
APPENDIX A

MAPS



**THE MUNICIPAL GROUP
OF COMPANIES**

**DEXTER CONSTRUCTION
COMPANY LTD.**

**WILLIAMSDALE QUARRY
EXPANSION**

**Williamsdale,
Cumberland County,
Nova Scotia**

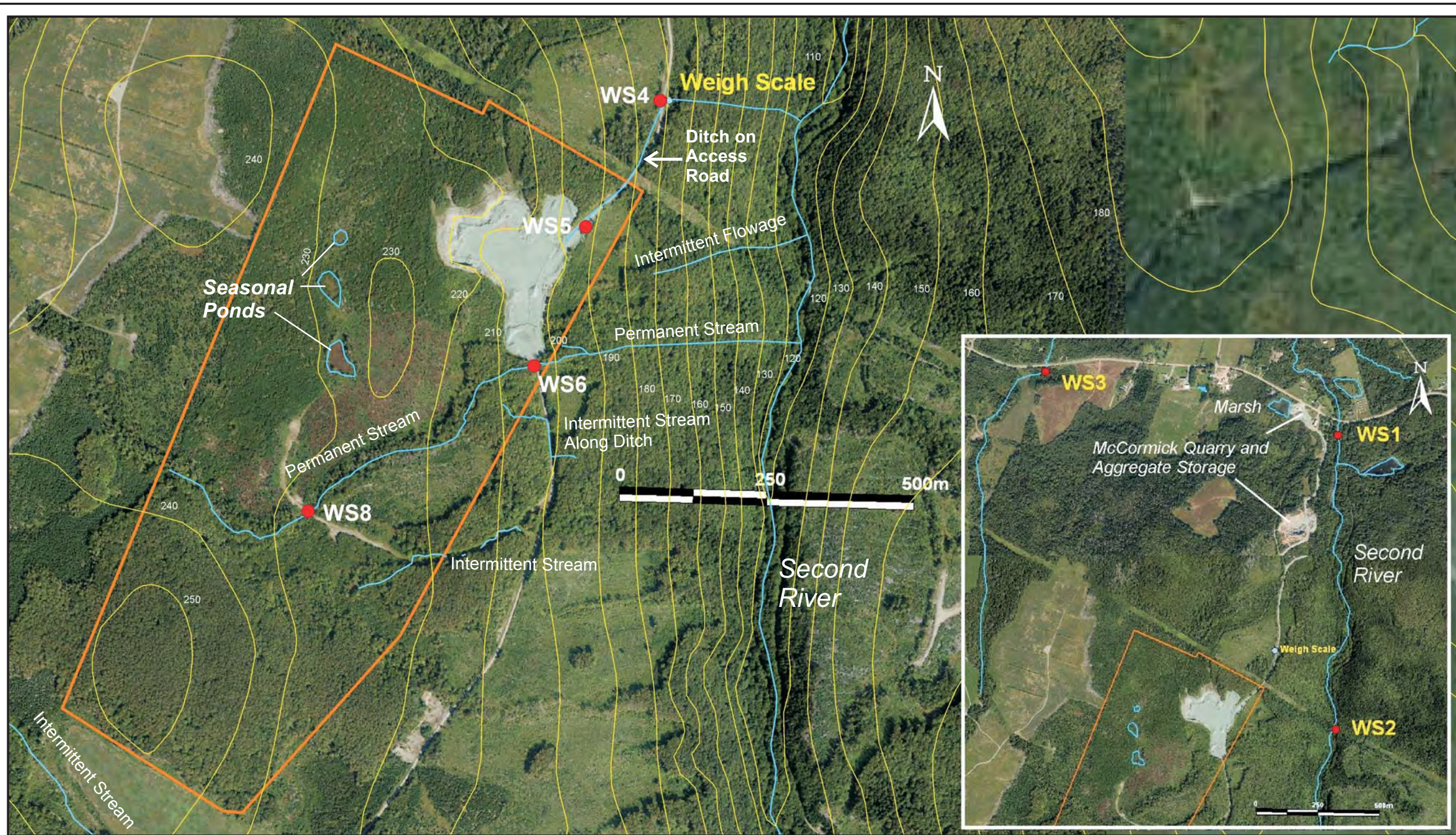
Site Location

 EA Study Area

Mapping by:
Envirosphere Consultants Ltd.
Windsor, Nova Scotia
April 2017

Base Map: NTS 1:50,000, 11E12

Map A-1



**THE MUNICIPAL GROUP
OF COMPANIES**

**DEXTER CONSTRUCTION
COMPANY LTD.**

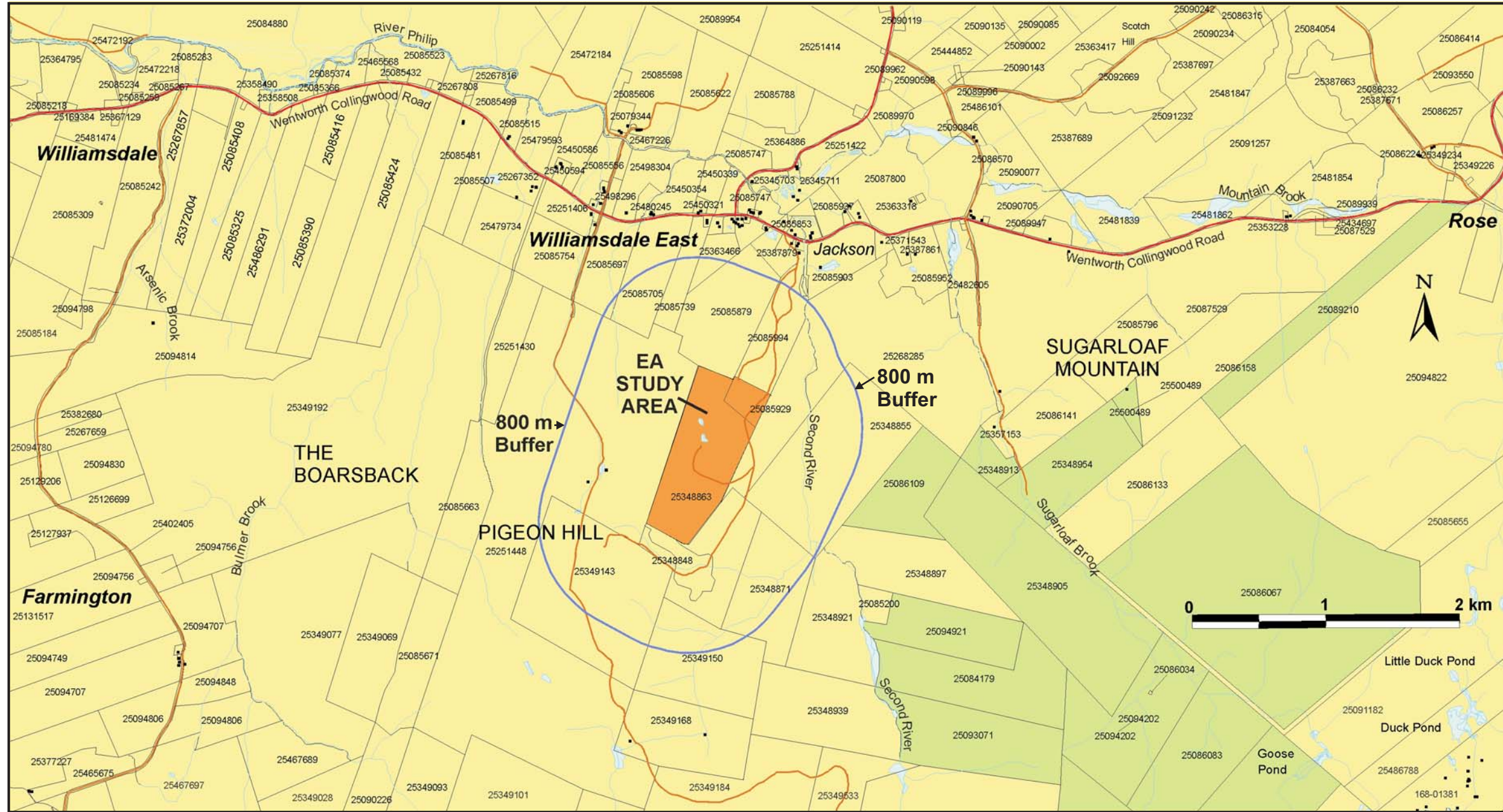
**WILLIAMSDALE QUARRY
EXPANSION
Cumberland County, N.S.**

Site Features

- Water Samples
- Elevations (m)
- Surface Waters
- EA Study Area

Map by:
 EnviroSphere Consultants Limited.
 Windsor, Nova Scotia, August 2017

Map A-2



THE MUNICIPAL GROUP OF COMPANIES

DEXTER CONSTRUCTION COMPANY LTD.

WILLIAMSDALE QUARRY EXPANSION

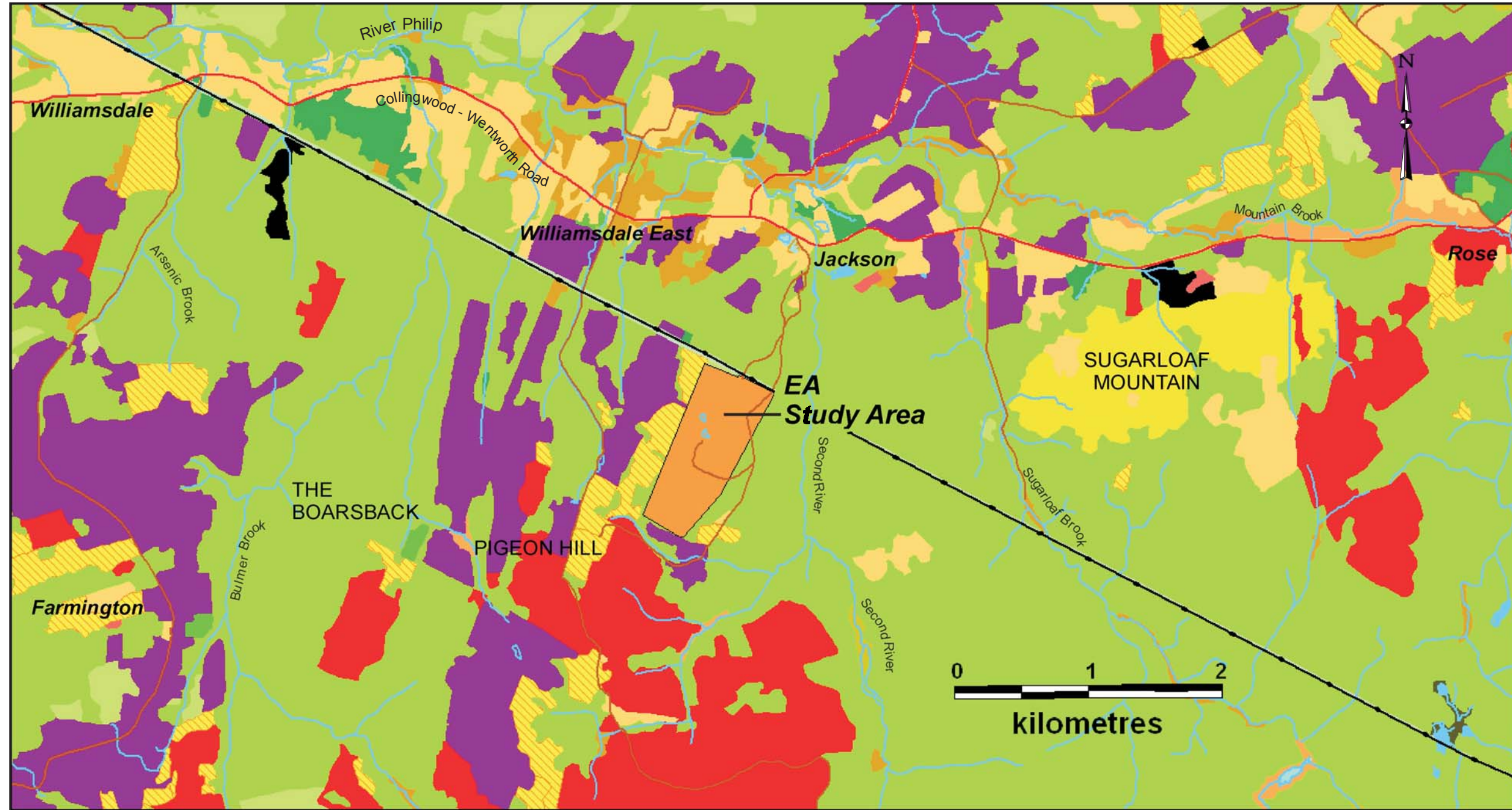
Cumberland County, Nova Scotia

Property Ownership

- Crown Land
- Quarry Property
- Property Boundaries
- Major Roads
- Minor Roads
- 800 m Buffer

Map by:
 EnviroSphere Consultants Limited
 Windsor, Nova Scotia, July 2017

Map A-3



THE MUNICIPAL GROUP OF COMPANIES

DEXTER CONSTRUCTION COMPANY LTD.

WILLIAMSDALE QUARRY EXPANSION
Cumberland County, N.S.

Land Use Classification

(based on NS Forestry Inventory, 2016)

- Agriculture / Urban
- Sugarbush
- Plantation
- Wetlands General
- Brush
- Inland Water
- Natural Stand
- Alders
- Silviculture
- Partial Depletion
- Tree Bog
- Open Bog
- Beaver Modified
- Clear Cut
- Blueberries
- Trunk Highway
- Secondary Roads & Trails
- Transmission Line


Map by:
Envirosphere Consultants Limited.
Windsor, Nova Scotia, May 2017

Map A-4

APPENDIX B

WETLAND/BOTANTICAL SURVEYS

Fall 2016 & Spring/Early Summer 2017



Botanical Survey for a Proposed Quarry Expansion at Williamsdale, Cumberland County, Nova Scotia

Ruth E. Newell, B. Sc. (Hons.), M.Sc.
November 31, 2016

Botanical Survey for a Proposed Quarry Expansion at Williamsdale, Cumberland County, Nova Scotia

Introduction

A vascular plant survey for a proposed quarry expansion in Williamsdale, Cumberland County, Nova Scotia was conducted by botanist Ruth E. Newell (B.Sc. (Hons.), M.Sc.) on Sept. 17, 2016.

The survey area is approximately 62.2 hectares (Figs. 1 & 2).

Habitats present on site include three very small seasonal marshes, undisturbed, primarily hardwood forest, an access roadway which bisects the property at its midpoint and a number of clearcuts at various stages of regrowth.

All vascular plant species observed during this survey, the habitats in which they occur and their status ranks are provided in TABLE 1. Definitions for these status ranks are provided in TABLE 1 and can also be found on the Atlantic Canada Conservation Data Centre (ACDC) website (http://www.accdc.com/dl_files/Definitions.pdf, <http://www.accdc.com/en/general-status.htm>).

The survey area, including the existing quarry are shown in Figures 1 and 2.



Figure 1. Satellite image of the existing quarry (area outlined in red) and of the survey area (area enclosed within yellow line).

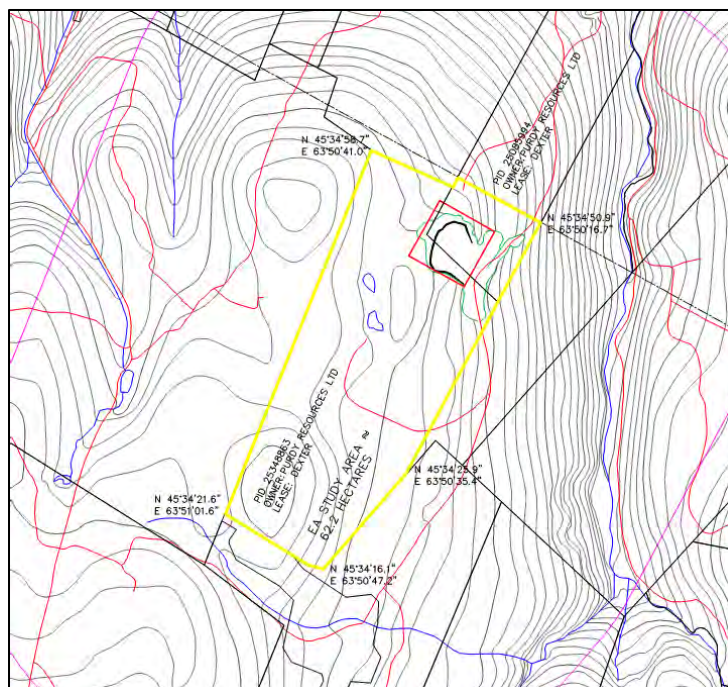


Figure 2. Topographic map of survey area (yellow box).



Figure 3. A closer view of one section of the survey site showing the location of three marshes (blue arrows) and the location of species of conservation concern observed during this survey: Tender Sedge (*Carex tenera*) – yellow dot, Yellow Ladies’-tresses (*Spiranthes ochroleuca*) - Green dot and Blood Milkwort (*Polygala sanguinea*) - red dot.

Results

Habitat Descriptions

1) Marshes

Three small seasonal marshes are present within the survey area. All three occur in fairly close proximity to each other in the north half of the study site and are likely part of the same drainage system (Fig. 3). All three have mineral soil as a substrate. They were all completely dry at the time of this survey. The southern most marsh is dominated throughout by Royal Fern (*Osmunda regalis*) (Fig. 4). Various willow species (*Salix* spp.) are very common around the marsh edges (TABLE 1). The second marsh (Fig. 5), a short distance north of the previously described wetland, is dominated by Common Woolly Bulrush (*Scirpus cyperinus*). Again, as with the first marsh, willows are very common in the peripheral areas. The third and northernmost marsh is dominated by the shrub Meadowsweet (*Spiraea alba* var. *latifolia*). Willows (*Salix* spp.) again, are very common around the edges of this marsh (Fig. 6).

Some of the other more common species occurring in these marshes include: Sensitive Fern (*Onoclea sensibilis*), Cinnamon Fern (*Osmunda cinnamomea*) and Red-osier Dogwood (*Cornus stolonifera*). Rhodora (*Rhododendron canadense*) and Large Cranberry (*Vaccinium macrocarpon*) were common species in the northernmost marsh but seemed to be absent in the other two wetlands.

Species of conservation concern:

No species of conservation concern were observed within these three wetlands.



Figure 4. The southernmost marsh in a series of three marshes within the survey area. The brown/golden vegetation is Royal Fern (*Osmunda regalis*). The fronds of this fern have died likely due to extreme drought conditions. Willows (*Salix* spp.) are very common around the periphery of the marsh.



Figure 5. The middle marsh in a series of three marshes occurring within the survey area. The dominant species in the center of this wetland is Common Woolly Bulrush (*Scirpus cyperinus*). Abundant peripheral species include Sensitive Fern (*Onoclea sensibilis*), Royal Fern (*Osmunda regalis*) and several willow species (*Salix* spp.).



Figure 6. The northernmost marsh in a series of three marshes within the survey area. The common species within this wetland are Common Woolly Bulrush (*Scirpus cyperinus*) and the shrub Meadowsweet (*Spiraea alba* var. *latifolia*).

2) Clearcuts

Most of the top two thirds of the survey area has been cut over at various times over the past ten years.

Common herbaceous species present in these areas include Canada Goldenrod (*Solidago canadensis*), Rough Goldenrod (*Solidago rugosa*), Tall White Aster (*Doellingeria umbellata*), Fowl Manna Grass (*Glyceria striata*), Soft Rush (*Juncus effusus* s.l.), Fireweed (*Epilobium angustifolium*), Pearly Everlasting (*Anaphalis margaritacea*), Wild Strawberry (*Fragaria virginiana*). Common shrub and tree species include: Pin Cherry (*Prunus pensylvanica*), Wire Birch (*Betula populifolia*), Balsam Fir (*Abies balsamea*), Wild Raspberry (*Rubus strigosus*), willows (*Salix* spp.), White Spruce (*Picea glauca*), Lowbush Blueberry (*Vaccinium angustifolium*), etc.

Species of conservation concern:

- 1) Tender Sedge (*Carex tenera*) (no photo available) (location: ~ 45.580185°, -063.844433°)

Tender Sedge (*Carex tenera*) was observed in a clearcut just north of the northernmost marsh (Fig. 3). Several clumps were located in a small depression growing with Mad-dog Skullcap (*Scutellaria lateriflora*). This species has a general status of YELLOW (= sensitive) within Nova Scotia and is listed as a S2 species (= imperiled) by the Atlantic Canada Conservation Data Centre.



Figure 7. One of the areas near the existing quarry which has been cutover. The age of this clearcut is estimated to be approximately 6 – 10 years.

3) Woodland (undisturbed)

The southwestern third of the property and a small section immediately north of the existing quarry consist of relatively undisturbed woodland (Fig. 8). Occasional small streams and seepages are found within these areas. Tree species present include American Beech (*Fagus grandifolia*), Sugar Maple (*Acer saccharum*), Mountain Maple (*Acer spicatum*), Moose Maple (*Acer pensylvanicum*), Yellow Birch (*Betula alleghaniensis*), Red Spruce (*Picea rubens*) and Eastern Hemlock (*Tsuga canadensis*). Commonly occurring herbaceous species in this habitat include several wood ferns (*Dryopteris intermedia*, *D. cathusiana*), Cinnamon Fern (*Osmunda cinnamomea*), Wild Sarsaparilla (*Aralia nudicaulis*), Oak fern (*Gymnocarpium dryopteris*), Wood Aster (*Oclemena acuminata*) and Jack-in-the-pulpit (*Arisaema triphyllum*). Shrubs present include Canada Fly Honeysuckle (*Lonicera canadensis*), Hobblebush (*Viburnum alnifolium*) and Beaked Hazelnut (*Corylus cornuta*).

Species of conservation concern:

There were no species of conservation concern found within woodland habitat during this survey.



Figure 8. Undisturbed woodland in the southern portion of the survey area.

4) Roadway

The parcel of land under consideration for this quarry expansion is partly bisected at its midpoint by a roadway which likely acted as an access route for earlier clearcutting activities (Fig. 3, Fig. 9, TABLE 1).

This is a fairly disturbed area and has a mixture of both exotic (non-native) and native vascular plant species including Common Plantain (*Plantago major*), Fall Dandelion (*Leontodon autumnalis*), Common St. John's-wort (*Hypericum perforatum*), Healall (*Prunella vulgaris*), Path Rush (*Juncus tenuis*), Wild Strawberry (*Fragaria virginiana*), Colonial Bentgrass (*Agrostis capillaris*), Rough Bentgrass (*Agrostis scabra*), Pearly Everlasting (*Anaphalis margaritacea*), Poverty Grass (*Danthonia spicata*), various Goldenrods (*Solidago* spp.) various Asters including Tall White Aster (*Doellingeria umbellata*), Wood Aster (*Oclemena acuminata*), New York Aster (*Symphyotrichum novi-belgii*) and Calico Aster (*Symphyotrichum lateriflorum*), etc. Many of these species are characteristic of disturbed and/or run out soils. Several rare native vascular plant species were noted and documented within this habitat (Figs. 10 & 11). These are species that would normally be found in areas of natural disturbance in the wild.



Figure 9. Access roadway located in middle of survey area.

Species of conservation concern:

1. Yellow Ladies'-tresses (*Spiranthes ochroleuca*) (Fig. 10) (Location:45.57690°N, -063.84555°W)

Yellow Ladies'-tresses was scattered along the edge of the roadway which provided access to the interior of the property likely for clearcutting purposes (Fig 3). It was growing with Nodding Ladies'-tresses (*Spiranthes cernua*). The population size for Yellow Ladies'-tresses at this location was approximately 10 plants.

Although the General Status Rank for this species in Nova Scotia is GREEN, i.e., it is considered secure, the ACCDC Subnational Rank for this species is S3 which indicates a species that is considered

vulnerable. A vulnerable rank indicates a species that considered vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.



Figure 10. Yellow Ladies'-tresses (*Spiranthes ochroleuca*) growing on an access roadway.

2. Blood Milkwort (*Polygala sanguinea*) (Fig. 11) (Location: 45.57523°N, -063.84335°W)

Blood Milkwort (*Polygala sanguinea*) was also discovered on the access roadway which bisects the survey area. Approximately 10 flowering plants plus several non-flowering plants were located both along the edge of and in the centre of the roadway (Figs. 3 & 11).

The Nova Scotia General Status of Blood Milkwort is YELLOW, meaning, it is considered to be a sensitive species. The ACCDC subnational status for this species is S2S3 indicating that there is some uncertainty associated with the status of this species and it is therefore placed between two statuses and in this case, the statuses are IMPERILED and VULNERABLE.



Figure 11. Blood Milkwort (*Polygala sanguinea*) growing on an access roadway.

Discussion

No species listed under either federal species-at-risk legislation or provincial species-at-risk- legislation were observed on the quarry property during this survey.

Three species with various degrees of conservation concern were documented:

1. Tender Sedge (*Carex tenera*): General Status: YELLOW (sensitive); ACCDC Status: S2 (imperiled)
2. Blood Milkwort (*Polygala sanguinea*): General Status: YELLOW (sensitive); ACCDC Status: S2S3 (imperiled to vulnerable)
3. Yellow Ladies'-tresses (*Spiranthes ochroleuca*): General Status: GREEN (secure); ACCDC Status: S3 (vulnerable)

Tender Sedge (*Carex tenera*)

Several small clumps of this species were located just north of the northern most marsh (Fig. 3) in a clearcut. The plants were growing on the edge of a small depression in the open. Typically, this species occurs in meadows, moist or dry clearings, and woodland vernal pools (see Nova Scotia Plants, Marian C. Munro, Ruth E. Newell, Nicholas M. Hill, <https://ojs.library.dal.ca/NSM/article/view/5442>) Because it was late in the season for this species, i.e., fruit was in final stages of dispersal thereby rendering some plants unidentifiable, and because this location was only a short distance from one of the three marshes described earlier in this report, it is recommended that a return trip be made to this site earlier in the

growing season and also, that more time be spent in the general area of this section of the clearcut and in the vicinity of three marshes as well as in the marshes themselves to determine population size.

Blood Milkwort (*Polygala sanguinea*) & Yellow Ladies'-tresses (*Spiranthes ochroleuca*)

Both of these species are plants that typically occur in disturbed habitat whether it be naturally occurring or manmade. The construction of an access roadway at this location eventually provided or allowed for the formation of suitable growing conditions for Blood Milkwort and Yellow Ladies'-tresses. These two species are therefore considered to be of less conservation concern than the previous species (*Carex tenera*).

It is recommended that this fall survey be followed up with a late spring or early summer survey for two reasons: 1) to document possible early flowering/fruitletting plant species that are not evident in the fall and 2) to examine the three marshes and the clearcut area surrounding them more closely in order to look for additional plants of Tender Sedge (*Carex tenera*).

TABLE 1

Vascular plant species observed during the botanical survey for a proposed quarry expansion in Williamsdale, Cumberland County, Nova Scotia. The survey was conducted on September 17, 2016. The Nova Scotia General Status Ranks and the Atlantic Canada Conservation Data Centre's Subnational Status Ranks are provided for each species. The habitats where each species was observed are also noted in this table (C = clearcuts, M = marshes, R = roadway, W = undisturbed woodland). Species with conservation concern are indicated by bold font.

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Abies balsamea</i>	Balsam Fir	GREEN	S5	C, W
<i>Acer pensylvanicum</i>	Moose Maple	GREEN		W
<i>Acer rubrum</i>	Red Maple	GREEN	S5	M
<i>Acer saccharum</i>	Sugar Maple	GREEN	S5	C, W
<i>Acer spicatum</i>	Mountain Maple	GREEN	S5	W
<i>Agrostis capillaris</i>	Colonial Bentgrass	EXOTIC	SNA	C, R
<i>Agrostis scabra</i>	Rough Bentgrass	GREEN	S5	R

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Agrostis stolonifera</i>	Creeping Bent Grass	GREEN	S5	R
<i>Alnus alnobetula</i> <i>ssp. crispa</i>	Downy Alder	GREEN	S5	C
<i>Anaphalis margaritacea</i>	Pearly Everlasting	GREEN	S5	C, R
<i>Aralia nudicalulis</i>	Wild Sarsaparilla	GREEN	S5	C, W
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	GREEN	S5	W
<i>Betula alleghaniensis</i>	Yellow Birch	GREEN	S5	C, W
<i>Betula papyrifera</i>	Paper Birch	GREEN	S5	C
<i>Betula populifolia</i>	Wire Birch	GREEN	S5	C
<i>Bromus ciliatus</i>	Fringed Brome Grass	GREEN	S5	C
<i>Carex crinita</i>	Fringed Sedge	GREEN	S5	M, W
<i>Carex disperma</i>	Two-seeded Sedge	GREEN	S5	W
<i>Carex intumescens</i>	Bladder Sedge	GREEN	S5	P
<i>Carex lurida</i>	Sallow Sedge	GREEN	S5	W
<i>Carex pseudocyperus</i>	Cyperuslike Sedge	GREEN	S4S5	W
<i>Carex scabrata</i>	Rough Sedge	GREEN	S5	W
<i>Carex scoparia</i>	Broom Sedge	GREEN	S5	R
<i>Carex tenera</i>	Tender Sedge	YELLOW	S2	C
<i>Chelone glabra</i>	Turtlehead	GREEN	S5	W
<i>Chrysosplenium americanum</i>	Golden Saxifrage	GREEN	S5	W
<i>Cinna latifolia</i>	Drooping Wood Reed Grass	GREEN	S5	W
<i>Circaea alpina</i>	Small Enchanter's Nightshade	GREEN	S5	W
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	GREEN	S5	C, W
<i>Cornus canadensis</i>	Bunchberry	GREEN	S5	C
<i>Cornus stolonifera</i>	Red Osier Dogwood	GREEN	S5	C, M
<i>Corylus cornuta</i>	Beaked Hazelnut	GREEN	S5	W
<i>Danthonia compressa</i>	Flat-stemmed Oatgrass	GREEN	S5	R
<i>Danthonia spicata</i>	Poverty Grass	GREEN	S5	R
<i>Deparia acrostichoides</i>	Silvery Spleenwort	GREEN	S4	W

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Doellingeria umbellata</i>	Tall White Aster	GREEN	S5	C, R
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	GREEN	S5	W
<i>Dryopteris cristata</i>	Crested Wood Fern	GREEN	S5	W
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	GREEN	S5	W
<i>Chamerion angustifolium</i>	Fireweed	GREEN	S5	C
<i>Epilobium</i> sp.	a willow herb	-	-	R
<i>Equisetum arvense</i>	Field Horsetail	GREEN	S5	R
<i>Equisetum sylvaticum</i>	Woodland Horsetail	GREEN	S5	W
<i>Euphrasia nemorosa</i>	Common Eyebright	GREEN	S5	R
<i>Euthamia graminifolia</i>	Narrow-leaved Goldenrod	GREEN	S5	C, R
<i>Fagus grandifolia</i>	American Beech	GREEN	S5	C, W
<i>Fragaria virginiana</i>	Wild Strawberry	GREEN	S5	C, R
<i>Fraxinus americana</i>	White Ash	GREEN	S5	C
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	EXOTIC	SNA	W
<i>Glyceria melicaria</i>	Slender Manna Grass	GREEN	S4	W
<i>Glyceria striata</i>	Fowl Manna Grass	GREEN	S5	C, R, W
<i>Gymnocarpium dryopteris</i>	Oak Fern	GREEN	S5	W
<i>Hieracium</i> sp.	a hawkweed	EXOTIC	SNA	R
<i>Hypericum boreale</i>	Northern St. John's-wort	GREEN	S5	M
<i>Hypericum perforatum</i>	Common St. John's-wort	EXOTIC	SNA	R
<i>Impatiens capensis</i>	Spotted Touch-me-not	GREEN	S5	W
<i>Juncus brevicaudatus</i>		GREEN	S5	R
<i>Juncus effusus</i> s.l.	Soft Rush	GREEN	S5	C, R
<i>Juncus tenuis</i>	Path Rush	GREEN	S5	R
<i>Leontodon autumnalis</i>	Fall Dandelion	EXOTIC	SNA	R

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Lonicera canadensis</i>	Canada Fly Honeysuckle	GREEN	S5	W
<i>Lycopodium obscurum s.l.</i>	Tree-clubmoss	-	-	W
<i>Lycopus uniflorus</i>	Northern Water Horehound	GREEN	S5	M
<i>Moehringia lateriflora</i>	Blunt-leaved Sandwort	GREEN	S5	C
<i>Oclemena acuminata</i>	Wood Aster	GREEN	S5	C, R, W
<i>Oenothera biennis</i>	Common Evening Primrose	GREEN	S5	C, R
<i>Onoclea sensibilis</i>	Sensitive Fern	GREEN	S5	C, M, W
<i>Osmunda cinnamomea</i>	Cinnamon Fern	GREEN	S5	W
<i>Osmunda claytoniana</i>	Interrupted Fern	GREEN	S5	W
<i>Osmunda regalis</i>	Royal Fern	GREEN	S5	M
<i>Ostrya virginiana</i>	Ironwood	GREEN		W
<i>Picea glauca</i>	White Spruce	GREEN	S5	C, W
<i>Picea rubens</i>	Red Spruce	GREEN	S5	C, W
<i>Plantago major</i>	Common Plantain	EXOTIC	SNA	R
<i>Polygala sanguinea</i>	Blood Milkwort	YELLOW	S2S3	R
<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	GREEN	S5	W
<i>Polystichum acrostchoides</i>	Christmas Fern	GREEN	S5	C, W
<i>Populus tremuloides</i>	Trembling Aspen	GREEN	S5	M
<i>Potentilla sp.</i>	a cinquefoil	-	-	R
<i>Prunella vulgaris</i>	Heal-all	GREEN	S5	R
<i>Prunus pensylvanica</i>	Pin Cherry	GREEN	S5	C
<i>Pteridium aquilinum</i>	Bracken	GREEN	S5	R
<i>Ranunculus repens</i>	Creeping Buttercup	EXOTIC	SNA	W
<i>Rhododendron canadense</i>	Rhodora	GREEN	S5	M
<i>Rubus pubescens</i>	Dewberry	GREEN	S5	C
<i>Rubus sp.</i>	a blackberry	-	-	C
<i>Rubus idaeus ssp. strigosus</i>	Wild Raspberry	GREEN	S5	C

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Salix bebbiana</i>	Bebb's Willow	GREEN	S5	C, M
<i>Salix discolor</i>	Pussy Willow	GREEN	S5	M
<i>Salix pyrifolia</i>	Balsam Willow	GREEN	S5	M
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	GREEN	S5	C, M, W
<i>Scirpus microcarpus</i>	Red-tinged Bulrush	GREEN	S5	W
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	GREEN	S5	C, W
<i>Solidago bicolor</i>	White Goldenrod	GREEN	S5	R
<i>Solidago canadensis</i>	Canada Goldenrod	GREEN	S5	C, R
<i>Solidago puberula</i>	Downy Goldenrod	GREEN	S5	R
<i>Solidago rugosa</i>	Rough Goldenrod	GREEN	S5	C, R
<i>Spiraea alba</i> var. <i>latifolia</i>	Meadowsweet	GREEN	S5	C, M
<i>Spiranthes cernua</i>	Nodding Ladies'- tresses	GREEN	S5	R
<i>Spiranthes ochroleuca</i>	Yellow Ladies'- tresses	GREEN	S3	R
<i>Symphyotrichum lateriflorum</i>	Calico Aster	GREEN	S5	C, R, W
<i>Symphyotrichum novi-belgii</i>	New York Aster	GREEN	S5	R
<i>Thelypteris noveboracensis</i>	New York Fern	GREEN	S5	C, R, W
<i>Thelypteris simulata</i>	Bog Fern	GREEN	S4	M, W
<i>Toxicodendron rydbergii</i>	Poison Ivy	GREEN	S5	M
<i>Trientalis borealis</i>	Starflower	GREEN	S5	W
<i>Tsuga canadensis</i>	Eastern Hemlock	GREEN	S5	W
<i>Tussilago farfara</i>	Coltsfoot	EXOTIC	SNA	C
<i>Typha latifolia</i>	Broad-leaved Cattail	GREEN	S5	W
<i>Vaccinium angustifolium</i>	Lowbush Blueberry	GREEN	S5	C, R
<i>Vaccinium macrocarpon</i>	Large Cranberry	GREEN	S5	M
<i>Veronica americana</i>	American Speedwell	GREEN	S5	W
<i>Veronica scutellata</i>	Marsh Speedwell	GREEN	S5	M

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Viburnum alnifolium</i>	Hobblebush	GREEN	S5	W
<i>Viola blanda</i>	Sweet White Violet	GREEN	S5	W
<i>Viola macloskeyi</i>	Small White Violet	GREEN	S5	W

*The Nova Scotia general status ranks are based on the ranks used in the 2010 Wild Species of Canada Report (available at <http://www.accdc.com/en/general-status.html>); explanation of the general status ranks found within this report: GREEN = secure; YELLOW = sensitive; EXOTIC = a non-native species of no conservation concern.

**ACCDC: Atlantic Canada Conservation Data Centre (<http://www.accdc.com/>); explanation of subnational status ranks used in this report:

S5 = **Secure** - Common, widespread, and abundant in the province

S4 = **Apparently Secure** - Uncommon but not rare; some cause for long-term concern due to declines or other factors

S3 = **Vulnerable** - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation

S2 = **Imperiled** - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province

S2S3 = **Range Rank** - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community.

SNA = **Not Applicable** - A conservation status rank is not applicable because the species is not a suitable target for conservation activities

Botanical Survey for a Proposed Quarry Expansion at Williamsdale, Cumberland County, Nova Scotia, Part 2 (Spring Survey)

Ruth E. Newell, B.Sc. (Hons.), M.Sc.
June 15, 2017

Botanical Survey for a Proposed Quarry Expansion at Williamsdale, Cumberland County, Nova Scotia Part 2 (Spring Survey)

Introduction

A spring survey of vascular plants was conducted at the site of a proposed quarry expansion in Williamsdale, Cumberland County, Nova Scotia, on June 8, 2017 (Fig. 1). A spring or early summer survey was one of several recommendations in a report stemming from an earlier survey conducted by botanist Ruth E. Newell, on September 17th, 2016. A spring survey was recommended for the purpose of documenting early flowering and fruiting plant species that would not be readily evident in September or would be more difficult to identify accurately late in the growing season. Another recommendation from the previous study was to better determine the extent of the YELLOW-listed sedge species, Tender Sedge (*Carex tenera*), which was documented in the fall survey in the vicinity of one of three seasonal ponds/marshes which occur west of the current quarry pit. The spring survey was also conducted by botanist Ruth E. Newell.

The main areas surveyed for the spring survey were targeted based on the potential for the occurrence of species of significance as determined from the earlier survey. These areas included the mature deciduous woodland which dominates the southwest third of the property plus a small undisturbed section of hardwood forest immediately adjacent to the southernmost tip of the present quarry. In addition, the three seasonal ponds were resurveyed.

All vascular plants observed during both surveys are listed in TABLE 1. The additional species observed in the spring survey are highlighted in YELLOW in this table. The habitats in which each species occurred and their Atlantic Canada Conservation Data Centre and General Status ranks are indicated in TABLE 1. Definitions for these status ranks are provided in this report (TABLE 1) but are also available on the Atlantic Canada Conservation Data Centre (ACCDC) website (<http://www.accdc.com/>) and on the General Status Ranks of Wild Species in Canada website (please note that the 2010 Wild Species of Canada Report is only available by e-mailing the following address: ec.especessauvages-wildspecies.ec@canada.ca); an updated version of Wild Species, due to be released soon, will utilize the same ranking system as used by the ACCDC).



Figure 1. Satellite image of the existing quarry (area outlined in red) and of the survey area (area enclosed within yellow line).

Results

Woodland Habitat

As mentioned in the fall report, there is an extensive area of undisturbed deciduous woodland (Figs. 1, 2 & 3) in the bottom third of the property. In addition, there are two small isolated patches of similar forest on the north and south side of the existing quarry (Fig. 3). Sugar Maple (*Acer saccharum*) is the

predominant tree species in this woodland habitat and forms a high canopy. There is an understory component composed of Moose Maple (*Acer pensylvanicum*), Mountain Maple (*Acer spicatum*), Beech (*Fagus grandifolia*), Balsam Fir (*Abies balsamea*) and Yellow Birch (*Betula alleghaniensis*). Shrub species present include Hobblebush (*Viburnum alnifolium*), Canada Fly Honeysuckle (*Lonicera canadensis*), Beaked Hazelnut (*Corylus cornuta*) and Alternate-leaved Dogwood (*Cornus alternifolia*). Ground cover is dominated by Wood Ferns (*Dryopteris* spp.) plus a variety of other fern species (TABLE 1). Other herbaceous species present include Trout Lily (*Erythronium americanum*), Nodding Trillium (*Trillium cernuum*) and Red Baneberry (*Actaea rubra*).

A small stream (Figs. 3, 4 & 5) and several small wetlands (Figs. 3, 6 & 7) are present near the top edge of the larger woodland in the southern part of the property. Ultimately the stream leaves this deciduous woodland and heads northeastwards through a cutover area and small section of deciduous forest and then exits the property immediately south of the existing quarry. Vascular plant species associated with this stream and the wetlands are included with the woodland habitat species in TABLE 1.



Figure 2. Deciduous forest in the bottom third of the survey area. The dominant canopy species is Sugar Maple (*Acer saccharum*).



Figure 3. Image depicting locations of woodland wetlands A & B (white dots with black centers). The blue arrows show the path of a small stream which flows from the west side of the survey area up to the bottom edge of the existing quarry (green pin) and then proceeds under the roadway to the east. The orange arrows show the locations of the three seasonal ponds. The yellow dot represents the area where the YELLOW-listed plant species, Tender Sedge (*Carex tenera*) was located. The red asterisks represent undisturbed deciduous woodland.



Figure 4. Small stream occurring at the north end of the deciduous woodland in the southwest end of the survey site.



Figure 5. The same stream depicted in Fig. 4 but at a different location. This section of the stream is in a small isolated deciduous woodland immediately south of the existing quarry.

The two small wetlands mentioned above, that occur within the large deciduous woodland in the vicinity of the stream are in close proximity to each other. One wetland (A) (45.57544°N, -063.84694°W) is associated with the stream previously described. The second wetland (B) (45.57528°N, -063.84731°W) does not appear to be associated with the stream but is not far away from it or the first wetland. (Figs. 3, 6 & 7). These wetlands are dominated by a variety of fern and sedge species including Ostrich Fern (*Matteucia struthiopteris*), Silvery Spleenwort (*Deparia acrostichoides*), Sensitive Fern (*Onoclea sensibilis*), Cinnamon Fern (*Osmunda cinnamomea*), Rough Sedge (*Carex scabrata*) and Fringed Sedge (*Carex crinita* s.l). Other common vascular plant species present include: Golden Saxifrage (*Chrysosplenium americanum*), a touch-me-not (*Impatiens* sp.), Rough Goldenrod (*Solidago rugosa*), Bristly-stalked Sedge (*Carex leptalea*), Two-seeded Sedge (*Carex disperma*), Finely-nerved Sedge (*Carex leptoneuria*), Bog Stitchwort (*Stellaria alsine*) and Hooked Buttercup (*Ranunculus recurvatus*).

Wetland B is approximately 20 x 50 m in extent. Wetland A is slightly larger than wetland B.



Figure 6. One of the two wetlands (Wetland A in Fig. 3) located in the large deciduous woodland at the southwest end of the survey area. This area was associated with the small stream that crosses the property. Fern species, including Sensitive Fern (*Onoclea sensibilis*) and Ostrich Fern (*Matteucia struthiopteris*), are dominant in this wetland.



Figure 7. Wetland B in Fig. 3. This wetland is only a short distance from wetland A and appears to be more botanically diverse than wetland A.

Seasonal Ponds (labelled as *marshes* in the fall survey report)

All three seasonal ponds located to the west of the active quarry pit had water in them at the time of this survey (Figs. 3, 8 & 9). This is in stark contrast to the 2016 fall survey when all ponds were seemingly bone dry due to drought conditions over the previous summer (Fig. 9). Willows (*Salix* spp.), Meadowsweet (*Spiraea alba* var. *latifolia*), Royal Fern (*Osmunda regalis*), etc. are common to abundant species in these areas. There is also a robust stand of Poison Ivy (*Toxicodendron rydbergii*) on the lower west side of the southernmost pond (45.57809°N, -063.84477°W).

One of the goals of this spring survey was to examine the habitat in the vicinity of the ponds to be able to determine the distribution and abundance of Tender Sedge (*Carex tenera*). This YELLOW-listed species was observed near the north end of the upper most pond (Fig. 3) in an open clearcut on the edge of a small depression growing with Mad-dog Skullcap (*Scutellaria lateriflora*) during the fall survey (45.58023°N, -063.84426°W). This area was re-examined during the spring survey for this species. It was however, discovered that it was too early in the growing season to be able to recognize/identify this

sedge species in the field. All plant growth in this specific area appeared to be delayed possibly due to spring flooding (Fig. 10). Therefore, a return visit to this location is recommended for later in the growing season, possibly in mid-late July.



Figure 8. The southernmost seasonal pond in a north/south series of three ponds located west of the existing quarry. The photo was taken on June 8, 2017. On this date, all three ponds had water in them in contrast to the previous fall when all three ponds were dry (Fig. 9).



Figure 9. The same pond as in Fig. 8 on September 17, 2016. At this time, this wetland was completely dry. The shrubs present are willow species (*Salix* spp.). The centre of the wetland is dominated by Royal Fern (*Osmunda regalis*).



Figure 10. The habitat (edge of small depression in clearcut), where Tender Sedge (*Carex tenera*), a YELLOW-listed species in Nova Scotia, was discovered during a fall plant survey (Sept. 17, 2016). This photo was taken during the spring survey and shows limited growth and development of the various plant species in this area. This therefore, inhibits the accurate identification of the various graminoid plant species present.

Discussion

No additional species of conservation concern were observed during this spring vascular plant survey. (Please see the fall report for the species of conservation concern that were documented at that time).

With respect to the YELLOW-listed species, Tender Sedge (*Carex tenera*), unfortunately, June 8, 2017 proved to be too early in the growing season to be able to address the recommendation in the fall report to return to this site to determine its distribution and population size. Plant growth was not far enough along to enable accurate identification of the various graminoid species present (Fig. 10). It is therefore recommended that a return visit be made to this area later in the summer around mid- to late July to establish population size and distribution of this species.

TABLE 1

Vascular plant species observed during fall and spring botanical surveys for a proposed quarry expansion in Williamsdale, Cumberland County, Nova Scotia (species observed during a recent spring survey are highlighted in YELLOW). The surveys were conducted on September 17, 2016 and June 8, 2017. The Nova Scotia General Status Ranks and the Atlantic Canada Conservation Data Centre's Subnational Status Ranks are provided for each species. The habitats where each species was observed are also noted in this table (C = clearcuts, M = marshes (seasonal ponds), R = roadway, W = undisturbed deciduous woodland). Species with conservation concern are indicated by bold font.

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Abies balsamea</i>	Balsam Fir	GREEN	S5	C, W
<i>Acer pensylvanicum</i>	Moose Maple	GREEN		W
<i>Acer rubrum</i>	Red Maple	GREEN	S5	M
<i>Acer saccharum</i>	Sugar Maple	GREEN	S5	C, W
<i>Acer spicatum</i>	Mountain Maple	GREEN	S5	W
<i>Actaea rubra</i>	Red Baneberry	GREEN	S5	W
<i>Agrostis capillaris</i>	Colonial Bentgrass	EXOTIC	SNA	C, R
<i>Agrostis scabra</i>	Rough Bentgrass	GREEN	S5	R
<i>Agrostis stolonifera</i>	Creeping Bent Grass	GREEN	S5	R
<i>Alnus alnobetula</i> ssp. <i>crispa</i>	Downy Alder	GREEN	S5	C
<i>Anaphalis margaritacea</i>	Pearly Everlasting	GREEN	S5	C, R
<i>Aralia nudicalulis</i>	Wild Sarsaparilla	GREEN	S5	C, W
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	GREEN	S5	W
<i>Athyrium filix-femina</i>	Lady Fern	GREEN	S5	W
<i>Betula alleghaniensis</i>	Yellow Birch	GREEN	S5	C, W
<i>Betula papyrifera</i>	Paper Birch	GREEN	S5	C
<i>Betula populifolia</i>	Wire Birch	GREEN	S5	C
<i>Bromus ciliatus</i>	Fringed Brome Grass	GREEN	S5	C
<i>Cardamine diphylla</i>	Toothwort	GREEN	S4	W
<i>Carex crinita</i> sl	Fringed Sedge	GREEN	S5	M, W
<i>Carex deweyana</i>	Dewey's Sedge	GREEN	S5	W

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Carex disperma</i>	Two-seeded Sedge	GREEN	S5	W
<i>Carex intumescens</i>	Bladder Sedge	GREEN	S5	P
<i>Carex leptalea</i>	Bristly-stalked Sedge	GREEN	S5	W
<i>Carex leptonevia</i>	Finely-nerved Sedge	GREEN	S5	W
<i>Carex lurida</i>	Sallow Sedge	GREEN	S5	W
<i>Carex pseudocyperus</i>	Cyperuslike Sedge	GREEN	S4S5	W
<i>Carex scabrata</i>	Rough Sedge	GREEN	S5	W
<i>Carex scoparia</i>	Broom Sedge	GREEN	S5	R
<i>Carex tenera</i>	Tender Sedge	YELLOW	S2	C
<i>Chamerion angustifolium</i>	Fireweed	GREEN	S5	C
<i>Chelone glabra</i>	Turtlehead	GREEN	S5	W
<i>Chrysosplenium americanum</i>	Golden Saxifrage	GREEN	S5	W
<i>Cinna latifolia</i>	Drooping Wood Reed Grass	GREEN	S5	W
<i>Circaea alpina</i>	Small Enchanter's Nightshade	GREEN	S5	W
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	GREEN	S5	C, W
<i>Cornus canadensis</i>	Bunchberry	GREEN	S5	C
<i>Cornus stolonifera</i>	Red Osier Dogwood	GREEN	S5	C, M
<i>Corylus cornuta</i>	Beaked Hazelnut	GREEN	S5	W
<i>Danthonia compressa</i>	Flat-stemmed Oatgrass	GREEN	S5	R
<i>Danthonia spicata</i>	Poverty Grass	GREEN	S5	R
<i>Dennstaedtia punctilobula</i>	Hay-scented Fern	GREEN	S5	W
<i>Deparia acrostichoides</i>	Silvery Spleenwort	GREEN	S4	W
<i>Doellingeria umbellata</i>	Tall White Aster	GREEN	S5	C, R
<i>Dryopteris campyloptera</i>	Mountain Wood Fern	GREEN	S5	W
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	GREEN	S5	W
<i>Dryopteris cristata</i>	Crested Wood Fern	GREEN	S5	W

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	GREEN	S5	W
<i>Epilobium ciliatum</i>	Northern Willowherb	GREEN	S5	R, W
<i>Equisetum arvense</i>	Field Horsetail	GREEN	S5	R
<i>Equisetum sylvaticum</i>	Woodland Horsetail	GREEN	S5	W
<i>Erythronium americanum</i>	Trout Lily	GREEN	S4S5	C, W
<i>Euphrasia nemorosa</i>	Common Eyebright	GREEN	S5	R
<i>Euthamia graminifolia</i>	Narrow-leaved Goldenrod	GREEN	S5	C, R
<i>Fagus grandifolia</i>	American Beech	GREEN	S5	C, W
<i>Fragaria virginiana</i>	Wild Strawberry	GREEN	S5	C, R
<i>Fraxinus americana</i>	White Ash	GREEN	S5	C
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	EXOTIC	SNA	W
<i>Glyceria melicaria</i>	Slender Manna Grass	GREEN	S4	W
<i>Galium sp.</i>	a bedstraw	GREEN	S5	W
<i>Glyceria striata</i>	Fowl Manna Grass	GREEN	S5	C, R, W
<i>Gymnocarpium dryopteris</i>	Oak Fern	GREEN	S5	W
<i>Hieracium sp.</i>	a hawkweed	EXOTIC	SNA	R
<i>Hypericum boreale</i>	Northern St. John's-wort	GREEN	S5	M
<i>Hypericum perforatum</i>	Common St. John's-wort	EXOTIC	SNA	R
<i>Impatiens capensis</i>	Spotted Touch-me-not	GREEN	S5	W
<i>Juncus brevicaudatus</i>		GREEN	S5	R
<i>Juncus effusus s.l.</i>	Soft Rush	GREEN	S5	C, R
<i>Juncus tenuis</i>	Path Rush	GREEN	S5	R
<i>Leontodon autumnalis</i>	Fall Dandelion	EXOTIC	SNA	R
<i>Lonicera canadensis</i>	Canada Fly Honeysuckle	GREEN	S5	W
<i>Lycopodium obscurum s.l.</i>	Tree-clubmoss	-	-	W

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Lycopus uniflorus</i>	Northern Water Horehound	GREEN	S5	M
<i>Maianthemum racemosum</i>	Large False Solomon's Seal	GREEN	S4S5	W
<i>Matteucia struthiopteris</i>	Ostrich Fern	GREEN	S5	W
<i>Moehringia lateriflora</i>	Blunt-leaved Sandwort	GREEN	S5	C
<i>Oclemena acuminata</i>	Wood Aster	GREEN	S5	C, R, W
<i>Oenothera biennis</i>	Common Evening Primrose	GREEN	S5	C, R
<i>Onoclea sensibilis</i>	Sensitive Fern	GREEN	S5	C, M, W
<i>Osmunda cinnamomea</i>	Cinnamon Fern	GREEN	S5	W
<i>Osmunda claytoniana</i>	Interrupted Fern	GREEN	S5	W
<i>Osmunda regalis</i>	Royal Fern	GREEN	S5	M
<i>Ostrya virginiana</i>	Ironwood	GREEN	S5	W
<i>Packera schweinitziana</i>	Swamp Ragwort	GREEN	S4	M
<i>Picea glauca</i>	White Spruce	GREEN	S5	C, W
<i>Picea rubens</i>	Red Spruce	GREEN	S5	C, W
<i>Phegopteris connectilis</i>	Northern Beech Fern	GREEN	S5	W
<i>Plantago major</i>	Common Plantain	EXOTIC	SNA	R
<i>Polygala sanguinea</i>	Blood Milkwort	YELLOW	S2S3	R
<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	GREEN	S5	W
<i>Polystichum acrostchoides</i>	Christmas Fern	GREEN	S5	C, W
<i>Populus tremuloides</i>	Trembling Aspen	GREEN	S5	M
<i>Potentilla</i> sp.	a cinquefoil	-	-	R
<i>Prunella vulgaris</i>	Heal-all	GREEN	S5	R
<i>Prunus pensylvanica</i>	Pin Cherry	GREEN	S5	C
<i>Prunus virginiana</i>	Chokecherry	GREEN	S5	W
<i>Pteridium aquilinum</i>	Bracken	GREEN	S5	R
<i>Ranunculus recurvatus</i>	Hooked Buttercup	GREEN	S4	W

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Ranunculus repens</i>	Creeping Buttercup	EXOTIC	SNA	W
<i>Rhododendron canadense</i>	Rhodora	GREEN	S5	M
<i>Ribes glandulosum</i>	Skunk Currant	GREEN	S5	W
<i>Rubus pubescens</i>	Dewberry	GREEN	S5	C
<i>Rubus sp.</i>	a blackberry	-	-	C
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	Wild Raspberry	GREEN	S5	C,W
<i>Salix bebbiana</i>	Bebb's Willow	GREEN	S5	C, M
<i>Salix discolor</i>	Pussy Willow	GREEN	S5	M
<i>Salix pyrifolia</i>	Balsam Willow	GREEN	S5	M
<i>Sambucus racemosa</i> ssp. <i>pubens</i> var. <i>pubens</i>	Red Elderberry	GREEN	S5	W
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	GREEN	S5	C, M, W
<i>Scirpus microcarpus</i>	Red-tinged Bulrush	GREEN	S5	W
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	GREEN	S5	C, W
<i>Solidago bicolor</i>	White Goldenrod	GREEN	S5	R
<i>Solidago canadensis</i>	Canada Goldenrod	GREEN	S5	C, R
<i>Solidago puberula</i>	Downy Goldenrod	GREEN	S5	R
<i>Solidago rugosa</i>	Rough Goldenrod	GREEN	S5	C, R, W
<i>Spiraea alba</i> var. <i>latifolia</i>	Meadowsweet	GREEN	S5	C, M
<i>Spiranthes cernua</i>	Nodding Ladies'-tresses	GREEN	S5	R
<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses	GREEN	S3	R
<i>Stellaria alsine</i>	Bog Stitchwort	GREEN	S4	W
<i>Symphyotrichum lateriflorum</i>	Calico Aster	GREEN	S5	C, R, W
<i>Symphyotrichum novi-belgii</i>	New York Aster	GREEN	S5	R
<i>Thelypteris noveboracensis</i>	New York Fern	GREEN	S5	C, R, W
<i>Thelypteris simulata</i>	Bog Fern	GREEN	S4	M, W

Latin Name	Common Name	General Status* Rank	ACCDC Subnational Status Rank**	Habitat(s)
<i>Toxicodendron rydbergii</i>	Poison Ivy	GREEN	S5	M
<i>Trientalis borealis</i>	Starflower	GREEN	S5	W
<i>Trillium cernuum</i>	Nodding Trillium	GREEN	S4	W
<i>Tsuga canadensis</i>	Eastern Hemlock	GREEN	S5	W
<i>Tussilago farfara</i>	Coltsfoot	EXOTIC	SNA	C
<i>Typha latifolia</i>	Broad-leaved Cattail	GREEN	S5	W
<i>Vaccinium angustifolium</i>	Lowbush Blueberry	GREEN	S5	C, R
<i>Vaccinium macrocarpon</i>	Large Cranberry	GREEN	S5	M
<i>Veronica americana</i>	American Speedwell	GREEN	S5	W
<i>Veronica scutellata</i>	Marsh Speedwell	GREEN	S5	M
<i>Viburnum alnifolium</i>	Hobblebush	GREEN	S5	W
<i>Viola blanda</i>	Sweet White Violet	GREEN	S5	W
<i>Viola macloskeyi</i>	Small White Violet	GREEN	S5	W

*The Nova Scotia general status ranks are based on the ranks used in the 2010 Wild Species of Canada Report (available at <http://www.accdc.com/en/general-status.html>); the definitions of the general status ranks found within this report are: GREEN = secure; YELLOW = sensitive; EXOTIC = a non-native species of no conservation concern.

**ACCDC: Atlantic Canada Conservation Data Centre (<http://www.accdc.com/>); explanation of subnational status ranks used in this report:

S5 = **Secure** - Common, widespread, and abundant in the province

S4 = **Apparently Secure** - Uncommon but not rare; some cause for long-term concern due to declines or other factors

S3 = **Vulnerable** - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation

S2 = **Imperiled** - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province

S#S# = **Range Rank** - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community.

SNA = **Not Applicable** - A conservation status rank is not applicable because the species is not a suitable target for conservation activities

APPENDIX C

**ATLANTIC CANADA CONSERVATION DATA
CENTRE REPORT**

DATA REPORT 5707: Williamsdale, NS

Prepared 16 November 2016
by J. Churchill, Data Manager

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Map 1. A 100 km buffer around the study area

1.0 PREFACE

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

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

1.1 DATA LIST

Included datasets:

Filename	Contents
WilliamsdaleNS_5707ob.xls	All Rare and legally protected <i>Flora and Fauna</i> within 5 km of your study area
WilliamsdaleNS_5707ob100km.xls	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area

1.2 RESTRICTIONS

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

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

1.3 ADDITIONAL INFORMATION

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

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

Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney, Senior Scientist, Executive Director
Tel: (506) 364-2658
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Animals (Fauna)

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Plant Communities

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Billing

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

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

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

Western: Duncan Bayne
(902) 648-3536
Duncan.Bayne@novascotia.ca

Western: Donald Sam
(902) 634-7525
Donald.Sam@novascotia.ca

Central: Shavonne Meyer
(902) 893-6353
Shavonne.Meyer@novascotia.ca

Central: Kimberly George
(902) 893-5630
Kimberly.George@novascotia.ca

Eastern: Mark Pulsifer
(902) 863-7523
Mark.Pulsifer@novascotia.ca

Eastern: Donald Anderson
(902) 295-3949
Donald.Anderson@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

A 5 km buffer around the study area contains 3 records of 3 vascular, no records of nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA

A 5 km buffer around the study area contains 64 records of 28 vertebrate, 3 records of 1 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 5 km of the study area.



RESOLUTION

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

HIGHER TAXONII

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

3.0 SPECIAL AREAS

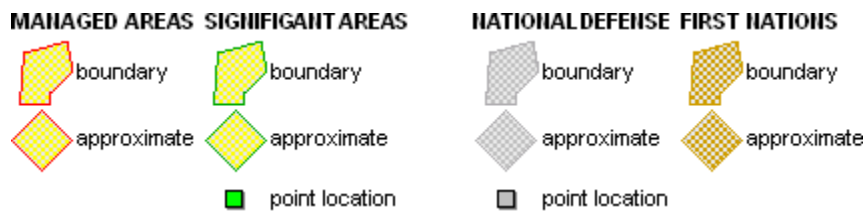
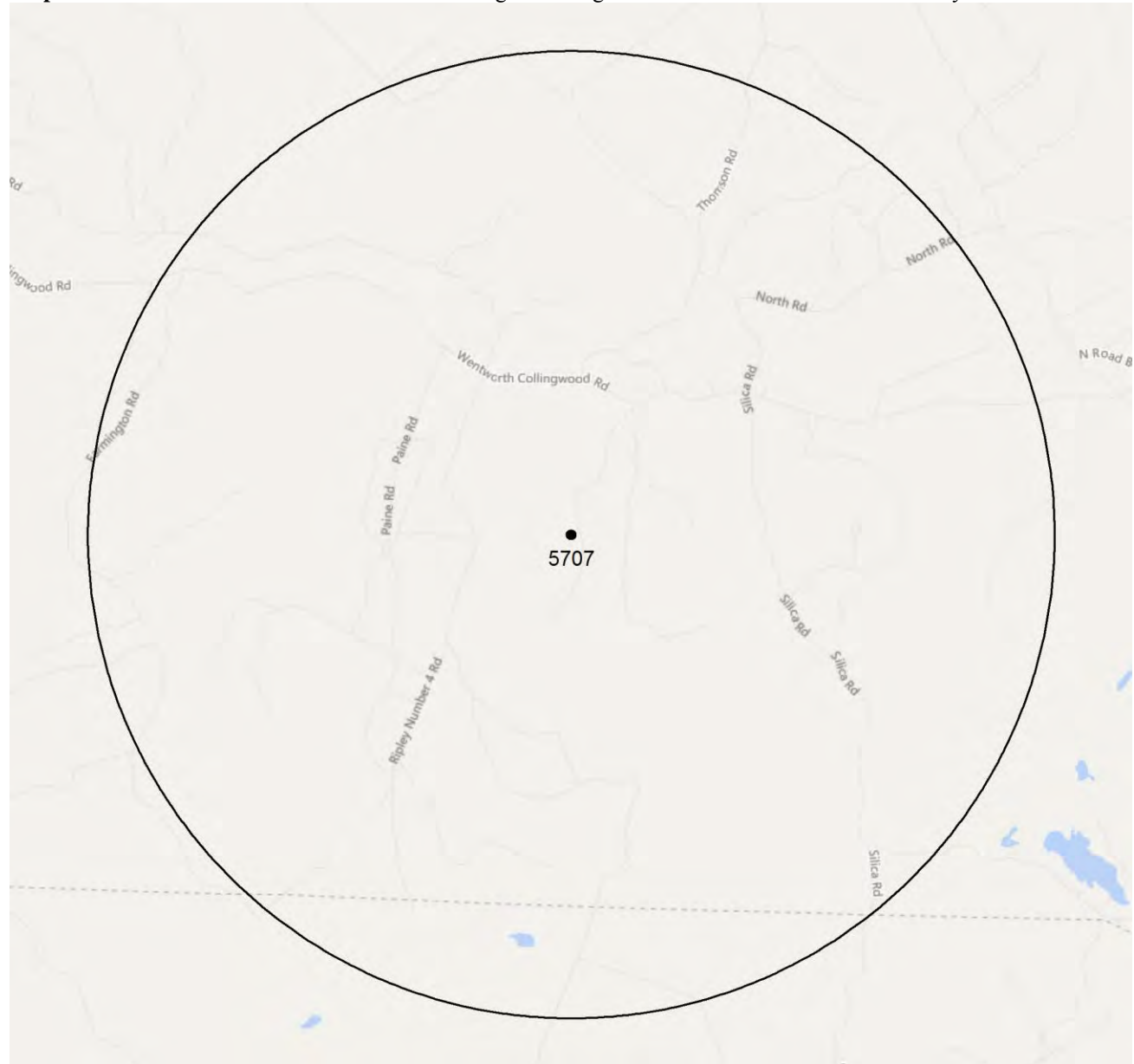
3.1 MANAGED AREAS

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

3.2 SIGNIFICANT AREAS

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

Map 3: Boundaries and/or locations of known Managed and Significant Areas within 5 km of the study area.



4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding “location-sensitive” species, section 4.3) within the 5 km-buffered 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)
P	<i>Symphotrichum ciliolatum</i>	Fringed Blue Aster				S2	3 Sensitive	1	2.7 \pm 7.0
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	2 May Be At Risk	1	2.7 \pm 7.0
P	<i>Symphotrichum boreale</i>	Boreal Aster				S2?	3 Sensitive	1	2.7 \pm 7.0

4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2B,S1M	1 At Risk	3	2.3 \pm 0.0
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	1	2.7 \pm 7.0
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	3	2.7 \pm 7.0
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	2	2.7 \pm 7.0
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3S4B	1 At Risk	1	2.7 \pm 7.0
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	1	2.7 \pm 7.0
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	2	2.7 \pm 7.0
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S2B	2 May Be At Risk	2	2.7 \pm 7.0
A	<i>Carduelis pinus</i>	Pine Siskin				S2S3	3 Sensitive	2	2.7 \pm 7.0
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	2 May Be At Risk	2	2.7 \pm 7.0
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	2	2.7 \pm 7.0
A	<i>Perisoreus canadensis</i>	Gray Jay				S3	3 Sensitive	2	2.7 \pm 7.0
A	<i>Poecile hudsonica</i>	Boreal Chickadee				S3	3 Sensitive	1	2.7 \pm 7.0
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	2	2.7 \pm 7.0
A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	2	2.7 \pm 7.0
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	1	2.7 \pm 7.0
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B	3 Sensitive	1	2.7 \pm 7.0
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	1	2.7 \pm 7.0
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	1	2.7 \pm 7.0
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B	3 Sensitive	2	2.7 \pm 7.0
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	6	2.7 \pm 7.0
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	7	2.7 \pm 7.0
A	<i>Catharus fuscescens</i>	Veery				S3S4B	4 Secure	3	2.2 \pm 0.0
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	4	1.0 \pm 0.0
A	<i>Vermivora peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	1	2.7 \pm 7.0
A	<i>Dendroica castanea</i>	Bay-breasted Warbler				S3S4B	3 Sensitive	3	2.0 \pm 0.0
A	<i>Dendroica striata</i>	Blackpoll Warbler				S3S4B	3 Sensitive	1	2.7 \pm 7.0
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak				S3S4B,S3N	4 Secure	5	2.0 \pm 0.0
I	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	3 Sensitive	3	4.2 \pm 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 a 5 km buffer of your study area are indicated below with “YES”.

Nova Scotia

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within 5 km of Study Site?
<i>Fraxinus nigra</i>	Black Ash		Threatened	No
<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Vulnerable	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	No
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
<i>Bat Hibernaculum</i>		[Endangered] 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 ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
39	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
25	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
2	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
1	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
1	Hall, R.A. 2001. S.. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 178 recs.
1	Hall, R.A. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 189 recs.
1	Pronych, G. & Wilson, A. 1993. Atlas of Rare Vascular Plants in Nova Scotia. Nova Scotia Museum, Halifax NS, I:1-168, II:169-331. 1446 recs.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 41593 records of 146 vertebrate and 1170 records of 67 invertebrate fauna; 7027 records of 307 vascular, 397 records of 110 nonvascular flora (attached: *ob100km.xls).

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

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	53	18.2 \pm 0.0	NS
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	52	18.2 \pm 0.0	NS
A	<i>Perimyotis subflavus</i>	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	18	34.9 \pm 0.0	NS
A	<i>Salmo salar pop. 1</i>	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered		S1	2 May Be At Risk	35	18.0 \pm 1.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	299	22.5 \pm 0.0	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	1 At Risk	1	82.9 \pm 0.0	NS
A	<i>Morone saxatilis pop. 2</i>	Striped Bass- Bay of Fundy pop.	Endangered			S1B	2 May Be At Risk	4	71.4 \pm 1.0	NS
A	<i>Dermochelys coriacea (Atlantic pop.)</i>	Leatherback Sea Turtle - Atlantic pop.	Endangered	Endangered		S1S2N		2	52.7 \pm 1.0	NB
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered		Endangered	S2M	1 At Risk	554	22.5 \pm 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	1 At Risk	17	17.4 ± 7.0	NS
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Special Concern	Endangered	S1S2B	1 At Risk	6	37.4 ± 7.0	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	3 Sensitive	198	9.9 ± 1.0	NS
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened			S2	2 May Be At Risk	5	53.4 ± 0.0	NS
A	<i>Anguilla rostrata</i>	American Eel	Threatened			S2	4 Secure	14	18.5 ± 1.0	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2B,S1M	1 At Risk	197	2.3 ± 0.0	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S2S3B	1 At Risk	352	12.6 ± 7.0	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	708	2.7 ± 7.0	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	1230	2.7 ± 7.0	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	751	2.7 ± 7.0	NS
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3S4B	1 At Risk	710	2.7 ± 7.0	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	1076	2.7 ± 7.0	NS
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened			SHB	3 Sensitive	5	54.3 ± 1.0	NB
A	<i>Ixobrychus exilis</i>	Least Bittern	Threatened	Threatened		SUB	5 Undetermined	13	40.2 ± 7.0	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened			SUB	5 Undetermined	50	12.6 ± 7.0	NS
A	<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Vulnerable	S1B,SNAM	3 Sensitive	294	29.0 ± 0.0	NS
A	<i>Bucephala islandica (Eastern pop.)</i>	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern		S1N	1 At Risk	69	34.4 ± 1.0	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern		S1S2B	2 May Be At Risk	40	41.1 ± 7.0	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	169	9.7 ± 7.0	NS
A	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	1	99.8 ± 1.0	NS
A	<i>Balaenoptera physalus</i>	Fin Whale - Atlantic pop.	Special Concern	Special Concern		S2S3		1	74.9 ± 1.0	NB
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S2S3M	3 Sensitive	16	32.5 ± 0.0	NS
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	63	22.1 ± 0.0	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	820	2.7 ± 7.0	NS
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern			S4N	4 Secure	49	61.4 ± 0.0	NB
A	<i>Tryngites subruficollis</i>	Buff-breasted Sandpiper	Special Concern			SNA	8 Accidental	10	65.2 ± 0.0	NB
A	<i>Lynx canadensis</i>	Canadian Lynx	Not At Risk		Endangered	S1	1 At Risk	10	64.9 ± 1.0	NB
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B	5 Undetermined	6	80.7 ± 7.0	NS
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1B	5 Undetermined	50	39.5 ± 0.0	NS
A	<i>Chlidonias niger</i>	Black Tern	Not At Risk			S1B	2 May Be At Risk	38	40.2 ± 7.0	NS
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	6	14.4 ± 5.0	NS
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S2?B	5 Undetermined	11	33.1 ± 7.0	NS
A	<i>Glaucomys volans</i>	Southern Flying Squirrel	Not At Risk	Special Concern		S2S3	3 Sensitive	6	65.5 ± 10.0	NS
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3		1	92.1 ± 100.0	NS
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	4 Secure	26	17.7 ± 0.0	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	350	29.4 ± 7.0	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	197	21.6 ± 0.0	NS
A	<i>Buteo lagopus</i>	Rough-legged Hawk	Not At Risk			S3N	4 Secure	4	51.7 ± 1.0	NB
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	4 Secure	138	12.4 ± 0.0	NS
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4		2	62.8 ± 1.0	NB
A	<i>Circus cyaneus</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	475	9.7 ± 7.0	NS
A	<i>Ammodramus nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	257	12.6 ± 7.0	NS
A	<i>Martes americana</i>	American Marten			Endangered	S1	1 At Risk	3	91.4 ± 0.0	NB
A	<i>Alces americanus</i>	Moose			Endangered	S1	1 At Risk	86	6.1 ± 0.0	NS
A	<i>Salmo salar</i>	Atlantic Salmon				S1	2 May Be At Risk	53	13.2 ± 50.0	NS
A	<i>Picoides dorsalis</i>	American Three-toed Woodpecker				S1?	5 Undetermined	5	33.6 ± 0.0	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B	5 Undetermined	23	30.3 ± 0.0	NS
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1B	2 May Be At Risk	4	54.3 ± 1.0	NB
A	<i>Anas acuta</i>	Northern Pintail				S1B	2 May Be At Risk	119	9.6 ± 0.0	NS
A	<i>Oxyura jamaicensis</i>	Ruddy Duck				S1B	4 Secure	87	40.2 ± 7.0	NS
A	<i>Gallinula chloropus</i>	Common Moorhen				S1B	5 Undetermined	34	38.6 ± 7.0	NS
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S1B	2 May Be At Risk	36	27.0 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Cistothorus palustris</i>	Marsh Wren				S1B	5 Undetermined	43	40.2 ± 7.0	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	4 Secure	126	19.5 ± 7.0	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	5 Undetermined	21	39.0 ± 0.0	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1B	5 Undetermined	41	41.3 ± 7.0	NS
A	<i>Dendroica pinus</i>	Pine Warbler				S1B	5 Undetermined	63	22.0 ± 7.0	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S3M	4 Secure	1046	22.2 ± 0.0	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	4 Secure	1622	22.2 ± 0.0	NS
A	<i>Pluvialis dominica</i>	American Golden-Plover				S1S2M	3 Sensitive	167	22.5 ± 0.0	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit				S1S2M	3 Sensitive	259	22.2 ± 0.0	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B	5 Undetermined	44	17.4 ± 7.0	NS
A	<i>Anas clypeata</i>	Northern Shoveler				S2B	2 May Be At Risk	177	27.0 ± 7.0	NS
A	<i>Anas strepera</i>	Gadwall				S2B	2 May Be At Risk	183	27.4 ± 7.0	NS
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	3 Sensitive	51	16.5 ± 7.0	NS
A	<i>Dendroica tigrina</i>	Cape May Warbler				S2B	3 Sensitive	215	6.7 ± 0.0	NS
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B	5 Undetermined	36	20.8 ± 7.0	NS
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S2B	2 May Be At Risk	96	2.7 ± 7.0	NS
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	4 Secure	222	7.5 ± 7.0	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S2B,S5N	4 Secure	69	25.0 ± 5.0	NS
A	<i>Branta bernicla</i>	Brant				S2M	3 Sensitive	28	35.0 ± 0.0	NS
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3	3 Sensitive	40	54.5 ± 0.0	NB
A	<i>Asio otus</i>	Long-eared Owl				S2S3	2 May Be At Risk	32	19.5 ± 7.0	NS
A	<i>Carduelis pinus</i>	Pine Siskin				S2S3	3 Sensitive	380	2.7 ± 7.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B	3 Sensitive	114	31.9 ± 7.0	NS
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	5 Undetermined	105	27.4 ± 7.0	NS
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	768	22.5 ± 0.0	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	2 May Be At Risk	468	2.7 ± 7.0	NS
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	565	2.7 ± 7.0	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B	2 May Be At Risk	94	11.9 ± 7.0	NS
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	85	7.7 ± 0.0	NS
A	<i>Numenius phaeopus hudsonicus</i>	Hudsonian Whimbrel				S2S3M	3 Sensitive	169	22.5 ± 0.0	NS
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S2S3M	4 Secure	307	22.2 ± 0.0	NS
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S2S3M	3 Sensitive	2	65.2 ± 0.0	NB
A	<i>Perisoreus canadensis</i>	Gray Jay				S3	3 Sensitive	472	2.7 ± 7.0	NS
A	<i>Poecile hudsonica</i>	Boreal Chickadee				S3	3 Sensitive	483	2.7 ± 7.0	NS
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	1021	2.7 ± 7.0	NS
A	<i>Alosa pseudoharengus</i>	Alewife				S3	3 Sensitive	21	36.7 ± 0.0	NS
A	<i>Salvelinus fontinalis</i>	Brook Trout				S3	3 Sensitive	21	63.7 ± 0.0	NS
A	<i>Sorex maritimensis</i>	Maritime Shrew				S3	4 Secure	105	51.8 ± 1.0	NB
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3	4 Secure	17	57.7 ± 0.0	NS
A	<i>Pekania pennanti</i>	Fisher				S3	3 Sensitive	2	44.2 ± 0.0	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3?N	3 Sensitive	68	47.7 ± 15.0	NS
A	<i>Calcarius lapponicus</i>	Lapland Longspur				S3?N	4 Secure	36	52.2 ± 2.0	NB
A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	525	2.7 ± 7.0	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	938	2.7 ± 7.0	NS
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B	3 Sensitive	771	2.7 ± 7.0	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	2 May Be At Risk	8	51.7 ± 0.0	NB
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	2 May Be At Risk	108	15.7 ± 7.0	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	3 Sensitive	434	7.5 ± 7.0	NS
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	514	2.7 ± 7.0	NS
A	<i>Wilsonia pusilla</i>	Wilson's Warbler				S3B	3 Sensitive	97	9.7 ± 7.0	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	1858	22.2 ± 0.0	NS
A	<i>Oceanodroma</i>	Leach's Storm-Petrel				S3B,S5M	4 Secure	1	83.1 ± 0.0	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
	<i>leucorhoa</i>									
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S3B,S5N	3 Sensitive	1	42.5 ± 0.0	NS
A	<i>Fratercula arctica</i>	Atlantic Puffin				S3B,S5N	3 Sensitive	3	64.4 ± 0.0	NB
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	4 Secure	1622	22.2 ± 0.0	NS
A	<i>Tringa flavipes</i>	Lesser Yellowlegs				S3M	4 Secure	1135	22.2 ± 0.0	NS
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	690	22.2 ± 0.0	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	2110	22.2 ± 0.0	NS
A	<i>Calidris fuscicollis</i>	White-rumped Sandpiper				S3M	4 Secure	956	22.2 ± 0.0	NS
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	4 Secure	1203	22.5 ± 0.0	NS
A	<i>Calidris alba</i>	Sanderling				S3M,S2N	4 Secure	1360	22.2 ± 0.0	NS
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	4 Secure	8	56.7 ± 4.0	NB
A	<i>Somateria mollissima</i>	Common Eider				S3S4	4 Secure	129	29.7 ± 7.0	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	124	2.7 ± 7.0	NS
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	4 Secure	142	11.9 ± 7.0	NS
A	<i>Sorex palustris</i>	American Water Shrew				S3S4	4 Secure	1	51.8 ± 1.0	NB
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B	3 Sensitive	307	11.9 ± 7.0	NS
A	<i>Anas discors</i>	Blue-winged Teal				S3S4B	2 May Be At Risk	314	11.9 ± 7.0	NS
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B	3 Sensitive	779	2.7 ± 7.0	NS
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	534	2.7 ± 7.0	NS
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	1316	2.7 ± 7.0	NS
A	<i>Catharus fuscescens</i>	Veery				S3S4B	4 Secure	564	2.2 ± 0.0	NS
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	1504	1.0 ± 0.0	NS
A	<i>Vermivora peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	405	2.7 ± 7.0	NS
A	<i>Dendroica castanea</i>	Bay-breasted Warbler				S3S4B	3 Sensitive	474	2.0 ± 0.0	NS
A	<i>Dendroica striata</i>	Blackpoll Warbler				S3S4B	3 Sensitive	60	2.7 ± 7.0	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B	4 Secure	8	12.6 ± 7.0	NS
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak				S3S4B,S3N	4 Secure	385	2.0 ± 0.0	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5N	4 Secure	150	17.4 ± 7.0	NS
A	<i>Bucephala albeola</i>	Bufflehead				S3S4N	4 Secure	67	30.1 ± 11.0	NS
A	<i>Leucophaeus atricilla</i>	Laughing Gull				SHB	4 Secure	8	54.0 ± 0.0	NB
A	<i>Progne subis</i>	Purple Martin				SHB	2 May Be At Risk	45	9.7 ± 7.0	NS
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N	4 Secure	23	30.6 ± 7.0	NS
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M	4 Secure	109	56.1 ± 0.0	NB
A	<i>Aythya americana</i>	Redhead				SHB,SNAM	4 Secure	10	40.2 ± 7.0	NS
I	<i>Gomphus ventricosus</i>	Skillet Clubtail	Endangered			S1	2 May Be At Risk	2	75.4 ± 1.0	NS
I	<i>Barnea truncata</i>	Atlantic Mud-piddock	Threatened			S1	1 At Risk	1	20.4 ± 1.0	NS
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Threatened	S1S2	3 Sensitive	10	15.7 ± 0.0	NS
I	<i>Danaus plexippus</i>	Monarch	Special Concern	Special Concern		S2B	3 Sensitive	99	14.1 ± 0.0	NS
I	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern			S3	3 Sensitive	10	41.5 ± 0.0	NS
I	<i>Cicindela formosa</i>	Big Sand Tiger Beetle				S1	2 May Be At Risk	1	75.7 ± 1.0	NS
I	<i>Papilio brevicauda bretonensis</i>	Short-tailed Swallowtail				S1	1 At Risk	1	87.6 ± 0.0	NB
I	<i>Satyrion acadica</i>	Acadian Hairstreak				S1	5 Undetermined	13	33.6 ± 0.0	NS
I	<i>Erora laeta</i>	Early Hairstreak				S1	2 May Be At Risk	1	80.6 ± 0.0	PE
I	<i>Somatochlora brevicincta</i>	Quebec Emerald				S1	2 May Be At Risk	1	38.5 ± 1.0	NS
I	<i>Leptodea ochracea</i>	Tidewater Mucket				S1	3 Sensitive	22	26.3 ± 0.0	NS
I	<i>Strophitus undulatus</i>	Creeper				S1	2 May Be At Risk	6	15.9 ± 1.0	NS
I	<i>Chlosyne nycteis</i>	Silvery Checkerspot				S1?	5 Undetermined	4	91.1 ± 0.0	NB
I	<i>Polygonia comma</i>	Eastern Comma				S1?	1 At Risk	4	70.0 ± 1.0	NS
I	<i>Polygonia satyrus</i>	Satyr Comma				S1?	3 Sensitive	2	90.8 ± 100.0	PE
I	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S1S2	4 Secure	11	37.8 ± 1.0	NS
I	<i>Somatochlora kennedyi</i>	Kennedy's Emerald				S1S2	2 May Be At Risk	7	39.0 ± 0.0	NS
I	<i>Coenagrion resolutum</i>	Taiga Bluet				S1S2	2 May Be At Risk	27	30.9 ± 0.0	NS

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	<i>Stylurus scudderii</i>	Zebra Clubtail				S1S2	2 May Be At Risk	9	72.7 ± 1.0	NS
	<i>Lycaena hyllus</i>	Bronze Copper				S2	4 Secure	75	33.7 ± 0.0	NS
	<i>Lycaena dospassosi</i>	Salt Marsh Copper				S2	1 At Risk	79	32.4 ± 0.0	NS
	<i>Satyrrium calanus</i>	Banded Hairstreak				S2	5 Undetermined	5	33.4 ± 1.0	NS
	<i>Boloria chariclea</i>	Arctic Fritillary				S2	3 Sensitive	13	33.4 ± 1.0	NS
	<i>Aglais milberti</i>	Milbert's Tortoiseshell				S2	4 Secure	18	31.2 ± 1.0	NS
	<i>Epithea princeps</i>	Prince Baskettail				S2	3 Sensitive	16	16.5 ± 0.0	NS
	<i>Somatochlora williamsoni</i>	Williamson's Emerald				S2	2 May Be At Risk	8	48.0 ± 0.0	NS
	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S2	2 May Be At Risk	9	30.1 ± 0.0	NS
	<i>Enallagma signatum</i>	Orange Bluet				S2	2 May Be At Risk	1	81.0 ± 0.0	NS
	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	3 Sensitive	130	4.2 ± 1.0	NS
	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	3 Sensitive	1	38.5 ± 1.0	NS
	<i>Thorybes pylades</i>	Northern Cloudywing				S2S3	3 Sensitive	7	26.1 ± 1.0	NS
	<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper				S2S3	4 Secure	15	73.9 ± 1.0	NS
	<i>Satyrrium liparops</i>	Striped Hairstreak				S2S3	5 Undetermined	10	37.9 ± 0.0	NS
	<i>Satyrrium liparops strigosum</i>	Striped Hairstreak				S2S3	3 Sensitive	6	91.7 ± 10.0	PE
	<i>Euphydryas phaeton</i>	Baltimore Checkerspot				S2S3	4 Secure	29	21.4 ± 1.0	NS
	<i>Gomphus descriptus</i>	Harpoon Clubtail				S2S3	3 Sensitive	5	15.5 ± 0.0	NS
	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S2S3	2 May Be At Risk	6	15.5 ± 0.0	NS
	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S2S3	2 May Be At Risk	3	39.8 ± 0.0	NS
	<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S2S3	2 May Be At Risk	19	67.8 ± 0.0	NS
	<i>Somatochlora forcipata</i>	Forcipate Emerald				S2S3	2 May Be At Risk	2	90.4 ± 1.0	NB
	<i>Somatochlora franklini</i>	Delicate Emerald				S2S3	3 Sensitive	4	19.6 ± 1.0	NS
	<i>Alasmidonta undulata</i>	Triangle Floater				S2S3	4 Secure	30	39.3 ± 0.0	NS
	<i>Carabus maeander</i>	a Ground Beetle				S3	3 Sensitive	1	92.7 ± 1.0	NB
	<i>Hippodamia parenthesis</i>	Parenthesis Lady Beetle				S3	5 Undetermined	5	92.7 ± 1.0	NB
	<i>Chilocorus stigma</i>	Twice-stabbed Lady Beetle				S3	4 Secure	1	92.7 ± 1.0	NB
	<i>Naemia seriata</i>	a Ladybird beetle				S3	3 Sensitive	1	62.1 ± 1.0	NS
	<i>Callophrys henrici</i>	Henry's Elfin				S3	4 Secure	3	75.4 ± 1.0	NS
	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	2 May Be At Risk	13	60.7 ± 0.0	NB
	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	19	21.6 ± 1.0	NS
	<i>Polygonia faunus</i>	Green Comma				S3	4 Secure	19	12.8 ± 0.0	NS
	<i>Megisto cymela</i>	Little Wood-satyr				S3	4 Secure	17	16.2 ± 0.0	NS
	<i>Oeneis jutta</i>	Jutta Arctic				S3	2 May Be At Risk	20	28.7 ± 0.0	NS
	<i>Aeshna clepsydra</i>	Mottled Darner				S3	4 Secure	3	70.9 ± 0.0	NS
	<i>Aeshna constricta</i>	Lance-Tipped Darner				S3	4 Secure	25	16.5 ± 0.0	NS
	<i>Boyeria grafiana</i>	Ocellated Darner				S3	3 Sensitive	6	24.7 ± 0.0	NS
	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	3 Sensitive	4	59.2 ± 1.0	NS
	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S3	4 Secure	9	38.5 ± 1.0	NS
	<i>Nannothemis bella</i>	Elfin Skimmer				S3	4 Secure	23	47.0 ± 0.0	NS
	<i>Sympetrum danae</i>	Black Meadowhawk				S3	3 Sensitive	2	91.0 ± 1.0	PE
	<i>Enallagma vernale</i>	Vernal Bluet				S3	5 Undetermined	4	18.9 ± 1.0	NS
	<i>Amphiagrion saucium</i>	Eastern Red Damselfly				S3	4 Secure	6	48.3 ± 1.0	NS
	<i>Polygonia interrogationis</i>	Question Mark				S3B	4 Secure	128	22.7 ± 0.0	NS
	<i>Erynnis juvenalis</i>	Juvenal's Duskywing				S3S4	4 Secure	23	33.4 ± 1.0	NS
	<i>Amblyscirtes vialis</i>	Common Roadside-Skipper				S3S4	4 Secure	18	38.2 ± 0.0	NS

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I	<i>Polygonia progne</i>	Grey Comma				S3S4	4 Secure	34	13.4 ± 0.0	NS
I	<i>Lanthis parvulus</i>	Northern Pygmy Clubtail				S3S4	4 Secure	7	10.6 ± 0.0	NS
I	<i>Lampsilis radiata</i>	Eastern Lampmussel				S3S4	3 Sensitive	57	15.1 ± 0.0	NS
	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	1 At Risk	29	86.7 ± 0.0	NS
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered		Endangered	S1S2	2 May Be At Risk	4	94.4 ± 0.0	NS
N	<i>Peltigera hydrothyria</i>	Eastern Waterfan	Threatened			S1	2 May Be At Risk	7	20.0 ± 3.0	NS
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened			S3	3 Sensitive	3	91.7 ± 1.0	NB
N	<i>Sclerophora peronella</i> (Nova Scotia pop.)	Frosted Glass-whiskers Lichen - Nova Scotia pop.	Special Concern	Special Concern		S1?		4	63.8 ± 0.0	NS
N	<i>Degelia plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	4 Secure	7	81.4 ± 0.0	NS
N	<i>Fissidens exilis</i>	Pygmy Pocket Moss	Not At Risk			S1S2	1 At Risk	3	52.2 ± 1.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	3 Sensitive	6	83.8 ± 0.0	NS
N	<i>Alcina brevirostris</i>	Short-Beaked Rigid Screw Moss				S1		1	70.1 ± 2.0	NS
N	<i>Collema cristatum</i>	Fingered Tarpaper Lichen				S1	5 Undetermined	6	64.2 ± 0.0	NS
N	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen				S1	2 May Be At Risk	1	62.4 ± 0.0	NS
N	<i>Alcina rigida</i>	Aloe-Like Rigid Screw Moss				S1?	2 May Be At Risk	4	23.5 ± 0.0	NS
N	<i>Campylostelium saxicola</i>	a Moss				S1?	3 Sensitive	2	80.4 ± 0.0	PE
N	<i>Conardia compacta</i>	Coast Creeping Moss				S1?	3 Sensitive	1	92.1 ± 1.0	NB
N	<i>Tortula obtusifolia</i>	a Moss				S1?	5 Undetermined	2	49.4 ± 1.0	NS
N	<i>Paludella squarrosa</i>	Tufted Fen Moss				S1?	3 Sensitive	2	63.7 ± 0.0	NS
N	<i>Timmia norvegica</i>	a moss				S1?	3 Sensitive	2	91.9 ± 0.0	NB
N	<i>Trichodon cylindricus</i>	Cylindric Hairy-teeth Moss				S1?		1	85.2 ± 3.0	NS
N	<i>Polychidium muscicola</i>	Eyed Mossthorns Woollybear Lichen				S1?	2 May Be At Risk	3	94.5 ± 1.0	NB
N	<i>Aulacomnium heterostichum</i>	One-sided Groove Moss				S1S2	3 Sensitive	2	26.4 ± 1.0	NS
N	<i>Brachythecium turgidum</i>	Thick Ragged Moss				S1S2	3 Sensitive	3	79.6 ± 0.0	NS
N	<i>Ctenidium molluscum</i>	Mollusc Ctenidium moss				S1S2		1	84.1 ± 2.0	NS
N	<i>Dicranoweisia crispula</i>	Mountain Thatch Moss				S1S2	3 Sensitive	1	88.9 ± 0.0	NB
N	<i>Didymodon rigidulus</i>	Rigid Screw Moss				S1S2	3 Sensitive	8	90.7 ± 2.0	NB
N	<i>Didymodon ferrugineus</i>	a moss				S1S2	3 Sensitive	1	91.7 ± 0.0	NB
N	<i>Hygrohypnum montanum</i>	a Moss				S1S2	3 Sensitive	1	93.2 ± 1.0	NB
N	<i>Hypnum pratense</i>	Meadow Plait Moss				S1S2	3 Sensitive	1	84.8 ± 3.0	NS
N	<i>Mnium thomsonii</i>	Thomson's Leafy Moss				S1S2	3 Sensitive	1	68.4 ± 2.0	NS
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1S2	3 Sensitive	2	24.4 ± 3.0	NS
N	<i>Seligeria calcarea</i>	Chalk Brittle Moss				S1S2	3 Sensitive	2	91.9 ± 0.0	NB
N	<i>Sematophyllum demissum</i>	a Moss				S1S2	3 Sensitive	1	86.4 ± 2.0	NS
N	<i>Tetradontium brownianum</i>	Little Georgia				S1S2	3 Sensitive	7	87.7 ± 1.0	NB
N	<i>Timmia megapolitana</i>	Metropolitan Timmia Moss				S1S2	3 Sensitive	3	23.2 ± 0.0	NS
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S1S2	3 Sensitive	1	50.5 ± 3.0	NS
N	<i>Bryohaplcladium microphyllum</i>	Tiny-leaved Haplcladium Moss				S1S2		1	39.4 ± 5.0	NS
N	<i>Sticta limbata</i>	Powdered Moon Lichen				S1S2	2 May Be At Risk	2	86.7 ± 0.0	NS
N	<i>Anacamptodon splachnoides</i>	a Moss				S2?	3 Sensitive	1	24.4 ± 3.0	NS
N	<i>Anomodon viticulosus</i>	a Moss				S2?	3 Sensitive	1	25.1 ± 5.0	NS
N	<i>Weissia muhlenbergiana</i>	a Moss				S2?	3 Sensitive	5	68.4 ± 1.0	NS
N	<i>Atrichum angustatum</i>	Lesser Smoothcap Moss				S2?	3 Sensitive	2	14.9 ± 5.0	NS
N	<i>Bryum algovicum</i>	a Moss				S2?	3 Sensitive	1	70.1 ± 2.0	NS

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N	<i>Campyllum polygamum</i>	a Moss				S2?	5 Undetermined	3	86.4 ± 2.0	NS
N	<i>Campyllum radicale</i>	Long-stalked Fine Wet Moss				S2?	5 Undetermined	1	84.8 ± 3.0	NS
N	<i>Dicranum condensatum</i>	Condensed Broom Moss				S2?	5 Undetermined	2	84.8 ± 3.0	NS
N	<i>Ditrichum rhynchostegium</i>	a Moss				S2?	3 Sensitive	2	91.4 ± 0.0	PE
N	<i>Fissidens taxifolius</i>	Yew-leaved Pocket Moss				S2?	3 Sensitive	2	69.3 ± 5.0	NS
N	<i>Hygrohypnum bestii</i>	Best's Brook Moss				S2?	3 Sensitive	1	86.4 ± 1.0	NB
N	<i>Orthotrichum anomalum</i>	Anomalous Bristle Moss				S2?	3 Sensitive	4	73.5 ± 2.0	NS
N	<i>Philonotis marchica</i>	a Moss				S2?	5 Undetermined	2	56.6 ± 0.0	NS
N	<i>Physcomitrium collenchymatum</i>	a Moss				S2?	3 Sensitive	1	85.2 ± 0.0	NS
N	<i>Platydictya jungermannioides</i>	False Willow Moss				S2?	3 Sensitive	2	91.7 ± 0.0	NB
N	<i>Racomitrium affine</i>	a Moss				S2?	5 Undetermined	2	79.1 ± 2.0	NS
N	<i>Rhytidium rugosum</i>	Wrinkle-leaved Moss				S2?	3 Sensitive	1	91.6 ± 1.0	NB
N	<i>Saelania glaucescens</i>	Blue Dew Moss				S2?	3 Sensitive	3	46.5 ± 0.0	NS
N	<i>Seligeria donniana</i>	Donian Beardless Moss				S2?	3 Sensitive	1	33.3 ± 3.0	NS
N	<i>Sematophyllum marylandicum</i>	a Moss				S2?	3 Sensitive	2	75.7 ± 6.0	NS
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S2?	3 Sensitive	1	83.5 ± 0.0	NS
N	<i>Tortella fragilis</i>	Fragile Twisted Moss				S2?	3 Sensitive	1	91.9 ± 0.0	NB
N	<i>Anomobryum filiforme</i>	a moss				S2?		3	91.7 ± 1.0	NB
N	<i>Plagiomnium rostratum</i>	Long-beaked Leafy Moss				S2?	5 Undetermined	4	84.1 ± 2.0	NS
N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S2?	3 Sensitive	1	68.7 ± 1.0	NB
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2?	3 Sensitive	7	46.5 ± 0.0	NS
N	<i>Leptogium teretiusculum</i>	Beaded Jellyskin Lichen				S2?	3 Sensitive	3	63.4 ± 0.0	NS
N	<i>Nephroma arcticum</i>	Arctic Kidney Lichen				S2?	2 May Be At Risk	1	96.9 ± 1.0	NB
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S2?	3 Sensitive	2	67.4 ± 2.0	NS
N	<i>Ephemerum serratum</i>	a Moss				S2S3	3 Sensitive	5	61.7 ± 2.0	NS
N	<i>Eurhynchium hians</i>	Light Beaked Moss				S2S3	3 Sensitive	3	67.2 ± 0.0	NS
N	<i>Platydictya subtilis</i>	Bark Willow Moss				S2S3	3 Sensitive	4	24.4 ± 3.0	NS
N	<i>Tortula truncata</i>	a Moss				S2S3	3 Sensitive	3	68.3 ± 300.0	NS
N	<i>Limprichtia revolvens</i>	a Moss				S2S3	3 Sensitive	1	63.6 ± 0.0	NS
N	<i>Solorina saccata</i>	Woodland Owl Lichen				S2S3	2 May Be At Risk	10	64.2 ± 0.0	NS
N	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen				S2S3	2 May Be At Risk	1	94.8 ± 0.0	NS
N	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen				S2S3	3 Sensitive	1	50.1 ± 0.0	NS
N	<i>Parmeliopsis ambigua</i>	Green Starburst Lichen				S2S3	3 Sensitive	2	73.6 ± 2.0	NS
N	<i>Umbilicaria polyphylla</i>	Petalled Rocktripe Lichen				S2S3	3 Sensitive	1	73.6 ± 2.0	NS
N	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen				S3	3 Sensitive	4	12.8 ± 0.0	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3	3 Sensitive	6	31.7 ± 0.0	NS
N	<i>Fuscopannaria ahneri</i>	Corrugated Shingles Lichen				S3	4 Secure	17	10.8 ± 0.0	NS
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3	4 Secure	6	81.4 ± 0.0	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3	3 Sensitive	4	89.7 ± 0.0	NS
N	<i>Leptogium lichenoides</i>	Tattered Jellyskin Lichen				S3	2 May Be At Risk	11	63.1 ± 0.0	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	3 Sensitive	4	79.5 ± 0.0	NS
N	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen				S3	4 Secure	11	89.7 ± 0.0	NS
N	<i>Calliargon giganteum</i>	Giant Spear Moss				S3?	3 Sensitive	2	68.8 ± 3.0	NS
N	<i>Drummondia prorepens</i>	a Moss				S3?	3 Sensitive	1	78.1 ± 5.0	NS
N	<i>Anomodon tristis</i>	a Moss				S3?	3 Sensitive	9	51.7 ± 1.0	NS

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N	<i>Helodium blandowii</i>	Wetland-plume Moss				S3?	4 Secure	4	63.6 ± 0.0	NS
N	<i>Mnium stellare</i>	Star Leafy Moss				S3?	5 Undetermined	2	26.4 ± 1.0	NS
N	<i>Sphagnum riparium</i>	Streamside Peat Moss				S3?	3 Sensitive	1	78.0 ± 1.0	NS
N	<i>Cladina stygia</i>	Black-footed Reindeer Lichen				S3?	3 Sensitive	2	70.1 ± 0.0	NB
N	<i>Anomodon rugelii</i>	Rugel's Anomodon Moss				S3S4	3 Sensitive	2	53.6 ± 0.0	NS
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S3S4	4 Secure	1	89.4 ± 3.0	NS
N	<i>Dicranella varia</i>	a Moss				S3S4	5 Undetermined	1	85.2 ± 3.0	NS
N	<i>Dicranum leioneuron</i>	a Dicranum Moss				S3S4	4 Secure	2	80.5 ± 0.0	NB
N	<i>Encalypta procera</i>	Slender Extinguisher Moss				S3S4	4 Secure	7	33.3 ± 3.0	NS
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	3 Sensitive	3	46.5 ± 0.0	NS
N	<i>Splachnum ampullaceum</i>	Cruet Dung Moss				S3S4	4 Secure	3	86.6 ± 0.0	NS
N	<i>Thamnobryum alleghaniense</i>	a Moss				S3S4	3 Sensitive	12	26.5 ± 4.0	NS
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S3S4	4 Secure	2	92.0 ± 1.0	NB
N	<i>Hylocomiastrum pyrenaicum</i>	a Feather Moss				S3S4	3 Sensitive	1	33.3 ± 3.0	NS
N	<i>Cladonia floerkeana</i>	Gritty British Soldiers Lichen				S3S4	5 Undetermined	1	98.2 ± 1.0	NB
N	<i>Leptogium saturninum</i>	Bearded Jellyskin Lichen				S3S4	5 Undetermined	3	91.7 ± 1.0	NB
N	<i>Parmeliopsis hyperopta</i>	Gray Starburst Lichen				S3S4	5 Undetermined	2	70.8 ± 1.0	NS
N	<i>Physconia detersa</i>	Bottlebrush Frost Lichen				S3S4	3 Sensitive	5	91.7 ± 1.0	NB
N	<i>Coccocarpia palmicola</i>	Salted Shell Lichen				S3S4	4 Secure	25	88.3 ± 1.0	NB
N	<i>Physcia caesia</i>	Blue-gray Rosette Lichen				S3S4	5 Undetermined	1	98.4 ± 1.0	NB
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	4 Secure	3	91.7 ± 1.0	NB
N	<i>Bryoria capillaris</i>	Gray Horsehair Lichen				S3S4	5 Undetermined	4	86.5 ± 1.0	NB
N	<i>Evernia prunastri</i>	Valley Oakmoss Lichen				S3S4	3 Sensitive	1	70.5 ± 2.0	NS
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	4 Secure	15	90.4 ± 1.0	NB
P	<i>Bartonia paniculata</i> ssp. <i>paniculata</i>	Branched Bartonia	Threatened	Threatened		SNA		1	91.2 ± 10.0	NS
P	<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	16	20.6 ± 1.0	NS
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	13	10.0 ± 0.0	NS
P	<i>Floerkea proserpinacoides</i>	False Mermaidweed	Not At Risk			S2	3 Sensitive	22	55.5 ± 7.0	NS
P	<i>Cypripedium arietinum</i>	Ram's-Head Lady's-Slipper			Endangered	S1	1 At Risk	159	30.9 ± 0.0	NS
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S1	1 At Risk	91	13.5 ± 0.0	NS
P	<i>Acer saccharinum</i>	Silver Maple				S1	5 Undetermined	12	63.0 ± 2.0	NS
P	<i>Osmorhiza depauperata</i>	Blunt Sweet Cicely				S1	2 May Be At Risk	1	68.3 ± 5.0	NS
P	<i>Sanicula odorata</i>	Clustered Sanicle				S1	2 May Be At Risk	14	44.8 ± 10.0	NS
P	<i>Zizia aurea</i>	Golden Alexanders				S1	2 May Be At Risk	35	23.7 ± 1.0	NS
P	<i>Antennaria rosea</i> ssp. <i>arida</i>	Rosy Pussytoes				S1	2 May Be At Risk	1	79.6 ± 0.0	NS
P	<i>Antennaria parlinii</i>	a Pussytoes				S1	2 May Be At Risk	13	53.6 ± 7.0	NS
P	<i>Bidens hyperborea</i>	Estuary Beggarticks				S1	2 May Be At Risk	2	21.9 ± 0.0	NS
P	<i>Ageratina altissima</i>	White Snakeroot				S1	2 May Be At Risk	27	72.9 ± 10.0	NS
P	<i>Cynoglossum virginianum</i> var. <i>boreale</i>	Wild Comfrey				S1	2 May Be At Risk	5	67.1 ± 1.0	NS
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1	2 May Be At Risk	7	50.1 ± 0.0	NS
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	2 May Be At Risk	14	30.6 ± 7.0	NS
P	<i>Stellaria crassifolia</i>	Fleshy Stitchwort				S1	2 May Be At Risk	3	89.6 ± 5.0	NB
P	<i>Hudsonia tomentosa</i>	Woolly Beach-heath				S1	2 May Be At Risk	8	68.1 ± 0.0	NB
P	<i>Elatine americana</i>	American Waterwort				S1	2 May Be At Risk	2	30.4 ± 0.0	NS
P	<i>Astragalus robbinsii</i> var. <i>minor</i>	Robbins' Milkvetch				S1	2 May Be At Risk	15	78.4 ± 2.0	NS
P	<i>Desmodium</i>	Canada Tick-trefoil				S1	2 May Be At Risk	22	50.3 ± 5.0	NS

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P	<i>canadense</i> <i>Desmodium glutinosum</i>	Large Tick-Trefoil				S1	2 May Be At Risk	17	60.2 ± 0.0	NS
P	<i>Ribes americanum</i>	Wild Black Currant				S1	5 Undetermined	5	44.5 ± 1.0	NS
P	<i>Fraxinus americana</i>	White Ash				S1	2 May Be At Risk	127	6.3 ± 0.0	NS
P	<i>Fraxinus pennsylvanica</i>	Red Ash				S1	2 May Be At Risk	9	73.0 ± 2.0	NS
P	<i>Polygonum achoreum</i>	Leathery Knotweed				S1	5 Undetermined	4	53.0 ± 0.0	NB
P	<i>Polygonum careyi</i>	Carey's Smartweed				S1	5 Undetermined	1	65.9 ± 3.0	NS
P	<i>Montia fontana</i>	Water Blinks				S1	2 May Be At Risk	4	77.5 ± 0.0	NS
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	5 Undetermined	1	96.6 ± 0.0	NS
P	<i>Clematis occidentalis</i>	Purple Clematis				S1	2 May Be At Risk	6	39.3 ± 0.0	NS
P	<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup				S1	2 May Be At Risk	25	14.8 ± 0.0	NS
P	<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry				S1	2 May Be At Risk	1	39.8 ± 1.0	NS
P	<i>Salix myrtillifolia</i>	Blueberry Willow				S1	2 May Be At Risk	25	71.2 ± 0.0	NB
P	<i>Salix serissima</i>	Autumn Willow				S1	2 May Be At Risk	2	82.3 ± 0.0	NS
P	<i>Agalinis paupercula</i> var. <i>borealis</i>	Small-flowered Agalinis				S1		9	39.8 ± 0.0	NS
P	<i>Dirca palustris</i>	Eastern Leatherwood				S1	2 May Be At Risk	48	56.5 ± 7.0	NS
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S1	2 May Be At Risk	2	71.2 ± 0.0	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S1	2 May Be At Risk	17	53.2 ± 0.0	NS
P	<i>Carex chordorrhiza</i>	Creeping Sedge				S1	2 May Be At Risk	52	42.3 ± 1.0	NS
P	<i>Carex garberi</i>	Garber's Sedge				S1	2 May Be At Risk	5	58.1 ± 0.0	NS
P	<i>Carex granularis</i>	Limestone Meadow Sedge				S1	2 May Be At Risk	2	48.6 ± 0.0	NS
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S1	2 May Be At Risk	2	82.3 ± 0.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1	2 May Be At Risk	4	24.1 ± 50.0	NS
P	<i>Carex pellita</i>	Woolly Sedge				S1	2 May Be At Risk	12	30.3 ± 0.0	NS
P	<i>Carex laxiflora</i>	Loose-Flowered Sedge				S1	2 May Be At Risk	3	57.2 ± 1.0	NS
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S1	2 May Be At Risk	5	64.0 ± 1.0	NB
P	<i>Carex plantaginea</i>	Plantain-Leaved Sedge				S1	2 May Be At Risk	4	51.3 ± 0.0	NS
P	<i>Carex prairea</i>	Prairie Sedge				S1	2 May Be At Risk	2	73.4 ± 1.0	NS
P	<i>Carex tenuiflora</i>	Sparse-Flowered Sedge				S1	2 May Be At Risk	5	46.4 ± 0.0	NS
P	<i>Carex tincta</i>	Tinged Sedge				S1	2 May Be At Risk	3	93.2 ± 0.0	NB
P	<i>Cyperus lupulinus</i> ssp. <i>macilentus</i>	Hop Flatsedge				S1	2 May Be At Risk	2	92.6 ± 0.0	NS
P	<i>Blysmus rufus</i>	Red Bulrush				S1	2 May Be At Risk	4	85.4 ± 1.0	PE
P	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush				S1	2 May Be At Risk	1	95.0 ± 0.0	NB
P	<i>Iris prismatica</i>	Slender Blue Flag				S1	2 May Be At Risk	1	87.4 ± 100.0	NS
P	<i>Juncus secundus</i>	Secund Rush				S1	2 May Be At Risk	1	84.0 ± 0.0	NS
P	<i>Juncus vaseyi</i>	Vasey Rush				S1	2 May Be At Risk	7	33.7 ± 10.0	NS
P	<i>Allium tricoccum</i>	Wild Leek				S1	2 May Be At Risk	20	31.6 ± 1.0	NS
P	<i>Trillium grandiflorum</i>	White Trillium				S1	5 Undetermined	3	73.4 ± 1.0	NS
P	<i>Malaxis brachypoda</i>	White Adder's-Mouth				S1	2 May Be At Risk	5	23.3 ± 1.0	NS
P	<i>Spiranthes casei</i> var. <i>casei</i>	Case's Ladies'-Tresses				S1	2 May Be At Risk	1	88.1 ± 0.0	NS
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S1	2 May Be At Risk	31	17.4 ± 0.0	NS
P	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>	Slim-stemmed Reed Grass				S1	3 Sensitive	1	53.0 ± 1.0	NB
P	<i>Elymus wiegandii</i>	Wiegand's Wild Rye				S1	2 May Be At Risk	21	14.8 ± 0.0	NS
P	<i>Elymus hystrix</i> var. <i>bigeloviana</i>	Spreading Wild Rye				S1	2 May Be At Risk	12	43.8 ± 1.0	NS
P	<i>Puccinellia fasciculata</i>	Saltmarsh Alkali Grass				S1	5 Undetermined	2	61.5 ± 1.0	NS
P	<i>Trisetum melicoides</i>	Purple False Oats				S1	2 May Be At Risk	2	91.8 ± 0.0	NB
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S1	2 May Be At Risk	11	47.5 ± 1.0	NS
P	<i>Equisetum palustre</i>	Marsh Horsetail				S1	2 May Be At Risk	1	76.2 ± 5.0	NS

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P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1	2 May Be At Risk	1	67.5 ± 0.0	NS
P	<i>Solidago hispida</i>	Hairy Goldenrod				S1?	2 May Be At Risk	1	74.6 ± 10.0	NB
P	<i>Suaeda rolandii</i>	Roland's Sea-Blite				S1?	2 May Be At Risk	6	22.3 ± 2.0	NS
P	<i>Crataegus robinsonii</i>	Robinson's Hawthorn				S1?	5 Undetermined	2	49.4 ± 5.0	NS
P	<i>Carex pensylvanica</i>	Pennsylvania Sedge				S1?	2 May Be At Risk	2	23.5 ± 0.0	NS
P	<i>Schoenoplectus robustus</i>	Sturdy Bulrush				S1?	5 Undetermined	2	36.2 ± 5.0	NS
P	<i>Dichanthelium acuminatum</i> var. <i>lindheimeri</i>	Woolly Panic Grass				S1?	5 Undetermined	2	87.5 ± 0.0	NS
P	<i>Fraxinus nigra</i>	Black Ash			Threatened	S1S2	1 At Risk	252	8.9 ± 0.0	NS
P	<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	28	33.7 ± 0.0	NS
P	<i>Rudbeckia laciniata</i> var. <i>gaspereauensis</i>	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	9	69.6 ± 0.0	NS
P	<i>Arabis hirsuta</i> var. <i>pycnocarpa</i>	Western Hairy Rockcress				S1S2	2 May Be At Risk	9	28.8 ± 0.0	NS
P	<i>Cardamine maxima</i>	Large Toothwort				S1S2	2 May Be At Risk	4	55.5 ± 0.0	NS
P	<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				S1S2	2 May Be At Risk	2	77.4 ± 0.0	NS
P	<i>Conopholis americana</i>	American Cancer-root				S1S2	2 May Be At Risk	3	69.5 ± 0.0	NS
P	<i>Anemone virginiana</i> var. <i>alba</i>	Virginia Anemone				S1S2	3 Sensitive	5	46.5 ± 7.0	NS
P	<i>Hepatica nobilis</i> var. <i>obtusata</i>	Round-lobed Hepatica				S1S2	2 May Be At Risk	46	32.1 ± 0.0	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1S2	2 May Be At Risk	16	93.2 ± 0.0	NS
P	<i>Gratiola neglecta</i>	Clammy Hedge-Hyssop				S1S2	3 Sensitive	11	42.8 ± 0.0	NS
P	<i>Carex livida</i> var. <i>radicaulis</i>	Livid Sedge				S1S2	2 May Be At Risk	20	46.4 ± 0.0	NS
P	<i>Juncus greenei</i>	Greene's Rush				S1S2	2 May Be At Risk	10	33.6 ± 5.0	NS
P	<i>Juncus alpinoarticulatus</i> ssp. <i>nodulosus</i>	Richardson's Rush				S1S2	2 May Be At Risk	3	90.7 ± 3.0	PE
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S1S2	5 Undetermined	2	63.3 ± 10.0	NS
P	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	Slim-stemmed Reed Grass				S1S2	3 Sensitive	6	29.4 ± 7.0	NS
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1S2	2 May Be At Risk	20	68.9 ± 0.0	NS
P	<i>Festuca subverticillata</i>	Nodding Fescue				S1S2	2 May Be At Risk	14	15.6 ± 0.0	NS
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S1S2	2 May Be At Risk	3	18.4 ± 0.0	NS
P	<i>Woodsia alpina</i>	Alpine Cliff Fern				S1S2	2 May Be At Risk	1	89.8 ± 0.0	NB
P	<i>Selaginella selaginoides</i>	Low Spikemoss				S1S2	2 May Be At Risk	6	91.7 ± 0.0	NB
P	<i>Carex vacillans</i>	Estuarine Sedge				S1S3	5 Undetermined	1	45.5 ± 0.0	NB
P	<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S2	3 Sensitive	9	43.0 ± 0.0	NS
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2	2 May Be At Risk	31	15.9 ± 1.0	NS
P	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				S2	3 Sensitive	7	40.2 ± 7.0	NS
P	<i>Lactuca hirsuta</i> var. <i>sanguinea</i>	Hairy Lettuce				S2	3 Sensitive	4	65.7 ± 7.0	NS
P	<i>Solidago multiradiata</i>	Multi-rayed Goldenrod				S2	2 May Be At Risk	10	71.2 ± 0.0	NB
P	<i>Symphotrichum undulatum</i>	Wavy-leaved Aster				S2	3 Sensitive	7	60.6 ± 1.0	NS
P	<i>Symphotrichum ciliolatum</i>	Fringed Blue Aster				S2	3 Sensitive	30	2.7 ± 7.0	NS
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2	3 Sensitive	6	50.2 ± 1.0	NS
P	<i>Caulophyllum thalictroides</i>	Blue Cohosh				S2	2 May Be At Risk	61	13.4 ± 0.0	NS
P	<i>Arabis drummondii</i>	Drummond's Rockcress				S2	3 Sensitive	19	18.1 ± 0.0	NS

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P	<i>Cardamine parviflora</i> var. <i>arenicola</i>	Small-flowered Bittercress				S2	3 Sensitive	8	49.9 ± 0.0	NS
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S2	3 Sensitive	22	37.4 ± 0.0	NS
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2	3 Sensitive	16	25.3 ± 1.0	NS
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	18	18.2 ± 0.0	NS
P	<i>Chenopodium rubrum</i>	Red Pigweed				S2	2 May Be At Risk	4	89.3 ± 0.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	3 Sensitive	8	79.3 ± 7.0	NS
P	<i>Hypericum majus</i>	Large St John's-wort				S2	3 Sensitive	4	9.0 ± 0.0	NS
P	<i>Oxytropis campestris</i> var. <i>johannensis</i>	Field Locoweed				S2	2 May Be At Risk	12	79.0 ± 1.0	NS
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2	3 Sensitive	12	16.2 ± 1.0	NS
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S2	3 Sensitive	16	34.2 ± 1.0	NS
P	<i>Oenothera fruticosa</i> ssp. <i>glauca</i>	Narrow-leaved Evening Primrose				S2	5 Undetermined	6	46.5 ± 7.0	NS
P	<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb				S2	3 Sensitive	63	30.6 ± 0.0	NS
P	<i>Rumex salicifolius</i> var. <i>mexicanus</i>	Triangular-valve Dock				S2	3 Sensitive	13	36.9 ± 0.0	NS
P	<i>Primula mistassinica</i>	Mistassini Primrose				S2	3 Sensitive	16	46.5 ± 7.0	NS
P	<i>Anemone canadensis</i>	Canada Anemone				S2	2 May Be At Risk	3	65.7 ± 7.0	NS
P	<i>Anemone quinquefolia</i>	Wood Anemone				S2	3 Sensitive	20	22.1 ± 0.0	NS
P	<i>Anemone virginiana</i>	Virginia Anemone				S2	3 Sensitive	17	44.7 ± 7.0	NS
P	<i>Anemone virginiana</i> var. <i>virginiana</i>	Virginia Anemone				S2	3 Sensitive	2	52.1 ± 7.0	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2	3 Sensitive	70	61.7 ± 1.0	NB
P	<i>Galium boreale</i>	Northern Bedstraw				S2	2 May Be At Risk	11	12.2 ± 5.0	NS
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2	3 Sensitive	85	63.2 ± 0.0	NB
P	<i>Salix pedicellaris</i>	Bog Willow				S2	3 Sensitive	70	41.1 ± 0.0	NS
P	<i>Salix sericea</i>	Silky Willow				S2	2 May Be At Risk	3	75.5 ± 1.0	NS
P	<i>Comandra umbellata</i>	Bastard's Toadflax				S2	2 May Be At Risk	9	69.5 ± 1.0	NB
P	<i>Saxifraga paniculata</i> ssp. <i>neogaea</i>	White Mountain Saxifrage				S2	3 Sensitive	16	49.6 ± 1.0	NS
P	<i>Tiarella cordifolia</i>	Heart-leaved Foamflower				S2	3 Sensitive	227	47.5 ± 1.0	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S2	3 Sensitive	9	47.3 ± 7.0	NS
P	<i>Carex atratiformis</i>	Scabrous Black Sedge				S2	3 Sensitive	3	35.9 ± 1.0	NS
P	<i>Carex bebbii</i>	Bebb's Sedge				S2	3 Sensitive	25	25.4 ± 0.0	NS
P	<i>Carex capillaris</i>	Hairlike Sedge				S2	3 Sensitive	14	35.0 ± 0.0	NS
P	<i>Carex castanea</i>	Chestnut Sedge				S2	2 May Be At Risk	23	47.8 ± 0.0	NS
P	<i>Carex comosa</i>	Bearded Sedge				S2	3 Sensitive	14	33.1 ± 7.0	NS
P	<i>Carex hystericina</i>	Porcupine Sedge				S2	2 May Be At Risk	9	17.9 ± 1.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S2	3 Sensitive	11	24.6 ± 0.0	NS
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S2	3 Sensitive	38	20.0 ± 6.0	NS
P	<i>Vallisneria americana</i>	Wild Celery				S2	2 May Be At Risk	7	30.4 ± 0.0	NS
P	<i>Juncus stygius</i> ssp. <i>americanus</i>	Moor Rush				S2	3 Sensitive	13	45.0 ± 0.0	NS
P	<i>Allium schoenoprasum</i>	Wild Chives				S2	2 May Be At Risk	1	57.8 ± 1.0	NB
P	<i>Allium schoenoprasum</i> var. <i>sibiricum</i>	Wild Chives				S2	2 May Be At Risk	1	46.5 ± 7.0	NS
P	<i>Lilium canadense</i>	Canada Lily				S2	2 May Be At Risk	98	14.7 ± 1.0	NS
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2	3 Sensitive	2	71.6 ± 0.0	NS
P	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Yellow Lady's-slipper				S2	3 Sensitive	11	54.0 ± 1.0	NS
P	<i>Cypripedium parviflorum</i> var. <i>makasin</i>	Small Yellow Lady's-Slipper				S2	3 Sensitive	13	67.5 ± 0.0	NS
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	2 May Be At Risk	36	2.7 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2	3 Sensitive	10	60.0 ± 0.0	NS
P	<i>Platanthera flava</i> var. <i>flava</i>	Southern Rein Orchid				S2	3 Sensitive	1	65.7 ± 7.0	NS
P	<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchid				S2	5 Undetermined	11	60.8 ± 1.0	NS
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	3 Sensitive	14	22.1 ± 0.0	NS
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2	2 May Be At Risk	28	56.7 ± 0.0	NS
P	<i>Calamagrostis stricta</i>	Slim-stemmed Reed Grass				S2	3 Sensitive	10	44.2 ± 0.0	NS
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	7	56.9 ± 0.0	NS
P	<i>Piptatherum canadense</i>	Canada Rice Grass				S2	3 Sensitive	7	35.7 ± 1.0	NS
P	<i>Piptatherum pungens</i>	Slender Rice Grass				S2	3 Sensitive	4	90.3 ± 0.0	NB
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S2	2 May Be At Risk	15	40.9 ± 0.0	NS
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S2	2 May Be At Risk	9	46.9 ± 0.0	NS
P	<i>Dryopteris fragrans</i> var. <i>remotiuscula</i>	Fragrant Wood Fern				S2	3 Sensitive	33	20.8 ± 1.0	NS
P	<i>Woodsia glabella</i>	Smooth Cliff Fern				S2	3 Sensitive	19	20.0 ± 1.0	NS
P	<i>Symphotrichum boreale</i>	Boreal Aster				S2?	3 Sensitive	9	2.7 ± 7.0	NS
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	5 Undetermined	3	85.6 ± 1.0	NS
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2?	3 Sensitive	7	41.5 ± 1.0	NS
P	<i>Rumex maritimus</i> var. <i>persicarioides</i>	Peach-leaved Dock				S2?	2 May Be At Risk	1	90.0 ± 5.0	PE
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S2?	5 Undetermined	5	12.6 ± 7.0	NS
P	<i>Carex peckii</i>	White-Tinged Sedge				S2?	2 May Be At Risk	7	44.4 ± 0.0	NS
P	<i>Eleocharis ovata</i>	Ovate Spikerush				S2?	3 Sensitive	14	13.4 ± 0.0	NS
P	<i>Scirpus pedicellatus</i>	Stalked Bulrush				S2?	3 Sensitive	8	27.5 ± 0.0	NS
P	<i>Potamogeton pulcher</i>	Spotted Pondweed			Vulnerable	S2S3	3 Sensitive	3	85.4 ± 2.0	NS
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S2S3	3 Sensitive	8	51.4 ± 1.0	NS
P	<i>Iva frutescens</i> ssp. <i>oraria</i>	Big-leaved Marsh-elder				S2S3	3 Sensitive	17	58.8 ± 0.0	NS
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S2S3	3 Sensitive	1	46.5 ± 7.0	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S2S3	3 Sensitive	11	73.6 ± 0.0	NS
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	27	17.2 ± 0.0	NS
P	<i>Hypericum dissimulatum</i>	Disguised St John's-wort				S2S3	3 Sensitive	4	11.7 ± 1.0	NS
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S2S3	3 Sensitive	47	48.5 ± 0.0	NS
P	<i>Shepherdia canadensis</i>	Soapberry				S2S3	3 Sensitive	78	63.7 ± 0.0	NS
P	<i>Empetrum eamesii</i> ssp. <i>eamesii</i>	Pink Crowberry				S2S3	3 Sensitive	1	80.6 ± 5.0	PE
P	<i>Chamaesyce polygonifolia</i>	Seaside Spurge				S2S3	3 Sensitive	3	53.9 ± 0.0	NB
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	3 Sensitive	18	18.0 ± 1.0	NS
P	<i>Polygonum buxiforme</i>	Small's Knotweed				S2S3	5 Undetermined	7	15.7 ± 7.0	NS
P	<i>Amelanchier fernaldii</i>	Fernald's Serviceberry				S2S3	5 Undetermined	2	26.0 ± 5.0	NS
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	3 Sensitive	1	46.6 ± 5.0	NS
P	<i>Galium aparine</i>	Common Bedstraw				S2S3	3 Sensitive	14	37.6 ± 3.0	NS
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2S3	3 Sensitive	1	64.0 ± 1.0	NB
P	<i>Salix pellita</i>	Satiny Willow				S2S3	3 Sensitive	9	17.8 ± 0.0	NS
P	<i>Veronica serpyllifolia</i> ssp. <i>humifusa</i>	Thyme-Leaved Speedwell				S2S3	3 Sensitive	7	87.5 ± 0.0	NB
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	3 Sensitive	9	11.9 ± 7.0	NS

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P	<i>Carex hirtifolia</i>	Pubescent Sedge				S2S3	3 Sensitive	46	14.7 ± 1.0	NS
P	<i>Carex houghtoniana</i>	Houghton's Sedge				S2S3	3 Sensitive	5	15.6 ± 0.0	NS
P	<i>Eleocharis olivacea</i>	Yellow Spikerush				S2S3	3 Sensitive	5	58.5 ± 0.0	NS
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S2S3	3 Sensitive	51	12.2 ± 1.0	NS
P	<i>Coeloglossum viride</i> <i>var. virescens</i>	Long-bracted Frog Orchid				S2S3	2 May Be At Risk	6	15.5 ± 0.0	NS
P	<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper				S2S3	3 Sensitive	520	29.6 ± 5.0	NS
P	<i>Poa glauca</i>	Glaucous Blue Grass				S2S3	3 Sensitive	16	49.6 ± 1.0	NS
P	<i>Stuckenia filiformis</i> <i>ssp. alpina</i>	Thread-leaved Pondweed				S2S3	3 Sensitive	2	96.7 ± 1.0	NB
P	<i>Botrychium lanceolatum</i> <i>var. angustisegmentum</i>	Lance-Leaf Grape-Fern				S2S3	3 Sensitive	14	15.8 ± 0.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	3 Sensitive	4	15.8 ± 0.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	7	39.8 ± 50.0	NS
P	<i>Angelica atropurpurea</i>	Purple-stemmed Angelica				S3	4 Secure	19	35.1 ± 2.0	NS
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	3 Sensitive	50	24.0 ± 0.0	NS
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S3	4 Secure	17	58.6 ± 0.0	NS
P	<i>Megalodonia beckii</i>	Water Beggarticks				S3	4 Secure	27	31.2 ± 1.0	NS
P	<i>Packera paupercula</i>	Balsam Groundsel				S3	4 Secure	44	44.5 ± 5.0	NS
P	<i>Betula pumila</i>	Bog Birch				S3	3 Sensitive	10	82.8 ± 0.0	NS
P	<i>Betula pumila</i> <i>var. pumila</i>	Bog Birch				S3	3 Sensitive	1	39.8 ± 1.0	NS
P	<i>Campanula aparinoides</i>	Marsh Bellflower				S3	3 Sensitive	43	17.8 ± 0.0	NS
P	<i>Minuartia groenlandica</i>	Greenland Stitchwort				S3	3 Sensitive	4	89.8 ± 0.0	NS
P	<i>Viburnum edule</i>	Squashberry				S3	3 Sensitive	8	68.0 ± 0.0	NS
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3	3 Sensitive	4	25.2 ± 1.0	NS
P	<i>Vaccinium caespitosum</i>	Dwarf Bilberry				S3	4 Secure	56	57.0 ± 0.0	NS
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3	4 Secure	1	75.5 ± 7.0	NS
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	15	15.7 ± 0.0	NS
P	<i>Proserpinaca palustris</i>	Marsh Mermaidweed				S3	4 Secure	16	30.6 ± 1.0	NS
P	<i>Proserpinaca palustris</i> <i>var. crebra</i>	Marsh Mermaidweed				S3	4 Secure	28	31.4 ± 0.0	NS
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3	4 Secure	5	39.3 ± 5.0	NS
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	14	47.6 ± 0.0	NS
P	<i>Epilobium hornemannii</i>	Hornemann's Willowherb				S3	4 Secure	2	95.9 ± 1.0	NB
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	3 Sensitive	23	39.3 ± 0.0	NS
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	3 Sensitive	21	9.6 ± 5.0	NS
P	<i>Polygonum pennsylvanicum</i>	Pennsylvania Smartweed				S3	4 Secure	29	21.7 ± 0.0	NS
P	<i>Polygonum scandens</i>	Climbing False Buckwheat				S3	3 Sensitive	33	14.1 ± 0.0	NS
P	<i>Plantago rugelii</i>	Rugel's Plantain				S3	4 Secure	6	44.4 ± 0.0	NS
P	<i>Primula laurentiana</i>	Laurentian Primrose				S3	4 Secure	31	64.0 ± 1.0	NS
P	<i>Samolus valerandi</i> <i>ssp. parviflorus</i>	Seaside Brookweed				S3	3 Sensitive	28	20.7 ± 0.0	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3	4 Secure	12	18.2 ± 0.0	NS
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	3 Sensitive	6	45.9 ± 0.0	NS
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	73	36.0 ± 5.0	NS
P	<i>Rhamnus alnifolia</i>	Alder-leaved Buckthorn				S3	4 Secure	217	22.6 ± 0.0	NS
P	<i>Agrimonia gryposepala</i>	Hooked Agrimony				S3	4 Secure	103	19.0 ± 0.0	NS
P	<i>Amelanchier stolonifera</i>	Running Serviceberry				S3	4 Secure	22	20.0 ± 5.0	NS
P	<i>Geocaulon lividum</i>	Northern Comandra				S3	4 Secure	6	15.4 ± 0.0	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	20	16.6 ± 1.0	NS

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P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	4 Secure	35	10.4 ± 0.0	NS
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	3 Sensitive	52	13.2 ± 0.0	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3	4 Secure	127	8.7 ± 0.0	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3	4 Secure	20	18.9 ± 0.0	NS
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	3 Sensitive	7	44.4 ± 0.0	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	44	29.6 ± 3.0	NS
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	33	16.3 ± 0.0	NS
P	<i>Carex swanii</i>	Swan's Sedge				S3	3 Sensitive	1	95.8 ± 2.0	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3	4 Secure	19	38.7 ± 0.0	NS
P	<i>Carex wiedgandii</i>	Wiegand's Sedge				S3	3 Sensitive	27	37.8 ± 0.0	NS
P	<i>Carex foenea</i>	Fernald's Hay Sedge				S3	4 Secure	21	20.3 ± 5.0	NS
P	<i>Eleocharis nitida</i>	Quill Spikerush				S3	4 Secure	15	15.7 ± 7.0	NS
P	<i>Elodea canadensis</i>	Canada Waterweed				S3	4 Secure	23	15.7 ± 0.0	NS
P	<i>Juncus subcaudatus</i> var. <i>planisepalus</i>	Woods-Rush				S3	3 Sensitive	14	30.9 ± 5.0	NS
P	<i>Juncus dudleyi</i>	Dudley's Rush				S3	4 Secure	27	34.0 ± 0.0	NS
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3	3 Sensitive	25	20.6 ± 100.0	NS
P	<i>Listera australis</i>	Southern Twayblade				S3	4 Secure	92	44.8 ± 0.0	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	4 Secure	97	14.5 ± 1.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	4 Secure	20	15.7 ± 0.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3	4 Secure	32	11.0 ± 7.0	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3	4 Secure	16	48.3 ± 0.0	NS
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3	4 Secure	27	11.8 ± 0.0	NS
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3	4 Secure	83	49.7 ± 0.0	NS
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	25	19.0 ± 0.0	NS
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S3	3 Sensitive	11	19.0 ± 0.0	NS
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S3	3 Sensitive	24	38.4 ± 0.0	NS
P	<i>Sparganium natans</i>	Small Burreed				S3	4 Secure	22	23.4 ± 0.0	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3	4 Secure	14	39.1 ± 1.0	NS
P	<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort				S3	3 Sensitive	11	11.0 ± 7.0	NS
P	<i>Equisetum pratense</i>	Meadow Horsetail				S3	3 Sensitive	15	24.6 ± 0.0	NS
P	<i>Equisetum variegatum</i>	Variegated Horsetail				S3	4 Secure	56	24.1 ± 0.0	NS
P	<i>Isoetes acadensis</i>	Acadian Quillwort				S3	3 Sensitive	5	23.3 ± 1.0	NS
P	<i>Lycopodium sitchense</i>	Sitka Clubmoss				S3	4 Secure	6	47.5 ± 0.0	NB
P	<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	3 Sensitive	24	19.0 ± 1.0	NS
P	<i>Botrychium dissectum</i>	Cut-leaved Moonwort				S3	4 Secure	10	16.1 ± 0.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	5 Undetermined	24	10.7 ± 0.0	NS
P	<i>Asclepias incarnata</i> ssp. <i>pulchra</i>	Swamp Milkweed				S3?	5 Undetermined	50	72.7 ± 0.0	NS
P	<i>Polygonum amphibium</i> var. <i>emersum</i>	Water Smartweed				S3?	5 Undetermined	1	71.7 ± 0.0	NS
P	<i>Lycopodium sabinifolium</i>	Ground-Fir				S3?	4 Secure	13	37.6 ± 0.0	NS
P	<i>Atriplex franktonii</i>	Frankton's Saltbush				S3S4	4 Secure	6	38.7 ± 5.0	NS
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	19	27.6 ± 0.0	NS
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	4 Secure	1	93.0 ± 0.0	NS
P	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3S4	4 Secure	8	39.5 ± 0.0	NS
P	<i>Nuphar lutea</i> ssp. <i>pumila</i>	Small Yellow Pond-lily				S3S4	4 Secure	8	23.0 ± 1.0	NS
P	<i>Sanguinaria</i>	Bloodroot				S3S4	4 Secure	91	10.8 ± 0.0	NS

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P	<i>canadensis</i>									
P	<i>Polygonum fowleri</i>	Fowler's Knotweed				S3S4	4 Secure	6	22.8 ± 1.0	NS
P	<i>Rumex maritimus</i>	Sea-Side Dock				S3S4		41	40.1 ± 2.0	NS
P	<i>Rumex maritimus</i> var. <i>fueginus</i>	Tierra del Fuego Dock				S3S4	4 Secure	3	90.6 ± 2.0	PE
P	<i>Crataegus succulenta</i>	Fleshy Hawthorn				S3S4	5 Undetermined	4	94.0 ± 0.0	NS
P	<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry				S3S4	4 Secure	65	33.6 ± 0.0	NS
P	<i>Salix petiolaris</i>	Meadow Willow				S3S4	4 Secure	64	16.5 ± 0.0	NS
P	<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S3S4	4 Secure	7	58.0 ± 0.0	NS
P	<i>Viola sagittata</i> var. <i>ovata</i>	Arrow-Leaved Violet				S3S4	4 Secure	13	49.4 ± 2.0	NS
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S3S4	4 Secure	114	42.0 ± 0.0	NS
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	4 Secure	9	49.4 ± 2.0	NS
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	169	39.3 ± 0.0	NS
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	5 Undetermined	6	51.4 ± 1.0	NB
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	4 Secure	7	17.6 ± 2.0	NS
P	<i>Luzula parviflora</i>	Small-flowered Woodrush				S3S4	4 Secure	9	18.1 ± 0.0	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	4 Secure	22	23.3 ± 0.0	NS
P	<i>Panicum tuckermanii</i>	Tuckerman's Panic Grass				S3S4	4 Secure	16	14.8 ± 0.0	NS
P	<i>Trisetum spicatum</i>	Narrow False Oats				S3S4	4 Secure	22	51.1 ± 5.0	NS
P	<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern				S3S4	4 Secure	82	25.8 ± 1.0	NS
P	<i>Equisetum hyemale</i>	Common Scouring-rush				S3S4	4 Secure	4	63.4 ± 0.0	NS
P	<i>Equisetum hyemale</i> var. <i>affine</i>	Common Scouring-rush				S3S4	4 Secure	53	34.3 ± 10.0	NS
P	<i>Equisetum scirpoides</i>	Dwarf Scouring-Rush				S3S4	4 Secure	63	18.1 ± 0.0	NS
P	<i>Lycopodium complanatum</i>	Northern Clubmoss				S3S4	4 Secure	19	17.7 ± 5.0	NS
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S3S4	4 Secure	5	87.4 ± 0.0	NS
P	<i>Viola canadensis</i>	Canada Violet				SH	0.1 Extirpated	2	55.5 ± 7.0	NS

5.1 SOURCE BIBLIOGRAPHY (100 km)

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

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1	Scott, F.W. 1988. Status Report on the Southern Flying Squirrel (<i>Glaucomys volans</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 2 recs.
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1	Spicer, C.D. 2004. Specimens from CWS Herbarium, Mount Allison Herbarium Database. Mount Allison University, 5939 recs.
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1	Toner, M. 2001. Lynx Records 1973-2000. NB Dept of Natural Resources, 29 recs.
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# recs	CITATION
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APPENDIX D

NOVA SCOTIA MUSEUM REPORT

HERITAGE AND BIOLOGICAL RESOURCES



**Communities,
Culture & Heritage**

1741 Brunswick Street
3rd Floor
P.O. Box 456
Halifax, NS
B3J 2R5

Tel: (902) 424-6475
Fax: (902) 424-0560

December 21, 2016

Heather A. Levy
Envirosphere Consultants Limited
PO 2906 Unit 5 - 120 Morison Dr.
Windsor, NS. B0N 2T0

Dear Ms. Levy:

**RE: Environmental Screening 16-11-16b
Williamsdale Quarry Expansion**

Further to your request of November 16, 2016 staff at Communities, Culture and Heritage has reviewed their files for reference to the presence of natural and heritage resources in the study area. Please be aware that the information is not comprehensive, and may include varying degrees of accuracy with respect to the precise location and condition of natural resources.

It should be noted that the amount and degree of disturbance from previous developments could have a significant role in establishing the presence, absence or condition of natural and heritage resources in this area.

Botany

Staff have reviewed the proposed area with respect to plant species at risk. The following plants are known from the vicinity of Williamsdale and should be considered prior to any development of the development site or access roads.

Alopecurus aequalis Yellow
Asplenium trichomanes ramosum Yellow
Bromus latiglumis Orange
Calamagrostis stricta Yellow (=C. neglecta)
Campanula aparinoides Yellow
Carex hirtifolia Yellow
Caulophyllum thalictroides Orange
Conioselinum chinense Yellow
Cypripedium reginae Orange
Elymus wiegandii Orange
Eriophorum gracile Yellow
Fallopia scandens Yellow
Fraxinus nigra Yellow
Galium boreale Orange
Hypericum majus Orange
Isoetes prototypus Yellow

Laportea Canadensis Yellow
Lilium Canadensis Yellow
Limosella australis Yellow
Rhamnus alnifolia Yellow
Thuja occidentalis Red

The presence/absence of the above species should be determined when identification is certain and the results should be stated in the final report.

Archaeology

Staff reviewed the study area for the Williamsdale Quarry Expansion. There are no recorded archaeological sites on file for the study area. There is a site recorded to the east and to the west of the study area. One waterbody is identifiable within the study area. Second River is just to the east and the River Philip is to the north. Historic maps indicate possible settlement.

It is recommended that an assessment for archaeological resources takes place.

If you have any questions, please contact me at 424-6475.

Sincerely,



Sean Weseloh-McKeane
Coordinator, Special Places

Enclosure

APPENDIX E

LABORATORY RESULTS

TSS & pH

Envirosphere Consultants Limited

Unit 5—120 Morison Drive, Box 2906, Windsor, Nova Scotia, B0N 2T0

ph: (902) 798-4022, fax: (902) 798-2614, e-mail: enviroco@ns.sympatico.ca, website: www.envirosphere.ca

Environmental Sample Analysis Report

Report Date: 12-Jun-17 Report Number: A0619

Envirosphere Consultants Ltd.
Unit 5 - 120 Morison Drive
Windsor, Nova Scotia
B0N 2T0

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	pH	Type of Sample	Detection Limit	Sample Comments
L2017-29	CRM	Municipal Williamsdale Quarry	CRM	6/9/2017	6/10/2017	7.0	STD	0.1	CRM pH 7.00 +- 0.01
L2017-29	Second River Downstream	Municipal Williamsdale Quarry	stream water	6/9/2017	6/10/2017	7.2	REG	0.1	Second River @ Collingwood Road
L2017-29	Second River upstream	Municipal Williamsdale Quarry	stream water	6/9/2017	6/10/2017	7.2	REG	0.1	Second River upstream @ power line
L2017-29	Second River upstream	Municipal Williamsdale Quarry	stream water	6/9/2017	6/10/2017	7.2	DUP	0.1	Second River upstream @ power line
L2017-29	Stream @ Civic 1501	Municipal Williamsdale Quarry	stream water	6/9/2017	6/10/2017	7.2	REG	0.1	Unnamed stream @ Civic 1501

Name of Analyst:

P. Stewart

Analyses reviewed by:

JH

Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 3-10 units The results in this report relate only to the items tested. More information is available upon request.

The quality of the results is dependent on the quality of sample provided.

Comment: Samples for pH should be kept cool until delivery to the lab unless the samples are analyzed immediately. Preferably samples should be analyzed within 24 hours. Hach manual recommends filling bottle completely and capping tightly; cooling to 4°C for storage and analyzing within 6 hours. If this can't be done, Hach manual recommends reporting the holding time with results.

Method: Standard Methods for the Examination of Water and Wastewater 22nd Edition. 2012 and online version., 4500-HB. Electrometric measurement of pH. ECL Method 8, pH.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.

Envirosphere Consultants Limited

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ph: (902) 798-4022, fax: (902) 798-2614, e-mail: enviroco@ns.sympatico.ca, website: www.envirosphere.ca

Environmental Sample Analysis Report

Report Date: 15-Jun-17 Report Number: A0621

Envirosphere Consultants Ltd.
PO Box 2906, Unit 5- 120 Morison Drive
Windsor, NS
B0N 2T0

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	TSS (mg/L)	Type of Sample	Detection Limit	Sample Comments
L2017-29	Stream @ Civic 1501	Municipal Williamsdale Quarry	stream water	6/9/2017	6/15/2017	67.0	REG	0.5 mg/L	Unnamed stream @ Civic 1501
L2017-29	Second River upstream	Municipal Williamsdale Quarry	stream water	6/9/2017	6/15/2017	<0.5	REG	0.5 mg/L	Second River upstream @ power line
L2017-29	Second River Downstream	Municipal Williamsdale Quarry	stream water	6/9/2017	6/15/2017	<0.5	REG	0.5 mg/L	Second River @ Collingwood Road
L2017-29	Second River Downstream (Dup)	Municipal Williamsdale Quarry	stream water	6/9/2017	6/15/2017	<0.5	DUP	0.5 mg/L	Second River @ Collingwood Road
L2017-29	Blank	Municipal Williamsdale Quarry	dH2O		6/15/2017	<0.5	BLANK	0.5 mg/L	
L2017-29	CRM	Municipal Williamsdale Quarry	CRM		6/15/2017	213.0	STD	0.5 mg/L	CRM = 211 mg/L

Name of Analyst: Heather Ly Analyses reviewed by: AS Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 1-1000 mg/L. The results in this report relate only to the items tested. More information is available upon request.

The quality of the results is dependent on the quality of sample provided.

Samples for TSS analysis should be kept cool until delivery to the lab unless they are analyzed immediately. A minimum sample volume of 500 ml is preferred. Place sample in a clean plastic container free of cracks or contamination. Fill the bottle to the top and then cap. Samples should reach the lab within 24 hours of sampling, but will be accepted up to 7 days.

Methods: Modified from Standard Methods for the Examination of Water and Wastewater 22nd Edition, 2012 and online version. 2540D. Total Suspended Solids. ECL method 3, Total Suspended Solids.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.

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Envirosphere Consultants Ltd.

Unit 5 - 120 Morison Drive

Windsor, Nova Scotia

B0N 2T0

Environmental Sample Analysis Report

Report Date: 16-Jun-17

Report Number: A0622

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	pH	Type of Sample	Detection Limit	Sample Comments
L2017-32	CRM	Municipal Williamsdale Quarry	CRM		6/16/2017	7.0	STD	0.1	CRM pH 7.00 +- 0.01
L2017-32	Ditch at Weigh Scale	Municipal Williamsdale Quarry	stream water	6/13/2017	6/16/2017	7.8	REG	0.1	
L2017-32	Second River @ Hwy	Municipal Williamsdale Quarry	stream water	6/13/2017	6/16/2017	7.1	REG	0.1	
L2017-32	WS5	Municipal Williamsdale Quarry	stream water	6/13/2017	6/16/2017	8	REG	0.1	
L2017-32	WS6	Municipal Williamsdale Quarry	stream water	6/13/2017	6/16/2017	7.2	REG	0.1	
L2017-32	WS7	Municipal Williamsdale Quarry	stream water	6/13/2017	6/16/2017	6.8	REG	0.1	
L2017-32	WS7 DUP	Municipal Williamsdale Quarry	stream water	6/13/2017	6/16/2017	6.8	DUP	0.1	
L2017-32	WS8	Municipal Williamsdale Quarry	stream water	6/13/2017	6/16/2017	6.7	REG	0.1	

Name of Analyst: _____

Jay Baker

Analyses reviewed by: _____

HL

Director (Lab Manager) (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 3-10 units The results in this report relate only to the items tested. More information is available upon request.

The quality of the results is dependent on the quality of sample provided.

Comment: Samples for pH should be kept cool until delivery to the lab unless the samples are analyzed immediately. Preferably samples should be analyzed within 24 hours. Hach manual recommends filling bottle completely and capping tightly; cooling to 4°C for storage and analyzing within 6 hours. If this can't be done, Hach manual recommends reporting the holding time with results.

Method: Standard Methods for the Examination of Water and Wastewater 22nd Edition. 2012 and online version., 4500-HB. Electrometric measurement of pH. ECL Method 8, pH.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.

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Envirosphere Consultants Ltd.
PO Box 2906, Unit 5- 120 Morison Drive
Windsor, NS
B0N 2T0

Environmental Sample Analysis Report

Report Date: 20-Jun-17 Report Number: A0623

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	TSS (mg/L)	Type of Sample	Detection Limit	Sample Comments
L2017-32	Ditch at Weigh Scale	Municipal Williamsdale Quarry	stream water	6/13/2017	6/20/2017	0.5	REG	0.5 mg/L	
L2017-32	Second River @ Hwy	Municipal Williamsdale Quarry	stream water	6/13/2017	6/20/2017	4.5	REG	0.5 mg/L	
L2017-32	WS5	Municipal Williamsdale Quarry	stream water	6/13/2017	6/20/2017	<0.5	REG	0.5 mg/L	
L2017-32	WS6	Municipal Williamsdale Quarry	stream water	6/13/2017	6/20/2017	1.5	REG	0.5 mg/L	
L2017-32	WS7	Municipal Williamsdale Quarry	stream water	6/13/2017	6/20/2017	<0.5	REG	0.5 mg/L	
L2017-32	WS7 DUP	Municipal Williamsdale Quarry	stream water	6/13/2017	6/20/2017	<0.5	REG	0.5 mg/L	
L2017-32	WS8	Municipal Williamsdale Quarry	stream water	6/13/2017	6/20/2017	<0.5	DUP	0.5 mg/L	

Name of Analyst: Heather Ly Analyses reviewed by: B Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 1-1000 mg/L. The results in this report relate only to the items tested. More information is available upon request.

The quality of the results is dependent on the quality of sample provided.

Samples for TSS analysis should be kept cool until delivery to the lab unless they are analyzed immediately. A minimum sample volume of 500 ml is preferred. Place sample in a clean plastic container free of cracks or contamination. Fill the bottle to the top and then cap. Samples should reach the lab within 24 hours of sampling, but will be accepted up to 7 days.

Methods: Modified from Standard Methods for the Examination of Water and Wastewater 22nd Edition, 2012 and online version, 2540D. Total Suspended Solids. ECL method 3, Total Suspended Solids.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.

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Environmental Sample Analysis Report

Report Date: 20-Jun-17 Report Number: A0623

Envirosphere Consultants Ltd.
PO Box 2906, Unit 5- 120 Morison Drive
Windsor, NS
B0N 2T0

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	TSS (mg/L)	Type of Sample	Detection Limit	Sample Comments
L2017-32	Blank	Municipal Williamsdale Quarry	dH2O		6/20/2017	<0.5	BLANK	0.5 mg/L	
L2017-32	CRM	Municipal Williamsdale Quarry	CRM		6/16/2017	214.0	STD	0.5 mg/L	CRM = 211 mg/L

Name of Analyst: _____ Analyses reviewed by:  Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 1-1000 mg/L The results in this report relate only to the items tested. More information is available upon request.

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Methods: Modified from Standard Methods for the Examination of Water and Wastewater 22nd Edition. 2012 and online version. 2540D. Total Suspended Solids. ECL method 3, Total Suspended Solids.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.