40.8 ± 0.0	NS
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	3 Sensitive	18	42.4 ± 5.0	NS
P	<i>Polygonum aviculare</i> ssp. <i>buxiforme</i>	Box Knotweed				S2S3	5 Undetermined	7	30.1 ± 0.0	NS
P	<i>Polygonum oxyspermum</i> ssp. <i>raili</i>	Ray's Knotweed				S2S3	5 Undetermined	3	42.0 ± 1.0	NS
P	<i>Amelanchier fernaldii</i>	Fernald's Serviceberry				S2S3	5 Undetermined	1	74.0 ± 7.0	NS
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	3 Sensitive	1	51.7 ± 5.0	NS
P	<i>Galium aparine</i>	Common Bedstraw				S2S3	3 Sensitive	24	23.6 ± 0.0	NS
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2S3	3 Sensitive	2	90.4 ± 0.0	NS
P	<i>Salix pellita</i>	Satiny Willow				S2S3	3 Sensitive	7	52.7 ± 4.0	NS
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	3 Sensitive	7	27.7 ± 5.0	NS
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S2S3	3 Sensitive	34	21.4 ± 2.0	NS
P	<i>Carex houghtoniana</i>	Houghton's Sedge				S2S3	3 Sensitive	4	54.8 ± 1.0	NS
P	<i>Eleocharis flavescens</i> var. <i>olivacea</i>	Bright-green Spikerush				S2S3	3 Sensitive	8	23.1 ± 0.0	NS
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S2S3	3 Sensitive	7	44.5 ± 7.0	NS
P	<i>Coeloglossum viride</i>	Long-bracted Frog Orchid				S2S3	2 May Be At Risk	13	47.8 ± 1.0	NS
P	<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper				S2S3	3 Sensitive	515	18.6 ± 1.0	NS
P	<i>Poa glauca</i>	Glaucous Blue Grass				S2S3	3 Sensitive	8	23.9 ± 1.0	NS
P	<i>Botrychium lanceolatum</i> ssp. <i>angustisegmentum</i>	Narrow Triangle Moonwort				S2S3	3 Sensitive	5	55.8 ± 5.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	3 Sensitive	4	30.4 ± 1.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	5	9.0 ± 7.0	NS
P	<i>Angelica atropurpurea</i>	Purple-stemmed Angelica				S3	4 Secure	1	70.9 ± 0.0	NS
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	3 Sensitive	16	22.7 ± 7.0	NS
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S3	4 Secure	29	22.9 ± 11.0	NS
P	<i>Bidens beckii</i>	Water Beggarticks				S3	4 Secure	10	40.9 ± 0.0	NS
P	<i>Packera paupercula</i> var. <i>paupercula</i>	Balsam Groundsel				S3	4 Secure	1	21.2 ± 0.0	NS
P	<i>Packera paupercula</i>	Balsam Groundsel				S3	4 Secure	53	19.4 ± 0.0	NS
P	<i>Alnus serrulata</i>	Smooth Alder				S3	3 Sensitive	317	77.6 ± 0.0	NS
P	<i>Betula pumila</i> var. <i>pumila</i>	Bog Birch				S3	3 Sensitive	1	99.0 ± 1.0	NS
P	<i>Betula pumila</i>	Bog Birch				S3	3 Sensitive	3	50.1 ± 0.0	NS
P	<i>Campanula aparinoides</i>	Marsh Bellflower				S3	3 Sensitive	23	27.4 ± 1.0	NS
P	<i>Mononeuria groenlandica</i>	Greenland Stitchwort				S3	3 Sensitive	108	16.4 ± 0.0	NS
P	<i>Empetrum eamesii</i>	Pink Crowberry				S3	3 Sensitive	88	26.0 ± 0.0	NS
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3	3 Sensitive	3	64.6 ± 0.0	NS
P	<i>Vaccinium cespitosum</i>	dwarf bilberry				S3	4 Secure	60	16.9 ± 0.0	NS
P	<i>Vaccinium uliginosum</i>	Alpine Bilberry				S3	3 Sensitive	3	43.1 ± 1.0	NS
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3	4 Secure	27	20.6 ± 7.0	NS
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	19	29.9 ± 3.0	NS
P	<i>Proserpinaca palustris</i>	Marsh Mermaidweed				S3	4 Secure	59	23.5 ± 0.0	NS
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3	4 Secure	40	19.7 ± 1.0	NS
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	47	29.8 ± 0.0	NS
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	3 Sensitive	6	48.1 ± 1.0	NS
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	3 Sensitive	20	17.8 ± 0.0	NS
P	<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed				S3	4 Secure	25	23.8 ± 0.0	NS
P	<i>Fallopia scandens</i>	Climbing False Buckwheat				S3	3 Sensitive	20	13.3 ± 2.0	NS
P	<i>Plantago rugelii</i>	Rugel's Plantain				S3	4 Secure	10	28.2 ± 0.0	NS
P	<i>Primula laurentiana</i>	Laurentian Primrose				S3	4 Secure	21	58.5 ± 7.0	NS
P	<i>Samolus parviflorus</i>	Seaside Brookweed				S3	3 Sensitive	40	23.9 ± 1.0	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3	4 Secure	10	27.1 ± 1.0	NS
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	3 Sensitive	1	67.4 ± 7.0	NS
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	52	21.7 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Endotropis alnifolia</i>	alder-leaved buckthorn				S3	4 Secure	135	21.9 ± 0.0	NS
P	<i>Agrimonia gryposepala</i>	Hooked Agrimony				S3	4 Secure	137	20.8 ± 0.0	NS
P	<i>Amelanchier spicata</i>	Running Serviceberry				S3	4 Secure	55	19.1 ± 3.0	NS
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S3	3 Sensitive	589	91.5 ± 0.0	NS
P	<i>Geocaulon lividum</i>	Northern Comandra				S3	4 Secure	4	86.1 ± 1.0	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	9	35.6 ± 3.0	NS
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	4 Secure	29	23.2 ± 0.0	NS
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	3 Sensitive	48	21.6 ± 0.0	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3	4 Secure	187	21.4 ± 0.0	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3	4 Secure	11	18.4 ± 6.0	NS
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	3 Sensitive	5	48.7 ± 0.0	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	42	18.3 ± 4.0	NS
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	30	21.3 ± 1.0	NS
P	<i>Carex swanii</i>	Swan's Sedge				S3	3 Sensitive	10	14.7 ± 0.0	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3	4 Secure	14	24.1 ± 0.0	NS
P	<i>Carex wiedgandii</i>	Wiegand's Sedge				S3	3 Sensitive	5	34.3 ± 0.0	NS
P	<i>Carex foenea</i>	Fernald's Hay Sedge				S3	4 Secure	14	5.7 ± 1.0	NS
P	<i>Eleocharis nitida</i>	Quill Spikerush				S3	4 Secure	14	22.8 ± 5.0	NS
P	<i>Elodea canadensis</i>	Canada Waterweed				S3	4 Secure	9	23.4 ± 0.0	NS
P	<i>Juncus marginatus</i>	Grassleaf Rush				S3	3 Sensitive	1	95.1 ± 0.0	NS
P	<i>Juncus subcaudatus</i>	Woods-Rush				S3	3 Sensitive	22	16.4 ± 1.0	NS
P	<i>Juncus dudleyi</i>	Dudley's Rush				S3	4 Secure	18	23.9 ± 0.0	NS
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3	3 Sensitive	8	34.7 ± 0.0	NS
P	<i>Neottia bifolia</i>	Southern Twayblade				S3	4 Secure	115	3.3 ± 0.0	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	4 Secure	83	23.8 ± 1.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	4 Secure	16	24.0 ± 1.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3	4 Secure	14	18.3 ± 4.0	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3	4 Secure	25	10.5 ± 4.0	NS
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3	4 Secure	21	48.6 ± 0.0	NS
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3	4 Secure	266	16.5 ± 0.0	NS
P	<i>Coleataenia longifolia</i>	Long-leaved Panicgrass				S3	4 Secure	421	87.3 ± 0.0	NS
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	2	41.2 ± 0.0	NS
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S3	3 Sensitive	5	54.3 ± 5.0	NS
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S3	3 Sensitive	15	40.9 ± 0.0	NS
P	<i>Sparganium natans</i>	Small Burreed				S3	4 Secure	11	24.3 ± 0.0	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3	4 Secure	15	46.4 ± 0.0	NS
P	<i>Asplenium viride</i>	Green Spleenwort				S3	3 Sensitive	11	62.0 ± 7.0	NS
P	<i>Equisetum pratense</i>	Meadow Horsetail				S3	3 Sensitive	17	21.4 ± 0.0	NS
P	<i>Equisetum variegatum</i>	Variegated Horsetail				S3	4 Secure	26	17.7 ± 0.0	NS
P	<i>Isoetes acadiensis</i>	Acadian Quillwort				S3	3 Sensitive	7	11.4 ± 10.0	NS
P	<i>Diphasiastrium sitchense</i>	Sitka Ground-cedar				S3	4 Secure	2	51.3 ± 1.0	NS
P	<i>Huperzia appressa</i>	Mountain Firmoss				S3	3 Sensitive	18	51.8 ± 7.0	NS
P	<i>Sceptridium dissectum</i>	Dissected Moonwort				S3	4 Secure	6	66.5 ± 0.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	5 Undetermined	21	26.1 ± 0.0	NS
P	<i>Bidens vulgata</i>	Tall Beggarticks				S3?	7 Exotic	5	25.3 ± 0.0	NS
P	<i>Persicaria amphibia</i> var. <i>emersa</i>	Long-root Smartweed				S3?	5 Undetermined	19	25.7 ± 0.0	NS
P	<i>Diphasiastrium x sabinifolium</i>	Savin-leaved Ground-cedar				S3?	4 Secure	5	67.5 ± 0.0	NS
P	<i>Atriplex glabriuscula</i> var. <i>franktonii</i>	Frankton's Saltbush				S3S4	4 Secure	1	83.2 ± 0.0	NS
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	11	28.7 ± 7.0	NS
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	4 Secure	2	17.1 ± 0.0	NS
P	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3S4	4 Secure	5	73.9 ± 0.0	NS
P	<i>Rhexia virginica</i>	Virginia Meadow Beauty				S3S4	4 Secure	426	65.5 ± 5.0	NS
P	<i>Nuphar microphylla</i>	Small Yellow Pond-lily				S3S4	4 Secure	2	92.9 ± 1.0	NS
P	<i>Sanguinaria canadensis</i>	Bloodroot				S3S4	4 Secure	74	18.3 ± 4.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Polygonum fowleri</i>	Fowler's Knotweed				S3S4	4 Secure	3	61.6 ± 1.0	NS
P	<i>Rumex fueginus</i>	Tierra del Fuego Dock				S3S4	4 Secure	17	57.9 ± 1.0	NS
P	<i>Crataegus succulenta</i>	Fleshy Hawthorn				S3S4	5 Undetermined	1	18.1 ± 0.0	NS
P	<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry				S3S4	4 Secure	68	18.8 ± 1.0	NS
P	<i>Salix petiolaris</i>	Meadow Willow				S3S4	4 Secure	24	27.3 ± 0.0	NS
P	<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S3S4	4 Secure	21	17.2 ± 0.0	NS
P	<i>Viola sagittata</i> var. <i>ovata</i>	Arrow-Leaved Violet				S3S4	4 Secure	29	19.7 ± 0.0	NS
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	4 Secure	9	32.8 ± 1.0	NS
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	11	32.9 ± 3.0	NS
P	<i>Sisyrinchium atlanticum</i>	Eastern Blue-Eyed-Grass				S3S4	4 Secure	31	61.7 ± 0.0	NS
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	5 Undetermined	27	40.8 ± 0.0	NS
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	4 Secure	8	17.9 ± 0.0	NS
P	<i>Luzula parviflora</i>	Small-flowered Woodrush				S3S4	4 Secure	5	61.7 ± 0.0	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	4 Secure	5	17.2 ± 0.0	NS
P	<i>Panicum philadelphicum</i>	Philadelphia Panicgrass				S3S4	4 Secure	20	23.2 ± 0.0	NS
P	<i>Trisetum spicatum</i>	Narrow False Oats				S3S4	4 Secure	20	21.2 ± 1.0	NS
P	<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern				S3S4	4 Secure	88	21.7 ± 0.0	NS
P	<i>Equisetum hyemale</i> ssp. <i>affine</i>	Common Scouring-rush				S3S4	4 Secure	75	15.4 ± 2.0	NS
P	<i>Equisetum scirpoides</i>	Dwarf Scouring-Rush				S3S4	4 Secure	65	21.5 ± 0.0	NS
P	<i>Diphasiastrum complanatum</i>	Northern Ground-cedar				S3S4	4 Secure	17	18.9 ± 0.0	NS
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S3S4	4 Secure	46	32.5 ± 1.0	NS
P	<i>Viola canadensis</i>	Canada Violet				SH	0.1 Extirpated	2	28.0 ± 0.0	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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Appendix D: Wetland Characteristics

Mount Uniacke Business Park
Wetland Characteristics

Wetland ID	Wetland Type	Landscape Position	Landform	Water Flow	Soil Type	Surface Hydrology	Dominant Vegetation	Potential for Fish Presence
WL1	Mixed-wood Swamp	Terrene	Flat	Outflow (inferred, via drainage)	Histosol	Saturated at surface	<i>H: Three-seeded sedge, New York fern, bog aster, cinnamon fern.</i> <i>S: Speckled alder</i> <i>T: Balsam fir, black spruce, paper birch, red maple</i>	None in wetland
WL2	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Three-seeded sedge, cinnamon fern, balsam fir, Canada mayflower</i> <i>S: Balsam fir, yellow birch</i> <i>T: Balsam fir, black spruce, paper birch, red maple</i>	None in wetland
WL3	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Cattail, cinnamon fern, shallow sedge, three-seeded sedge</i> <i>S: Speckled alder, black spruce</i> <i>T: Balsam fir, paper birch, red maple</i>	None in wetland
WL4	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Three-seeded sedge, New York fern, cinnamon fern.</i> <i>S: Balsam fir, yellow birch, red maple</i> <i>T: Balsam fir, black spruce, paper birch, red maple</i>	None in wetland
WL5	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Three-seeded sedge, New York fern, cinnamon fern.</i> <i>S: balsam fir, yellow birch</i>	None in wetland

Mount Uniacke Business Park
Wetland Characteristics

Wetland ID	Wetland Type	Landscape Position	Landform	Water Flow	Soil Type	Surface Hydrology	Dominant Vegetation	Potential for Fish Presence
							<i>T: Balsam fir, yellow birch, red maple</i>	
WL6	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Wool grass, sensitive fern, Walters sedge</i> <i>S: Balsam fir, red maple</i> <i>T: Balsam fir, red maple</i>	None in wetland
WL7	Treed Bog	Terrene	Basin	Isolated	Histosol	Saturated at surface Groundwater within 30cm	<i>H: Leatherleaf, rhodora, sweet gale, cottongrass</i> <i>S: Black spruce, balsam fir, white pine</i> <i>T: Balsam fir, black spruce</i>	None in wetland
WL8	Mixed-wood Swamp	Terrene	Basin	Outflow (inferred)	Histosol	Saturated at surface	<i>H: Canada rush, wild sarsaparilla, cattail.</i> <i>S: Balsam fir, black spruce</i> <i>T: Balsam fir, red maple</i>	None in wetland
WL9	Mixed-wood Swamp	Terrene	Basin/sloped	Isolated	Histosol	Saturated at surface Groundwater within 30cm	<i>H: Wool grass, cinnamon fern, bristly blackberry</i> <i>S: Black spruce, red maple</i> <i>T: Balsam fir, red maple</i>	None in wetland
WL10	Treed swamp/ Graminoid marsh complex	Terrene	Basin	Throughflow (via drainage)	Histic Epipedon	15cm standing water across 30% of wetland. Saturated at surface Groundwater within 30cm	<i>H: Canada rush, cinnamon fern, cattail, sensitive fern</i> <i>S: Speckled alder</i> <i>T: Balsam fir, red maple, yellow birch</i>	None in wetland

Mount Uniacke Business Park
Wetland Characteristics

Wetland ID	Wetland Type	Landscape Position	Landform	Water Flow	Soil Type	Surface Hydrology	Dominant Vegetation	Potential for Fish Presence
WL11	Hardwood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	H: Cattail, Canada mayflower, wool grass S: Red spruce, yellow birch T: Red spruce, yellow birch	None in wetland
WL12	Mixed-wood Swamp	Terrene	Basin Sloped	Outflow (via drainage)	Histosol	Saturated at surface Groundwater within 30cm	H: New York fern S: Balsam fir T: Balsam fir, white ash, striped maple	None in wetland
WL13	Hardwood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface 2cm standing water across 5% of wetland.	H: Three-seeded sedge, cinnamon fern, sensitive fern, fowl manna grass. S: Balsam fir, yellow birch T: Yellow birch	None in wetland
WL14	Mixed-wood Swamp	Terrene	Basin	Isolated	Histic Epipedon	Saturated at surface	H: Northern beech fern, crested shield fern cinnamon fern, three-seeded sedge S: Balsam fir, yellow birch T: Balsam fir, red maple, yellow birch	None in wetland
WL15	Mixed-wood Swamp	Terrene	Sloped Basin	Isolated	Histosol	Saturated at surface. 20cm standing water across 2% of wetland.	H: Crested shield fern cinnamon fern, three-seeded sedge, wild sarsparilla S: Balsam fir, yellow birch, black spruce T: White ash, red maple, yellow birch	None in wetland
WL16	Shallow Open Water	Terrene	Basin	Isolated	Histosol on rock	Shallow open water	H: Lily pad (Nymphaea odorata), eastern purple bladderwort, potamogeton species.	None in wetland

Appendix E: Photolog

APPENDIX E

*Mount Uniacke Business Park Wetland Alteration
Municipality of East Hants*



Photo 1: Wetland 2



Photo 3: Wetland 3 Groundcover



Photo 2: Wetland 3

Appendix F: WESP Results

APPENDIX F: Mount Uniacke Business Park Wetland Alteration Application:
WESP Results

Wetland 2

Attribute	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating
Surface Water Storage (WS)	6.47	Moderate	1.83	Lower
Stream Flow Support (SFS)	0.93	Lower	0.00	Lower
Streamwater Cooling (WC)	0.50	Lower	0.00	Lower
Sediment & Toxicant Retention & Stabilization (SR)	10.00	Higher	0.76	Lower
Phosphorus Retention (PR)	2.13	Lower	0.86	Lower
Nitrate Removal & Retention (NR)	10.00	Higher	2.22	Lower
Carbon Sequestration (CS)	5.92	Moderate		
Organic Nutrient Export (OE)	6.47	Moderate		
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Aquatic Invertebrate Habitat (INV)	2.40	Lower	4.09	Moderate
Amphibian Habitat (AM)	5.29	Moderate	4.82	Moderate
Waterbird Feeding Habitat (WBF)	5.74	Moderate	5.00	Moderate
Waterbird Nesting Habitat (WBN)	3.58	Moderate	0.00	Lower
Songbird, Raptor, & Mammal Habitat (SBM)	8.99	Higher	5.00	Moderate
Pollinator Habitat (POL)	9.72	Higher	0.00	Lower
Native Plant Habitat (PH)	3.51	Lower	5.29	Lower
Public Use & Recognition (PU)			0.40	Lower
Wetland Sensitivity (Sens)			7.59	Higher
Wetland Ecological Condition (EC)			10.00	Higher
Wetland Stressors (STR) (higher score means more)			1.88	Lower
Summary Ratings for Grouped Functions:				
HYDROLOGIC Group (WS)	6.47	Moderate	1.83	Lower
WATER PURIFICATION Group	9.42	Higher	1.91	Lower
AQUATIC SUPPORT Group	1.25	Lower	2.80	Lower
AQUATIC HABITAT Group	4.48	Moderate	3.42	Moderate
TRANSITION HABITAT Group	8.69	Higher	4.36	Lower
WETLAND CONDITION			10.00	Higher
WETLAND RISK			4.56	Moderate

APPENDIX F: Mount Uniacke Business Park Wetland Alteration Application:
WESP Results

Wetland 3

Attribute	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating
Surface Water Storage (WS)	0.94	Lower	1.55	Lower
Stream Flow Support (SFS)	2.97	Moderate	3.35	Moderate
Streamwater Cooling (WC)	1.50	Lower	0.87	Lower
Sediment & Toxicant Retention & Stabilization (SR)	0.00	Lower	1.36	Moderate
Phosphorus Retention (PR)	0.69	Lower	1.29	Moderate
Nitrate Removal & Retention (NR)	2.16	Lower	3.33	Lower
Carbon Sequestration (CS)	3.11	Lower		
Organic Nutrient Export (OE)	0.00	Lower		
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower
Resident & Other Fish Habitat (FR)	0.00	Lower	0.00	Lower
Aquatic Invertebrate Habitat (INV)	4.04	Moderate	4.56	Moderate
Amphibian Habitat (AM)	6.82	Higher	3.71	Moderate
Waterbird Feeding Habitat (WBF)	5.46	Moderate	2.50	Lower
Waterbird Nesting Habitat (WBN)	4.89	Moderate	0.00	Lower
Songbird, Raptor, & Mammal Habitat (SBM)	8.95	Higher	2.50	Lower
Pollinator Habitat (POL)	8.71	Higher	0.00	Lower
Native Plant Habitat (PH)	5.49	Moderate	5.00	Lower
Public Use & Recognition (PU)			0.49	Lower
Wetland Sensitivity (Sens)			6.57	Moderate
Wetland Ecological Condition (EC)			10.00	Higher
Wetland Stressors (STR) (higher score means more)			1.88	Lower
Summary Ratings for Grouped Functions:				
HYDROLOGIC Group (WS)	0.94	Lower	1.55	Lower
WATER PURIFICATION Group	1.52	Lower	2.89	Lower
AQUATIC SUPPORT Group	1.70	Lower	3.98	Lower
AQUATIC HABITAT Group	5.53	Moderate	2.32	Moderate
TRANSITION HABITAT Group	8.42	Higher	3.75	Lower
WETLAND CONDITION			10.00	Higher
WETLAND RISK			4.13	Lower

Appendix G: Wetland Compensation



August 21, 2019

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

Dear Mr. Jones,

RE: Uniacke Business Park Expansion - Application to alter a wetland

As part of the above application, I am writing to confirm that upon receipt of confirmation from your department on the area of compensation required, the Municipality will procure the services of a wetland restoration specialist to provide the necessary compensation. A Letter of Understanding between the Municipality and a wetland restoration specialist will be provided to your department prior to the alteration of wetland habitat taking place.

Sincerely,

Connie Nolan, CPA, CA, CFE
Chief Administrative Officer

e: Project File