

APPENDIX A

NOVA SCOTIA REGISTRY OF JOINT STOCKS

Entity Snapshot

Entity details

Information as of	19 September 2025
Registry ID	3191614
Business/Organization Name	KENNETH LUTZ TRUCKS LIMITED
Incorporation Date	24 November 2006
Annual Return due Date	30 November 2025
Type	Limited Company
Status	Active
Registered Office	144 BROW OF MOUNTAIN RD W, AYLESFORD, NOVA SCOTIA, B0P 1C0, CANADA
Mailing Address	144 BROW OF MOUNTAIN RD W, AYLESFORD, NOVA SCOTIA, B0P 1C0, CANADA

Directors and Officers

Name	Position
KENNETH D. LUTZ	Director
KENNETH D. LUTZ	President, Secretary

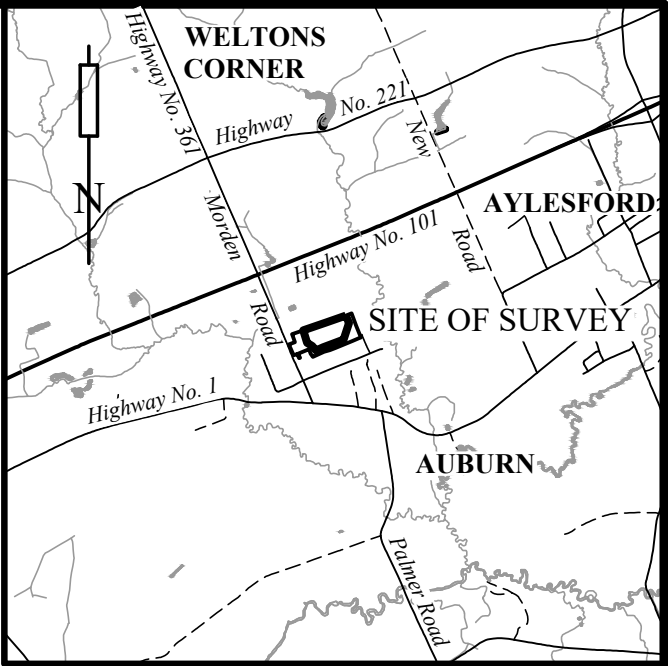
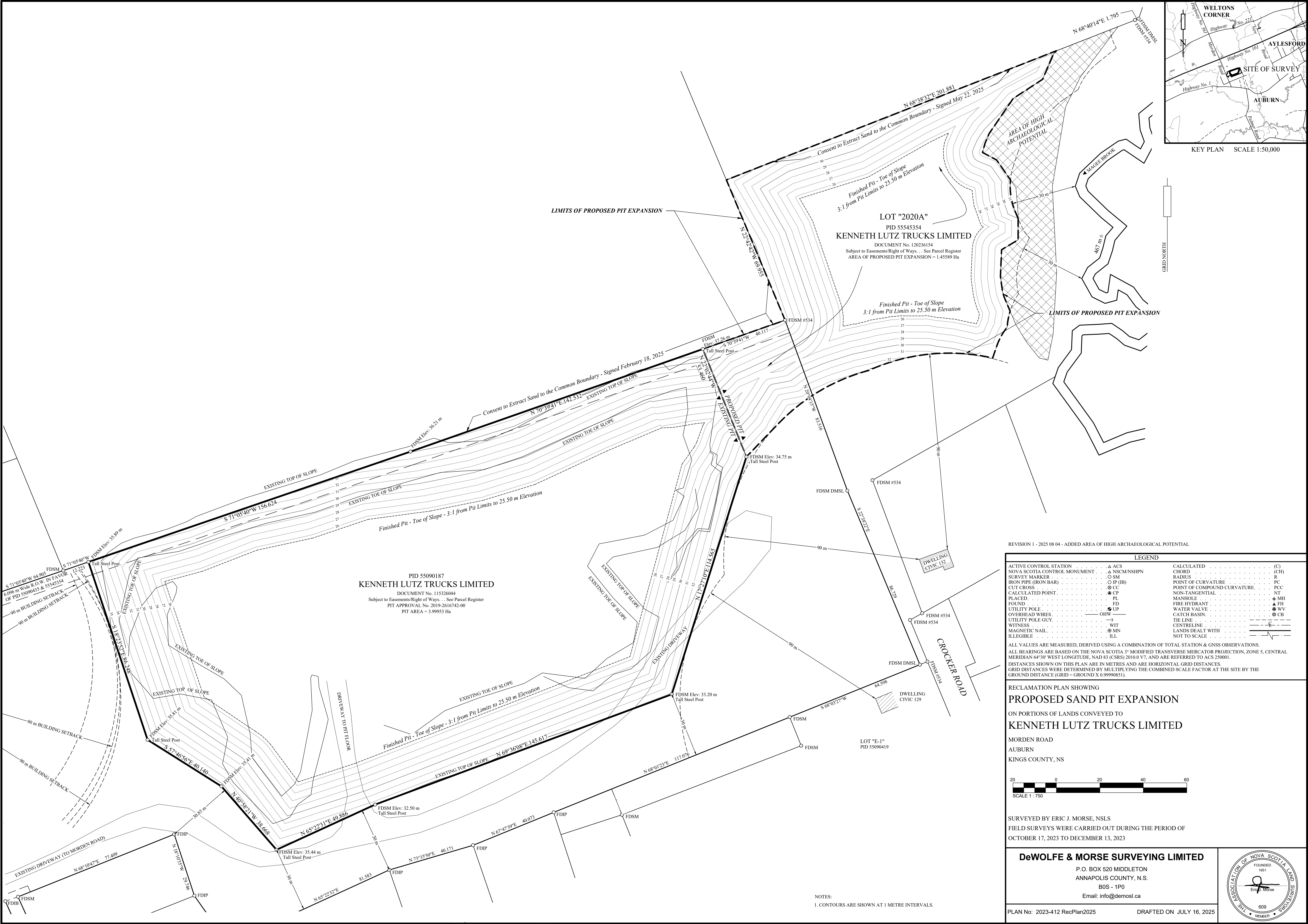
Recognized Agent

Name	Position	Civic Address	Mailing Address
KENNETH D. LUTZ	Recognized Agent	144 BROW MOUNTAIN ROAD W AYLESFORD NOVA SCOTIA B0P 1C0 CANADA	144 BROW MOUNTAIN ROAD W AYLESFORD NOVA SCOTIA B0P 1C0 CANADA

APPENDIX B

RECLAMATION PLAN

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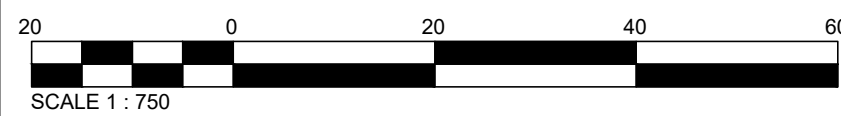
REVISION 1 - 2025 08 04 - ADDED AREA OF HIGH ARCHAEOLOGICAL POTENTIAL

LEGEND		
ACTIVE CONTROL STATION	Δ ACS	CALCULATED (C)
NOVA SCOTIA CONTROL MONUMENT	Δ NSCM/NSHPN	CHORD (CH)
SURVEY MARKER	○ SM	RADIUS R
IRON PIPE (IRON BAR)	○ IP (IB)	POINT OF CURVATURE PC
CUT CROSS	⊗ CC	POINT OF COMPOUND CURVATURE PCC
CALCULATED POINT	⊙ CP	NON-TANGENTIAL NT
PLACED	PL	MANHOLE MH
FOUND	FD	FIRE HYDRANT FH
UTILITY POLE	⊙ UP	WATER VALVE WV
OVERHEAD WIRES	— OHW —	CATCH BASIN CB
UTILITY POLE GUY	—	TIE LINE
WITNESS	WIT	CENTRELINE
MAGNETIC NAIL	⊙ MN	LANDS DEALT WITH
ILLEGIBLE	ILL	NOT TO SCALE

ALL VALUES ARE MEASURED, DERIVED USING A COMBINATION OF TOTAL STATION & GNSS OBSERVATIONS.
ALL BEARINGS ARE BASED ON THE NOVA SCOTIA 3rd MODIFIED TRANSVERSE MERCATOR PROJECTION, ZONE 5, CENTRAL MERIDIAN 64°30' WEST LONGITUDE, NAD 83 (CSRS) 2010.0 V7, AND ARE REFERRED TO ACS 250001.
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND ARE HORIZONTAL GRID DISTANCES.
GRID DISTANCES WERE DETERMINED BY MULTIPLYING THE COMBINED SCALE FACTOR AT THE SITE BY THE GROUND DISTANCE (GRID = GROUND X 0.99990851).

RECLAMATION PLAN SHOWING
PROPOSED SAND PIT EXPANSION
ON PORTIONS OF LANDS CONVEYED TO
KENNETH LUTZ TRUCKS LIMITED

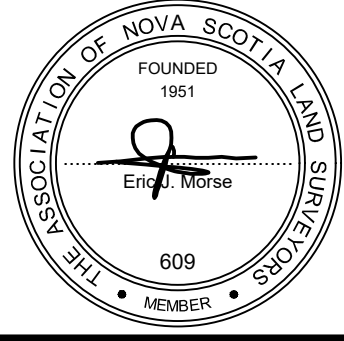
MORDEN ROAD
AUBURN
KINGS COUNTY, NS



SURVEYED BY ERIC J. MORSE, NSLS
FIELD SURVEYS WERE CARRIED OUT DURING THE PERIOD OF
OCTOBER 17, 2023 TO DECEMBER 13, 2023

DeWOLFE & MORSE SURVEYING LIMITED

P.O. BOX 520 MIDDLETON
ANNAPOLIS COUNTY, N.S.
B0S - 1P0
Email: info@demost.ca



PLAN No: 2023-412 RecPlan2025

DRAFTED ON JULY 16, 2025

NOTES:
1. CONTOURS ARE SHOWN AT 1 METRE INTERVALS.

APPENDIX C

MAIL-OUT

Proposed Sand Pit Expansion Project

Notice of Upcoming Environmental Assessment

Kenneth Lutz Trucks Ltd. has operated the Morden Road Sand Pit in Auburn for over 20 years, supplying essential aggregate materials for construction, infrastructure, and agricultural use. This Project received approval to expand the pit beyond 2 ha in 2019, and Kenneth Lutz Trucks Ltd. is now seeking to expand the Project beyond 4 ha. This expansion will extend the sand pit's lifespan by 10+ years, contributing to the regional economy by creating jobs and meeting the growing demand for products such as topsoil, septic filter sand, cable-burying material, and animal bedding.

Fraxinus Environmental and Geomatics is preparing an Environmental Assessment (EA) for the expansion, pursuant to the requirements of the Nova Scotia Environment Act and Environmental Assessment Regulations. The EA is expected to be submitted for review to the NS Department of Environment & Climate Change (NSECC) in May, 2025.



Questions? Comments?

Email us at:

engagement@fraxinusenviro.com



The existing sand pit is located on PID 55090187 and the expansion project will encompass the adjacent PID 55545354.

An interactive version of this map can be found at: fraxinusenviro.com/engagement
Alternately, scan the QR code to view this map on your mobile device.

APPENDIX D

WETLAND PLOT DATA

Parameter	Lutz-WL1-W (Wetland)	Lutz-WL1-U (Upland)
Survey Date	11/8/2024	11/8/2024
Surveyor	Ian Bryson	Ian Bryson
Wetland Conditions	Yes	No
Wetland Vegetation Present	Yes	No
Hydrology Present	Yes	No
Hydric Soils Present	Yes	No
Dominant Wetland Class	Swamp	–
Subdominant Wetland Class	Marsh	–
Wetland Landscape Position	Lotic	–
Wetland Landform	Floodplain	Terrace
Wetland Flow Path	Throughflow	–
Wetland Local Relief	Concave	None
Wetland Vegetation Form	h (deciduous trees) ts (tall shrubs) ne (narrow-leaved emergents) gc (herbs)	h (deciduous trees) ts (tall shrubs) gc (herbs)
Hydric Soils Indicators	F3: Depleted Matrix	–
Primary Hydrology Indicators	A1: Surface Water A2: High Water Table A3: Saturation B1: Water Marks B2: Sediment Deposits B3: Drift Deposits B9: Water-stained Leaves	–

Parameter	Lutz-WL1-W (Wetland)	Lutz-WL1-U (Upland)
	B13: Aquatic Fauna	
Secondary Hydrology Indicators	B10: Drainage Patterns B16: Moss Trim Lines D2: Geomorphic Position	–
Vegetation - Trees	Red maple (<i>Acer rubrum</i>): 15% (FAC)	Red maple (<i>Acer rubrum</i>): 20% (FAC) Northern red oak (<i>Quercus rubra</i>): 5% (FACU) Large-toothed aspen (<i>Populus grandidentata</i>): 5% (FACU) Paper birch (<i>Betula papyrifera</i>): 5% (FACU)
Vegetation - Shrubs	Speckled alder (<i>Alnus incana</i>): 30% (FACW) Chokecherry (<i>Prunus virginiana</i>): 5% (FAC) White meadowsweet (<i>Spiraea alba</i>): 1% (FAC) Red raspberry (<i>Rubus idaeus</i>): <1% (FAC)	Northern red oak (<i>Quercus rubra</i>): 20% (FACU) Red maple (<i>Acer rubrum</i>): 20% (FAC) Late lowbush blueberry (<i>Vaccinium angustifolium</i>): 10% (FAC) Velvet-leaved blueberry (<i>Vaccinium myrtilloides</i>): 10% (FAC) Eastern white pine (<i>Pinus strobus</i>): 5% (FAC) White spruce (<i>Picea glauca</i>): <1% (FAC)
Vegetation - Herbs	Reed canary grass (<i>Phalaris arundinacea</i>): 90% (FACW) Hairy flat-top white aster (<i>Doellingeria umbellata</i>): 15% (FAC) Giant goldenrod (<i>Solidago gigantea</i>): 10% (FAC) Virginia clematis (<i>Clematis virginiana</i>): 5% (FACW)	Eastern teaberry (<i>Gaultheria procumbens</i>): 40% (FAC) Bracken fern (<i>Pteridium aquilinum</i>): 30% (FACU) Partridgeberry (<i>Mitchella repens</i>): 10% (FACU) Fibrous-root sedge (<i>Carex communis</i>): 10% (FACU) Virginia clematis (<i>Clematis virginiana</i>): 5% (FACW) Shaved sedge (<i>Carex tonsa</i> var. <i>tonsa</i>): 5% (UPL) Calico aster (<i>Symphotrichum lateriflorum</i>): 1% (FAC)
Other Cover	Thatch: 5%	Bare Soil Sediment: 10% Thatch: 5%

APPENDIX E

WESP-AC RESPONSES

Cover Page: Basic Description of Assessment	WESP-AC version 3.3
Site Name:	Morden Pit - WL1
Investigator Name:	Ian Bryson
Date of Field Assessment:	2024-06-18
Nearest Town:	Auburn
Latitude (decimal degrees):	45.0239
Longitude (decimal degrees):	-64.8635
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in hectares):	0.8 ha
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	20%
What percent (approx.) of the wetland were you able to visit?	0
What percent (approx.) of the AA were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	Yes
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	rare plants, calciphile plants
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes - July 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	Hundreds
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Form OF. WESP-AC version 3.3 (nontidal wetlands)				
<p>Read the Instrucs worksheet (tab) first. Note that answering some of the questions below will require opening the KML files accompanying this calculator as well as using these online map viewers:</p> <p>Google Earth Pro: https://www.google.com/earth/download/gep/agree.html</p> <p>Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/</p> <p>When available, GIS and processed LiDAR imagery may also be helpful.</p>				
Site ID: Morden Pit - WL1		Person completing this Form OF: Ian Bryson		
#	Indicator Name	Condition Choices	Data	
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one.		
		New Brunswick	0	
		Nova Scotia	1	
		Prince Edward Island	0	
		Newfoundland-Labrador	0	
OF2	Ponded Area Within 1 km. [WBFb, WBN]	The area of non-tidal surface water that is ponded during most of the growing season and is in or adjacent to the AA, plus other such areas within 1 km, is:		
		<0.01 hectare (about 10 m x 10 m).	0	
		0.01 - 0.1 hectare.	1	
		0.1 - 1 hectare.	0	
		1 to 10 hectares.	0	
		10 to 100 hectares.	0	
		>100 hectares.	0	
		* "Adjacent to" or "abutting" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. "Ponded" means not flowing in rivers or streams. If adjacent ponded water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro or similar. Click on Ruler icon in toolbar, then Polygon in pop-up menu.		
		OF3	Ponded Water & Wetland Within 1 km. [AMb, WBF, RSB, KMH, PH, Sens]	The area of wetlands, plus area of persistently ponded surface water , that is in or adjacent to the AA, plus other such areas within 1 km, is:
<0.01 hectare (about 10 m x 10 m).	0			
0.01 - 0.1 hectare.	0			
0.1 - 1 hectare.	0			

		1 to 10 hectares.	1
		10 to 100 hectares.	0
		>100 hectares.	0
OF4	Size of Vegetated Wetland Plus Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all adjacent upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation, or roads wider than 10m is:	
		<0.01 hectare (about 10 m x 10 m).	0
		0.01 - 0.1 hectare.	0
		0.1 - 1 hectare.	0
		1 to 10 hectares.	0
		10 to 100 hectares.	1
		100 to 1000 hectares.	0
		>1000 hectares. [<i>This is nearly always the answer in relatively undeveloped landscapes.</i>]	0

OF5	Distance to Large Vegetated Tract [AM, RSB, KMH, PH, POL, Sens]	The minimum distance from the edge of the AA to the edge of the closest vegetated land (but excluding row crops, lawn, conifer plantation) larger than 375 hectares (about 2 km on a side), is:	
		<50 m, and not separated from the 375-ha vegetated area by any width of paved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes.]	1
		<50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation.	0
		50-500 m, and not separated.	0
		50-500 m, but separated by those features.	0
		0.5 - 5 km, and not separated.	0
		0.5 - 5 km, but separated by those features.	1
		None of the above (the closest patches or corridors which are that large are >5 km away).	0
		PROTOCOL: For this and all other distance measures requested in subsequent questions, you may use Google Earth Pro or similar app. Click on the Ruler icon, then Path, and draw and measure the route.	
OF6	Herbaceous Uniqueness [AMb, WBFb, WBNb, RSBb, KMHb, PHb, POLb]	From canopy perspective, the AA's vegetation cover is >10% herbaceous* but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous* but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous* but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1".	0
		* For this question, "herbaceous vegetation" should Include moss as well as grasslike plants not under a canopy of woody vegetation. Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. If none of the criteria are met, leave as 0.	
OF7	Woody Uniqueness [AMb, RSBb, KMHb, PHb, POLb]	The AA's vegetation cover is >10% woody* but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody* but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody* but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1"	0
		* woody cover = trees & shrubs taller than 1 m, not obviously planted in rows. If none of the criteria are met, leave as 0.	
OF8	Local Vegetated Cover Percentage [WSb, AM, RSB, KMH, PH, POL, Sens]	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, pavement, or young conifer plantations) is:	

		<5% of the land.	0
		5 to 20% of the land.	0
		20 to 60% of the land.	1
		60 to 90% of the land.	0
		>90% of the land.	0
		PROTOCOL: In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer.	
OF9	Distance by Road to Nearest Population Center [NRb, WFRb, FAb, FRb, WBFb, RSB, KMHb, PH, CRI, STR]	Measured along the maintained road nearest the AA, the distance to the nearest population center is:	
		<100 m.	1
		100 - 500 m.	0
		0.5- 1 km.	0
		1 - 5 km.	0
		>5 km.	0
		* a settled area with more than about 5 regularly-inhabited structures per square km. In NB, the GeoNB viewer layer called Buildings may be helpful.	
OF10	Distance to Domestic Wells [NRb, CRI]	The closest wells or water bodies that currently provide drinking water are:	
		Within 0-100 m. of the AA.	1
		100-500 m. away.	0
		>500 m. away	0
		PROTOCOL: Measure this from aerial imagery or estimate it while visiting the wetland. Assume wells are the source of water for domestic uses in nearly all rural areas.	
OF11	Distance to Nearest Maintained Road [NRb, FAb, FRb, AM, WBN, RSB, PH, CRI, STR]	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:	
		<10 m.	0
		10 - 25 m.	0
		25 - 50 m.	0
		50 - 100 m.	1
		100 - 500 m.	0
		>500 m.	0
		NOTE: If using aerial imagery, be alert for roads hidden under a tree canopy. "Maintained" means only that the road is kept free of vegetation such that most on-road vehicles could drive the road for at least part of the year.	

OF12	Wildlife Access [AM, RSB, KMH, STR]	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0
OF13	Distance to Poned Water [AM, WBF, WBN, RSB, KMH, PH, Sens]	The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is:	
		<50 m, and not separated by any width of paved roads, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0
		<50 m, but completely separated by those features.	0
		50-500 m, and not separated.	11
		50-500 m, but separated by those features.	0
		0.5 - 1 km, and not separated.	0
		0.5 - 1 km, but separated by those features.	0
		None of the above (the closest patches or corridors that large are >1 km away).	0
OF14	Distance to Large Poned Water [APP, FA, WBF, CRI]	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares during most of a normal year is:	
		<100 m.	0
		100 m - 1 km.	0
		1 - 2 km.	0
		2-5 km.	1
		5-10 km.	0
		>10 km.	0
		OF15	Tidal Proximity [APP, FA, WBF, CRI]
<100 m.	0		
100 m - 1 km.	0		
1 - 5 km.	0		
5-10 km.	0		
10-40 km.	1		
>40 km.	0		
PROTOCOL: In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. Consult local observers if possible. In NS, see the Headtide KMZ file provided with this calculator to assist the determination. Points shown in that file are only an approximation, so local information if available may be preferable.			
OF16	Upland Edge Contact [NR,	Select one:	

RSB, Sens]

The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0
1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0

		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0
		More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	1
OF17	Flood Damage from Non-tidal Waters [WSb]	Within 5 km downstream or downslope of the AA (select first true choice):	
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure at a lower elevation (not adjacent) that is vulnerable to river flooding unrelated to tidal storm surges.	1
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure at a lower elevation that is vulnerable to river flooding unrelated to tidal storm surges.	0
		PROTOCOL: If possible contact local authorities to determine if such maps exist or if river flooding has damaged unprotected infrastructure in the past few decades. If no maps available, assess potential vulnerability of buildings, roads, and bridges that are close to the same elevation as nearby rivers after considering whether they may be protected from most floods by levees or flow-regulating dams.	
OF18	Relative Elevation in Watershed [WSb, SFTSb, NR, APPb, Sens]	From a topographic map, determine the maximum and minimum elevation of the AA's watershed (not the AA's catchment). Watershed boundaries are in the accompanying KMZ files. Then subtract the watershed's minimum elevation from the AA's elevation, divide by the watershed's elevation range (max-min), and enter decimal result (0 to 1.00) in next column.	0.10
OF19	Water Quality Sensitive Watershed or Area [SRb, PRb, NRb]	<u>In NS</u> , the AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay (NS Protected Water Supply Areas). <u>In NB</u> : the AA is in a Designated Protected Watershed or Protected Wellfield or similarly designated areas according to the GeoNB viewer: http://www.snb.ca/geonb1/e/apps/apps-E.asp Enter 1= yes, 0 =no or in another province without a map with similar designations.	0
OF20	Degraded Water Upstream [SRb, PRb, NRb]	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients , or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:	
		The condition is present within the AA.	0
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0

Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0
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		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1
OF21	Degraded Water Downstream [SRb, PRb, NRb]	The problem described above is downslope from the AA, and:	
		The condition is present within 1 km downslope and connected to the AA by a channel.	0
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km downstream), or no surface connection to downstream channel exists. This is the situation for nearly all wetlands in this region.	1
OF22	Wetland as a Proportion of Its Catchment (Contributing Area, CA) [WS, SFTSb, SR, PR, NR, APP, Sens]	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:	
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0
		0.01 to 0.1.	1
		0.1 to 1.	0
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0
		* Topographic maps may be viewed online, for example, at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.html	
OF23	Unvegetated Surface in the Contributing Area [WSb, SRb, PRb, NRb, APP]	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :	
		<10%.	1
		10 to 25%.	0
		>25%.	0

OF24	Transport From Upslope [WSb, SRb, PRb, NRb]	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by some combination of the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:	
		Mostly true.	0
		Somewhat true.	1
		Mostly untrue.	0
OF25	Aspect [WS, SFTSb, NR, CS, CC, APP]	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:	
		Northward (N, NE). north-facing contributing area.	0
		Southward (S, SW). south-facing contributing area.	1
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0
OF26	Internal Flow Distance [WS, SR, PR, NR, OE]	If wetland has both an inlet and outlet, measure the distance between them. If outlet only, measure the maximum straight-line distance within the wetland from that point. If neither inlet nor outlet, measure wetland's maximum dimension. If wetland receives surface water only during annual flooding from an adjoining river, measure the distance along a line from wetland's upland edge extending perpendicular to the source channel. The applicable distance is:	
		<10 m	0
		10 - 50 m	0
		50 - 100 m	0
		100 - 1000 m	0
		1- 2 km	0
		>2 km	0
		PROTOCOL: Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. In NS, access the online Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap and then enable the layer Forestry> WAM Predicted Flow and measure the inlet-outlet distance.	
OF27	Growing Degree Days Index [SFTSb, SR, PR, NR, CC, APP, OE, AM, WBF, Sens]	In Google Earth, open the KMZ Growing Degree Days file that accompanies this calculator for the wetland's province. Place your cursor over the AA and left-click. From the pop-up window, enter the GRIDCODE number in the next column.	2283

OF28	Anadromous Species Access or Use [SFTSb, FA]	According to agency biologists and/or your own observations, the AA. <i>[Mark just the first choice that is true.]</i> :	
		Is known to support rearing and/or spawning by Atlantic salmon or other anadromous species or eels, even if access to downstream waters is partially limited. Contact local fishery biologists, review the ACCDC report, and visit these websites: In NB: https://www.salmonatlas.com/the-atlantic-salmon-rivers-of-new-brunswick-canada In Newfoundland, https://www.salmonatlas.com/the-atlantic-salmon-rivers-of-newfoundland-canada In Labrador, https://www.salmonatlas.com/the-atlantic-salmon-rivers-of-labrador-canada In NS, Provincial Landscape Viewer>Wildlife>Significant Habitat>Species at Risk. Also: https://www.salmonatlas.com/the-atlantic-salmon-rivers-of-nova-scotia-canada	0
		Has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species or eels and is probably accessed by those during some conditions.	1
		NOTE: If in NS, red dots along streams and connected lakes imply use by Atlantic Salmon and possibly other fish species of conservation concern.	
OF29	Species of Conservation Concern [FAb, FRb, AMb, WBFb, WBNb, RSBb, PHb, Sens]	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :	
		Presence of one or more of the plant species listed for this province in the Plants_Rare worksheet. In addition, if in NS, mark this if the AA is within a mapped Atlantic Coastal Plain Flora Buffer (go to Provincial Landscape Viewer> Wildlife> Special Management Practice Zones).	0
		Presence of one or more of the fish species of conservation concern as listed in the Wildlife_Rare worksheet of the Wildlife_Rare worksheet	0
		Presence of one or more of the amphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet	0
		Presence of one or more of the waterbird species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet	0
		Presence of one or more of the nesting songbird or raptor species (RSB) of conservation concern as listed in the Wildlife_Rare worksheet during their nesting season (May-July for most species).	1
		None of the above, or no data.	0
		PROTOCOL: At the bottom of this data form list all such species that are present. Use site-specific (not buffered) information from ACCDC if obtainable with a custom request, or from an environmental assessment you do. Otherwise, for each waterbird, songbird, and raptor species of concern, you must go to ebird.org > Explore> Species Maps, enter species name and the AA's county, then view map. For species marked "B" in the Wildlife_Rare sheet (tab), in the eBird toolbar filter by June-July to focus on occurrences most likely to indicate breeding. Another source of locational data (all species) is iNaturalist.org. See WESP-AC manual for more complete instructions.	
OF30	Important Bird Area (IBA) [WBFb, WBNb, RSBb]	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0

OF31	Black Duck Nesting Area [WBN]	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank .	2
OF32	Wintering Deer or Moose Concentration Areas [KMH]	If AA is NOT in Nova Scotia, or is on private land with no information, change to blank (not 0). Otherwise (for NS): With the Provincial Landscape Viewer, for Wintering Moose, go to Wildlife> Significant Habitat. For Mainland Moose Concentration Areas, go to Wildlife> Special Management Practice Zones. NOT: Moose Zones, Deer Zones. Enter: yes= 1, no= 0.	
		ADDITIONAL PROTOCOL: in NB: In Google Earth, view the KMZ overlay that accompanies this calculator, or download the shapefile (Crown Lands Conservation Areas) at http://www.snb.ca/geonb1/e/DC/catalogue-E.asp	
OF33	Other Conservation Designation [CRI]	The AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. With Provincial Landscape Viewer, see Protected Areas. In NB: Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area (go to http://www.snb.ca/geonb1/e/apps/apps-E.asp and see Candidate PNA Map Viewer.) Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0
OF34	Conservation Investment [CRI]	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0
OF35	Mitigation Investment [CRI]	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank .	0
OF36	Sustained Scientific Use [CRI]	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank .	0
OF37	Calcareous Region [APP]	The AA is in an area with extensive limestone, marl, or gypsum, or (in NS only) is NOT in a subregion that has been heavily exposed to acid precipitation*. Enter: true= 1, false= 0. If no information, change to BLANK (not 0) .	0
		* for NS, see map in Appendix A of the manual (green or yellow coloured areas)	
OF38	Ownership [CRI, STR]	Select the ONE ownership that covers the largest proportion of the AA. In Google Earth, open KMZ file called NS_Crownlands. Use more recent information if available.	
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0
		Ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0

	Ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0
	Ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1

Form F. WESP-AC version 3.3 (non-tidal wetlands)

Site ID:	Morden Pit - WL1	Field Investigator(s): Ian Bryson	
Visit Date:	18-Jun-24		
#	Indicator Name	Condition Choices	Data
F1	Vegetation, Water, Soil [SFTS, NR, CSP, CC, APP, FA, FR, AM, WBF, WBN, KMH, Sens]	Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:	
		A. Moss and/or lichen cover more than 25% of the ground. Often dominated by sedges, ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat and that layer typically is >40 cm (16 inches) thick. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.	
		A1. Surface water is usually absent or, if present, pH is typically <4.5 and conductivity is usually <100 µS/cm (<64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is <4.0.	0
		A2. Not A1. Surface water, if present, has pH typically >4.5 and conductivity is usually >100 µS/cm (>64 ppm TDS). Sedge cover is usually extensive. Tree and tall shrub cover may also be extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower.	0
		B. Moss and/or lichen cover less than 25% of the ground. Soil is typically mineral or decomposed organic (muck) and if peaty the peat is mostly less than 40 cm thick. Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:	
		B1. Trees and shrubs taller than 1 m comprise more than 25% of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).	1
		B2. Not B1. Trees & shrubs taller than 1 m comprise less than 25% of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.	0
		NOTE: Do not assume these 4 choices necessarily translate to Bog, Fen, Swamp, Marsh respectively. Ericaceous shrubs are mostly in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also.	
F2	Adjacent or Subordinate Types [APP, AM, WBF, RSB]	If the AA is smaller than 1 ha, mark all other types (as defined above) that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types that are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.	
		A1.	0
		A2.	0
		B1.	0
		B2.	1
		*"Adjacent" is used in the same sense as abutting, adjoining, or contiguous. Those terms are used interchangeably throughout WESP-AC to mean mapped types that share any part of a boundary. 1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar.	
F3	Vegetation Height & Form Diversity [WS, SFTS, NR, WFR, CSP, CC, APP, WBF]	Following EACH row below, indicate with a number code the percentage of the living vegetation canopy in the AA that is occupied by that feature (6 if >95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 10-25%, 1 if >0-5%, 0 if none). Percentages must sum to 100%.	
		evergreen trees (may include tamarack) taller than 6 m.	1

	WBN, RSB, KMH, PH, POL, Sens]	deciduous trees taller than 6 m.	2
		evergreen shrubs or trees 2 to 6 m tall not directly below the canopy of trees.	1
		deciduous shrubs or trees 2 to 6 m tall not directly below the canopy of trees.	2
		evergreen vegetation 0.5 to 2 m tall not directly below the canopy of taller vegetation.	0
		deciduous vegetation 0.5 to 2 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.	3
		Non-woody vegetation (except mosses) not under a tree or shrub canopy.	4
		NOTE: "Canopy perspective" is the view looking down from a horizontal plane that is at the height of the AA's tallest vegetation. Deciduous shrubs in this region may include buttonbush, Labrador tea, bayberry (Morella), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and some others.	
F4	Dominance of Low Shrub Genera [RSB, PH, Sens]	If the AA has almost no (<5%) woody cover shorter than 2 m leave 0's in the next column and proceed to next question. Otherwise, determine which two woody plant genera comprise the greatest portion of the low (<2 m) woody cover. Then choose one:	
		Those 2 genera together comprise > 80% of woody cover shorter than 5 ft. Low woody cover is monotypic or nearly so.	0
		Those 2 genera together comprise 50-80% of low woody cover.	0
		No 2 genera together comprise > 50% of low woody cover. Several low woody genera are significantly present.	1
		NOTE: Estimate the percentage as a percentage of just the low woody cover, not a percentage of the entire AA. "Genera" is intended to mean readily distinguishable plant forms (e.g., willow vs. alder vs. birch), not different species within these forms.	
F5	Woody Diameter Classes [CSP, AM, WBN, RSB, POL]	Mark ALL the types that comprise >5% of the woody canopy cover in the AA or >5% of the wooded areas (if any) along its upland edge (perimeter), whichever % is greater. The edge should include only the trees whose canopies extend into the AA.	
		coniferous, 1-9 cm diameter and >1 m tall.	1
		broad-leaved deciduous 1-9 cm diameter and >1 m tall.	1
		coniferous, 10-19 cm diameter.	1
		broad-leaved deciduous 10-19 cm diameter.	1
		coniferous, 20-40 cm diameter.	0
		broad-leaved deciduous 20-40 cm diameter.	1
		coniferous, >40 cm diameter.	0
		broad-leaved deciduous >40 cm diameter.	1
F6	Height Class Interspersion [NR, AM, RSB, KMH, PH, Sens]	Follow the key below and mark the ONE row that best describes MOST of the AA:	
		A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise >70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.	
		A1. The two height classes are mostly scattered and intermixed throughout the AA.	0
		A2. Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.	0
		B. Either the vegetation shorter than 1 m comprises >70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:	
		B1. The less prevalent height class is mostly scattered and intermixed within the prevalent one.	0
		B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.	1
F7	Herbaceous % of Vegetated Wetland [WFR, CC, AM, WBF, WBN, RSB, POL]	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:	
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F11 (Invasive Plant Cover).	0
		5-25% of the vegetated part of the AA.	0
		25-50% of the vegetated part of the AA.	0
		50-95% of the vegetated part of the AA.	1
		>95% of the vegetated part of the AA.	0

		NOTE: Your response should correlate with the last condition choice in F3 (Vegetation Height & Form Diversity) except where moss cover is extensive or herbaceous cover is largely beneath a woody canopy.	
F8	Flowering Forb Cover [PH, POL]	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:	
		<5% of the herbaceous part of the AA.	0
		5-25% of the herbaceous part of the AA.	1
		25-50% of the herbaceous part of the AA.	0
		50-95% of the herbaceous part of the AA.	0
		>95% of the herbaceous part of the AA.	0
		NOTE: Compare with just the herbaceous part of the AA, not the entire AA or the entire vegetated part. Forbs are plants with conspicuous flowers. They may not be flowering at the time of your visit but most can be recognized by having broad leaves rather than blades like grasses. Include forbs hidden beneath a grass or woody canopy as well as forbs in the open. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that do not contain conspicuous flowers at any time of year.	
F9	Robust Herbaceous Vegetation [SR, CC, WBN, RSB, KMH]	The percentage of the herbaceous vegetation cover in the AA that is cattail (<i>Typha</i> spp.), common reed (<i>Phragmites</i>), or tall (>1m) bulrush is:	
		<1% of the herbaceous vegetation, or herbaceous vegetation is absent.	1
		1-25% of the herbaceous vegetation.	0
		25-75% of the herbaceous vegetation.	0
		>75%, of the herbaceous vegetation.	0
		NOTE: Compare with just the herbaceous part of the AA, not the entire AA or the entire vegetated part.	
F10	Dominance of Most Abundant Herbaceous Genera [PH, Sens]	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:	
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0
F11	Invasive Plant Cover [PH, Sens]	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet (tab).	
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	0
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	1
		NOTE: This is not asking for this as a % of all vegetated cover in the AA, just the % of the herbaceous or woody part. See Plants_invasive worksheet (tab) for species to consider.	
F12	Invasive Cover Along Upland Edge [PH, STR]	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species is:	
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	0
		some (but <5%) of the upland edge.	0
		5-50% of the upland edge.	1
		most (>50%) of the upland edge.	0
F13	Nitrogen Fixers [NRb, APP, Sens]	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:	
		<1% or none.	0
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0

		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0
		NOTE: Do not include N-fixing algae or lichens.	
F14	Sphagnum Moss Extent [SFTS, WFR, CSP, CC]	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:	
		<5% of the vegetated part of the AA.	1
		5-25% of the vegetated part of the AA.	0
		25-50% of the vegetated part of the AA.	0
		50-95% of the vegetated part of the AA.	0
		>95% of the vegetated part of the AA.	0
		NOTE: Your answer usually should be consistent with responses in F1 (Vegetation & Substrate) and F21 (Soil Texture)	
F15	Large Snags [WBN, RSB, POL]	The number of large snags (diameter >20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:	
		None, or fewer than 8/ hectare which exceed this diameter.	0
		Several (>8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.	1
		Several (>8/hectare) but above not true.	0
		NOTE: Snags are dead standing trees that often (not always) lack bark and foliage.	
F16	Downed Wood [AM, POL]	The number of downed wood pieces longer than 2 m and with diameter >10 cm , and not persistently submerged, is:	
		Few or none that meet these criteria.	0
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	1
		NOTE: Exclude temporary "burn piles."	
F17	% Bare Ground & Detached Plant Litter [SFTS, SR, PR, NR, WFR, APP, AM, RSB, POL, Sens]	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:	
		Little or no (<5%) <i>bare ground</i> is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0
		Slightly bare ground (5-20% bare between plants) is visible in places, and those areas comprise less than 5% of the unflooded parts of the AA.	1
		Slightly bare ground (5-20% bare between plants) comprises more than 5% of the unflooded parts of the AA,	0
		Very bare ground (20-50% bare between plants) comprises more than 5% of the unflooded parts of the AA.	0
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0
		NOTE: Thatch is dead plant material (stems, leaves) resting on the ground surface. Graminoids include all grasslike plants. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season.	
F18	Upland Inclusions [NR, RSB]	Within the AA, inclusions of upland are:	
		Few or none.	0
		Intermediate (1 - 10% of vegetated part of the AA).	0
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	1
F19	Shallow Open Poned Water + Bare Saturated Substrate [CC, WBF]	During any 2 consecutive weeks of the growing season, the extent of poned (stagnant) water shallower than 6 cm and with no vegetation that ever shades it , plus bare saturated substrate (e.g., mudflat) with no vegetation that ever shades it and with dimensions of greater than 3 x 3 m is:	
		None, or <100 sq. m.	0
		100-1000 sq. m.	1
		1000 – 10,000 sq. m.	0

		10,000 - 100,000 sq. m	0
		>100,000 sq. m.	0
F20	Puddles (microtopography) [WS, SR, PR, NR, CC, AM, PH, POL]	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:	
		Few or none (minimal microtopography; <1% of the land has such features, or entire AA is always water-covered).	0
		Intermediate.	0
		Several (extensive micro-topography).	1
F21	Soil Texture [WS, SFTS, PR, NR, WFR, CSP, CC, APP, PH, Sens]	In parts of the AA that lack persistent water, the texture of soil in the uppermost (<20 cm) layer is mostly:	
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1
		Deep Peat , to 40 cm (16 inch) depth or greater.	0
		Shallow Peat or organic <40 cm deep.	0
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0
		PROTOCOL: Use a trowel or shovel to check the surface soil layer in at least 3 widely spaced locations along a topographic gradient within the AA.	
F22	% of AA that is Flooded Only Seasonally [WS, SR, NR, CC, APP, FA, WBN, PH]	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:	
		None, or <0.01 hectare and <1% of the AA.	0
		1-20% of the AA, or <1% but >0.01 ha.	0
		20-50% of the AA.	0
		50-95% of the AA.	1
		>95% of the AA.	0
		PROTOCOL: Look for flood marks including litter suspended in shrubs; water lines or ice scour lines on trees, rocks, or structures; bleaching at the bases of tall herbaceous plants; adventitious roots; matted vegetation. If possible ask land owner or neighbors about water extent during wettest and driest times of most years. In riverine systems, the extent of this zone can be roughly estimated by multiplying the bankful height by 2 and visualising where that would intercept the land along the river. Areas that flood only seasonally often have a larger proportion of upland and annual (vs. perennial) plant species.	
F23	% of AA with Persistent Surface Water [PR, NR, WFR, CC, FA, FR, AM, WBF, WBN, RSB, KMH, POL]	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:	
		None or trace.	0
		1-20% of the AA.	1
		20-50% of the AA.	0
		50-95% of the AA.	0
		>95% of the AA. True for many fringe wetlands.	0
		NOTE: If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors if possible. Indicators of persistence may include non-anadromous fish, some dragonfly taxa, submerged aquatic plant species, beaver, and muskrat, although none of these alone are definitive.	
F24	% of AA Without Surface Water [SFTS, SR, PR, NR,	The percentage of the AA that <u>never</u> contains <u>surface</u> water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:	

	WFR, CC, APP, FA, FR, AM, WBF, WBN, RSB, PH, Sens]	<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	1
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0
		25-50% of the AA never contains surface water.	0
		50-75% of the AA never contains surface water.	0
		75-99% of the AA never contains surface water, OR >99% and during most years there is at least one persistently ponded water body larger than 0.1 ha in the AA.	0
		> 99%. AND during most years there is never more than 0.1 ha of ponded surface water within the AA. Enter "1" and SKIP to F43 (Channel Connection).	0
		NOTE: This addresses areas whose soils remain saturated for much of the year despite never being covered by surface water. Such areas are mostly along the wetland's boundary with upland and are distinguished from upland (non-wetland) by hydric soil indicators and/or predominance of wetland-indicator plant species (see worksheet tab "Plants WIS").	
	REMINDER:	The percentages in F22, F23, and F24 must together sum to 100 percent, neither less nor more.	
F25	% of Summertime Water that Is Shaded [SFTS, CC, APP, FA]	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are within the AA at that time is:	
		<5% of the water is shaded, or no surface water is present then.	0
		5-25% of the water is shaded.	1
		25-50% of the water is shaded.	0
		50-75% of the water is shaded.	0
		>75% of the water is shaded.	0
		* "Vegetation" includes herbaceous plants as well as woody, including floating-leaved vegetation other than moss or algae mats. Note that even areas that appear to have a continuous canopy of grasslike plants contain spaces between plants that would not be shaded by those plants during the specified time (mid-day).	
F26	Fringe Wetland [WFR, WBF, WBN, KMH, CRI]	During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter "1" if true, "0" if false.	0
F27	Lacustrine Wetland [WFR, FR, WBF, WBN, KMH, CRI]	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0
		* "abutting" means no upland (artificial or natural) completely separates the described features (open water and vegetation) along their directly shared edge.	
F28	Surface Water Annual Fluctuation Range [WS, SR, PR, NR, CC, APP, AM, WBN, KMH]	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:	
		<10 cm change (stable or nearly so).	0
		10 cm - 50 cm change.	0
		0.5 - 1 m change.	0
		1-2 m change.	1
		>2 m change.	0
		PROTOCOL: See F22 (Seasonal-only Flooding).	
F29	Predominant Depth Class [SFTS, SR, PR, CC, APP, FA, FR, WBF, WBN, KMH, PH, Sens]	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:	
		<10 cm deep (but >0).	0
		10 - 50 cm deep.	0
		0.5 - 1 m deep.	1
		1 - 2 m deep.	0
		>2 m deep. True for many fringe wetlands.	0

		NOTE: This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas.	
F30	Depth Classes - Evenness of Proportions [FR, WBF, WBN]	When present, surface water in most of the AA usually consists of (select one):	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0
		One depth class that comprises 50-90% of the AA's inundated area.	0
		Neither of above. There are 3 or more depth classes and none occupy >50%.	1
		NOTE: Estimate these proportions by considering the gradient and microtopography of the site.	
F31	% of Water That Is Ponded, not Flowing [WS, SFTS, SR, NR, CC, AM, WBF, WBN, Sens]	During most times when surface water is present, the percentage that is ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) is:	
		<5% of the water, or it never occupies >100 sq.m annually. Nearly all the surface water is flowing , and an outlet (F43) is likely present. SKIP to F34 (Vegetated Width).	1
		5-30% of the water.	0
		30-70% of the water.	0
		70-95% of the water.	0
		>95% of the water. Includes but not limited to wetlands with no outlets (F42).	0
		NOTE: Nearly all wetlands with surface water have some ponded water.	
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or abutting the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, If false, enter "0" and SKIP to F38 (Floating Algae & Duckweed).	0
F33	% of Ponded Water that is Open [SR, PR, NR, WFR, AM, WBF, WBN, KMH]	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a tree or shrub canopy) is:	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F38 (Floating Algae & Duckweed).	0
		1-4% of the ponded water. Enter "1" and SKIP to F38 (Floating Algae & Duckweed).	0
		5-30% of the ponded water.	0
		30-70% of the ponded water.	0
		70-99% of the ponded water.	0
		100% of the ponded water.	0
F34	Width of Vegetated Zone within Wetland [SFTS, SR, PR, NR, AM, WBN, RSB, KMH, PH, Sens]	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:	
		<1 m.	0
		1 - 9 m.	0
		10 - 29 m.	1
		30 - 49 m.	0
		50 - 100 m.	0
		> 100 m, or open water is absent at that time.	0
		NOTE: "Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators.	
F35	Flat Shoreline Extent [SR, WBN]	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:	
		<1% of the water edge.	0
		1-25% of the water edge.	0
		25-50% of the water edge.	0

		50-75% of the water edge.	1
		>75% of the water edge.	0
		NOTE: If the only surface water present in summer is in multiple small pools, estimate the percent of their collective shorelines that has such a gentle slope.	
F36	Interspersion of Emergents & Open Water [SR, PR, NR, OE, APP, FA, FR, AM, WBF, WBN, RSB, PH]	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	1
		Intermediate.	0
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0
		NOTE: In this question do not include underwater or floating-leaved plants as "vegetation".	
F37	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F43 (Channel Connection).	1
F38	Floating Algae & Duckweed [PR, APP]	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0
F39	Isolated Island [WBN]	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a waterbird nest.	0
F40	Non-vegetated Aquatic Cover [FA, FR, AM]	During most of the growing season the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood, undercut banks, and/or by waters deeper than 0.5 m , is:	
		Little or none.	0
		Intermediate.	1
		Extensive.	0
		NOTE: consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted	
F41	Tributary Channel [SRb, PRb, NRb, APP]	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. Enter 1= yes, 0= no and SKIP to F43 .	1
F42	Input Water Temperature [SFTSb]	Based on lack of shade, water source characteristics, or actual temperature measurements, runoff or channel inflow entering the wetland is likely to be warmer than surface water in the AA would otherwise be during part of most years. Enter 1= yes, 0= no.	0
F43	Channel Connection & Outflow Duration [WS, SFTS, SR, PR, NR, CSP, CC, OE, APP, FA, FR, KMH, Sens]	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]	
		Persistent (surface water flows out for >9 months/year).	1
		Seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0
		Temporary (surface water flows out for <14 days, not necessarily consecutive).	0
		None -- but maps show (a) a stream channel in the same wetland complex but not in the AA, or (b) a stream network outside of the AA and located downslope from the AA's wetland complex and within a distance that is less than the wetland complex's maximum length. SKIP to F46 (Fishless).	0
		No surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F46 (Fishless).	0

		<p>PROTOCOL: If a perennial channel does not intersect or abut the AA, look for areas with seasonal or temporary outflow at the lowest elevation of the AA. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes that eventually connect to the ocean, not to a closed depression. If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.</p>	
F44	Outflow Confinement [WS, SR, PR, NR, CSP, OE, Sens, STR]	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:	
		Mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0
		Leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1
		Is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0
		* "Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt.	
F45	Throughflow Resistance [WS, SR, PR, NR, OE, FA, FR]	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0
		Bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0
		Bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	1
		Bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0
		Bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0
F46	Fishless [AM, WBN]	The AA is likely to never host any fish, not even small non-sport fish (e.g., minnows) and not even during annual high water. Enter 1 if true or 0 if false. Then proceed to next question. Consider whether surface water is always absent (F24), AA has no connection (not even temporary, F43) to a downslope stream network, whether a pipe/culvert connection or large waterfall is always impassable even to small fish, and whether the AA may have been stocked artificially with fish.	0
F47	Beaver Probability [SFTS, CC, APP, FA, FR, AM, WBF, WBN, RSB, KMH, PH, Sens]	Use of the AA by beaver during the past 5 years is (select most applicable ONE):	
		Evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1
		Likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs near surface water.	0
		Unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0
F48	Groundwater Strength of Evidence [WS, SFTS, PRb, NR, APP, FA, FR, AM]	Select first applicable choice:	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1

		NOTE: Adhere to these criteria strictly -- do not speculate based only on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here.	
F49	Internal Gradient [WS, SR, PR, NR, OE, WBF, WBN]	The gradient along most of the flow path within the AA is:	
		<2% or the AA has no surface water outlet (not even seasonally).	1
		2-5%.	0
		6-10%.	0
		>10%.	0
		NOTE: Most wetlands have a gradient of <2%. This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100.	
F50	Vegetated 30m Buffer as % of Perimeter [SFTSb, SRb, PRb, NRb, APP, FA, FR, AM, WBN, RSB, PH, POL, Sens, STR]	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that is free of direct human disturbance (i.e., no lawns, row crops, heavily grazed land, plantations of conifers < 2m tall, pavement, buildings) is:	
		<5%.	0
		5 to <30%.	0
		30 to <60%.	0
		60 to 90%.	1
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F53.	0
F51	Type of Cover in 30m Buffer [NRb, STR]	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	
		Impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		Bare or nearly bare pervious surface (e.g., unpaved road, dike, landslide) or managed or heavily grazed vegetation (e.g., lawn, row crops), .	1
F52	Buffer Slope [SRb, PRb, NRb, Sens]	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%.	0
		5-30%.	0
		>30%.	1
F53	Distance to Steep Bank, Bridge, Building or Nest Structure [RSB, POL]	The distance from the wetland edge to the closest mostly-bare vertical bank or cliff suitable for bank- or cliff-nesting birds, or to a nest box or platform or other constructed feature (e.g., bridge, building) suitable as nest site for pollinator colonies or nesting swallows, is:	
		<3 m or within the AA	0
		3 to <10 m	0
		10 to <30 m	0
		30 to 100 m	1
		> 100 m	0
F54	New or Expanded Wetland [NR, CSP, Sens]	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	
		No. Also mark this if site was once tidal but within the past decade was converted to non-tidal by dyking.	1
		Yes, and created or expanded 20 - 100 years ago.	0
		Yes, and created or expanded 3-20 years ago.	0

		Yes, and created or expanded within last 3 years.	0
		Yes, but time of origin or expansion unknown.	0
		Unknown if new or expanded within 20 years or not.	0
		NOTE: If available, historical aerial photography, old maps, soil maps, or permit files may help determine this.	
F55	Fire History [WFR, CSP, PH, STR]	More than 1% of the AA's previously vegetated area:	
		Burned within past 5 years.	0
		Burned 6-10 years ago.	0
		Burned 11-30 years ago.	0
		Burned >30 years ago, or no evidence of a burn and no data.	1
		PROTOCOL: Look for charred soil layers, scorched bark or stumps (in multiple widely-spaced locations) or ask landowner. Do not include campfire remnants or other burned wood carried to the AA by floods. Review aerial imagery for grayish areas that could indicate recent burn.	
F56	Visibility [WBFb, CRI, STR]	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	
		<25%.	1
		25-50%.	0
		>50%.	0
F57	Non-consumptive Uses - Actual or Potential [WBFb, CRI, STR]	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	
		For an average person, walking is physically possible <u>in</u> (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F58	Unvisited Core Area [FAb, FRb, AM, WBF, WBN, RSB, KMHb, PH, CRI, STR]	The percentage of the AA almost never visited by humans during an average growing season probably comprises:	
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
		NOTE: Include only the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail.	
F59	Frequently Visited Area [AM, WBF, WBN, RSB, PH, PU, STR]	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[See note above.]</i>	
		<5%. If F58 was answered ">95%" (mostly never visited), SKIP to F62 (Consumptive Uses).	1
		5-50%.	0
		50-95%.	0
		>95% of the AA.	0
F60	BMP for Soils [PH, CRI]	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent people, vehicles, and livestock from disturbing soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0

F61	BMP for Wildlife Protection [AM, WBF, WBN, CRI]	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off-road vehicles appear to effectively exclude or divert visitors, vehicles, and livestock from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0
F62	Consumptive Uses (Provisioning Services) [FAB, FRb, WBFb, PHb, CRI]	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	
		Low-impact commercial timber harvest (e.g., selective thinning)	0
		Commercial or traditional-use harvesting of native plants, their fruits, or mushrooms	0
		Waterfowl hunting	0
		Moose hunting	0
		Fishing	0
		Trapping of furbearers	0
		None of the above	1
		* Evidence can include direct observation, information from reliable sources, or physical evidence such as fishing lures or line, shell casings, blinds, meat poles, camps.	
F63	Calcareous Fen [PR, PH]	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet (tab) for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to BLANK (not 0) .	0
F64	Keystone Species Presence [KMH]	Mark all species below that you observed directly, or for which you found other evidence such as tracks, dens, lodges, rubbings, bones, reports from qualified observers.	
		Moose	0
		Beaver	1
		Muskrat	1
F65	pH Measurement [PR, NR, CSP, APP, FA, FR, AM, WBN, Sens]	The pH in most of the AA's surface water:	
		Was measured, and is: <i>[enter the reading in the column to the right.]</i>	7.4
		Was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0
		Neither of above. Enter "1".	0
		PROTOCOL: Measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent precipitation.	
F66a	TDS [PRb, NRb, APP, Sens]	TDS is: <i>[Enter the reading in ppm or mg/L in the column to the right. If unable to measure, leave BLANK.]</i>	
F66b	Conductivity [PRb, NRb, APP, Sens]	Conductivity is <i>[Enter the reading in µS/cm in the column to the right. If unable to measure, leave BLANK.]</i>	170
F67	Methane Source [CC]	In a part of the wetland with stagnant ponded surface water, probe the submerged sediment and note whether any bubbles immediately rise to the surface. Enter "1" if either is true, "0" if false, or BLANK if no surface water is present or accessible at time of visit.	0
F68	Methane Suppression Potential [CC]	In a part of the wetland with stagnant ponded surface water or saturated soil, probe the substrate and note whether a "rotten egg" (sulphurous) odour is detected. Enter "1" if either is true, "0" if false, or BLANK if no surface water or saturated soil is present or accessible at time of visit.	0

> REMINDER:

To document this assessment, also complete the CovPg form

Form S. WESP-AC version 3.3 (nontidal wetlands)		
Site ID:	Morden Pit - WL1	Investigator(s): Ian Bryson
Visit Date:	18-Jun-24	

S1	Altered Timing of Water Inputs				Data
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, APP, PH, STR]</i>				
	stormwater from impervious surfaces that drains directly to the wetland				
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation				
	regular removal of surface or groundwater for irrigation or other consumptive use				
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland				
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)				
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch				
	artificial drains or ditches in or near the wetland				
	accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)				
	logging within the wetland				
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles				
	straightening, ditching, dredging, and/or lining of tributary channels				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent within the wetland of timing shift	>95% of wetland	5-95% of wetland	<5% of wetland	0
	When most of the timing shift began	<3 yrs ago	3-10 yrs ago	>10 yrs ago	0
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>				
	Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0
	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0
Sum=				0	
Stressor Subscore=				0.00	
S2	Accelerated Inputs of Contaminants and/or Salts				
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its Contributing Area -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [FA, NRv, PRv, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities				x
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/ gas extraction, other sources.				
	road salt				x
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA				x
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				

	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Usual toxicity of most toxic contaminants	industrial effluent or public landfill	domestic effluent, cropland	mildly impacting (livestock, pets, low density residential, lawns)	2
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	2
AA proximity to main sources (actual or potential)	<15 m	15-100 m or in groundwater	in more distant part of contributing area	1
Sum=				5
Stressor Subscore=				0.56
S3	Accelerated Inputs of Nutrients			
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [PRv, NRv, APP, STR]</i>				
stormwater or wastewater effluent (including failing septic systems), landfills				x
fertilizers applied to lawns, ag lands, or other areas in the CA				x
livestock, dogs				x
artificial drainage of upslope lands				x
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Type of loading	concentrated livestock, high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	dispersed livestock, pets, low density residential	2
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	1
AA proximity to main sources (actual or potential)	<15 m	15-100 m or in groundwater	in more distant part of contributing area	1
Sum=				4
Stressor Subscore=				0.44

If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	infrequent & mainly during scattered events	0
Sum=				0
Stressor Subscore=				0.00
S6	Wildlife Disturbance Potential			
In the last column, place a check mark next to any item present in or near the AA that is likely to have increased the potential for disturbance of wildlife. [WBF, WBN, RSB, KMH]				
Noise exceeding 100 decibels (e.g., the sound of a gas-powered lawnmower, snowmobile, motorboat, chainsaw or motorcycle at about 3 m, or low-elevation jets or helicopters) when heard from within the wetland.				
Humans visiting the wetland or adjoining areas visible from the wetland.				
Powerlines, walls, or fences higher than 1 m and longer than 100 m that raptors, waterfowl, other birds, and ungulates may collide with.				
Stationary floodlights constantly illuminating more than 0.01 hectare of the wetland at night.				
If any items were checked above, then for each row of the table below, assign points for the greatest of the disturbances.				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Frequency	Multiple days per week during sensitive time for some species.	Intermediate.	Once or twice annually during sensitive time for some species.	0
Duration	Nearly continuous for hours.	Intermediate.	Usually less than 15 minutes.	0
sum=				0
Stressor subscore=				0

Specific Functions or Values:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating
Surface Water Storage (WS)	2.98	Lower	7.22	Higher
Stream Flow & Temperature Support (SFTS)	8.67	Higher	8.90	Higher
Sediment & Toxicant Retention & Stabilisation (SR)	4.95	Moderate	6.18	Higher
Phosphorus Retention (PR)	0.89	Lower	7.29	Higher
Nitrate Removal & Retention (NR)	4.92	Higher	10.00	Higher
Wildfire Resistance (WFR)	6.36	Higher	10.91	Higher
Carbon Stock Preservation (CSP)	0.47	Lower		
Carbon Capture (CC)	8.46	Higher		
Organic Nutrient Export (OE)	8.45	Higher		
Aquatic Primary Productivity (APP)	11.11	Higher	8.51	Higher
Anadromous Fish Habitat (FA)	8.20	Higher	7.08	Higher
Resident & Other Fish Habitat (FR)	8.83	Higher	7.93	Higher
Amphibian Habitat (AM)	63.65	Higher	6.16	Higher
Waterbird Feeding Habitat (WBF)	7.75	Higher	27.50	Higher
Waterbird Nesting Habitat (WBN)	7.55	Moderate	27.50	Higher
Raptor & Wetland Songbird Habitat (RSB)	9.07	Higher	10.00	Higher
Keystone Mammal Habitat (KMH)	13.13	Higher	27.50	Higher
Native Plant Habitat (PH)	-19.16	Lower	-1.03	Lower
Pollinator Habitat (POL)	9.67	Higher	6.67	Higher
Cultural & Recreational Importance (CRI)			5.01	Higher
Wetland Sensitivity (Sens)			8.94	Higher
Wetland Stressors (STR)			6.51	Higher

Grouped Functions. NOTE: When calculated from the above, the scores for the following groups did not include scores for Wildfire Resistance (WFR), Carbon Capture (CC), Keystone Mammal Habitat (KMH), Cultural & Recreational Importance (CRI), Wetland Sensitivity, or Stressors.				
HYDROLOGIC (HYg) (WS)	2.98	Lower	7.22	Higher
WATER & CLIMATE PROTECTION (WQg) (max + average)/2 of SR, PR, NR, CSP	3.88	Higher	8.91	Higher
AQUATIC SUPPORT (ASg) (max + average)/2 of SFTS, OE, APP	10.26	Higher	8.81	Higher
AQUATIC HABITAT (AHg) (max+avg)/2 of FA, FR, AM, WBF, WBN	41.42	Higher	21.37	Higher
TRANSITION HABITAT (THg) (max + avg)/2 of RSB, PH, POL	4.77	Higher	7.61	Higher
In NS, is the wetland a WSS (Wetland of Special Significance) based on the WESP-AC's WSS Interpretive Tool?	NO			

1. General Description of Tool:

This interpretive tool automatically determines whether the subject wetland will be regulated as a Wetland of Special Significance (WSS). This determination is made based on the WESP-AC scores for functions and benefits, per the Nova Scotia *Wetland Conservation Policy*.

A 'Function-Benefit Product' (FBP) is calculated based upon the Grouped Functions. Threshold values based on standard deviations of the FBP in the calibration data set (n= 121) are applied in order to categorize the FBP scores into 'Low', 'Moderate' or 'High' categories. The categories are subsequently used to apply the 'Functional WSS Rules' described below and automatically generate this type of WSS determination.

For the purpose of defining and applying the Functional WSS rules, two supergroups are defined based on grouped functions, as follows: **(1) Support Supergroup** - includes Hydrologic, Water Quality Support, and Aquatic Support grouped functions. **(2) Habitat Supergroup** - includes Aquatic Habitat and Transition Habitat grouped functions.

2. Functional WSS Rule Definitions:

Habitat Rule: In consideration of the Habitat Supergroup, the subject wetland is a WSS if **either** of the following sub-rules are satisfied:

(HAB 1) Two 'High Scores' **OR**

(HAB 2) One 'High' and one 'Moderate' score

Support Rule: In consideration of the Support Supergroup, the subject wetland is a WSS if **either** of the following sub-rules are satisfied:

(SUP 1) Three 'High' scores **OR**

(SUP 2) Two 'High' and one 'Moderate' score

Habitat/Support Hybrid Rule: In consideration of both the Habitat and Support Supergroups, the subject wetland is a WSS if the following is satisfied:

(HYB 1) One 'High' Habitat score **AND** Two or three 'High' Support scores

3. Functional WSS Interpretation Results

Function-Benefit Product (FBP)	FBP SCORE	FBP SCORE CATEGORY
SUPPORT SUPERGROUP - HYDROLOGIC	21.52	Low
SUPPORT SUPERGROUP - WATER & CLIMATE PROTECTION	34.58	Moderate
SUPPORT SUPERGROUP - AQUATIC SUPPORT	90.35	High
HABITAT SUPERGROUP - AQUATIC HABITAT	885.09	High
HABITAT SUPERGROUP - TRANSITION HABITAT	36.25	Low

3a. Functional WSS Determination: Automatic Method

Habitat Rule Satisfied?	NO
Support Rule Satisfied?	NO
Habitat/Support Hybrid Rule Satisfied?	NO

CONCLUSION: NO

APPENDIX F

ACCDC REPORT

DATA REPORT 8156: Aylesford, NS

Prepared 17 July 2024
by K.Tenwolde,
Conservation Data Analyst

CONTENTS OF REPORT

1.0 Preface

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

2.0 Rare and Endangered Species

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

3.0 Special Areas

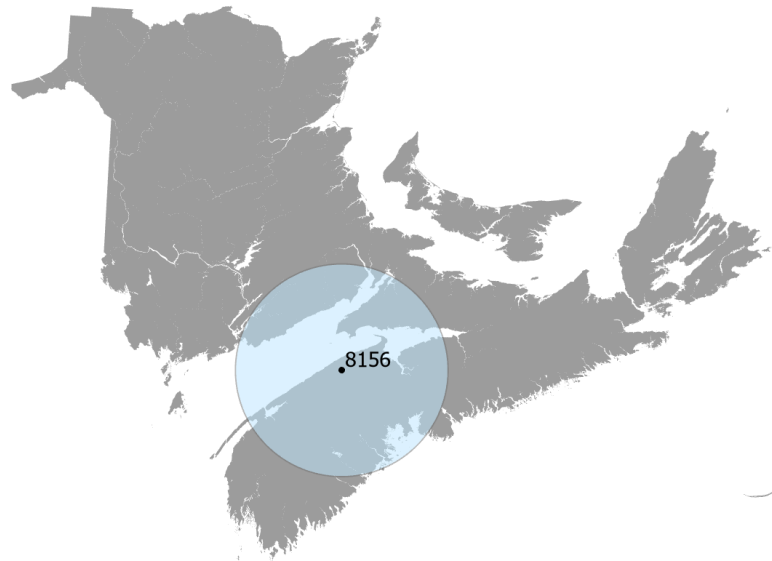
- 3.1 Managed Areas
- 3.2 Significant Areas
- Map 3: Special Areas

4.0 Rare Species Lists

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

5.0 Rare Species within 100 km

- 5.1 Source Bibliography



Map 1. A 100 km buffer around the study area

1.0 PREFACE

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

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

1.1 DATA LIST

Included datasets:

Filename

AylesfordNS_8156ob.xls
AylesfordNS_8156ob100km.xls
AylesfordNS_8156ff_py.xls

Contents

Rare or legally protected Flora and Fauna in your study area
A list of Rare and legally protected Flora and Fauna within 100 km of your study area
Rare Freshwater Fish in your study area (DFO database)

1.2 RESTRICTIONS

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

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

1.3 ADDITIONAL INFORMATION

The accompanying Data Dictionary provides metadata for the data provided.

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

Plants, Lichens, Ranking Methods, All other Inquiries

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

Animals (Fauna)

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

Data Management, GIS

Charity Robicheau
Senior Conservation Data Analyst
charity.robicheau@accdc.ca

Billing

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

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

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

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

Western: Emma Vost
(902) 670-8187
Emma.Vost@novascotia.ca

Western: Sarah Spencer
(902) 541-0081
Sarah.Spencer@novascotia.ca

Central: Shavonne Meyer
(902) 893-0816
Shavonne.Meyer@novascotia.ca

Central: Kimberly George
(902) 890-1046
Kimberly.George@novascotia.ca

Eastern: Harrison Moore
(902) 497-4119
Harrison.Moore@novascotia.ca

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

Eastern: Elizabeth Walsh
(902) 563-3370
Elizabeth.Walsh@novascotia.ca

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

2.0 RARE AND ENDANGERED SPECIES

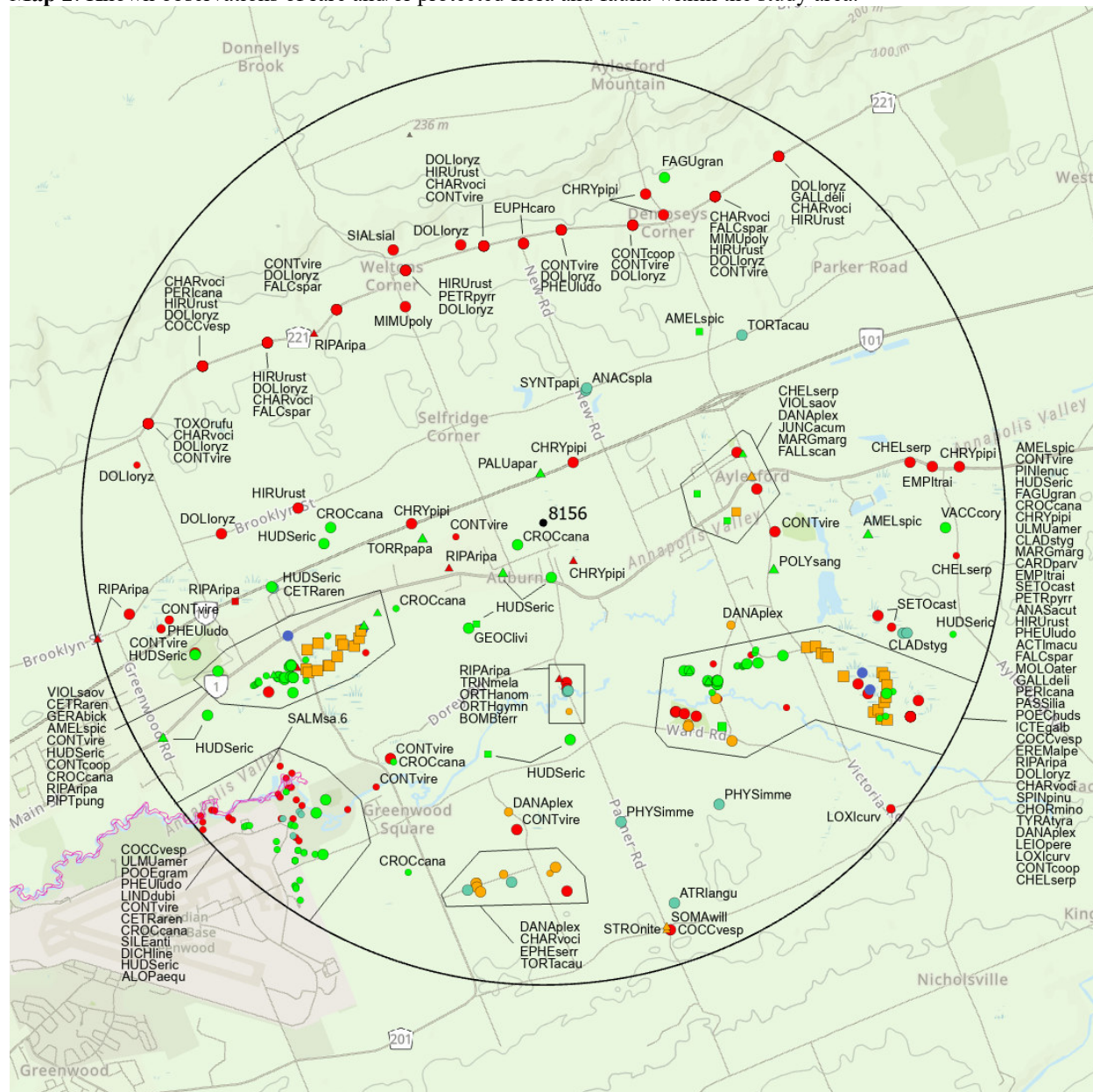
2.1 FLORA

The study area contains 160 records of 20 vascular and 25 records of 10 nonvascular flora (Map 2 and attached: *ob.xls), excluding 'location-sensitive' species.

2.2 FAUNA

The study area contains 245 records of 35 vertebrate and 21 records of 5 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List), excluding 'location-sensitive species'. Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

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



Resolution

- 1.0 = Within 10s of metres
- 1.7 = Within 50s of metres
- 2.0 = Within 100s of metres
- △ 2.7 = Within 500s of metres
- △ 3.0 = Within kilometres
- 3.7 = Within 5s of kilometres
- 4.0 = Within 10s of kilometres
- 4.7 = Within 50s of kilometres

Higher taxon

- Vertebrate fauna
- Invertebrate fauna
- Vascular flora
- Nonvascular flora

3.0 SPECIAL AREAS

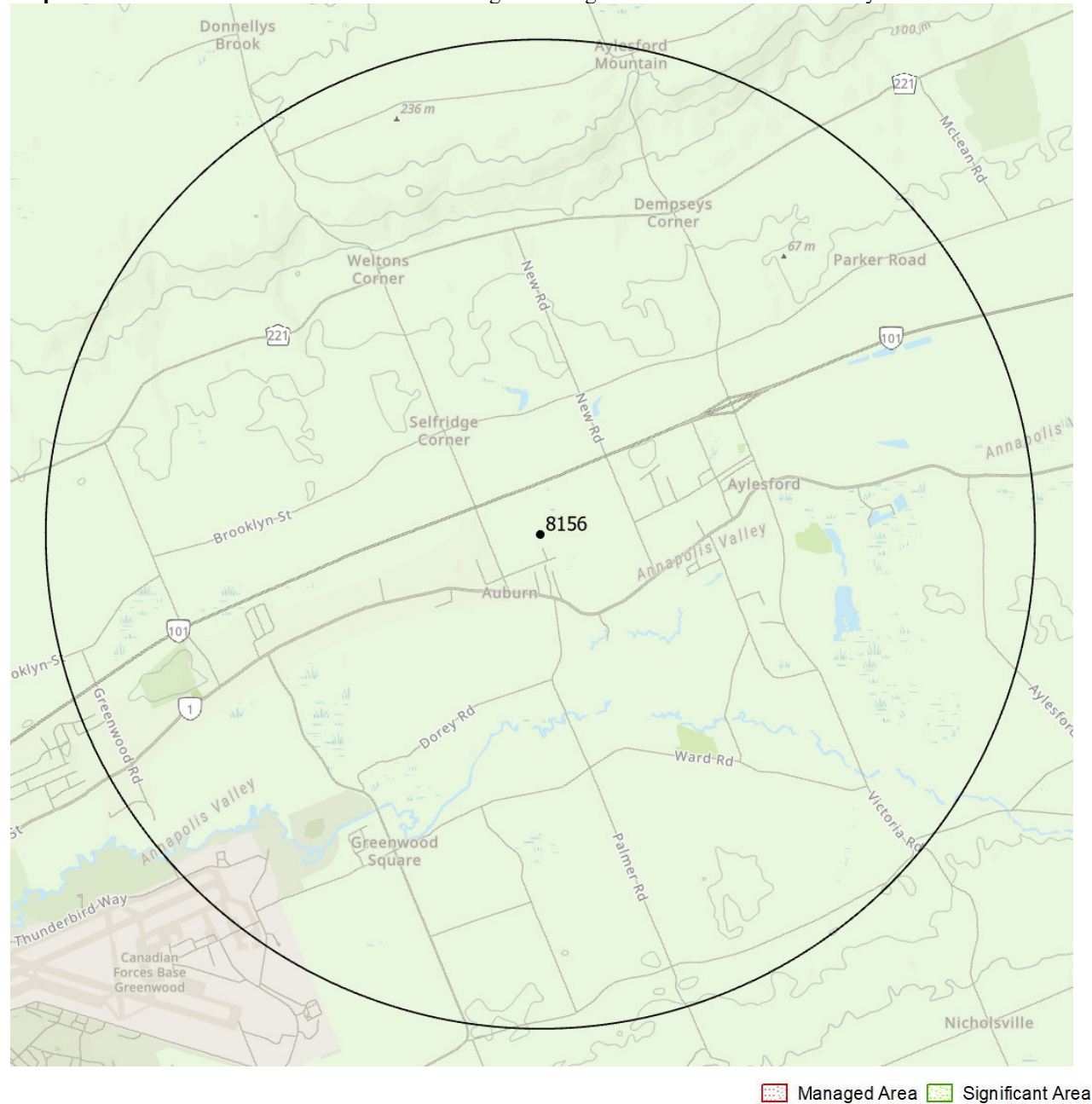
3.1 MANAGED AREAS

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 the study area.



4.0 RARE SPECIES LISTS

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

4.1 FLORA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
N	<i>Orthotrichum gymnostomum</i>	Aspen Bristle Moss				S1	1	1.8 \pm 0.2
N	<i>Physcomitrium immersum</i>	a Moss				S1?	2	3.3 \pm 0.2
N	<i>Tortula acaulon</i>	Cuspidate Earth Moss				S1S2	2	3.0 \pm 0.2
N	<i>Syntrichia papillosa</i>	a Moss				S1S2	1	1.5 \pm 0.2
N	<i>Anacamptodon splachnoides</i>	a Moss				S2	1	1.5 \pm 0.2
N	<i>Atrichum angustatum</i>	Lesser Smoothcap Moss				S2?	1	4.3 \pm 0.2
N	<i>Orthotrichum anomalum</i>	Anomalous Bristle Moss				S2?	1	1.8 \pm 0.2
N	<i>Cetraria arenaria</i>	Sand-loving Icelandmoss Lichen				S2S3	11	2.3 \pm 0.0
N	<i>Ephemerum serratum</i>	a Moss				S3	1	4.1 \pm 0.2
N	<i>Cladonia stygia</i>	Black-footed Reindeer Lichen				S3?	4	3.8 \pm 0.01
P	<i>Silene antirrhina</i>	Sleepy Catchfly				S1	1	4.5 \pm 0.01
P	<i>Torreyochloa pallida</i> var. <i>pallida</i>	Pale False Manna Grass				S1	1	1.3 \pm 1.5
P	<i>Crocianthemum canadense</i>	Long-branched Frostweed			Endangered	S1S2	61	0.4 \pm 1.2
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	72	0.6 \pm 0.1
P	<i>Piptatheropsis pungens</i>	Slender Ricegrass				S2	1	2.8 \pm 0.0
P	<i>Cardamine parviflora</i>	Small-flowered Bittercress				S3	1	2.9 \pm 7.07
P	<i>Palustricodon aparinoides</i>	Marsh Bellflower				S3	1	0.5 \pm 1.0
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	1	2.6 \pm 0.01
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	1	2.5 \pm 1.0
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	1	4.0 \pm 0.2
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S3	1	4.5 \pm 0.01
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	1	4.4 \pm 0.2
P	<i>Fagus grandifolia</i>	American Beech				S3S4	2	3.2 \pm 0.01
P	<i>Fallopia scandens</i>	Climbing False Buckwheat				S3S4	1	2.0 \pm 5.0
P	<i>Amelanchier spicata</i>	Running Serviceberry				S3S4	6	2.2 \pm 1.2
P	<i>Geocaulon lividum</i>	Northern Comandra				S3S4	1	1.4 \pm 1.5
P	<i>Ulmus americana</i>	White Elm				S3S4	2	2.6 \pm 0.01
P	<i>Viola sagittata</i> var. <i>ovata</i>	Arrow-Leaved Violet				S3S4	2	2.0 \pm 0.5
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	1	1.7 \pm 2.0
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3S4	2	4.5 \pm 0.01

4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2B	11	1.1 \pm 0.5
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2	3.0 \pm 0.2
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	6	2.2 \pm 0.2
A	<i>Hirundo rustica</i>	Barn Swallow	Special Concern	Threatened	Endangered	S3B	25	2.7 \pm 0.15
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Special Concern	Threatened	S3B	2	2.9 \pm 7.07
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Special Concern	Threatened	S3B	5	2.4 \pm 0.01
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Special Concern	Threatened	Vulnerable	S3B	64	2.9 \pm 7.07
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	5	2.9 \pm 7.07
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	40	1.0 \pm 0.01
A	<i>Chrysemys picta picta</i>	Eastern Painted Turtle	Special Concern	Special Concern		S4	7	0.5 \pm 0.36

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	1	3.4 ± 0.2
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	2	2.8 ± 0.2
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	2	4.4 ± 0.25
A	<i>Anas acuta</i>	Northern Pintail				S1B,SUM	1	2.5 ± 0.2
A	<i>Poecetes gramineus</i>	Vesper Sparrow				S1S2B,SUM	3	4.2 ± 0.01
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	2	2.9 ± 7.07
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	3	2.6 ± 0.2
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	4	2.9 ± 7.07
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B,SUM	1	2.9 ± 7.07
A	<i>Perisoreus canadensis</i>	Canada Jay				S3	2	2.9 ± 7.07
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	1	2.9 ± 7.07
A	<i>Spinus pinus</i>	Pine Siskin				S3	2	2.9 ± 7.07
A	<i>Charadrius vociferus</i>	Killdeer				S3B	16	2.9 ± 7.07
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	3	2.9 ± 7.07
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S3B	12	2.9 ± 7.07
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S4M	1	1.7 ± 0.2
A	<i>Falco sparverius</i>	American Kestrel				S3B,S4S5M	5	2.9 ± 7.07
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B,S5M	4	2.9 ± 7.07
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S3B,S5N,S5M	1	2.4 ± 0.01
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	2	4.5 ± 0.01
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B,S4S5M	5	2.9 ± 7.07
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	1	2.9 ± 7.07
A	<i>Leiothlypis peregrina</i>	Tennessee Warbler				S3S4B,S5M	2	2.9 ± 7.07
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B,S5M	1	2.9 ± 7.07
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N,S5M	1	2.9 ± 7.07
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Endangered	S2?B,S3M	16	2.3 ± 0.05
I	<i>Bombus terricola</i>	Yellow-banded Bumble Bee	Special Concern	Special Concern	Vulnerable	S3	1	2.1 ± 0.01
I	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	2	2.1 ± 8.76
I	<i>Somatochlora williamsoni</i>	Williamson's Emerald				S2S3	1	4.6 ± 0.4
I	<i>Strophiona nitens</i>	Chestnut Bark Long-horned Beetle				S3	1	4.6 ± 0.4

4.3 LOCATION SENSITIVE SPECIES

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

Nova Scotia

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within the Study Site?
<i>Alces alces americana</i>	Moose – Mainland population		Endangered	No
<i>Fraxinus nigra</i>	Black Ash		Threatened	No
<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Endangered	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	YES
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.		Vulnerable	No
Bat Hibernaculum or bat species occurrence		[Endangered]¹	[Endangered]¹	YES
<i>Snake hibernaculum</i>		[Threatened] ²	[Threatened] ²	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.

² *Thamnophis sauritus* (Eastern Ribbonsnake) is Threatened under the Federal Species at Risk Act (SARA) and the Nova Scotia Endangered Species Act. Occurrences between October 15 – April 15 are considered location sensitive.

4.4 SOURCE BIBLIOGRAPHY

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

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5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 53408 records of 155 vertebrate and 2914 records of 79 invertebrate fauna; 19025 records of 321 vascular and 5414 records of 251 nonvascular flora (attached: *ob100km.xls).

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

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Coregonus huntsmani</i>	Atlantic Whitefish	Endangered	Endangered	Endangered	S1	166	36.0 ± 1.0	NS
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	756	0.9 ± 0.1	NS
A	<i>Myotis septentrionalis</i>	Northern Myotis	Endangered	Endangered	Endangered	S1	107	18.3 ± 0.1	NS
A	<i>Perimyotis subflavus</i>	Tricolored Bat	Endangered	Endangered	Endangered	S1	207	13.3 ± 0.1	NS
A	<i>Salmo salar pop. 1</i>	Atlantic Salmon - Inner Bay of Fundy population	Endangered	Endangered		S1	208	100.0 ± 0.1	NB
A	<i>Salmo salar pop. 6</i>	Atlantic Salmon - Nova Scotia Southern Upland population	Endangered			S1	29	39.1 ± 1.0	NS
A	<i>Eubalaena glacialis</i>	North Atlantic Right Whale	Endangered	Endangered		S1	1	78.0 ± 50.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus subspecies	Endangered	Endangered	Endangered	S1B	148	100.0 ± 0.01	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	49	24.7 ± 0.5	NS
A	<i>Dermochelys coriacea pop. 2</i>	Leatherback Sea Turtle - Atlantic population	Endangered	Endangered		S1S2N	5	74.2 ± 1.0	NS
A	<i>Morone saxatilis pop. 2</i>	Striped Bass - Bay of Fundy population	Endangered			S2S3B,S2S3N	4	34.3 ± 1.0	NS
A	<i>Rangifer tarandus pop. 2</i>	Caribou - Atlantic-Gaspésie population	Endangered	Endangered	Extirpated	SX	2	92.9 ± 5.0	NB
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Threatened	Endangered	S1B	8	37.8 ± 7.07	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Threatened	Special Concern		S1B	43	39.6 ± 7.07	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	1421	1.3 ± 0.1	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened	Threatened	Endangered	S2B	1851	1.1 ± 0.5	NS
A	<i>Thamnophis saurita pop. 3</i>	Eastern Ribbonsnake - Atlantic population	Threatened	Threatened	Threatened	S2S3	2496	33.5 ± 0.01	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2S3B,S1M	2007	100.0 ± 0.15	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit	Threatened			S2S3M	121	40.9 ± 0.5	NS
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened			S2S3N	13	47.9 ± 0.27	NS
A	<i>Hydrobates leucorhous</i>	Leach's Storm-Petrel	Threatened			S3B	22	73.2 ± 0.2	NS
A	<i>Tringa flavipes</i>	Lesser Yellowlegs	Threatened			S3M	877	100.0 ± 0.5	NS
A	<i>Anguilla rostrata</i>	American Eel	Threatened			S3N	580	100.0 ± 0.01	NB
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened	Threatened		SHB	24	35.8 ± 7.07	NS
A	<i>Ixobrychus exilis</i>	Least Bittern	Threatened	Threatened		SUB	14	30.4 ± 0.2	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened	Threatened		SUB	80	12.4 ± 7.07	NS
A	<i>Salmo salar pop. 12</i>	Atlantic Salmon - Gaspé - Southern Gulf of St. Lawrence population	Special Concern			S1	1	96.8 ± 0.2	NS
A	<i>Antrostomus vociferus</i>	Eastern Whip-Poor-Will	Special Concern	Threatened	Threatened	S1?B	15	12.4 ± 7.07	NS
A	<i>Passerculus sandwichensis princeps</i>	Ipswich Sparrow	Special Concern	Special Concern		S1B	1	47.0 ± 0.2	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	350	12.4 ± 7.07	NS
A	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern population	Special Concern	Special Concern	Endangered	S2N	48	10.7 ± 1.5	NS
A	<i>Balaenoptera physalus pop. 1</i>	Fin Whale - Atlantic population	Special Concern	Special Concern		S2S3	3	66.2 ± 1.0	NB
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern	Special Concern		S2S3M	17	36.0 ± 0.05	NS
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	952	10.1 ± 0.2	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Special Concern	Threatened	Endangered	S3B	1528	11.0 ± 0.25	NS
A	<i>Cardellina canadensis</i>	Canada Warbler	Special Concern	Threatened	Endangered	S3B	1216	12.1 ± 0.01	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Special Concern	Threatened	S3B	861	12.4 ± 7.07	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Special Concern	Threatened	S3B	1402	10.2 ± 0.15	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Special Concern	Threatened	Vulnerable	S3B	1752	10.3 ± 0.25	NS
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B,S3N,S3M	1076	11.5 ± 0.25	NS
A	<i>Podiceps auritus</i>	Horned Grebe	Special Concern	Special Concern		S3N,SUM	48	48.4 ± 0.2	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	1692	1.0 ± 0.01	NS
A	<i>Phocoena phocoena pop. 1</i>	Harbour Porpoise - Northwest Atlantic Population	Special Concern			S4	37	15.0 ± 6.67	NS
A	<i>Chrysemys picta</i>	Painted Turtle	Special Concern	Special Concern		S4	14	48.0 ± 0.02	NS
A	<i>Chrysemys picta picta</i>	Eastern Painted Turtle	Special Concern	Special Concern		S4	1446	0.5 ± 0.36	NS
A	<i>Anarhichas lupus</i>	Atlantic Wolffish	Special Concern	Special Concern		SNR	1	80.2 ± 0.2	NS
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B,SUN,SUM	40	18.4 ± 0.2	NS
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1B	28	57.9 ± 7.07	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Chlidonias niger</i>	Black Tern	Not At Risk			S1B	9	73.3 ± 0.1	NB
A	<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius	Not At Risk		Vulnerable	S1B,SUM	517	100.0 ± 0.01	NB
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S2?B,SUM	2	73.0 ± 0.15	NB
A	<i>Lynx canadensis</i>	Canada Lynx	Not At Risk		Endangered	S2S3	16	59.7 ± 5.0	NB
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3	2	71.0 ± 0.01	NB
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	52	30.7 ± 0.5	NS
A	<i>Megaptera novaeangliae</i>	Humpback Whale	Not At Risk			S3	6	12.3 ± 0.2	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	235	100.0 ± 0.01	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	188	12.4 ± 7.07	NS
A	<i>Buteo lagopus</i>	Rough-legged Hawk	Not At Risk			S3N	8	48.1 ± 0.2	NS
A	<i>Accipiter atricapillus</i>	American Goshawk	Not At Risk			S3S4	143	12.0 ± 0.25	NS
A	<i>Glaucomys volans</i>	Southern Flying Squirrel	Not At Risk			S3S4	17	30.6 ± 0.25	NS
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4	5	70.7 ± 0.1	NS
A	<i>Ammospiza nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	182	13.5 ± 0.25	NS
A	<i>Calidris canutus rufa</i>	Red Knot rufa subspecies	E,SC	Endangered	Endangered	S2M	589	40.9 ± 0.5	NS
A	<i>Morone saxatilis</i>	Striped Bass	E,SC			S2S3B,S2S3N	26	18.4 ± 0.2	NS
A	<i>Gadus morhua</i>	Atlantic Cod	E,SC,DD			SNR	6	43.4 ± 0.65	NS
A	<i>Salmo salar</i>	Atlantic Salmon	E,T,SC			S1B,S1N	11	18.5 ± 0.2	NS
		Atlantic Walrus - Nova Scotia -							NS
A	<i>Odobenus rosmarus pop. 5</i>	Newfoundland - Gulf of St Lawrence population	X			SX	1	59.7 ± 5.0	
A	<i>Alces alces americana</i>	Moose			Endangered	S1	119	100.0 ± 0.01	NS
A	<i>Alces alces</i>	Moose				S1	35	43.2 ± 0.2	NS
A	<i>Picoides dorsalis</i>	American Three-toed Woodpecker				S1?	3	63.7 ± 0.1	NB
A	<i>Uria aalge</i>	Common Murre				S1?B	11	18.5 ± 0.2	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B,SUM	59	17.1 ± 7.07	NS
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1B	7	91.2 ± 3.22	NB
A	<i>Oxyura jamaicensis</i>	Ruddy Duck				S1B	35	32.6 ± 0.2	NS
A	<i>Gallinula galeata</i>	Common Gallinule				S1B	22	44.1 ± 7.07	NS
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S1B	63	19.5 ± 0.15	NS
A	<i>Cistothorus palustris</i>	Marsh Wren				S1B	45	44.1 ± 7.07	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	151	14.3 ± 7.07	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	33	14.3 ± 7.07	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S4M	1968	100.0 ± 0.01	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S4M	1315	100.0 ± 0.5	NS
A	<i>Anas acuta</i>	Northern Pintail				S1B,SUM	71	2.5 ± 0.2	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1B,SUM	65	11.7 ± 0.15	NS
A	<i>Vespertilionidae sp.</i>	bat species				S1S2	399	10.4 ± 0.1	NS
A	<i>Poecetes gramineus</i>	Vesper Sparrow				S1S2B,SUM	77	12.1 ± 7.07	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B,SUM	86	19.6 ± 0.25	NS
A	<i>Alca torda</i>	Razorbill				S2B	38	23.9 ± 0.25	NS
A	<i>Fratercula arctica</i>	Atlantic Puffin				S2B	50	65.1 ± 11.0	NB
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	75	14.3 ± 7.07	NS
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	267	11.0 ± 0.25	NS
A	<i>Somateria mollissima</i>	Common Eider				S2B,S2N,S4M	612	10.8 ± 0.15	NS
A	<i>Spatula clypeata</i>	Northern Shoveler				S2B,SUM	193	29.5 ± 7.07	NS
A	<i>Mareca strepera</i>	Gadwall				S2B,SUM	218	100.0 ± 0.2	NB
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B,SUM	94	11.5 ± 0.15	NS
A	<i>Calidris alba</i>	Sanderling				S2N,S3M	1570	100.0 ± 0.15	NS
A	<i>Martes americana</i>	American Marten			Endangered	S2S3	23	36.0 ± 0.1	NS
A	<i>Asio otus</i>	Long-eared Owl				S2S3	26	37.8 ± 7.07	NS
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	83	25.2 ± 7.07	NS
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S2S3B	20	27.6 ± 0.03	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	388	11.6 ± 0.15	NS
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3B,S2S3N	43	12.3 ± 14.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B,S4S5M	362	100.0 ± 0.1	NB
A	<i>Setophaga pinus</i>	Pine Warbler				S2S3B,S4S5M	75	21.8 ± 0.15	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B,SUM	175	12.1 ± 7.07	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	<i>Pluvialis dominica</i>	American Golden-Plover				S2S3M	188	40.8 ± 0.24	NS
A	<i>Numenius phaeopus hudsonicus</i>	Whimbrel				S2S3M	154	35.2 ± 0.65	NS
A	<i>Phalaropus fulicarius</i>	Red Phalarope				S2S3M	5	65.1 ± 11.0	NB
A	<i>Perisoreus canadensis</i>	Canada Jay				S3	637	12.1 ± 7.07	NS
A	<i>Poecile hudsonicus</i>	Boreal Chickadee				S3	453	12.0 ± 0.25	NS
A	<i>Spinus pinus</i>	Pine Siskin				S3	677	11.5 ± 0.25	NS
A	<i>Salvelinus fontinalis</i>	Brook Trout				S3	194	12.3 ± 0.22	NS
A	<i>Salvelinus namaycush</i>	Lake Trout				S3	1	93.9 ± 0.01	NB
A	<i>Sorex maritimensis</i>	Maritime Shrew				S3	2	41.2 ± 1.0	NS
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3	24	44.1 ± 0.5	NS
A	<i>Pekania pennanti</i>	Fisher				S3	21	25.9 ± 0.2	NS
A	<i>Calcarius lapponicus</i>	Lapland Longspur				S3?N,SUM	9	16.4 ± 0.2	NS
A	<i>Spatula discors</i>	Blue-winged Teal				S3B	258	18.2 ± 7.07	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3B	711	100.0 ± 0.5	NS
A	<i>Tringa semipalmata</i>	Willet				S3B	761	100.0 ± 0.15	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	48	65.1 ± 11.0	NB
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	79	14.3 ± 7.07	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	412	10.0 ± 0.2	NS
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S3B	778	10.1 ± 0.01	NS
A	<i>Alosa pseudoharengus</i>	Alewife				S3B	27	19.1 ± 0.2	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S4M	1714	1.7 ± 0.2	NS
A	<i>Falco sparverius</i>	American Kestrel				S3B,S4S5M	387	12.0 ± 0.25	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3B,S4S5N,S5M	186	100.0 ± 0.1	NB
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B,S5M	675	10.3 ± 0.25	NS
A	<i>Setophaga striata</i>	Blackpoll Warbler				S3B,S5M	101	10.1 ± 0.2	NS
A	<i>Cardellina pusilla</i>	Wilson's Warbler				S3B,S5M	169	12.2 ± 0.15	NS
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S3B,S5N,S5M	113	12.2 ± 0.2	NS
A	<i>Setophaga tigrina</i>	Cape May Warbler				S3B,SUM	171	18.2 ± 7.07	NS
A	<i>Branta bernicla</i>	Brant				S3M	19	39.0 ± 0.2	NS
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	1895	100.0 ± 0.01	NS
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	648	40.9 ± 0.5	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	2295	100.0 ± 0.01	NS
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S3M	185	100.0 ± 0.5	NS
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	1198	100.0 ± 0.5	NS
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	11	59.5 ± 0.53	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	103	12.4 ± 7.07	NS
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	361	11.1 ± 0.15	NS
A	<i>Sorex albibarbis</i>	Eastern Water Shrew				S3S4	2	87.4 ± 1.0	NB
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B,S4S5M	448	12.2 ± 0.15	NS
A	<i>Setophaga castanea</i>	Bay-breasted Warbler				S3S4B,S4S5M	578	12.0 ± 0.15	NS
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B,S5M	915	100.0 ± 0.2	NB
A	<i>Leiothlypis peregrina</i>	Tennessee Warbler				S3S4B,S5M	363	17.8 ± 0.1	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B,S5M	87	12.1 ± 7.07	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3S4N	219	16.0 ± 0.05	NS
A	<i>Lanius borealis</i>	Northern Shrike				S3S4N	48	24.8 ± 0.2	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S4B,S4N,S5M	236	100.0 ± 0.2	NB
A	<i>Morus bassanus</i>	Northern Gannet				SHB	86	100.0 ± 0.01	NS
A	<i>Aythya americana</i>	Redhead				SHB	6	85.1 ± 0.2	NS
A	<i>Leucophaeus atricilla</i>	Laughing Gull				SHB	10	62.5 ± 0.5	NB
A	<i>Progne subis</i>	Purple Martin				SHB	42	33.2 ± 7.07	NS
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N,S5M	40	12.4 ± 0.2	NS
I	<i>Bombus bohemicus</i>	Ashton Cuckoo Bumble Bee	Endangered	Endangered	Endangered	S1	21	15.5 ± 0.05	NS
I	<i>Epeoloides pilosulus</i>	Macropis Cuckoo Bee	Endangered	Endangered	Endangered	S1	2	17.9 ± 5.0	NS
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern	Endangered	S2?B,S3M	1309	10.1 ± 0.2	NS
I	<i>Barnea truncata</i>	Atlantic Mud-piddock	Threatened	Threatened		S1	11	47.4 ± 0.2	NS
I	<i>Bombus suckleyi</i>	Suckley's Cuckoo Bumble Bee	Threatened			SH	3	80.7 ± 5.0	NS
I	<i>Alasmodonta varicosa</i>	Brook Floater	Special Concern	Special Concern	Threatened	S3	3	67.5 ± 0.1	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
	<i>Bombus terricola</i>	Yellow-banded Bumble Bee	Special Concern	Special Concern	Vulnerable	S3	358	10.2 ± 0.01	NS
	<i>Coccinella transversoguttata richardsoni</i>	Transverse Lady Beetle	Special Concern		Endangered	SH	6	18.4 ± 2.5	NS
	<i>Gomphurus ventricosus</i>	Skillet Clubtail	Special Concern	Endangered		SH	1	79.9 ± 1.0	NS
	<i>Erora laeta</i>	Early Hairstreak				S1	2	82.5 ± 2.5	NS
	<i>Ophiogomphus anomalus</i>	Extra-Striped Snaketail				S1	8	86.6 ± 0.05	NS
	<i>Pachydiplax longipennis</i>	Blue Dasher				S1	36	18.8 ± 0.2	NS
	<i>Atlanticoncha ochracea</i>	Tidewater Mucket				S1	12	68.3 ± 1.0	NS
	<i>Polygonia comma</i>	Eastern Comma				S1?	26	18.6 ± 0.2	NS
	<i>Polygonia satyrus</i>	Satyr Comma				S1?	7	57.8 ± 2.5	NS
	<i>Boloria chariclea grandis</i>	Purple Lesser Fritillary				S1S2	2	56.3 ± 2.5	NS
	<i>Somatochlora brevicincta</i>	Quebec Emerald				S1S2	1	82.5 ± 1.0	NS
	<i>Hippodamia tredecimpunctata tibialis</i>	Thirteen-spotted Lady Beetle				S2	17	63.7 ± 0.2	NB
	<i>Satyrus acadica</i>	Acadian Hairstreak				S2	5	78.7 ± 2.5	NS
	<i>Coenagrion resolutum</i>	Taiga Bluet				S2	13	50.1 ± 0.2	NS
	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	78	15.6 ± 0.2	NS
	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	6	17.6 ± 0.2	NS
	<i>Nymphalis l-album j-album</i>	Compton Tortoiseshell				S2S3	25	50.1 ± 0.2	NS
	<i>Aglaia milberti</i>	Milbert's Tortoiseshell				S2S3	23	18.5 ± 2.5	NS
	<i>Somatochlora kennedyi</i>	Kennedy's Emerald				S2S3	3	79.9 ± 1.0	NS
	<i>Somatochlora williamsoni</i>	Williamson's Emerald				S2S3	6	4.6 ± 0.4	NS
	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S2S3	2	82.1 ± 0.01	NS
	<i>Enallagma geminatum</i>	Skimming Bluet				S2S3	6	38.0 ± 0.2	NS
	<i>Stylurus scudleri</i>	Zebra Clubtail				S2S3	29	18.5 ± 0.2	NS
	<i>Alasmodonta undulata</i>	Triangle Floater				S2S3	34	61.3 ± 0.1	NS
	<i>Strophiona nitens</i>	Chestnut Bark Long-horned Beetle				S3	4	4.6 ± 0.4	NS
	<i>Psephenus herricki</i>	Herrick's Water Penny Beetle				S3	2	67.7 ± 0.2	NS
	<i>Lebia ornata</i>	Ornate Harp Ground Beetle				S3	1	72.9 ± 0.2	NS
	<i>Hippodamia parenthesis</i>	Parenthesis Lady Beetle				S3	11	59.3 ± 0.05	NS
	<i>Disonychia pensylvanica</i>	Pennsylvania Flea Beetle				S3	1	26.5 ± 0.2	NS
	<i>Omophron americanum</i>	American Round Sand Beetle				S3	5	96.4 ± 0.01	NS
	<i>Chrysochus auratus</i>	Dogbane Leaf Beetle				S3	9	60.4 ± 0.2	NS
	<i>Naemia seriata</i>	Seaside Lady Beetle				S3	88	18.5 ± 0.2	NS
	<i>Pachyrhinus elegans</i>	Elegant Broad-nosed Weevil				S3	2	72.9 ± 0.2	NS
	<i>Tachyerges ephippiatus</i>	Caparison Weevil				S3	1	93.6 ± 0.2	NB
	<i>Chilocorus stigma</i>	Twice-stabbed Lady Beetle				S3	32	50.1 ± 0.2	NS
	<i>Myzia pullata</i>	Streaked Lady Beetle				S3	8	63.2 ± 0.2	NB
	<i>Ipthiminius opacus</i>	Cloudy Darkling Beetle				S3	2	64.1 ± 0.2	NB
	<i>Monochamus marmorator</i>	Balsam Fir Sawyer				S3	3	65.3 ± 0.2	NB
	<i>Dicerca tenebrosa</i>	Dark Jewel Beetle				S3	2	50.5 ± 0.2	NS
	<i>Dicerca tuberculata</i>	Swollen Jewel Beetle				S3	1	90.5 ± 9.73	NS
	<i>Astylopsis sexguttata</i>	Six-speckled Long-horned Beetle				S3	1	93.6 ± 0.2	NB
	<i>Satyrus calanus falacer</i>	Falacer Hairstreak				S3	49	18.3 ± 0.02	NS
	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	28	12.0 ± 0.56	NS
	<i>Strymon melinus</i>	Gray Hairstreak				S3	21	22.8 ± 2.5	NS
	<i>Phanogomphus descriptus</i>	Harpoon Clubtail				S3	4	94.3 ± 0.1	NB
	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S3	17	65.7 ± 0.1	NS
	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S3	13	35.1 ± 0.2	NS
	<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S3	18	65.7 ± 0.1	NS
	<i>Epithea princeps</i>	Prince Baskettail				S3	12	62.5 ± 1.0	NS
	<i>Somatochlora forcipata</i>	Forcipate Emerald				S3	6	48.3 ± 0.2	NS
	<i>Enallagma vernale</i>	Vernal Bluet				S3	2	77.6 ± 1.0	NS
	<i>Polygonia interrogationis</i>	Question Mark				S3B	160	20.0 ± 0.5	NS
	<i>Lepturopsis biforis</i>	Two-spotted Long-horned Beetle				S3S4	3	40.1 ± 0.2	NS
	<i>Cecropia pylades</i>	Northern Cloudywing				S3S4	11	81.9 ± 0.01	NB
	<i>Amblyscirtes hegona</i>	Pepper and Salt Skipper				S3S4	8	37.2 ± 2.5	NS
	<i>Cupido comyntas</i>	Eastern Tailed Blue				S3S4	40	20.0 ± 0.5	NS

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I	<i>Argynnis aphrodite</i>	Aphrodite Fritillary				S3S4	2	75.4 ± 0.01	NS
I	<i>Argynnis aphrodite winni</i>	Aphrodite Fritillary				S3S4	39	18.7 ± 0.01	NS
I	<i>Polygonia faunus</i>	Green Comma				S3S4	31	20.0 ± 1.0	NS
I	<i>Oeneis jutta ascerta</i>	Jutta Arctic				S3S4	26	48.3 ± 0.1	NS
I	<i>Aeshna clepsydra</i>	Mottled Darner				S3S4	28	62.9 ± 1.0	NS
I	<i>Aeshna constricta</i>	Lance-Tipped Darner				S3S4	39	26.0 ± 0.2	NS
I	<i>Boyeria graefiana</i>	Ocellated Darner				S3S4	21	23.2 ± 0.1	NS
I	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3S4	32	20.4 ± 0.2	NS
I	<i>Somatochlora franklini</i>	Delicate Emerald				S3S4	6	50.5 ± 0.2	NS
I	<i>Erythrodiplax berenice</i>	Seaside Dragonlet				S3S4	2	76.1 ± 0.1	NS
I	<i>Nannothemis bella</i>	Elfin Skimmer				S3S4	20	36.5 ± 0.1	NS
I	<i>Sympetrum danae</i>	Black Meadowhawk				S3S4	7	63.3 ± 0.2	NS
I	<i>Enallagma vesperum</i>	Vesper Bluet				S3S4	24	26.4 ± 0.01	NS
I	<i>Amphiagrion saucium</i>	Eastern Red Damsel				S3S4	11	61.5 ± 0.2	NS
I	<i>Icaricia saepiolus amica</i>	Greenish Blue				SH	1	83.5 ± 2.5	NS
I	<i>Chlosyne nycteis</i>	Silvery Checkerspot				SH	4	66.1 ± 2.5	NS
I	<i>Eristalis brousii</i>	Hourglass Drone Fly				SX	1	50.1 ± 0.2	NS
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered	Endangered	Endangered	S1	9	37.9 ± 1.0	NS
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	13	40.2 ± 0.5	NS
N	<i>Peltigera hydrothyrja</i>	Eastern Waterfan	Threatened	Threatened	Threatened	S1	875	42.7 ± 0.01	NS
N	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	325	28.8 ± 0.01	NS
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened	Threatened	Threatened	S3	202	12.1 ± 0.01	NS
N	<i>Fuscopannaria leucosticta</i>	White-rimmed Shingle Lichen	Threatened			S3	46	41.4 ± 0.2	NS
N	<i>Heterodermia squamulosa</i>	Scaly Fringe Lichen	Threatened			S3	141	14.4 ± 0.2	NS
N	<i>Pectenaria plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	609	22.6 ± 0.5	NS
N	<i>Sclerophora peronella</i> (Atlantic pop.)	Frosted Glass-whiskers (Atlantic population)	Special Concern	Special Concern		S3S4	30	15.8 ± 3.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	40	35.2 ± 4.0	NS
N	<i>Fissidens exilis</i>	Pygmy Pocket Moss	Not At Risk			S3	18	17.2 ± 0.2	NS
N	<i>Radula obconica</i>	a scalewort				S1	1	46.0 ± 0.2	NS
N	<i>Aloina brevirostris</i>	Short-Beaked Rigid Screw Moss				S1	2	65.8 ± 2.5	NS
N	<i>Homalotheciella subcapillata</i>	Few-haired Moss				S1	1	75.0 ± 0.2	NS
N	<i>Orthotrichum gymnostomum</i>	Aspen Bristle Moss				S1	1	1.8 ± 0.2	NS
N	<i>Orthotrichum pallens</i>	Pale Bristle Moss				S1	1	76.1 ± 0.1	NS
N	<i>Seligeria calcarea</i>	Chalk Brittle Moss				S1	2	73.6 ± 0.2	NB
N	<i>Seligeria diversifolia</i>	a Moss				S1	1	62.1 ± 0.1	NB
N	<i>Sematophyllum demissum</i>	a Moss				S1	1	52.9 ± 1.6	NS
N	<i>Tetradontium brownianum</i>	Little Georgia				S1	7	59.3 ± 0.1	NB
N	<i>Cyrtio-hypnum minutulum</i>	Tiny Cedar Moss				S1	1	75.3 ± 0.1	NS
N	<i>Blennothallia crispa</i>	Crinkled Jelly Lichen				S1	1	68.0 ± 0.05	NS
N	<i>Umbilicaria vellea</i>	Grizzled Rocktripe Lichen				S1	2	59.8 ± 1.0	NB
N	<i>Usnea perplexans</i>	Powdered Beard Lichen				S1	1	56.7 ± 0.4	NS
N	<i>Scytinium dactylinum</i>	Brown-buttoned Jellyskin Lichen				S1	2	15.7 ± 0.05	NS
N	<i>Flavoparmelia baltimorensis</i>	Rock Greenshield Lichen				S1	2	56.2 ± 0.2	NS
N	<i>Lathagrium cristatum</i>	Fingered Jelly Lichen				S1	6	58.5 ± 1.0	NB
N	<i>Ephebe hispidula</i>	Dryside Rockshag Lichen				S1	1	28.2 ± 0.05	NS
N	<i>Ephebe perspinulosa</i>	Thread Lichen				S1	2	21.3 ± 0.2	NS
N	<i>Fuscopannaria praetermissa</i>	Moss Shingles Lichen				S1	1	60.2 ± 0.05	NS
N	<i>Parmotrema perforatum</i>	Perforated Ruffle Lichen				S1	46	76.6 ± 0.01	NS
N	<i>Polychidium muscicola</i>	Eyed Mossthorns Woollybear Lichen				S1	11	17.8 ± 0.2	NS
N	<i>Pseudevernia consocians</i>	Common Antler Lichen				S1	1	84.5 ± 0.05	NS
N	<i>Spilonema revertens</i>	Rock Hairball Lichen				S1	4	36.2 ± 0.01	NS
N	<i>Sticta limbata</i>	Powdered Moon Lichen				S1	12	37.7 ± 0.01	NS
N	<i>Lathagrium fuscovirens</i>	Crumpled Rock Tarpaper Lichen				S1	2	43.7 ± 0.05	NS
N	<i>Dermatocarpon miniatum</i>	Common Stippleback Lichen				S1	4	12.9 ± 0.01	NS
N	<i>Leptogium hibernicum</i>	Hibernia Jellyskin Lichen				S1	1	89.7 ± 0.01	NS
N	<i>Peltigera lepidophora</i>	Scaly Pelt Lichen				S1	11	30.1 ± 0.2	NS

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N	<i>Hypogymnia hultenii</i>	Powdered Honeycomb Lichen				S1	3	86.8 ± 0.5	NS
N	<i>Notothylas orbicularis</i>	Round Hornwort				S1?	1	44.6 ± 0.2	NS
N	<i>Calypogeia neogaea</i>	Common Pouchwort				S1?	3	37.1 ± 0.2	NS
N	<i>Jubula pennsylvanica</i>	a liverwort				S1?	15	12.4 ± 0.2	NS
N	<i>Aloina rigida</i>	Aloe-Like Rigid Screw Moss				S1?	4	64.5 ± 0.1	NS
N	<i>Imbriobryum muehlenbeckii</i>	Muehlenbeck's Bryum Moss				S1?	2	44.9 ± 0.01	NS
N	<i>Cirriophyllum piliferum</i>	Hair-pointed Moss				S1?	3	17.2 ± 0.2	NS
N	<i>Conardia compacta</i>	Coast Creeping Moss				S1?	2	58.9 ± 1.5	NB
N	<i>Tortula obtusifolia</i>	a Moss				S1?	1	63.7 ± 0.1	NB
N	<i>Didymodon tophaceus</i>	Olive Beard Moss				S1?	2	68.0 ± 0.01	NS
N	<i>Grimmia anodon</i>	Toothless Grimmia Moss				S1?	4	75.9 ± 3.0	NS
N	<i>Homomallium adnatum</i>	Adnate Hairy-gray Moss				S1?	2	39.4 ± 0.2	NS
N	<i>Meesia triquetra</i>	Three-ranked Cold Moss				S1?	3	67.5 ± 0.01	NS
N	<i>Paludella squarrosa</i>	Tufted Fen Moss				S1?	3	70.7 ± 0.01	NS
N	<i>Physcomitrium immersum</i>	a Moss				S1?	9	13.5 ± 0.2	NS
N	<i>Platydictya minutissima</i>	Small Willow Moss				S1?	1	17.6 ± 0.2	NS
N	<i>Schistostegia pennata</i>	Luminous Moss				S1?	2	79.1 ± 0.01	NS
N	<i>Timmia norvegica</i>	a moss				S1?	3	59.1 ± 0.1	NB
N	<i>Trichodon cylindricus</i>	Cylindric Hairy-teeth Moss				S1?	5	10.4 ± 0.2	NS
N	<i>Plagiomnium ellipticum</i>	Marsh Leafy Moss				S1?	1	9.3 ± 0.01	NS
N	<i>Syntrichia ruralis</i>	a Moss				S1?	1	89.9 ± 0.1	NB
N	<i>Enchylium limosum</i>	Lime-loving Tarpaper Lichen				S1?	2	67.8 ± 0.2	NS
N	<i>Euopsis granatina</i>	Lesser Rockbud Lichen				S1?	1	30.2 ± 1.33	NS
N	<i>Scytinium intermedium</i>	Forty-five Jellyskin Lichen				S1?	1	68.1 ± 4.0	NS
N	<i>Melanelia culbersonii</i>	Appalachian Camouflage Lichen				S1?	1	80.5 ± 0.05	NS
N	<i>Peltigera malacea</i>	Veinless Pelt Lichen				S1?	1	64.5 ± 1.0	NB
N	<i>Peltigera venosa</i>	Fan Pelt Lichen				S1?	1	89.8 ± 0.01	NB
N	<i>Porella pinnata</i>	Pinnate Scalewort				S1S2	3	21.7 ± 0.2	NS
N	<i>Reboulia hemisphaerica</i>	Purple-margined Liverwort				S1S2	2	12.0 ± 0.2	NS
N	<i>Arrhenopterum heterostichum</i>	One-sided Groove Moss				S1S2	3	56.8 ± 5.0	NS
N	<i>Brachythecium turgidum</i>	Thick Ragged Moss				S1S2	3	18.2 ± 3.0	NS
N	<i>Dicranoweisia crispula</i>	Mountain Thatch Moss				S1S2	1	65.6 ± 0.1	NB
N	<i>Didymodon rigidulus</i>	Rigid Screw Moss				S1S2	10	59.1 ± 0.1	NB
N	<i>Didymodon ferrugineus</i>	Rusty Beard Moss				S1S2	2	59.5 ± 0.1	NB
N	<i>Hygrohypnum montanum</i>	a Moss				S1S2	2	63.0 ± 1.0	NB
N	<i>Hypnum pratense</i>	Meadow Plait Moss				S1S2	1	18.5 ± 3.0	NS
N	<i>Mnium thomsonii</i>	Thomson's Leafy Moss				S1S2	1	60.7 ± 2.0	NS
N	<i>Tortula acaulon</i>	Cuspidate Earth Moss				S1S2	8	14.2 ± 0.2	NS
N	<i>Plagiothecium latebricola</i>	Alder Silk Moss				S1S2	3	60.2 ± 1.0	NB
N	<i>Platydictya confervoides</i>	a Moss				S1S2	1	61.6 ± 0.01	NS
N	<i>Sematophyllum marylandicum</i>	a Moss				S1S2	1	70.7 ± 0.1	NS
N	<i>Timmia megapolitana</i>	Metropolitan Timmia Moss				S1S2	2	76.4 ± 1.6	NS
N	<i>Tortula mucronifolia</i>	Mucronate Screw Moss				S1S2	3	51.0 ± 3.0	NS
N	<i>Syntrichia papillosa</i>	a Moss				S1S2	3	1.5 ± 0.2	NS
N	<i>Pseudotaxiphyllum distichaceum</i>	a Moss				S1S2	2	44.8 ± 4.8	NS
N	<i>Hamatocaulis vernicosus</i>	a Moss				S1S2	5	67.5 ± 0.2	NS
N	<i>Haplocladium microphyllum</i>	Tiny-leaved Haplocladium Moss				S1S2	1	46.4 ± 3.2	NS
N	<i>Rhynchostegium serrulatum</i>	Dark Beaked Moss				S1S2	1	76.8 ± 2.0	NS
N	<i>Enchylium bachmanianum</i>	Bachman's Jelly Lichen				S1S2	2	42.2 ± 0.2	NS
N	<i>Sclerophora amabilis</i>	Collared Glass-whiskers Lichen				S1S2	3	47.5 ± 0.01	NS
N	<i>Cladonia sulphurina</i>	Greater Sulphur-cup Lichen				S1S2	7	69.1 ± 0.2	NB
N	<i>Peltigera ponojensis</i>	Pale-bellied Pelt Lichen				S1S2	3	62.7 ± 1.0	NB
N	<i>Pilophorus cereolus</i>	Powdered Matchstick Lichen				S1S2	3	70.6 ± 3.0	NS
N	<i>Rhizoplaca subdiscrepans</i>	Scattered Rock-posy Lichen				S1S2	8	45.8 ± 0.2	NS
N	<i>Parmotrema reticulatum</i>	Netted Ruffle Lichen				S1S2	12	20.7 ± 0.2	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
N	<i>Parmeliella parvula</i>	Poor-man's Shingles Lichen				S1S2	1	87.0 ± 0.1	NS
N	<i>Radula tenax</i>	Tenacious Scalewort				S1S3	2	32.4 ± 0.2	NS
N	<i>Aphanorrhagma serratum</i>	Lidded Earth Moss				S1S3	1	15.4 ± 0.2	NS
N	<i>Chaenotheca hygrophila</i>	a lichen				S1S3	4	54.2 ± 0.2	NS
N	<i>Umbilicaria polyrhiza</i>	Ballpoint Rocktripe Lichen				S1S3	1	99.5 ± 0.01	NS
N	<i>Lecanora polytrapa</i>	a lichen				S1S3	8	27.5 ± 1.0	NS
N	<i>Heterodermia galactophylla</i>	Branching Fringe Lichen				S1S3	5	40.7 ± 0.2	NS
N	<i>Xylopsora friesii</i>	a Lichen				S1S3	1	59.8 ± 1.0	NB
N	<i>Peltigera neckeri</i>	Black-saddle Pelt Lichen				S1S3	3	66.7 ± 5.0	NB
N	<i>Usnea fragilesceus</i>	Inflationary Beard Lichen				S1S3	1	55.8 ± 0.2	NS
N	<i>Usnea chaetophora</i>	Articulated Beard Lichen				S1S3	1	35.8 ± 0.05	NS
N	<i>Stereocaulon intermedium</i>	Pacific Brain Foam Lichen				S1S3	13	15.3 ± 0.01	NS
N	<i>Anacamptodon splachnoides</i>	a Moss				S2	5	1.5 ± 0.2	NS
N	<i>Scorpidium scorpioides</i>	Hooked Scorpion Moss				S2	3	96.3 ± 0.1	NB
N	<i>Sphagnum platyphyllum</i>	Flat-leaved Peat Moss				S2	3	17.7 ± 0.01	NS
N	<i>Sphagnum subnitens</i>	Lustrous Peat Moss				S2	4	82.5 ± 0.3	NS
N	<i>Scorpidium cossonii</i>	Cosson's Hook Moss				S2	1	93.1 ± 1.0	NB
N	<i>Usnea flavocardia</i>	Blood-splattered Beard Lichen				S2	1	95.6 ± 4.5	NS
N	<i>Cystocoleus ebeneus</i>	Rockgossamer Lichen				S2	7	30.1 ± 0.26	NS
N	<i>Hypotrachyna catawbiensis</i>	Powder-tipped Antler Lichen				S2	35	33.4 ± 0.5	NS
N	<i>Scytinium imbricatum</i>	Scaly Jellyskin Lichen				S2	5	42.1 ± 0.2	NS
N	<i>Nephroma arcticum</i>	Arctic Kidney Lichen				S2	2	53.8 ± 0.5	NS
N	<i>Nephroma resupinatum</i>	a lichen				S2	14	18.2 ± 0.05	NS
N	<i>Placynthium flabellum</i>	Scaly Ink Lichen				S2	8	17.8 ± 0.05	NS
N	<i>Cololejeunea biddlecomiae</i>	Biddlecome's Pouncewort				S2?	1	12.9 ± 0.2	NS
N	<i>Moerckia flotoviana</i>	Flotow's Ruffwort				S2?	1	68.4 ± 0.01	NS
N	<i>Riccardia multifida</i>	Delicate Germanderwort				S2?	4	13.0 ± 0.2	NS
N	<i>Anomodon viticulosus</i>	a Moss				S2?	6	23.6 ± 0.2	NS
N	<i>Weissia muhlenbergiana</i>	a Moss				S2?	7	17.2 ± 0.2	NS
N	<i>Atrichum angustatum</i>	Lesser Smoothcap Moss				S2?	10	4.3 ± 0.2	NS
N	<i>Ptychostomum pendulum</i>	Drooping Bryum				S2?	1	65.9 ± 2.5	NS
N	<i>Drepanocladus polygamus</i>	Polygamous Hook Moss				S2?	9	10.6 ± 0.2	NS
N	<i>Pseudocampylum radicale</i>	Long-stalked Fine Wet Moss				S2?	3	18.5 ± 3.0	NS
N	<i>Climacium americanum</i>	American Tree Moss				S2?	10	68.9 ± 0.2	NS
N	<i>Dicranum condensatum</i>	Condensed Broom Moss				S2?	6	18.5 ± 3.0	NS
N	<i>Ditrichum rhynchostegium</i>	a Moss				S2?	6	73.1 ± 1.0	NS
N	<i>Fissidens bushii</i>	Bush's Pocket Moss				S2?	18	12.5 ± 0.2	NS
N	<i>Fontinalis hypnoides</i>	a moss				S2?	2	75.6 ± 0.5	NS
N	<i>Fontinalis sullivantii</i>	Sullivant's Water Moss				S2?	3	66.5 ± 0.01	NS
N	<i>Grimmia olneyi</i>	a Moss				S2?	10	70.5 ± 0.3	NS
N	<i>Grimmia anomala</i>	Mountain Forest Grimmi				S2?	1	64.9 ± 1.5	NS
N	<i>Hygrohypnum bestii</i>	Best's Brook Moss				S2?	6	17.2 ± 0.01	NS
N	<i>Orthotrichum anomalum</i>	Anomalous Bristle Moss				S2?	8	1.8 ± 0.2	NS
N	<i>Philonotis marchica</i>	a Moss				S2?	2	70.6 ± 0.15	NS
N	<i>Physcomitrium collenchymatum</i>	a Moss				S2?	1	18.2 ± 0.1	NS
N	<i>Platydictya jungermannioides</i>	False Willow Moss				S2?	3	59.5 ± 0.1	NB
N	<i>Rhytidium rugosum</i>	Wrinkle-leaved Moss				S2?	2	59.3 ± 1.0	NB
N	<i>Saellania glaucescens</i>	Blue Dew Moss				S2?	2	65.6 ± 0.1	NB
N	<i>Tortella fragilis</i>	Fragile Twisted Moss				S2?	1	59.1 ± 0.1	NB
N	<i>Anomobryum julaceum</i>	Slender Silver Moss				S2?	4	59.3 ± 1.0	NB
N	<i>Rauvolfia scita</i>	Smaller Fern Moss				S2?	16	70.4 ± 0.1	NS
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2?	7	59.1 ± 0.1	NB
N	<i>Platylomella lescunii</i>	a Moss				S2?	19	12.7 ± 0.2	NS
N	<i>Phyliscum demangeonii</i>	Black Rock-wafer Lichen				S2?	6	30.1 ± 0.34	NS
N	<i>Oxyrrhynchium hians</i>	Light Beaked Moss				S2S3	6	18.3 ± 5.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
N	<i>Platydictya subtilis</i>	Bark Willow Moss				S2S3	6	13.6 ± 0.01	NS
N	<i>Plagiomnium rostratum</i>	Long-beaked Leafy Moss				S2S3	10	18.9 ± 2.0	NS
N	<i>Scorpidium revolvens</i>	Limprichtia Moss				S2S3	3	70.7 ± 0.01	NS
N	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen				S2S3	9	12.7 ± 0.08	NS
N	<i>Moelleropsis nebulosa</i> ssp. <i>frullaniae</i>	Blue-gray Moss Shingle Lichen				S2S3	1	89.7 ± 0.5	NS
N	<i>Ramalina thrausta</i>	Angelhair Ramalina Lichen				S2S3	12	39.1 ± 1.0	NS
N	<i>Collema leptaleum</i>	Crumpled Bat's Wing Lichen				S2S3	96	15.2 ± 0.01	NS
N	<i>Usnea ceratina</i>	Warty Beard Lichen				S2S3	3	38.0 ± 0.05	NS
N	<i>Usnea hirta</i>	Bristly Beard Lichen				S2S3	4	58.4 ± 0.2	NS
N	<i>Usnea rubicunda</i>	Red Beard Lichen				S2S3	6	56.7 ± 0.05	NS
N	<i>Ahtiana aurescens</i>	Eastern Candlewax Lichen				S2S3	29	49.5 ± 0.5	NS
N	<i>Usnocetraria oakesiana</i>	Yellow Band Lichen				S2S3	23	16.9 ± 0.05	NS
N	<i>Catinaria atropurpurea</i>	a lichen				S2S3	1	93.3 ± 0.2	NS
N	<i>Cetraria muricata</i>	Spiny Heath Lichen				S2S3	1	97.7 ± 0.01	NS
N	<i>Cladonia incrassata</i>	Powder-foot British Soldiers Lichen				S2S3	3	70.9 ± 0.2	NS
N	<i>Cladonia mateocyatha</i>	Mixed-up Pixie-cup				S2S3	5	35.4 ± 1.2	NS
N	<i>Cladonia parasitica</i>	Fence-rail Lichen				S2S3	3	49.8 ± 1.2	NS
N	<i>Scytinium tenuissimum</i>	Birdnest Jellyskin Lichen				S2S3	7	61.7 ± 0.05	NS
N	<i>Melanohalea septentrionalis</i>	Northern Camouflage Lichen				S2S3	4	57.2 ± 0.6	NS
N	<i>Myelochroa aurulenta</i>	Powdery Axil-bristle Lichen				S2S3	6	35.9 ± 0.05	NS
N	<i>Parmelia fertilis</i>	Fertile Shield Lichen				S2S3	11	23.9 ± 0.01	NS
N	<i>Hypotrachyna minarum</i>	Hairless-spined Shield Lichen				S2S3	6	35.9 ± 1.5	NS
N	<i>Parmeliopsis ambigua</i>	Green Starburst Lichen				S2S3	2	35.8 ± 2.0	NS
N	<i>Racodium rupestre</i>	Rockhair Lichen				S2S3	4	66.9 ± 0.01	NS
N	<i>Umbilicaria polyphylla</i>	Petalled Rocktripe Lichen				S2S3	1	35.8 ± 2.0	NS
N	<i>Usnea cavernosa</i>	Pitted Beard Lichen				S2S3	4	30.6 ± 0.2	NS
N	<i>Usnea mutabilis</i>	Bloody Beard Lichen				S2S3	4	56.6 ± 0.25	NS
N	<i>Fuscopannaria soledata</i>	a Lichen				S2S3	17	67.2 ± 0.01	NS
N	<i>Stereocaulon condensatum</i>	Granular Soil Foam Lichen				S2S3	15	10.4 ± 0.2	NS
N	<i>Stereocaulon subcoralloides</i>	Coralloid Foam Lichen				S2S3	1	61.1 ± 1.0	NB
N	<i>Dimelaena oreina</i>	Golden Moonglow Lichen				S2S3	5	45.8 ± 0.2	NS
N	<i>Hypotrachyna revoluta</i>	Granulating Loop Lichen				S2S3	2	39.1 ± 2.0	NS
N	<i>Cetraria arenaria</i>	Sand-loving Icelandmoss Lichen				S2S3	33	10.0 ± 0.2	NS
N	<i>Cladonia coccifera</i>	Eastern Boreal Pixie-cup Lichen				S2S3	1	15.3 ± 0.01	NS
N	<i>Cladonia deformis</i>	Lesser Sulphur-cup Lichen				S2S3	11	40.8 ± 3.0	NS
N	<i>Cladonia phyllophora</i>	Felt Lichen				S2S3	2	24.6 ± 4.5	NS
N	<i>Hypotrachyna afrorevoluta</i>	Pustulate Revolute Loop Lichen				S2S3	4	35.9 ± 1.5	NS
N	<i>Usnea flammea</i>	Coastal Bushy Beard Lichen				S2S3	2	40.3 ± 0.05	NS
N	<i>Ephemerum serratum</i>	a Moss				S3	12	15.2 ± 0.2	NS
N	<i>Fissidens taxifolius</i>	Yew-leaved Pocket Moss				S3	16	10.0 ± 0.2	NS
N	<i>Anomodon tristis</i>	a Moss				S3	20	28.1 ± 0.2	NS
N	<i>Sphagnum contortum</i>	Twisted Peat Moss				S3	9	10.6 ± 0.2	NS
N	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss				S3	6	42.0 ± 0.1	NS
N	<i>Rostania occultata</i>	Crusted Tarpaper Lichen				S3	9	17.4 ± 0.2	NS
N	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen				S3	47	13.2 ± 0.2	NS
N	<i>Solorina saccata</i>	Woodland Owl Lichen				S3	20	58.5 ± 1.0	NB
N	<i>Fuscopannaria ahlneri</i>	Roughened Shingle Lichen				S3	37	35.2 ± 0.5	NS
N	<i>Scytinium lichenoides</i>	Tattered Jellyskin Lichen				S3	33	59.8 ± 1.0	NB
N	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen				S3	33	21.2 ± 0.2	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	10	65.2 ± 1.0	NB
N	<i>Placynthium nigrum</i>	Common Ink Lichen				S3	2	59.8 ± 1.0	NB
N	<i>Punctelia appalachensis</i>	Appalachian Speckleback Lichen				S3	178	11.0 ± 0.2	NS
N	<i>Viridothelium virens</i>	a lichen				S3	7	43.1 ± 0.5	NS
N	<i>Ephebe lanata</i>	Waterside Rockshag Lichen				S3	14	17.8 ± 0.01	NS
N	<i>Phaeophyscia adiastrata</i>	Powder-tipped Shadow Lichen				S3	25	12.9 ± 0.01	NS
N	<i>Phaeophyscia pusilloides</i>	Pompom-tipped Shadow Lichen				S3	10	24.7 ± 0.2	NS
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S3	7	11.3 ± 0.1	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
N	<i>Metzgeria conjugata</i>	Rock Veilwort				S3?	4	12.8 ± 0.53	NS
N	<i>Barbula convoluta</i>	Lesser Bird's-claw Beard Moss				S3?	5	13.1 ± 0.2	NS
N	<i>Calliergon giganteum</i>	Giant Spear Moss				S3?	3	18.0 ± 0.01	NS
N	<i>Drummondia prorepens</i>	a Moss				S3?	9	15.7 ± 0.2	NS
N	<i>Elodium blandowii</i>	Blandow's Bog Moss				S3?	5	22.8 ± 3.0	NS
N	<i>Mnium stellare</i>	Star Leafy Moss				S3?	3	64.3 ± 1.5	NS
N	<i>Sphagnum lindbergii</i>	Lindberg's Peat Moss				S3?	4	72.7 ± 5.0	NB
N	<i>Sphagnum riparium</i>	Streamside Peat Moss				S3?	4	36.1 ± 1.5	NS
N	<i>Cladonia stygia</i>	Black-footed Reindeer Lichen				S3?	12	11.6 ± 0.2	NS
N	<i>Anomodon rugelii</i>	Rugel's Anomodon Moss				S3S4	11	12.9 ± 1.5	NS
N	<i>Dichelyma capillaceum</i>	Hairlike Dichelyma Moss				S3S4	8	47.0 ± 3.0	NS
N	<i>Dicranum leioneuron</i>	a Dicranum Moss				S3S4	2	68.2 ± 0.1	NB
N	<i>Encalypta ciliata</i>	Fringed Extinguisher Moss				S3S4	3	49.7 ± 1.0	NS
N	<i>Encalypta procera</i>	Slender Extinguisher Moss				S3S4	7	33.1 ± 0.2	NS
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	3	36.2 ± 0.01	NS
N	<i>Splachnum ampullaceum</i>	Cruet Dung Moss				S3S4	4	40.3 ± 0.1	NS
N	<i>Thamnobryum alleghaniense</i>	a Moss				S3S4	52	10.5 ± 0.71	NS
N	<i>Tomentypnum nitens</i>	Golden Fuzzy Fen Moss				S3S4	4	67.8 ± 0.2	NS
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S3S4	6	52.9 ± 1.6	NS
N	<i>Hylocomiastrum pyrenaicum</i>	a Feather Moss				S3S4	4	17.2 ± 0.2	NS
N	<i>Bryoria pseudofuscescens</i>	Mountain Horsehair Lichen				S3S4	19	36.5 ± 1.5	NS
N	<i>Enchylium tenax</i>	Soil Tarpaper Lichen				S3S4	7	27.6 ± 0.01	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3S4	41	10.7 ± 0.05	NS
N	<i>Arctoparmelia incurva</i>	Finger Ring Lichen				S3S4	36	19.4 ± 0.2	NS
N	<i>Scytinium teretiusculum</i>	Curly Jellyskin Lichen				S3S4	28	13.1 ± 0.2	NS
N	<i>Leptogium acadense</i>	Acadian Jellyskin Lichen				S3S4	49	13.7 ± 0.2	NS
N	<i>Scytinium subtile</i>	Appressed Jellyskin Lichen				S3S4	35	17.5 ± 0.01	NS
N	<i>Felipes leucopellaeus</i>	a lichen				S3S4	3	48.1 ± 0.2	NS
N	<i>Chaenotheca brachypoda</i>	a stubble lichen				S3S4	1	47.7 ± 0.2	NS
N	<i>Cladonia floerkeana</i>	Gritty British Soldiers Lichen				S3S4	8	52.0 ± 0.01	NS
N	<i>Vahlia leucophaea</i>	Shelter Shingle Lichen				S3S4	42	17.8 ± 0.05	NS
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3S4	122	10.7 ± 0.2	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3S4	248	100.0 ± 10.41	NS
N	<i>Melanohalea olivacea</i>	Spotted Camouflage Lichen				S3S4	8	27.6 ± 1.0	NS
N	<i>Parmeliopsis hyperopta</i>	Gray Starburst Lichen				S3S4	5	40.3 ± 0.05	NS
N	<i>Parmotrema perlatum</i>	Powdered Ruffle Lichen				S3S4	58	27.2 ± 0.01	NS
N	<i>Peltigera hymenina</i>	Cloudy Pelt Lichen				S3S4	1	41.9 ± 1.5	NS
N	<i>Sphaerophorus fragilis</i>	Fragile Coral Lichen				S3S4	2	95.7 ± 3.08	NS
N	<i>Sclerophora peronella</i>	Frosted Glass-whiskers Lichen				S3S4	71	24.5 ± 0.2	NS
N	<i>Coccocarpia palmicola</i>	Salted Shell Lichen				S3S4	133	20.3 ± 0.2	NS
N	<i>Physcia caesia</i>	Blue-gray Rosette Lichen				S3S4	4	37.7 ± 0.2	NS
N	<i>Physcia tenella</i>	Fringed Rosette Lichen				S3S4	2	87.8 ± 0.02	NS
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	385	13.1 ± 0.2	NS
N	<i>Evernia prunastri</i>	Valley Oakmoss Lichen				S3S4	43	16.9 ± 0.2	NS
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	139	20.5 ± 0.01	NS
P	<i>Rhynchospora macrostachya</i>	Tall Beakrush	Endangered	Endangered	Endangered	S1	60	72.8 ± 0.01	NS
P	<i>Clethra alnifolia</i>	Coast Pepper-Bush	Endangered	Threatened	Vulnerable	S2	180	63.5 ± 0.01	NS
P	<i>Trichostema dichotomum</i>	Forked Bluecurls	Threatened			S1	10	67.0 ± 0.01	NS
P	<i>Fraxinus nigra</i>	Black Ash	Threatened		Threatened	S1S2	915	13.2 ± 0.01	NS
P	<i>Hydrocotyle umbellata</i>	Water Pennywort	Special Concern	Special Concern	Endangered	S2	90	74.4 ± 2.9	NS
P	<i>Eleocharis tuberculosa</i>	Tuberclad Spike-rush	Special Concern	Special Concern	Vulnerable	S2	1	97.6 ± 0.01	NS
P	<i>Lachnanthes caroliniana</i>	Redroot	Special Concern	Special Concern	Vulnerable	S2	1494	71.0 ± 0.01	NS
P	<i>Lophiola aurea</i>	Goldencrest	Special Concern	Special Concern	Vulnerable	S2	809	63.1 ± 0.01	NS
P	<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S3	146	100.0 ± 1.0	NS
P	<i>Scirpus longii</i>	Long's Bulrush	Special Concern		Vulnerable	S3	506	59.7 ± 0.01	NS
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S3	14	29.3 ± 0.1	NS
P	<i>Floerkea proserpinacoides</i>	False Mermaidweed	Not At Risk			S2S3	37	18.5 ± 1.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>Acer saccharinum</i>	Silver Maple				S1	35	24.2 ± 0.01	NS
P	<i>Toxicodendron vernix</i>	Poison Sumac				S1	42	81.3 ± 0.5	NS
P	<i>Osmorhiza depauperata</i>	Blunt Sweet Cicely				S1	1	39.9 ± 5.0	NS
P	<i>Antennaria rosea</i> ssp. <i>arida</i>	Rosy Pussytoes				S1	1	30.7 ± 0.5	NS
P	<i>Nabalus racemosus</i>	Glaucous Rattlesnakeroot				S1	13	82.8 ± 0.2	NS
P	<i>Andersonglossum boreale</i>	Northern Wild Comfrey				S1	5	27.5 ± 0.1	NS
P	<i>Turritis glabra</i>	Tower Mustard				S1	2	38.7 ± 0.5	NS
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	7	45.6 ± 7.07	NS
P	<i>Silene antirrhina</i>	Sleepy Catchfly				S1	5	4.5 ± 0.01	NS
P	<i>Callitriche hermaphrodita</i>	Northern Water-starwort				S1	8	65.8 ± 0.01	NB
P	<i>Elatine americana</i>	American Waterwort				S1	3	95.9 ± 0.05	NB
P	<i>Astragalus robbinsii</i>	Robbins' Milkvetch				S1	2	30.7 ± 0.2	NS
P	<i>Astragalus robbinsii</i> var. <i>minor</i>	Robbins' Milkvetch				S1	33	30.6 ± 0.05	NS
P	<i>Gentianella amarella</i> ssp. <i>acuta</i>	Northern Gentian				S1	1	97.8 ± 0.25	NB
P	<i>Ribes americanum</i>	Wild Black Currant				S1	12	57.0 ± 1.0	NS
P	<i>Fraxinus pennsylvanica</i>	Red Ash				S1	35	31.5 ± 0.5	NS
P	<i>Polygonum achoreum</i>	Leathery Knotweed				S1	3	44.1 ± 10.0	NS
P	<i>Phytolacca americana</i>	Common Pokeweed				S1	3	25.1 ± 0.2	NS
P	<i>Podostemum ceratophyllum</i>	Horn-leaved Riverweed				S1	4	44.2 ± 0.25	NS
P	<i>Montia fontana</i>	Water Blinks				S1	2	35.2 ± 0.5	NS
P	<i>Lysimachia minima</i>	Chaffweed				S1	1	73.9 ± 0.01	NS
P	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife				S1	2	83.4 ± 0.01	NS
P	<i>Anemone parviflora</i>	Small-flowered Anemone				S1	13	93.9 ± 0.5	NB
P	<i>Clematis occidentalis</i>	Purple Clematis				S1	15	59.4 ± 0.2	NB
P	<i>Ranunculus pennsylvanicus</i>	Pennsylvania Buttercup				S1	3	67.7 ± 0.1	NB
P	<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry				S1	1	63.0 ± 1.0	NS
P	<i>Salix myrtillifolia</i>	Blueberry Willow				S1	26	94.1 ± 0.05	NB
P	<i>Agalinis tenuifolia</i>	Slender Agalinis				S1	1	12.1 ± 0.2	NS
P	<i>Scrophularia lanceolata</i>	Lance-leaved Figwort				S1	5	7.5 ± 1.0	NS
P	<i>Carex digitalis</i>	Slender Wood Sedge				S1	6	55.9 ± 0.2	NS
P	<i>Carex garberi</i>	Garber's Sedge				S1	3	93.0 ± 0.5	NB
P	<i>Carex granularis</i>	Limestone Meadow Sedge				S1	1	94.2 ± 5.0	NB
P	<i>Carex laxiflora</i>	Loose-Flowered Sedge				S1	6	12.1 ± 7.07	NS
P	<i>Carex ormostachya</i>	Necklace Spike Sedge				S1	7	12.9 ± 5.0	NS
P	<i>Carex plantaginea</i>	Plantain-Leaved Sedge				S1	8	59.0 ± 0.2	NB
P	<i>Carex prairea</i>	Prairie Sedge				S1	2	28.3 ± 1.0	NS
P	<i>Carex tinctoria</i>	Tinged Sedge				S1	7	64.0 ± 0.2	NB
P	<i>Carex viridula</i> var. <i>saxillitoralis</i>	Greenish Sedge				S1	1	37.6 ± 0.2	NS
P	<i>Carex grisea</i>	Inflated Narrow-leaved Sedge				S1	4	94.3 ± 5.0	NB
P	<i>Carex saxatilis</i>	Russet Sedge				S1	12	98.3 ± 5.0	NB
P	<i>Eleocharis erythropoda</i>	Red-stemmed Spikerush				S1	4	83.7 ± 0.01	NB
P	<i>Fimbristylis autumnalis</i>	Slender Fimbry				S1	3	82.2 ± 0.2	NS
P	<i>Scirpus atrovirens</i>	Dark-green Bulrush				S1	3	66.2 ± 0.03	NS
P	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush				S1	8	60.3 ± 0.01	NS
P	<i>Iris prismatica</i>	Slender Blue Flag				S1	1	21.2 ± 100.0	NS
P	<i>Sisyrinchium fuscum</i>	Coastal Plain Blue-eyed-grass				S1	6	57.1 ± 1.5	NS
P	<i>Juncus secundus</i>	Secund Rush				S1	3	19.4 ± 0.1	NS
P	<i>Juncus vaseyi</i>	Vasey Rush				S1	6	71.6 ± 0.01	NB
P	<i>Triantha glutinosa</i>	Sticky False-Asphodel				S1	6	93.1 ± 0.2	NB
P	<i>Trillium grandiflorum</i>	White Trillium				S1	3	28.4 ± 1.0	NS
P	<i>Malaxis monophyllos</i> var. <i>brachypoda</i>	North American White Adder's-mouth				S1	6	27.4 ± 0.5	NS
P	<i>Spiranthes casei</i> var. <i>casei</i>	Case's Ladies'-Tresses				S1	2	37.8 ± 0.1	NS
P	<i>Dichanthelium xanthophyllum</i>	Slender Panic Grass				S1	10	66.8 ± 0.2	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>Elymus hystrix</i>	Spreading Wild Rye				S1	8	67.4 ± 0.01	NS
P	<i>Torreyochloa pallida</i> var. <i>pallida</i>	Pale False Manna Grass				S1	2	1.3 ± 1.5	NS
P	<i>Graphephorum melicoides</i>	Purple False Oats				S1	5	60.8 ± 0.01	NB
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S1	23	21.2 ± 100.0	NS
P	<i>Equisetum palustre</i>	Marsh Horsetail				S1	5	29.2 ± 5.0	NS
P	<i>Selaginella rupestris</i>	Rock Spikemoss				S1	21	65.2 ± 0.01	NS
P	<i>Suaeda rolandii</i>	Roland's Sea-Blite				S1?	14	47.7 ± 0.25	NS
P	<i>Carex pensylvanica</i>	Pennsylvania Sedge				S1?	2	61.6 ± 0.2	NS
P	<i>Carex rostrata</i>	Narrow-leaved Beaked Sedge				S1?	1	73.5 ± 0.01	NB
P	<i>Bolboschoenus robustus</i>	Sturdy Bulrush				S1?	1	55.2 ± 5.0	NS
P	<i>Juncus antheratus</i>	Greater Poverty Rush				S1?	1	22.6 ± 0.01	NS
P	<i>Allium schoenoprasum</i>	Wild Chives				S1?	12	10.6 ± 0.2	NS
P	<i>Allium schoenoprasum</i> var. <i>sibiricum</i>	Wild Chives				S1?	4	62.2 ± 7.07	NS
P	<i>Panicum dichotomiflorum</i> ssp. <i>puritanorum</i>	Spreading Panicgrass				S1?	5	75.7 ± 0.25	NS
P	<i>Huperzia selago</i>	Northern Firmoss				S1?	1	27.5 ± 1.0	NS
P	<i>Crocanthemum canadense</i>	Long-branched Frostweed			Endangered	S1S2	153	0.4 ± 1.2	NS
P	<i>Cypripedium arietinum</i>	Ram's-Head Lady's-Slipper			Endangered	S1S2	311	60.3 ± 0.01	NS
P	<i>Sanicula odorata</i>	Clustered Sanicle				S1S2	9	18.9 ± 2.0	NS
P	<i>Ageratina altissima</i>	White Snakeroot				S1S2	60	32.3 ± 0.01	NS
P	<i>Draba glabella</i>	Rock Whitlow-Grass				S1S2	12	100.0 ± 0.01	NB
P	<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				S1S2	4	23.1 ± 2.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1S2	14	35.7 ± 1.0	NS
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S1S2	10	37.8 ± 10.0	NS
P	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	Slim-stemmed Reed Grass				S1S2	3	77.7 ± 7.07	NS
P	<i>Woodsia alpina</i>	Alpine Cliff Fern				S1S2	11	62.1 ± 0.5	NB
P	<i>Selaginella selaginoides</i>	Low Spikemoss				S1S2	8	59.4 ± 0.4	NB
P	<i>Zizia aurea</i>	Golden Alexanders				S2	15	72.6 ± 0.01	NS
P	<i>Antennaria parlinii</i> ssp. <i>fallax</i>	Parlin's Pussytoes				S2	41	43.4 ± 0.1	NS
P	<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S2	34	11.9 ± 2.0	NS
P	<i>Solidago multiradiata</i>	Multi-rayed Goldenrod				S2	22	93.2 ± 0.5	NB
P	<i>Arabis pycnocarpa</i>	Cream-flowered Rockcress				S2	17	35.4 ± 0.1	NS
P	<i>Cardamine maxima</i>	Large Toothwort				S2	31	18.8 ± 4.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	191	0.6 ± 0.1	NS
P	<i>Desmodium canadense</i>	Canada Tick-trefoil				S2	14	32.0 ± 7.07	NS
P	<i>Hylodesmum glutinosum</i>	Large Tick-trefoil				S2	42	14.3 ± 7.07	NS
P	<i>Oxytropis campestris</i> var. <i>johannensis</i>	Field Locoweed				S2	28	30.7 ± 0.01	NS
P	<i>Conopholis americana</i>	American Cancer-root				S2	118	20.3 ± 0.2	NS
P	<i>Anemonastrum canadense</i>	Canada Anemone				S2	27	18.9 ± 0.2	NS
P	<i>Hepatica americana</i>	Round-lobed Hepatica				S2	67	23.4 ± 0.01	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S2	1	48.0 ± 0.2	NS
P	<i>Galium boreale</i>	Northern Bedstraw				S2	10	45.6 ± 7.07	NS
P	<i>Gratiola neglecta</i>	Clammy Hedge-Hyssop				S2	15	68.8 ± 0.2	NB
P	<i>Dirca palustris</i>	Eastern Leatherwood				S2	70	57.2 ± 0.2	NS
P	<i>Carex chordorrhiza</i>	Creeping Sedge				S2	2	73.0 ± 0.01	NB
P	<i>Carex livida</i>	Livid Sedge				S2	4	57.5 ± 10.0	NS
P	<i>Juncus Greenei</i>	Greene's Rush				S2	2	79.3 ± 0.01	NS
P	<i>Juncus alpinoarticulatus</i> ssp. <i>americanus</i>	Northern Green Rush				S2	6	67.9 ± 0.02	NB
P	<i>Allium tricoccum</i>	Wild Leek				S2	168	13.1 ± 0.01	NS
P	<i>Lilium canadense</i>	Canada Lily				S2	55	14.3 ± 7.07	NS
P	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Yellow Lady's-slipper				S2	31	23.9 ± 5.0	NS
P	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Small Yellow Lady's-Slipper				S2	14	13.1 ± 0.1	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>makasin</i>								
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	35	64.6 ± 1.0	NB
P	<i>Platanthera flava</i> var. <i>flava</i>	Southern Rein Orchid				S2	17	42.7 ± 7.07	NS
P	<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchid				S2	28	17.8 ± 0.01	NS
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	13	51.9 ± 1.0	NS
P	<i>Bromus latiglumis</i>	Broad-Grumled Brome				S2	1	94.2 ± 2.8	NB
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S2	41	23.9 ± 0.01	NS
P	<i>Elymus wiegandii</i>	Wiegand's Wild Rye				S2	3	89.1 ± 0.01	NB
P	<i>Festuca subverticillata</i>	Nodding Fescue				S2	13	34.7 ± 1.0	NS
P	<i>Piptatheropsis pungens</i>	Slender Ricegrass				S2	17	2.8 ± 0.0	NS
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S2	6	57.4 ± 0.25	NS
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	2	78.1 ± 0.02	NS
P	<i>Rumex persicarioides</i>	Peach-leaved Dock				S2?	1	71.5 ± 0.01	NS
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S2?	6	64.7 ± 1.0	NS
P	<i>Carex peckii</i>	White-Tinged Sedge				S2?	5	66.2 ± 0.03	NB
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S2S3	437	9.5 ± 1.0	NS
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2S3	19	18.6 ± 1.0	NS
P	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				S2S3	10	27.6 ± 0.5	NS
P	<i>Eutrochium dubium</i>	Coastal Plain Joe Pye Weed				S2S3	2	80.6 ± 0.05	NS
P	<i>Lactuca hirsuta</i>	Hairy Lettuce				S2S3	5	40.2 ± 2.5	NS
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2S3	13	23.3 ± 7.07	NS
P	<i>Caulophyllum thalictroides</i>	Blue Cohosh				S2S3	70	16.7 ± 0.01	NS
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S2S3	43	100.0 ± 0.5	NB
P	<i>Boechera stricta</i>	Drummond's Rockcress				S2S3	26	27.5 ± 1.0	NS
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2S3	15	32.0 ± 1.0	NS
P	<i>Oxybasis rubra</i>	Red Goosefoot				S2S3	3	97.8 ± 1.0	NB
P	<i>Hypericum majus</i>	Large St John's-wort				S2S3	8	74.6 ± 0.01	NS
P	<i>Hypericum x dissimulatum</i>	Disguised St. John's-wort				S2S3	5	73.4 ± 0.1	NS
P	<i>Empetrum atropurpureum</i>	Purple Crowberry				S2S3	1	88.8 ± 7.07	NS
P	<i>Euphorbia polygonifolia</i>	Seaside Spurge				S2S3	10	100.0 ± 0.01	NS
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2S3	11	47.1 ± 1.0	NS
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	59	11.3 ± 0.5	NS
P	<i>Oenothera fruticosa</i> ssp. <i>tetragona</i>	Narrow-leaved Evening Primrose				S2S3	20	40.9 ± 0.05	NS
P	<i>Polygala polygama</i>	Racemed Milkwort				S2S3	48	56.6 ± 0.2	NS
P	<i>Polygonum aviculare</i> ssp. <i>buxiforme</i>	Box Knotweed				S2S3	7	40.0 ± 7.07	NS
P	<i>Polygonum oxyspermum</i> ssp. <i>raii</i>	Ray's Knotweed				S2S3	3	74.4 ± 1.0	NS
P	<i>Rumex triangulivalvis</i>	Triangular-valve Dock				S2S3	14	30.0 ± 1.0	NS
P	<i>Primula mistassinica</i>	Mistassini Primrose				S2S3	10	91.2 ± 0.1	NB
P	<i>Anemone quinquefolia</i>	Wood Anemone				S2S3	53	16.7 ± 0.01	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2S3	27	18.0 ± 0.2	NS
P	<i>Amelanchier fernaldii</i>	Fernald's Serviceberry				S2S3	2	66.0 ± 7.07	NS
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	18	60.2 ± 0.02	NB
P	<i>Galium obtusum</i>	Blunt-leaved Bedstraw				S2S3	8	22.0 ± 0.01	NS
P	<i>Salix pellita</i>	Satiny Willow				S2S3	19	14.9 ± 7.07	NS
P	<i>Tiarella stolonifera</i>	Stoloniferous Foamflower				S2S3	44	24.6 ± 0.01	NS
P	<i>Agalinis purpurea</i> var. <i>parviflora</i>	Small-flowered Purple False Foxglove				S2S3	4	93.1 ± 1.0	NB
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S2S3	58	7.7 ± 0.2	NS
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	4	62.8 ± 0.5	NB
P	<i>Carex capillaris</i>	Hairlike Sedge				S2S3	26	30.7 ± 0.2	NS
P	<i>Carex comosa</i>	Bearded Sedge				S2S3	13	5.0 ± 1.9	NS
P	<i>Carex houghtoniana</i>	Houghton's Sedge				S2S3	10	58.9 ± 0.2	NB
P	<i>Carex hystericina</i>	Porcupine Sedge				S2S3	11	9.5 ± 1.0	NS
P	<i>Carex longii</i>	Long's Sedge				S2S3	1	92.1 ± 10.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>Carex scirpoidea</i>	Scirpuslike Sedge				S2S3	6	81.8 ± 0.01	NB
P	<i>Eleocharis ovata</i>	Ovate Spikerush				S2S3	9	31.6 ± 0.16	NS
P	<i>Scirpus pedicellatus</i>	Stalked Bulrush				S2S3	12	94.5 ± 0.01	NB
P	<i>Vallisneria americana</i>	Wild Celery				S2S3	30	62.6 ± 0.01	NS
P	<i>Najas gracillima</i>	Thread-Like Naiad				S2S3	21	71.4 ± 0.01	NS
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2S3	129	23.5 ± 0.01	NS
P	<i>Spiranthes casei</i>	Case's Ladies'-Tresses				S2S3	2	74.6 ± 0.01	NS
P	<i>Spiranthes casei</i> var. <i>novaescotiae</i>	Case's Ladies'-Tresses				S2S3	5	22.6 ± 0.5	NS
P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2S3	20	32.0 ± 1.6	NS
P	<i>Calamagrostis stricta</i>	Slim-stemmed Reed Grass				S2S3	7	66.3 ± 0.01	NB
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S2S3	9	26.2 ± 2.0	NS
P	<i>Cystopteris laurentiana</i>	Laurentian Bladder Fern				S2S3	1	80.6 ± 1.0	NB
P	<i>Woodsia glabella</i>	Smooth Cliff Fern				S2S3	68	59.1 ± 0.1	NB
P	<i>Botrychium lanceolatum</i> ssp. <i>angustisegmentum</i>	Narrow Triangle Moonwort				S2S3	15	27.5 ± 1.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	3	34.7 ± 1.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	8	31.6 ± 0.1	NS
P	<i>Potamogeton pulcher</i>	Spotted Pondweed			Vulnerable	S3	28	51.8 ± 0.2	NS
P	<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S3	30	30.7 ± 0.5	NS
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S3	16	65.8 ± 0.78	NB
P	<i>Iva frutescens</i>	Big-leaved Marsh-elder				S3	95	30.1 ± 0.2	NS
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S3	1	88.1 ± 0.2	NS
P	<i>Symphyotrichum boreale</i>	Boreal Aster				S3	9	43.7 ± 7.07	NS
P	<i>Symphyotrichum ciliolatum</i>	Fringed Blue Aster				S3	36	27.1 ± 1.0	NS
P	<i>Symphyotrichum undulatum</i>	Wavy-leaved Aster				S3	167	17.7 ± 0.01	NS
P	<i>Alnus serrulata</i>	Smooth Alder				S3	705	61.5 ± 0.01	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S3	46	66.1 ± 0.01	NS
P	<i>Betula pumila</i>	Bog Birch				S3	1	81.9 ± 1.0	NS
P	<i>Cardamine parviflora</i>	Small-flowered Bittercress				S3	17	2.9 ± 7.07	NS
P	<i>Palustricodon aparinoides</i>	Marsh Bellflower				S3	22	0.5 ± 1.0	NS
P	<i>Lobelia kalmii</i>	Brook Lobelia				S3	9	93.0 ± 0.01	NB
P	<i>Mononeuria groenlandica</i>	Greenland Stitchwort				S3	200	61.9 ± 0.01	NS
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S3	22	69.1 ± 3.0	NS
P	<i>Sagina nodosa</i> ssp. <i>borealis</i>	Knotted Pearlwort				S3	1	95.9 ± 5.0	NS
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S3	5	59.4 ± 0.01	NB
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S3	18	35.3 ± 3.0	NS
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S3	36	66.3 ± 0.01	NS
P	<i>Viburnum edule</i>	Squashberry				S3	14	62.6 ± 0.01	NB
P	<i>Crassula aquatica</i>	Water Pygmyweed				S3	1	95.4 ± 0.1	NS
P	<i>Empetrum eamesii</i>	Pink Crowberry				S3	7	79.3 ± 0.01	NS
P	<i>Vaccinium uliginosum</i>	Alpine Bilberry				S3	1	94.1 ± 0.2	NB
P	<i>Halenia deflexa</i>	Spurred Gentian				S3	5	91.6 ± 1.7	NB
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	31	11.9 ± 2.0	NS
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S3	12	69.9 ± 0.6	NB
P	<i>Utricularia resupinata</i>	Inverted Bladderwort				S3	13	63.2 ± 0.01	NS
P	<i>Epilobium densum</i>	Downy Willowherb				S3	16	29.2 ± 3.0	NS
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	36	17.8 ± 0.1	NS
P	<i>Persicaria arifolia</i>	Halberd-leaved Tearthumb				S3	34	24.1 ± 0.01	NS
P	<i>Plantago rugelii</i>	Rugel's Plantain				S3	9	24.5 ± 0.01	NS
P	<i>Primula laurentiana</i>	Laurentian Primrose				S3	78	10.9 ± 1.0	NS
P	<i>Samolus parviflorus</i>	Seaside Brookweed				S3	44	77.2 ± 0.01	NS
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	6	23.3 ± 7.07	NS
P	<i>Anemone virginiana</i>	Virginia Anemone				S3	13	60.9 ± 0.05	NS
P	<i>Cephalanthus occidentalis</i>	Common Buttonbush				S3	1975	62.8 ± 0.01	NS
P	<i>Salix pedicellaris</i>	Bog Willow				S3	96	15.0 ± 0.01	NS
P	<i>Salix sericea</i>	Silky Willow				S3	144	18.7 ± 0.01	NS
P	<i>Saxifraga paniculata</i> ssp.	Laestadius' Saxifrage				S3	52	30.7 ± 0.5	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>laestadii</i>								
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	26	4.0 ± 0.2	NS
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	46	7.0 ± 0.2	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S3	13	50.3 ± 0.2	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S3	19	41.0 ± 1.0	NS
P	<i>Carex bebbii</i>	Bebb's Sedge				S3	24	60.0 ± 0.01	NS
P	<i>Carex castanea</i>	Chestnut Sedge				S3	1	74.6 ± 0.01	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3	18	59.0 ± 0.01	NB
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	17	61.1 ± 0.2	NB
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S3	16	67.5 ± 0.01	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	76	8.3 ± 2.7	NS
P	<i>Carex rosea</i>	Rosy Sedge				S3	55	20.2 ± 0.2	NS
P	<i>Carex swanii</i>	Swan's Sedge				S3	85	9.9 ± 2.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S3	9	21.2 ± 0.01	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3	19	20.3 ± 0.01	NS
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S3	44	62.9 ± 0.01	NS
P	<i>Carex atratiformis</i>	Scabrous Black Sedge				S3	4	66.2 ± 0.1	NS
P	<i>Eleocharis nitida</i>	Quill Spikerush				S3	22	21.8 ± 7.07	NS
P	<i>Eleocharis flavescens</i> var. <i>olivacea</i>	Bright-green Spikerush				S3	13	44.9 ± 0.1	NS
P	<i>Eleocharis quinqueflora</i>	Few-flowered Spikerush				S3	10	92.8 ± 0.01	NB
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S3	10	29.5 ± 1.5	NS
P	<i>Coeloglossum viride</i>	Long-bracted Frog Orchid				S3	20	24.5 ± 0.01	NS
P	<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper				S3	595	28.2 ± 7.07	NS
P	<i>Neottia bifolia</i>	Southern Twayblade				S3	126	11.5 ± 0.01	NS
P	<i>Platanthera flava</i>	Southern Rein-Orchid				S3	37	55.0 ± 0.01	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	40	18.5 ± 1.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	31	13.3 ± 1.0	NS
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S3	16	4.5 ± 0.01	NS
P	<i>Piptatheropsis canadensis</i>	Canada Ricegrass				S3	15	64.8 ± 0.01	NS
P	<i>Poa glauca</i>	Glaucous Blue Grass				S3	26	27.5 ± 1.0	NS
P	<i>Stuckenia filiformis</i>	Thread-leaved Pondweed				S3	6	64.0 ± 7.07	NS
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S3	11	30.4 ± 1.0	NS
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S3	8	18.9 ± 1.0	NS
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S3	13	27.2 ± 1.0	NS
P	<i>Asplenium viride</i>	Green Spleenwort				S3	24	59.1 ± 0.05	NB
P	<i>Dryopteris fragrans</i>	Fragrant Wood Fern				S3	78	49.7 ± 0.01	NS
P	<i>Sceptridium dissectum</i>	Dissected Moonwort				S3	9	7.8 ± 1.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	47	18.6 ± 1.0	NS
P	<i>Persicaria amphibia</i> var. <i>emersa</i>	Long-root Smartweed				S3?	44	54.8 ± 0.01	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3?	53	22.6 ± 0.5	NS
P	<i>Diphasiastrum x sabinifolium</i>	Savin-leaved Ground-cedar				S3?	13	17.8 ± 0.25	NS
P	<i>Bidens vulgata</i>	Tall Beggarticks				S3S4	4	36.7 ± 0.2	NS
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3S4	115	60.0 ± 0.2	NB
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S3S4	53	17.8 ± 0.03	NS
P	<i>Bidens beckii</i>	Water Beggarticks				S3S4	41	55.8 ± 0.2	NS
P	<i>Packera paupercula</i>	Balsam Groundsel				S3S4	93	61.4 ± 0.41	NS
P	<i>Atriplex glabriuscula</i> var. <i>franktonii</i>	Frankton's Saltbush				S3S4	17	18.2 ± 0.01	NS
P	<i>Shepherdia canadensis</i>	Soapberry				S3S4	163	39.8 ± 0.54	NS
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3S4	3	51.2 ± 0.5	NS
P	<i>Vaccinium cespitosum</i>	Dwarf Bilberry				S3S4	105	17.8 ± 0.01	NS
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	14	12.0 ± 0.2	NS
P	<i>Fagus grandifolia</i>	American Beech				S3S4	1005	10.0 ± 0.2	NS
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3S4	23	44.0 ± 0.5	NS
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3S4	81	48.7 ± 3.0	NS
P	<i>Decodon verticillatus</i>	Swamp Loosestrife				S3S4	172	56.7 ± 0.2	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	<i>Nuphar microphylla</i>	Small Yellow Pond-lily				S3S4	9	60.7 ± 0.2	NS
P	<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed				S3S4	39	10.6 ± 0.2	NS
P	<i>Fallopia scandens</i>	Climbing False Buckwheat				S3S4	22	2.0 ± 5.0	NS
P	<i>Rumex pallidus</i>	Seabeach Dock				S3S4	3	44.1 ± 0.01	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3S4	17	27.5 ± 1.0	NS
P	<i>Endotropis alnifolia</i>	Alder-leaved Buckthorn				S3S4	132	25.4 ± 0.3	NS
P	<i>Amelanchier spicata</i>	Running Serviceberry				S3S4	75	2.2 ± 1.2	NS
P	<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry				S3S4	46	31.1 ± 0.01	NS
P	<i>Fragaria vesca</i>	Woodland Strawberry				S3S4	4	68.2 ± 0.2	NB
P	<i>Galium aparine</i>	Common Bedstraw				S3S4	26	9.9 ± 0.2	NS
P	<i>Geocaulon lividum</i>	Northern Comandra				S3S4	8	1.4 ± 1.5	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3S4	2	80.3 ± 0.01	NS
P	<i>Ulmus americana</i>	White Elm				S3S4	141	2.6 ± 0.01	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3S4	152	9.5 ± 0.2	NS
P	<i>Viola sagittata</i> var. <i>ovata</i>	Arrow-Leaved Violet				S3S4	87	2.0 ± 0.5	NS
P	<i>Viola selkirkii</i>	Great-Spurred Violet				S3S4	12	27.5 ± 1.0	NS
P	<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage				S3S4	62	56.8 ± 0.2	NS
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	30	18.9 ± 2.0	NS
P	<i>Sisyrinchium atlanticum</i>	Eastern Blue-Eyed-Grass				S3S4	113	51.5 ± 0.35	NS
P	<i>Triglochin gaspensis</i>	Gaspé Arrowgrass				S3S4	13	58.1 ± 0.1	NB
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	13	1.7 ± 2.0	NS
P	<i>Juncus subcaudatus</i>	Woods-Rush				S3S4	14	24.8 ± 2.0	NS
P	<i>Luzula parviflora</i> ssp. <i>melanocarpa</i>	Black-fruited Woodrush				S3S4	14	11.2 ± 7.07	NS
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3S4	34	11.2 ± 7.07	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	11	27.5 ± 1.0	NS
P	<i>Platanthera obtusata</i>	Blunt-leaved Orchid				S3S4	17	32.0 ± 10.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3S4	53	46.1 ± 0.01	NS
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3S4	11	4.5 ± 0.01	NS
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3S4	304	13.3 ± 0.01	NS
P	<i>Coleataenia longifolia</i>	Long-leaved Panicgrass				S3S4	1595	63.0 ± 0.01	NS
P	<i>Panicum philadelphicum</i>	Philadelphia Panicgrass				S3S4	26	5.8 ± 0.01	NS
P	<i>Koeleria spicata</i>	Narrow False Oats				S3S4	31	30.7 ± 0.5	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3S4	32	32.3 ± 0.01	NS
P	<i>Lorinseria areolata</i>	Netted Chain Fern				S3S4	27	84.2 ± 7.07	NS
P	<i>Equisetum pratense</i>	Meadow Horsetail				S3S4	10	17.5 ± 0.01	NS
P	<i>Diphasiastrum complanatum</i>	Northern Ground-cedar				S3S4	22	6.7 ± 1.0	NS
P	<i>Diphasiastrum sitchense</i>	Sitka Ground-cedar				S3S4	2	40.2 ± 1.0	NS
P	<i>Huperzia appressa</i>	Mountain Firmoss				S3S4	50	26.6 ± 0.5	NS
P	<i>Sceptridium multifidum</i>	Leathery Moonwort				S3S4	15	11.4 ± 0.2	NS
P	<i>Botrychium matricariifolium</i>	Daisy-leaved Moonwort				S3S4	10	34.2 ± 10.0	NS
P	<i>Bidens discoidea</i>	Swamp Beggarticks				SH	1	75.0 ± 0.25	NS
P	<i>Viola canadensis</i>	Canada Violet				SH	1	62.9 ± 0.75	NS
P	<i>Dichanthelium meridionale</i>	Matting Witchgrass				SH	1	80.1 ± 10.0	NS

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

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96	Belliveau, A.G. & Churchill, J.L.; Anderson, F.; Brooks, F. 2023. Lichen Inventory of Blue Rocks, NS. E.C. Smith Herbarium.
96	Churchill, J.L. 2021. Atlantic Canada Conservation Data Centre Fieldwork 2021. Atlantic Canada Conservation Data Centre.
95	Breen, A. 2019. 2019 Atlantic Whitefish observations. Coastal Action, 95 recs.
95	McNeil, J.A. 2019. Eastern Painted Turtle trapping records, 2017. Mersey Tobeatic Research Institute.
94	NatureServe Canada. 2019. iNaturalist Maritimes Butterfly Records. iNaturalist.org and iNaturalist.ca.
88	McNeil, J.A. 2020. Snapping Turtle and Eastern Painted Turtle records, 2020. Mersey Tobeatic Research Institute.
86	e-Butterfly. 2016. Export of Maritimes records and photos. Maxim Larivee, Sambo Zhang (ed.) e-butterfly.org.
86	Porter, Caitlin. 2021. Field data for 2020 in various locations across the Maritimes. Atlantic Canada Conservation Data Centre, 3977 records.
84	Coastal Action. 2024. SAR records from 2022. Coastal Action, 87 records.
83	Birds Canada. 2023. Maritimes Swiftwatch project data for 2023. Pers. comm., 270 recs.
83	Tims, J. & Craig, N. 1995. Environmentally Significant Areas in New Brunswick (NBESA). NB Dept of Environment & Nature Trust of New Brunswick Inc, 6042 recs. https://doi.org/10.1037/arc0000014 .
81	Belliveau, A. 2013. Rare species records from Nova Scotia. Mersey Tobeatic Research Institute, 296 records. 296 recs.
79	Hubley, Nicole. 2022. Monarch (<i>Danaus plexippus</i>) records submitted to MTRI from the 2021 field season. Mersey Tobeatic Research Institute.
79	iNaturalist. 2020. iNaturalist butterfly records selected for the Maritimes Butterfly Atlas. iNaturalist.
78	McNeil, J.A. 2018. Wood Turtle records, 2018. Mersey Tobeatic Research Institute, 68 recs.
77	Sollows, M.C., 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.
74	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
74	Blaney, C.S. 2000. Fieldwork 2000. Atlantic Canada Conservation Data Centre. Sackville NB, 1265 recs.

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73	Blaney, C.S. 2019. Sean Blaney 2019 field data. Atlantic Canada Conservation Data Centre, 4407 records.
71	Blaney, C.S. 2017. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
71	Brazner, John; MacKinnon, Frances. 2020. Relative conservation value of Nova Scotia's forests: forested wetlands as avian biodiversity hotspots. Canadian Journal of Forest Research, 50(12): 1307-1322. dx.doi.org/10.1139/cjfr-2020-0101.
71	McNeil, J.A. 2019. Snapping Turtle records, 2019. Mersey Tobeatic Research Institute.
70	Birds Canada. 2022. Maritimes Swiftwatch project data for 2022. Pers. comm., 155 records.
69	Roland, A.E. & Smith, E.C. 1969. The Flora of Nova Scotia, 1st Ed. Nova Scotia Museum, Halifax, 743pp.
66	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
64	Klymko, John. 2022. Atlantic Canada Conservation Data Centre zoological fieldwork 2021. Atlantic Canada Conservation Data Centre.
63	McNeil, J.A. 2013. Ribbonsnake (<i>Thamnophis sauritus</i>) sightings, 2012. Parks Canada, 63 records of 26+ individuals.
63	Roland, A.E. 1976. The Coastal Plain Flora of Kejimikujik National Park. Parks Canada Report, 238 pp.
62	McNeil, J.A. 2015. Blandings Turtle (<i>Emydoidea blandingii</i>), Eastern Ribbonsnake (<i>Thamnophis sauritus</i>), and Snapping Turtle (<i>Chelydra serpentina</i>) sightings, 2015. Mersey Tobeatic Research Institute.
62	McNeil, Jeffie. 2022. 2021 Turtle Records. Mersey Tobeatic Research Institute.
60	Bryson, I.C. 2020. Nova Scotia flora and lichen observations 2020. Nova Scotia Environment, 139 recs.
60	McLean, K. 2020. Species occurrence records from Clean Annapolis River Project fieldwork in 2020. Clean Annapolis River Project, 206 records.
59	Benedict, B. Connell Herbarium Specimens (Data). University New Brunswick, Fredericton. 2003.
59	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database [as of 2018-03]. Mersey Tobeatic Research Institute.
59	Staicer, C. & Bliss, S.; Achenbach, L. 2017. Occurrences of tracked breeding birds in forested wetlands. , 303 records.
58	Bagnell, B.A. 2001. New Brunswick Bryophyte Occurrences. B&B Botanical, Sussex, 478 recs.
58	Parks Canada. 2021. Species at Risk observations from 2019-2020 in Kejimikujik National Park and Historic Site. Parks Canada, 76 records.
57	McMullin, R.T. 2022. Maritimes lichen records. Canadian Museum of Nature.
57	Riley, Jonathan; Viola, Ashlea; Newington, Nina; Proulx, Lisa. 2023. SAR lichens at Goldsmith Lake. Municipality of the District of Digby, 57 records.
55	Mersey Tobeatic Research Institute. 2023. NS Turtle Records. Mersey Tobeatic Research Institute, 214 recs.
54	LaPaix, R.W.; Crowell, M.J.; MacDonald, M.; Neily, T.D.; Quinn, G. 2017. Stantec Nova Scotia rare plant records, 2012-2016. Stantec Consulting.
53	Churchill, J.L. 2020. Atlantic Canada Conservation Data Centre Fieldwork 2020. Atlantic Canada Conservation Data Centre, 1083 recs.
53	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
52	Belliveau, A.G., Churchill, J.L. 2019. Compilation of flora and fauna observation records from Isle Haute, Nova Scotia. Acadia University; Atlantic Canada Conservation Data Centre, 522 recs.
52	Brooks, Fiona. 2023. Field data - 2023. Atlantic Canada Conservation Data Centre.
52	Cowie, F. 2007. Electrofishing Population Estimates 1979-98. Canadian Rivers Institute, 2698 recs.
52	Richardson, D., Anderson, F., Cameron, R., McMullin, T., Clayden, S. 2014. Field Work Report on Black Foam Lichen (<i>Anzia colpodetes</i>). COSEWIC.
51	Churchill, J.L.; Klymko, J.D. 2015. Chignecto and Tintamarre National Wildlife Area Bird Surveys 2015. Atlantic Canada Conservation Data Centre, 2238 recs.
49	Neily, T.H. 2019. Tom Neily NS Bryophyte records (2009-2013). T.H. Neily, Atlantic Canada Conservation Data Centre, 1029 specimen records.
46	Blaney, C.S. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2018. Atlantic Canada Conservation Data Centre.
46	Crowell, Iain & Crowell, Iain. 2023. Field data - 2023. Atlantic Canada Conservation Data Centre.
46	Feltham, Carter. 2022. Monarch (<i>Danaus plexippus</i>) and Milkweed MTRI records from the 2022 Field Season. Mersey Tobeatic Research Institute.
45	Bayne, D.M. 2007. Atlantic Coastal Plain Flora record, 2004-06. Nova Scotia Nature Trust. Pers. comm. to C.S. Blaney, 57 recs.
44	McLean, K. 2019. Wood Turtle observations. Clean Annapolis River Project.
44	Toms, Brad. 2024. MTRI lichens database. Mersey Tobeatic Research Institute, 170 records.
44	Wallace, S. 2020. Stewardship Department species occurrence data on NTNB preserves. Nature Trust of New Brunswick.
43	Epworth, W. 2012. Species at Risk records, 2009-11. Fort Folly Habitat Recovery Program, 162 recs.
43	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-03-18]. Mersey Tobeatic Research Institute.
41	Sollows, M.C. 2009. NBM Science Collections databases: molluscs. New Brunswick Museum, Saint John NB, download Jan. 2009, 6951 recs (2957 in Atlantic Canada).
40	Cameron, E. 2007. Canadian Gypsum Co. survey 2005-07. Dillon Consulting Ltd, 40 recs.
40	LaPaix, Rich. 2022. Rare species observations, 2018-2022. Nova Scotia Nature Trust.
38	Mazerolle, D.M. 2020. Atlantic Canada Conservation Data Centre botanical fieldwork 2019. Atlantic Canada Conservation Data Centre.
38	Tranquilla, L. 2015. Maritimes Marsh Monitoring Project 2015 data. Bird Studies Canada, Sackville NB, 5062 recs.
37	Cameron, R.P. 2009. Cyanolichen database. Nova Scotia Environment & Labour, 1724 recs.
37	Newell, R.E. 2019. Crocanthemum canadense records compiled for provincial status report. pers. comm. from Ruth Newell to AC CDC.
36	Blaney, C.S.; Spicer, C.D.; Popma, T.M.; Hanel, C. 2002. Fieldwork 2002. Atlantic Canada Conservation Data Centre. Sackville NB, 2252 recs.
36	McNeil, J.A. 2017. Eastern Ribbonsnake (<i>Thamnophis sauritus</i>) sightings, 2017. Mersey Tobeatic Research Institute, 36 recs.
36	Mersey Tobeatic Research Institute. 2021. 2020 Monarch records from the MTRI monitoring program. Mersey Tobeatic Research Institute, 72 records.
36	Tsehtik, M.; Leblanc, M.; Creaser, T. 2020. Coastal Action: 2020 Species at Risk Data. Coastal Action, 40 records.
35	East Coast Aquatics Inc. 2021. Species at Risk records from Spicer North Mountain Quarry Expansion Environmental Assessment. East Coast Aquatics, 44 records.
35	Roland, A.E. 1980. Checklist of Vascular Plants of Kejimikujik National Park in Lichens, Liverworts, Mosses and Flowering Plants of Kejimikujik National Park. Roland, A.E. (ed.) Parks Canada Report, pp. 52-140, 160 pp.
34	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
33	Blaney, C.S.; Korol, J.B.; Crowell, I. 2023. 2022 AC CDC Botany program field data. Atlantic Canada Conservation Data Centre, 5293 records.
33	Klymko, J.J.D. 2018. 2017 field data. Atlantic Canada Conservation Data Centre.
33	Mersey Tobeatic Research Institute. 2023. 2023 Wood Turtle Records - Volunteer Collection. Mersey Tobeatic Research Institute, 50 recs.

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32	Benedict, B. Connell Herbarium Specimen Database Download 2004. Connell Memorial Herbarium, University of New Brunswick. 2004.
32	Honeyman, K. 2019. Unique Areas Database, 2018. J.D. Irving Ltd.
31	Jobin, C. & Clow, A., Van Dijk, J. 2019. Eastern Waterfan data, Mount Allison Fundy Field Camp 2019. Chapman, C.J. (ed.) Fundy National Park and Mount Allison University, 31 recs.
31	McGrattan, Alysha. 2023. Monarch conservation in Southern New Brunswick. Nature NB.
30	Benjamin, L.K. 2012. NSDNR fieldwork & consultant reports 2008-2012. Nova Scotia Dept Natural Resources, 196 recs.
30	Birds Canada. 2023. Maritimes Marsh Monitoring Program occurrences from 2022-2023. Birds Canada, 4603 records.
30	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
29	Frittaion, C. 2012. NSNT 2012 Field Observations. Nova Scotia Nature Trust, Pers comm. to S. Blaney Feb. 7, 34 recs.
29	Korol, Burke. 2023. Field data - 2023. Atlantic Canada Conservation Data Centre.
29	Phinney, L. 2019. Little Brown Myotis maternal colony counts and birdSAR, 2019. Mersey Tobeatic Research Institute.
28	Blaney, C.S. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 1042 recs.
28	Pepper, C. 2013. 2013 rare bird and plant observations in Nova Scotia. , 181 records.
27	McAlpine, D.F. New Brunswick Museum bee specimens. New Brunswick Museum. 2013.
26	Benjamin, L.K. (compiler). 2001. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources, 15 spp, 224 recs.
26	McLean, K. 2020. Wood Turtle observations . Clean Annapolis River Project.
25	Burnie, B. 2013. 2013 Scirpus longii field data. Mount Saint Vincent University, 51 recs.
25	Hinds, H.R. 1986. Notes on New Brunswick plant collections. Connell Memorial Herbarium, unpubl, 739 recs.
25	McNeil, J.A. 2014. Blandings Turtle (Emydoidea blandingii) and Snapping Turtle (Chelydra serpentina) sightings, 2014. Mersey Tobeatic Research Institute.
25	McNeil, J.A. 2019. Snapping Turtle records, 2017. Mersey Tobeatic Research Institute.
24	Belliveau, A.G. 2021. New Black ash site records near Kentville, NS. Acadia University, 47 records.
24	Broders, H.G. 2006. Unpublished data. , 24 recs.
23	Erskine, A.J. 1999. Maritime Nest Records Scheme (MNRS) 1937-1999. Canadian Wildlife Service, Sackville, 313 recs.
23	McLean, K. 2019. Species At Risk observations. Clean Annapolis River Project.
23	Mersey Tobeatic Research Institute. 2023. Monarch (Danaus plexippus) and Milkweed MTRI records from the 2023 Field Season. Mersey Tobeatic Research Institute.
23	Neily, T.H. 2017. Nova Scotia lichen records. Mersey Tobeatic Research Institute.
23	Speers, L. 2008. Butterflies of Canada database: New Brunswick 1897-1999. Agriculture & Agri-Food Canada, Biological Resources Program, Ottawa, 2048 recs.
22	Breen, A. 2018. 2018 Atlantic Whitefish observations. Coastal Action.
22	Klymko, J.J.D.; Robinson, S.L. 2012. 2012 field data. Atlantic Canada Conservation Data Centre, 447 recs.
22	Nelly, T.H. 2006. Cyprripedium arietinum in Hants Co. Pers. comm. to C.S. Blaney. 22 recs, 22 recs.
22	Patrick, A.; Horne, D.; Noseworthy, J. et. al. 2017. Field data for Nova Scotia and New Brunswick, 2015 and 2017. Nature Conservancy of Canada.
21	Benjamin, L.K. 2011. NSDNR fieldwork & consultant reports 1997, 2009-10. Nova Scotia Dept Natural Resources, 85 recs.
21	Klymko, J.J.D.; Robinson, S.L. 2014. 2013 field data. Atlantic Canada Conservation Data Centre.
21	MacKinnon, D.S. & O'Brien, M.K.H.; Cameron, R.P. 2002. Fieldwork 2000. Dept of Environment & Labour, Protected Areas Branch, 252 recs.
21	Nussey, Pat & NCC staff. 2019. AEI tracked species records, 2016-2019. Chapman, C.J. (ed.) Atlantic Canada Conservation Data Centre, 333.
21	Riley, J. 2023. Rare and at Risk lichens and plants near Goldsmith Lake, NS. Pers. comm. to J.L. Churchill.
20	Ferguson, D.C. 1954. The Lepidoptera of Nova Scotia. Part I, macrolepidoptera. Proceedings of the Nova Scotian Institute of Science, 23(3), 161-375.
20	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2009. New Brunswick Dept Natural Resources, 19 recs (14 active).
20	O'Grady, Sally. 2010. Water Pennywort in Kejimikujik National Park, 2010. Parks Canada, 20 shapefiles.
20	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.
20	Skomorowski, Joanna. 2024. 2022 Nova Scotia Nature Trust SAR occurrences. Nova Scotia Nature Trust, 58 records.
19	Basquill, S.P., Porter, C. 2019. Bryophyte and lichen specimens submitted to the E.C. Smith Herbarium. NS Department of Lands and Forestry.
19	Richardson, D., Anderson, F., Cameron, R, Pepper, C., Clayden, S. 2015. Field Work Report on the Wrinkled Shingle lichen (Pannaria lurida). COSEWIC.
18	Basquill, S.; Sam, D. 2019. Crocanthemum canadense observations near Greenwood, NS, 2015-2019. pers. commun. from Nova Scotia Department of Lands and Forestry to AC CDC, 18 recs.
18	Basquill, S.P. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre, Sackville NB, 69 recs.
18	Bryson, I. 2020. Nova Scotia and Newfoundland rare species observations, 2018-2020. Nova Scotia Environment.
18	Chapman, C.J. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 11171 recs.
18	Manthorne, A. 2019. Incidental aerial insectivore observations. Birds Canada.
18	NS DNR. 2017. Black Ash records from NS DNR Permanent Sample Plots (PSPs), 1965-2016. NS Dept of Natural Resources.
18	Oldham, M.J. 2000. Oldham database records from Maritime provinces. Oldham, M.J.; ONHIC, 487 recs.
17	Anderson, Frances; Neily, Tom. 2010. A Reconnaissance Level Survey of Calciphilous Lichens in Selected Karst Topography in Nova Scotia with Notes on Incidental Bryophytes. Mersey Tobeatic Research Institute.
17	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-05-25]. Mersey Tobeatic Research Institute, 668 recs.
17	Neily, T.H. 2013. Email communication to Sean Blaney regarding Listera australis observations made from 2007 to 2011 in Nova Scotia. , 50.
16	Askanas, H. 2016. New Brunswick Wood Turtle Database. New Brunswick Department of Energy and Resource Development.
16	Hunsinger, J. 2021. Species at Risk records from Medway Community Forest Cooperative monitoring plots and baited game cameras, 2019-2020. Medway Community Forest Cooperative, 16 records.
16	New Brunswick Department of Natural Resources and Energy Development. 2023. Wood turtle records from 2016-2021. New Brunswick Department of Natural Resources and Energy Development, 637 records.
16	Siemens-Worsley, Allison. 2024. iNaturalist Wood Turtle observations for New Brunswick and Nova Scotia. NatureServe Canada.
15	Basquill, S.P. 2011 vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.

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15	Cowie, Faye. 2007. Surveyed Lakes in New Brunswick. Canadian Rivers Institute, 781 recs.
15	Klymko, J.J.D. 2012. Odonata specimens & observations, 2010. Atlantic Canada Conservation Data Centre, 425 recs.
15	Nature Conservancy of Canada. 2022. NCC Field data for Nova Scotia. Nature Conservancy of Canada.
14	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
14	Cameron, R.P. 2018. <i>Degellia plumbea</i> records. Nova Scotia Environment.
14	Haughian, Sean. 2021. Update to lichen data from 2017-2021. Nova Scotia Museum.
14	Hinds, H.R. 1999. Connell Herbarium Database. University New Brunswick, Fredericton, 131 recs.
14	Holder, M. 2003. Assessment and update status report on the Eastern <i>Lilaeopsis</i> (<i>Lilaeopsis chinensis</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 16 recs.
14	McAlpine, D.F. 1983. Status & Conservation of Solution Caves in New Brunswick. New Brunswick Museum, Publications in Natural Science, no. 1, 28pp.
14	McNeil, J.A. 2018. Snapping Turtle records, 2018. Mersey Tobeatic Research Institute.
14	Sollows, M.C., 2009. NBM Science Collections databases: Coccinellid & Cerambycid Beetles. New Brunswick Museum, Saint John NB, download Feb. 2009, 569 recs.
14	Thomas, A.W. 1996. A preliminary atlas of the butterflies of New Brunswick. New Brunswick Museum.
14	Wallace, Shaylyn. 2023. Painted Turtle and Snapping Turtle records since 2015. New Brunswick Department of Energy and Resource Development.
13	Atlantic Canada Conservation Data Centre. 2020. Cape LaHave Island observations from August 2020. Atlantic Canada Conservation Data Centre, 605 records.
13	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
13	Hall, R.A. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 189 recs.
13	Mackinnon, D.S. 1998. Ponhook Lake survey map & notes. Dept of Environment and Labour, Protected Areas Branch, 13 recs.
13	Nova Scotia Nature Trust. 2014. Ladyslipper records from Saint Croix Nova Scotia, JLC Ed. Nova Scotia Nature Trust.
12	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of C. insculpta sightings. Acadia University, Wolfville NS, 88 recs.
12	Basquill, S.P. 2012. 2012 rare vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.
12	Caissie, A. Herbarium Records. Fundy National Park, Alma NB. 1961-1993.
12	Hall, R.A. 2001. S. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 178 recs.
12	Hill, N.M. 2021. Observation of <i>Carex haydenii</i> and black ash near Marshy Hope and Ponhook Lake. pers. comm.
12	Wissink, R. 2000. Rare Plants of Fundy: maps. Parks Canada, 20 recs.
11	Clayden, S.R. 2005. Confidential supplement to Status Report on Ghost Antler Lichen (<i>Pseudevernia cladonia</i>). Committee on the Status of Endangered Wildlife in Canada, 27 recs.
11	Doucet, D.A. 2008. Fieldwork 2008: Odonata. ACCDC Staff, 625 recs.
11	e-Butterfly. 2018. Selected Maritimes butterfly records from 2016 and 2017. Maxim Larrivee, Sambo Zhang (ed.) e-butterfly.org.
11	Goltz, J.P. & Bishop, G. 2005. Confidential supplement to Status Report on Prototype Quillwort (<i>Isoetes prototypus</i>). Committee on the Status of Endangered Wildlife in Canada, 111 recs.
11	Goltz, J.P. 2012. Field Notes, 1989-2005. , 1091 recs.
11	Haughian, S.R. 2018. Description of <i>Fuscopannaria leucosticta</i> field work in 2017. New Brunswick Museum, 314 recs.
11	LaPaix, R.W.; Crowell, M.J.; MacDonald, M. 2011. Stantec rare plant records, 2010-11. Stantec Consulting, 334 recs.
11	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 records.
11	Ogden, K. Nova Scotia Museum butterfly specimen database. Nova Scotia Museum. 2017.
11	Sabine, D.L. <i>Bombus terricola</i> specimens in Dwayne Sabine's personal collection. pers. comm. 2022.
10	Belliveau, A.G. & Vail, Cole; King, Katie. 2020. New <i>Allium tricoccum</i> locations. Cornwallis River. Chapman, C.J. (ed.) Acadia University.
10	Bredin, K.A. 2001. WTF Project: Freshwater Mussel Fieldwork in Freshwater Species data. Atlantic Canada Conservation Data Center, 101 recs.
10	Churchill, J.L.; Walker, J. 2017. Species at Risk Surveys at Correctional Services Canada Properties in Nova Scotia and New Brunswick. Atlantic Canada Conservation Data Centre.
10	Epworth, W. 2013. Species at Risk records, 2013. Fort Folly Habitat Recovery Program, 27 recs.
10	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
10	Neily, T. H. 2018. Lichen and Bryophyte records, AEI 2017-2018. Tom Neily; Atlantic Canada Conservation Data Centre.
10	Nova Scotia Nature Trust. 2013. Nova Scotia Nature Trust 2013 Species records. Nova Scotia Nature Trust, 95 recs.
10	Parker, M.S.R. 2011. Hampton Wind Farm 2010: significant floral/faunal observations. , 13 recs.
10	Phinney, Lori; Toms, Brad; et. al. 2016. Bank Swallows (<i>Riparia riparia</i>) in Nova Scotia: inventory and assessment of colonies. Merser Tobeatic Research Institute, 25 recs.
9	Basquill, S.P. 2009. 2009 field observations. Nova Scotia Dept of Natural Resources.
9	Blaxley, Megan; Vinson, Neil. 2020. <i>Peltigera hydrothyrta</i> records from a tributary of Lake Brook, Fundy National Park. Chapman-Lam, Colin J. (ed.) Fundy National Park, 9.
9	Brunelle, P.-M. (compiler). 2010. ADIP/MDDS Odonata Database: NB, NS Update 1900-09. Atlantic Dragonfly Inventory Program (ADIP), 935 recs.
9	Pepper, C. 2021. Rare bird, plant and mammal observations in Nova Scotia, 2017-2021.
9	Sabine, D.L. 2005. 2001 Freshwater Mussel Surveys. New Brunswick Dept of Natural Resources & Energy, 590 recs.
9	Sollows, M.C. 2008. NBM Science Collections databases: herpetiles. New Brunswick Museum, Saint John NB, download Jan. 2008, 8636 recs.
9	Toms, Brad. 2011. Species at Risk data from 2011 field surveys. Mersey Tobeatic Research Institute, 17 recs.
8	Bryson, I. 2013. Nova Scotia rare plant records. CBCL Ltd., 180 records.
8	Canadian National Collection of Insects Arachnids, and Nematodes <i>Bombus</i> specimen database export. Government of Canada. 2022.
8	Hinds, H.R. 1992. Rare Vascular Plants of Fundy National Park. , 10 recs.
8	Holder, M.L.; Kingsley, A.L. 2000. Kingsley and Holder observations from 2000 field work.
8	King, Katie; Jean, Samuel. 2021. Black ash observations near Booklyn, NS. E.C. Smith Herbarium.
8	McAlpine, D.F. 1998. NBM Science Collections: Wood Turtle records. New Brunswick Museum, Saint John NB, 329 recs.
8	Ogden, J. NS DNR Butterfly Collection Dataset. Nova Scotia Department of Natural Resources. 2014.
8	Wissink, R. 2006. Fundy National Park Digital Database. Parks Canada, 41 recs.
7	Benjamin, L.K. 2009. Boreal Felt Lichen, Mountain Avens, Orchid and other recent records. Nova Scotia Dept Natural Resources, 105 recs.

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7	Boyne, A.W. & Grecian, V.D. 1999. Tern Surveys. Canadian Wildlife Service, Sackville, unpublished data. 23 recs.
7	Cameron, R.P. 2009. Nova Scotia nonvascular plant observations, 1995-2007. Nova Scotia Dept Natural Resources, 27 recs.
7	Kennedy, B.; Cron, C. 2019. observations of Poison Sumac and Buttonbush, Nova Scotia. pers. commun to AC CDC.
7	Sollows, M.C. Export of New Brunswick Museum butterfly records for the Maritimes provinces. New Brunswick Museum. 2016.
7	Tingley, S. (compiler). 2001. Butterflies of New Brunswick. Web site: www.geocities.com/Yosemite/8425/butrflfly . 142 recs.
6	Benjamin, L.K. 2006. <i>Cypripedium arietinum</i> . Pers. comm. to D. Mazerolle. 9 recs, 9 recs.
6	Brazner, J.; Hill, N. 2018. Plant observations along the Cornwallis River, Nova Scotia. Nova Scotia Department of Lands and Forestry.
6	Bredin, K.A. 2002. NS Freshwater Mussel Fieldwork. Atlantic Canada Conservation Data Centre, 30 recs.
6	Cameron, R.P. 2013. 2013 rare species field data. Nova Scotia Department of Environment, 71 recs.
6	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
6	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2010. New Brunswick Dept Natural Resources, 16 recs (11 active).
6	Klymko, J. 2019. Atlantic Canada Conservation Data Centre zoological fieldwork 2018. Atlantic Canada Conservation Data Centre.
6	Klymko, John. 2024. Atlantic Canada Conservation Data Centre zoological fieldwork 2023. Atlantic Canada Conservation Data Centre.
6	Matthew Smith. 2010. Field trip report from Avon Caving Club outlining the discovery of <i>Cypripedium arietinum</i> and <i>Hepatica nobilis</i> populations. Public Works and Government Services Canada.
6	McAlpine, D.F. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB, 241 recs.
6	McMullin, Troy. 2021. Anzia colpodes observations near Kejimikujik National Park. Canadian Museum of Nature.
6	Newington, Nina. 2023. Email to James Churchill regarding a SAR Birds near Goldsmith Lake, Annapolis County. pers. comm.
6	Nova Scotia Nature Trust. 2022. Ram's Head Lady Slipper observations from 2015 and 2019. , 6 records.
6	Popma, T.M. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 113 recs.
6	Riley, Johnathan. 2023. Wisqoq north of Kejimikujik National Park. Pers. comm. Municipality of the District of Digby, 6 records.
6	Spicer, C.D. & Harries, H. 2001. Mount Allison Herbarium Specimens. Mount Allison University, 128 recs.
6	Voscort, L. <i>Bombus terricola</i> specimens collected during MSc research in southwestern Nova Scotia. Acadia University. 2022.
5	Blaney, C.S.; Mazerolle, D.M.; Klymko, J.; Spicer, C.D. 2006. Fieldwork 2006. Atlantic Canada Conservation Data Centre. Sackville NB, 8399 recs.
5	Carter, Jeff; Churchill, J.; Churchill, I.; Churchill, L. 2020. Bank Swallow colony Scots Bay, NS. Atlantic Canada Conservation Data Centre.
5	Christie, D.S. 2000. Christmas Bird Count Data, 1997-2000. Nature NB, 54 recs.
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1	Stewart, P. 2013. email to Sean Blaney regarding the discovery of a <i>Listera australis</i> population at Blockhouse. Envirosphere Consultants Limited, 1.
1	Timmons, M. 2019. Telephone report of <i>Polygala polygama</i> at Aylesford Mountain, Kings Co., NS by Megan Timmons to C.S. Blaney. , 1 record.
1	Toms, Brad. 2009. New <i>Scirpus longii</i> record on Lake Rossignol. Mersey Tobeatic Research Institute.
1	Toner, M. 2001. Lynx Records 1973-2000. NB Dept of Natural Resources, 29 recs.
1	Vinison, Neil. 2018. Record of <i>Saxifraga paniculata</i> from Fundy NP, emailed to S. Blaney 19 July 2018. Pers. comm.
1	Vinson, N. 2018. Email to S. Blaney regarding new occurrence of <i>Saxifraga paniculata</i> on Point Wolfe River. Parks Canada, 1 record.
1	Vinson, N. 2019. Eastern Waterfowl record from Long Reach Brook, Fundy National Park, June 12, 2019. Parks Canada Agency, Fundy National Park, 1 record.
1	Vinson, Neil. 2016. Emails to Sean Blaney regarding yellow flower (<i>Primula veris</i>) and coastal habitat leaf rosettes (<i>Primula laurentiana</i>) in Fundy National Park. pers. comm., 2 rec.
1	Walker, E.M. 1933. The Odonata of the Maritime Provinces. Proc. Nova Scotian Inst. Sci., 18: 106-128. 3 recs.
1	Weatherby, C.A. 1942. Two weeks in southwestern Nova Scotia. Rhodora, 44: 229-236.
1	Webster, R.P. 2004. Lepidopteran Records for National Wildlife Areas in New Brunswick. Webster, 1101 recs.
1	Williams, M. Cape Breton University Digital Herbarium. Cape Breton University Digital Herbarium. 2013.

# recs	CITATION
1	Wissink, R. 2000. Four-toed Salamander Survey results, 2000. Fundy National Park, Internal Documents, 1 rec.
1	Wong, Sarah. 2020. Eastern Ribbonsnake (<i>Thamnophis sauritus</i>) sighting at Mersey River inflow to Lake Rossignol, August 24, 2020. pers, comm., 1 record.

APPENDIX G

PHOTO LOG

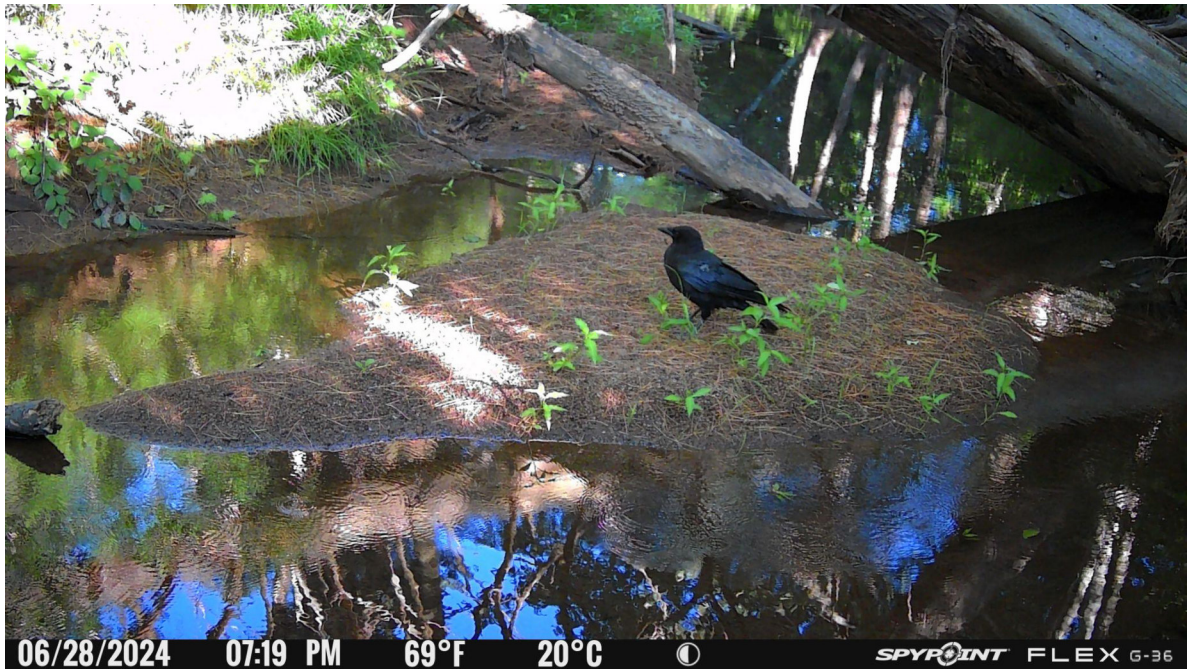


Photo 1: Raven



Photo 2: American robin



Photo 3: Muskrat



Photo 4: Coyote

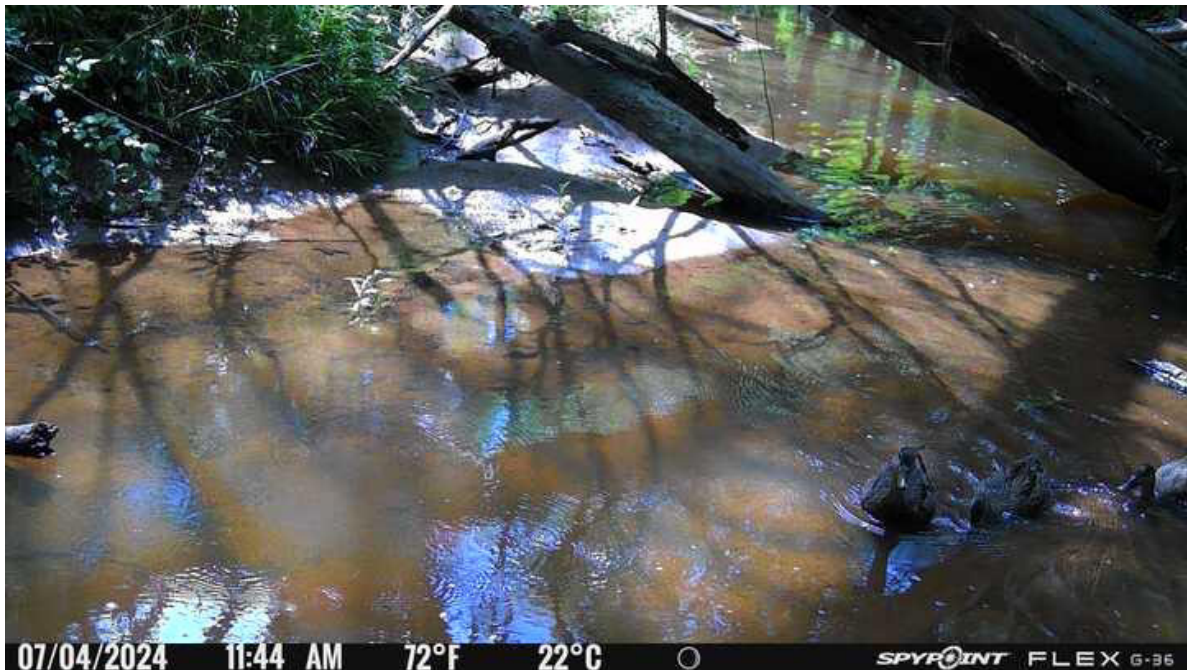


Photo 5: Group of American black ducks or mallards



Photo 6: North American beaver



Photo 7: Raccoon



Photo 8: Red fox



Photo 9: Peregrine falcon (upper right)



Photo 10: American robin (upper centre) and two sparrows (right of centre)



Photo 11: White-tailed deer

APPENDIX H

PROJECT TEAM CVs

KEY AREAS OF SPECIALTY

- Wetland Science
- Botany, Lichenology & Plant Community Ecology
- Assessment and Analysis for Species at Risk (SAR) & Species of Conservation Interest (SOCI)
- Geographic Information Systems (GIS), Remote Sensing & Spatial Modelling
- Environmental Impact Assessment & Regulatory Permitting
- Biophysical Assessments for Major Projects
- Technical Writing and Editing
- Team Leadership and Resourcing
- Project Management

PROFESSIONAL PROFILE

Ian Bryson is a terrestrial ecologist and geomatics specialist with 21 years of professional experience. He has specialist knowledge in the realms of Environmental Assessment, vegetation science (vascular flora and lichens), wetland science, GIS and Remote Sensing, Species at Risk, and regulatory permitting. Recently (September 2023), Ian has moved into the realm of independent environmental consulting as the founder of Fraxinus Environmental & Geomatics Limited.

Between April 2022 and September 2023, Ian was employed as a senior scientist at CBCL Limited, specializing in terrestrial ecology and wetlands. In this capacity, he provided senior-level technical expertise to projects within those disciplines and was responsible for overseeing the quality and technical consistency of this practice across CBCL's geographic areas (Atlantic Canada and Ontario). For the two years prior to this appointment (January 2020-April 2022), he served as the Program Lead for the Wetlands Program at the Nova Scotia Department of Environment and Climate Change (NS ECC). In this position, he was responsible for overseeing that the various goals of the Nova Scotia *Wetland Conservation Policy* are effectively met, particularly as it relates to no-net-loss of wetland area and function.

Prior to his time at NS ECC, he spent 13 years as an environmental consultant (also at CBCL Limited), where he worked on a diverse array of multidisciplinary environmental and engineering projects in Canada and internationally, for a variety of government (Federal, Provincial, and Municipal) and private sector clients. He has served as project manager on numerous projects and has been responsible for project controls, client management, and communications. He has also served as a

senior technical lead on many projects, overseeing the technical deployment of biophysical field programs on varying themes, including botanical, aquatics, wetlands, mammals, turtles, birds, and terrestrial/benthic habitat classification.

Ian is an experienced surveyor of vascular flora and lichens within the Atlantic Region, with an emphasis on Species at Risk and Species of Conservation Interest within wetland habitats. He has conducted numerous comprehensive inventories of plants and lichens in a variety of habitats, and has conducted targeted surveys for various Federally and Provincially listed SAR within these taxa - including Black Ash, Ram's-Head Lady Slipper, Boreal Felt Lichen, Frosted Glass Whiskers, Wrinkled Shingle Lichen, Black Foam Lichen, and Blue Felt Lichen. He is an active contributor of observations of SAR and SOCI to the Atlantic Canada Conservation Data Centre (ACCDC) database and has assisted ACCDC staff on surveys in the past.

The usage of GIS and Remote Sensing technology plays prominently in the execution of Ian's ecological specialties, particularly in terms of ecological modelling, habitat suitability modelling for SAR, land classification, and terrain analysis. He is also one of the most experienced wetland practitioners in Atlantic Canada, having performed hundreds of delineations and functional assessments within all Atlantic jurisdictions, executed multiple wetland monitoring plans, attained numerous permits, and advised on the design and construction of multiple wetland compensation projects.

REPRESENTATIVE CLIENTS

Private Landowners; Non-Government Organizations; Municipalities; Utilities; Provincial and Federal Government; Environmental Consulting Firms; Surveying and Engineering Firms.

EDUCATION

- 2012 M.Sc. in Biology – St Francis Xavier University
- 2007 Advanced Diploma in GIS (Honours) – Centre of Geographic Sciences (COGS)
- 1997 B.Sc., Advanced Major in Biology – St. Francis Xavier University
- 1995 Diploma in Engineering – St. Francis Xavier University

EMPLOYMENT HISTORY

- Sept 2023 – Present
Fraxinus Environmental & Geomatics
Principal & Senior Scientist
Key Responsibilities: Wetland delineation and functional assessment; Vegetation and lichen inventories for various major projects; Wetland carbon research and analysis for NGOs and land conservancies; Wetland compensation and

restoration planning; Regulatory compliance assessments and environmental permitting; Environmental Assessment general coordination; Business administration, marketing and client relations.

- Apr 2022 – Sept 2023
CBCL Limited Consulting Engineers
Senior Technical Specialist – Ecology and Wetlands
Key Responsibilities: Providing senior level technical expertise to projects within the practice area of ecology and wetlands; Overseeing the quality and technical consistency of the ecology and wetland practice across CBCL's geographic areas (Atlantic Canada and Ontario); Developing an interdisciplinary practice for wetland restoration; Providing senior-level technical review and QA/QC for client deliverables; Mentoring of junior staff for professional and technical development in the environmental sector; Project management.
- Jan 2020 – Apr 2022
Nova Scotia Department of Environment and Climate Change
Wetland Specialist
Key Responsibilities: Overseeing various aspects of the implementation of the Nova Scotia *Wetland Conservation Policy*, chiefly pertaining to the goal of no-net-loss of wetland habitat within the Province. Typical duties include: Regulatory review of wetland alteration applications and Environmental Assessments; review and acceptance of wetland compensation proposals; review and acceptance of wetland monitoring data; providing subject matter expertise and field support for NS ECC Inspection, Compliance and Enforcement staff; communication and collaboration on matters of wetland science/policy with consultants, government departments, and the public. Special project work in this position has included ongoing implementation of the Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC) as the sole functional assessment protocol within the Province, and investigation of additional means of designating Wetlands of Special Significance on the basis of biodiversity.
- Apr 2016 – Dec 2019:
CBCL Limited Consulting Engineers
Group Leader – Environmental Sciences
Key Responsibilities: Supervising environmental staff and overseeing project resourcing for a team of environmental scientists and technicians; Providing senior-level technical review and QA/QC for client deliverables; Mentoring junior staff for professional and technical development in the environmental sector; Ongoing application of ecological specialties and project management.
- Nov 2007 – Apr 2016:
CBCL Limited Consulting Engineers
Environmental Scientist & GIS Specialist
Key Responsibilities: Application of terrestrial ecology and GIS in support of a wide variety of environmental assessment and development projects. Typical duties included habitat assessment, ecological field program design,

species at risk analysis, rare plant surveys, wetland science, wetland delineation and functional assessment, environmental reporting and permitting, and project management.

- May 2007 – Nov 2007
Dalhousie University GIS Centre
GIS Analyst (Term)
Key Responsibilities: Project design, cartography, data management, and analysis of geospatial data. Consulting with faculty, undergraduate and graduate students on research projects implementing GIS technology. Technical training in the use of ArcGIS software. Internet-based mapping using ArcGIS server, Google Maps, and Microsoft Virtual Earth.
- 2005-2007
Taylor-Mazier Associates
Field Ecologist & Consultant
Key Responsibilities: Wetland monitoring, rare plant surveys, terrestrial habitat assessments, technical reporting and statistical analysis of ecological data.
- 2003-2005
St Francis Xavier University – Biology Department
Research Assistant and Laboratory Supervisor
Key Responsibilities: Collection and preparation of marine mollusc specimens for electron microscopy; Digital imaging and photography for scientific publications; Preparation for and delivery of undergraduate ecology laboratory sessions, including coordination of field trips; Grading of assignments, exams, and tabulation of results.

PROFESSIONAL MEMBERSHIPS AND AFFILIATIONS

Geomatics Association of Nova Scotia (GANS)

Canadian Environmental Certifications and Approvals Board (CECAB) – Environmental Professional (EP)

Recognized Wetland Delineator (Nova Scotia)

NS Dept. of Natural Resources & Renewables- Recognized Lichen surveyor for Provincial Crown Lands.

CONTINUING EDUCATION

2021 Management Leadership Development Program – NS Public Service Commission

2017 Environmental Toxicity Testing, Maxxam Analytics

2016 Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC), NB Environment

- 2016 Nova Scotia Wetland Conservation Policy, ESAM
- 2015 DFO Culvert Guidelines, ESAM
- 2014 Wetland Restoration Training Course, University of Guelph
- 2014 PSMJ Project Management Bootcamp
- 2013 Nova Scotia Endangered Species Act, ESAM
- 2010 Nova Scotia Advanced Wetlands Delineation Course, Maritime College of Forest Technology
- 2009 Hydric Soil Properties and Indicators for Nova Scotia, Maritime College of Forest Technology
- 2008 Forest Vegetation Identification, Maritime College of Forest Technology

PUBLICATIONS

- 2012 Bryson, I.C. *Successional Analysis of Post-Agricultural Forests Using Light Detecting and Ranging (LiDAR)*. M.Sc. Thesis, St.FX University.
- 2009 Bryson, I.C. *Sensitive Coastal Ecosystems and Habitats*. In J. Walmsley (Ed.), *The 2009 State of Nova Scotia's Coast Technical Report* (pp. 200-228). ISBN: 978-1-55457-327-1. Available from <http://www.gov.ns.ca/coast/documents/report/Coastal-Tech-Report-Nov-09.pdf>

CONFERENCES & MEETINGS ATTENDED

- 2017 International Association for Impact Assessment (IAIA) Conference, Montreal, QC
- 2015 ESRI Eastern Region Users Conference, Halifax, NS
- 2013 ESRI Eastern Region Users Conference, Halifax, NS
- 2013 Dalhousie University Net Impact Sustainability Case Competition (Judge)
- 2012 Geomatics Atlantic, Halifax, NS
- 2012 Nova Scotia Wetland Practitioners Forum, Halifax, NS (Presenter)
- 2011 ESRI Eastern Region Users Conference, Halifax, NS
- 2010 NBEIA Wetlands Forum, Moncton, NB
- 2010 ESRI Eastern Region Users Conference, Halifax, NS
- 2009 ESRI Eastern Region Users Conference, Halifax, NS
- 2009 Geomatics Atlantic, Wolfville, NS

SELECTED PROJECT EXPERIENCE

- Wetlands Carbon Research – Kingsburg Coastal Conservancy: In partnership with The Kingsburg Coastal Conservancy(KCC), Strum Consulting, and Dalhousie University, conducted a detailed analysis of wetland carbon storage for wetland ecosystems on two large land-bases on The Kingsburg Peninsula and Feltzen South, Lunenburg County, NS.
- Wind Farm Development Biophysical Assessment - Confidential Client: Project Manager - Oversaw the execution of various biophysical field programs in support of a wind installation in Nova Scotia; including avifauna spring migration and breeding surveys, mainland moose PGI inventories, wood turtle surveys, botanical and lichen surveys, and wetland assessments.
- Wind Farm Development Biophysical Assessments (Multiple Sites) - Confidential Client: Vegetation & Lichen Surveyor - Conducted comprehensive vegetation and lichen surveys in support of a number of large installations in Nova Scotia.
- Forested Wetlands Carbon Research – Mersey Tobeatic Research Institute: Principal Researcher - A novel multiscale topographic wetland potential model was developed for the Pleasant River watershed in western Nova Scotia, using LiDAR elevation data. Predicted wetlands were verified during a field sampling campaign, which included wetland boundary delineation, peat depth measurement, and wetland peat sampling for carbon content and bulk density analyses. The wetland potential model was calibrated based on ground reference data and achieved an overall detection accuracy of 94.63%. A peat depth model was developed based on multiscale topographic variables, and in turn used to calculate Soil Organic Carbon (SOC) stores for the predicted wetlands based on measured values of bulk density and carbon content. Based on this model, SOC stores within the watershed were calculated to be 367.8 Mg/ha.
- Proposed Wind Site EA Studies for Wetlands and Vegetation – RES Canada: Program Lead & Sr. Biologist - Responsible for the planning and execution of comprehensive wetland and vegetation studies for a large proposed wind farm site in the Cobequid Hills of Nova Scotia. Executed field inventory of vascular and non-vascular flora, and conducted wetland assessments. Formulated and deployed app-based data collection methods using ArcGIS Survey 123 and QuickCapture for efficient data capture during wetland and vegetation surveys. Conducted spatial modelling of wetland potential (site-specific LiDAR WAM) and of habitat features for SAR birds. Adapted the WESP-AC functional assessment protocol to Survey 123 format. Data collection is in preparation for an anticipated future EA submission.
- Proposed Bear Lake Wind Farm Biodiversity and Species at Risk Studies – NSPI: Project Manager & Sr. Field Biologist - Responsible for the planning and execution of comprehensive aquatics, wetland and vegetation field studies for a proposed wind farm site at Upper Vaughan, NS (2022).
- Proposed Nuttby II Wind Farm - Biodiversity and Species at Risk Studies – NSPI: Project Manager & Sr. Field Biologist - Responsible for the planning and execution of comprehensive aquatics, wetland and vegetation field studies for a proposed wind farm site expansion at Nuttby Mountain, NS (2022).
- Development of LiDAR-Based Wet Areas Mapping for Nova Scotia – NS Department of Environment & Climate Change (NS ECC): Project Lead – Developed a Provincial-Scale GIS mapping tool for wetland prediction, based on high-resolution

elevation data from Light Detecting and Ranging (LiDAR). Initially intended for NS ECC internal use, the model is being adopted for more widespread usage as the basis for the Provincial Wet Areas Mapping v2 (WAM2) project. (2021-2022).

- Implementation of the Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC) for Regulatory Approvals in Nova Scotia – NS ECC: Project Lead – Developed and implemented criteria for implementing WESP-AC functional assessment results within the wetland regulatory approvals process in Nova Scotia, including a new scoring system for determining ‘Functional Wetlands of Special Significance’ (2019-2021).
- Oak Island Wetland Monitoring – Oak Island Tours: Design and execution of a number of 5-year monitoring protocols to assess the effects of a temporary wetland dewatering on Oak Island, NS (2015-2023).
- Dartmouth 4-Pad Arena Wetland Monitoring – HRM: Design and execution of a 5-year monitoring protocol to assess the effects of a proposed wetland alteration in Dartmouth, NS, and to evaluate the success of associated wetland compensation projects (2015-2022).
- Highway 104 Environmental Assessment – NSTIR: Responsible for the overall technical coordination of an EA Submission for a 38 km highway twinning corridor between Sutherlands River and Antigonish, NS. Ministerial approval granted February 2019. (2018-2019).
- Environmental Effects Determination & Permitting, Nelson Bridge, Margaree Valley, NS - NSTIR: Sr. Biologist – Conducted site visit, and evaluated potential impacts of a proposed bridge replacement on various valued ecological components, and secured regulatory approvals for Project construction (2018).
- Environmental Effects Determination, Barnhill Bridge, Belmont, NS - NSTIR: Project Manager / Sr. Biologist - Evaluated potential impacts of a proposed bridge replacement on various valued ecological components. Coordinated execution of hydrological and archaeological studies for the site (2017).
- Environmental Effects Determination for two Cumberland Co. Bridges - NSTIR: Project Manager - Evaluated potential impacts of two proposed bridge re-development on various valued ecological components (2017).
- Environmental Effects Determination for Banks Bridge, Bear River, NS - NSTIR: Project Manager - Evaluated potential impacts of a proposed bridge re-development on various valued ecological components, coordinated execution of hydraulic analysis and archaeological studies (2017).
- Glendale Drive Sewer Replacement -Halifax Water: Project Manager / Sr. Biologist - Coordinated wetland studies, regulatory approvals and execution of pre-/during/post-construction monitoring plans for a sanitary sewer line replacement through a wetland in Lower Sackville, NS (2017-2018).
- Highway 104 EA: Wetlands – NSTIR: Sr. Biologist - Conducted numerous wetland delineations, functional assessments and associated mapping and reporting for a 38 km highway twinning corridor between Sutherlands River and Antigonish, NS (2018).

- Highway 104 EA: Vegetation and Lichens – NSTIR: Sr. Biologist - Responsible for the coordination and execution of vascular plant and lichen inventories, with emphasis on searches for species of conservation concern (2018).
- Halifax LED Street lighting – Cahill Group, for HRM: GIS data management, and production of engineering design drawings for field installations of ~22,000 LED light fixtures throughout HRM (2015-2018).
- Bedford Rifle Range Vegetation and Wetland Inventory – DCC/DND: Conducted numerous wetland delineations, functional assessments and associated mapping and reporting for a large National Defence Site in Bedford, NS, in addition to rare flora surveys and general vegetation inventory (2017).
- NS Highway Twinning Feasibility Study Vegetation Inventory – NSTIR: Conducted botanical inventory, with emphasis on locating species of conservation concern, for various highway twinning corridors totalling approximately 200 km (2016-2017).
- NS Highway Twinning Feasibility Study - NSTIR – Conducted numerous wetland delineations, functional assessments and associated mapping and reporting for various highway twinning corridors totalling approximately 200 km (2016-2017).
- Dartmouth 4-Pad Arena – HRM: Delineated and performed functional assessment, permitting and compensation concept development for a proposed arena site in Dartmouth, NS. (2015-2016).
- Cambrai Rifle Range Training Area – DCC/DND: Rare flora surveys and general vegetation inventory for a large rifle range site in Makinsons, NL; associated mapping and reporting (2015-2016).
- Parkers Pond Training Area – DCC/DND: Rare flora surveys and general vegetation inventory for a training property in Emerald Vale, NL; associated mapping and reporting (2015-2016).
- Emerald Vale Training Area – DCC/DND: RARE flora surveys and general vegetation inventory for a training property in St. John's, NL; associated mapping and reporting (2015-2016).
- Highway Twinning Feasibility Study – Constraints Mapping – NSTIR: Generated environmental constraints mapping for 8 potential highway routes throughout Nova Scotia, as a component in assessing their feasibility for future development (2015-2017).
- Maritime Link – Subsea Cable Route Constraints Mapping – Emera Newfoundland & Labrador: Generated biophysical and ecological constraints mapping for a ~180 km subsea cable route across the Cabot Strait (2015).
- Maritime Link – Wetland Risk Model – Emera Newfoundland & Labrador: Generated a novel multi-criteria wetland risk model for access planning usage by client and construction contractors (2014).

- Maritime Link – Ecological Constraints Mapping – Emera Newfoundland & Labrador: Compiled comprehensive constraints mapping based on physical and ecological sensitivities throughout the terrestrial portions of the Maritime Link Project areas in Cape Breton and Newfoundland (2013-2014).
- Dolphin Cove Environmental Impact Assessment - DCTCI Limited: Evaluated potential impacts of proposed dolphinarium development on valued ecological components in the Turks and Caicos Islands (2016).
- Terence Bay Wind Farm Environmental Assessment– Chebucto Terence Bay Windfields: Executed rare flora and wetland inventories, and generated associated mapping and reporting for a 7 MW wind farm (2012-2014).
- Safe, Clean Drinking Water Project - City of Saint John: Delineated and performed functional compiled ecological baseline documentation, and associated ecological constraints mapping for proposed water system upgrades in Saint John, NB (2014).
- Maritime Link Wetland Depth Profiling – Emera Newfoundland & Labrador: Field sampled and mapped wetland peat depths for a ~310 km transmission corridor in western Newfoundland (2013-2014).
- Hartlen Point Avian Mortality Monitoring – DCC/DND: Design and execution of a 1-year weekly monitoring protocol to assess the effects of a radar antenna array on avifauna mortality (2014).
- Stellarton Business Park Compensation Wetland - Town of Stellarton: Design and execution of field programs for monitoring re-vegetation of a constructed wetland (2008 –2013).
- Baccaro Point Rare Flora Surveys – DCC/DND: Execution of a field program to inventory rare flora at a radar site in southwestern Nova Scotia (2014).
- Maritime Link – Rare Flora Surveys – Emera Newfoundland & Labrador: Performed rare flora surveys and general vegetation inventory for approximately 310 km of transmission/grounding corridor in western Newfoundland and 80 km in Cape Breton, plus associated mapping and reporting (2013-2014).
- Maritime Link Wetland Delineation and Functional Assessment – Emera Newfoundland & Labrador: Performed field delineation and WESPUS functional assessment for wetlands along a ~85 km transmission and grounding line corridor in Cape Breton (2013).
- MacMillan Flowage Wetland and Watercourse Assessment – NSPI: Project management, coordination of field surveys, GIS mapping and reporting (2013).
- Mill Cove Antenna Site: Natural Resources Inventory Update – DCC/DND. Performed wetland delineation and functional assessment for a large site on the South Shore of NS (2012-2013).

- Maritime Link Ecological Land Classification – Emera Newfoundland & Labrador: Field sampled, mapped and classified vegetation communities for a 2260 km² transmission line study area in western Newfoundland. Orthophoto, LiDAR and satellite image classification, accuracy assessment, database management and ecological map atlas production (2011-2013).
- Maritime Link Wetland Classification Study – Emera Newfoundland & Labrador: Field sampled, mapped and classified wetlands for a 2260 km² transmission line study area in western Newfoundland (2011-2012).
- Fales River Wetland Assessment – Municipality of the County of Kings: Wetland delineation and regulatory applications for alteration of a suburban wetland (2011-2012).
- Abercrombie Ash Site Wetland Delineation - NSPI: Project management, wetland reconnaissance and subsequent delineation for an ash landfill expansion area (2011).
- Avon River Wetland Delineation - NSPI: Project management and wetland delineation for a hydro canal expansion area (2011).
- Bedford, Sydney and Debert Rifle Ranges: Natural Resources Inventory Update – DCC/DND. Performed wetland delineation and merchantable volume sampling on three rifle range sites in Nova Scotia (2011).
- New Wind Wetland Delineation - NSPI: Wetland site reconnaissance and wetland delineation for several potential wind farm locations throughout mainland Nova Scotia (2011).
- New Wind Species at Risk - NSPI: Rare species reconnaissance and vascular plant survey for several potential wind farm locations throughout mainland Nova Scotia (2011).
- Nuttby Mountain Wind Farm – NSPI: Species at risk screening, habitat mapping, and wetland inventory (2010).
- Hants West Business Park Feasibility Study – Hants Regional Development Authority: Generated multi-criteria spatial models using GIS for determining the suitability of potential business park locations (2010).
- Trinidad Solid Waste Management Plan – Trinidad Ministry of Local Government: Constructed a waste generation centroid model for determining optimal placement of solid waste transfer stations (2010).
- Tantallon and Porters Lake Watershed Studies – HRM: Generated multi-criteria spatial models for industrial and residential suitability (2010).
- North Dartmouth Trunk Sewer - HRM: Constructed multiple viewpoint visual impact model of a proposed cut/fill along Highway 118 in Dartmouth, NS (2010).

- Antigonish Wetland Compensation Project - NSTIR: Wetland delineation, vascular plant survey, habitat mapping and compilation of baseline ecological inventory and wetland compensation proposal (2010).
- Wetland Study -Kent Homes, Fredericton, NB: Site reconnaissance, wetland determination, wetland delineation and associated mapping/ reporting for seven wetlands on a forested suburban site near Fredericton, NB (2010).
- Saint John Exhibition Grounds Wetland Study - Saint John Exhibition Association: Site reconnaissance, wetland determination, delineation and associated mapping and reporting for an urban wetland in Saint John, NB (2010).
- Nuttby Mountain Wind Farm - NSPI: Wetland reconnaissance and presence/absence determination, LiDAR-based risk analysis, constraints mapping and wetland alteration permit applications (2010).
- Digby Wind Farm - Emera Utility Services: Wetland presence/absence determination and verification of air-photo-derived wetland boundaries. Generated constraints mapping for the purposes of avoidance and minimization of wetland and wetland buffer impacts (2010).
- Digby Wind Farm Conway Transmission Line – NSPI: Wetland determination, delineation and associated permitting for construction of a 16km transmission line (2010).
- Highway 125 Wetland Permitting - NSTIR: Wetland determination and delineation, vascular plant inventory, habitat mapping, watershed-level functional analysis, and permit applications for wetland infill sites along a highway twinning alignment (2009-2010).
- Maryvale Wind Farm Wetland Alteration Application - Eon Wind Electric: A Wetland Alteration Application was submitted for a disturbed wetland near Antigonish, NS. Scope of work included delineation, classification, functional assessment, mapping and preparation of a restoration plan for the disturbed wetland (2009).
- Islands Wind Farm – Schneider Power: Species at risk screening, site reconnaissance and preliminary habitat, flora and wetland inventories for 2 islands off southwestern Nova Scotia (2009).
- Burnside Industrial Park Phases 12 & 13 - HRM: Wetland presence/absence determination, wetland delineation and constraints mapping in preparation for preliminary engineering design and future permitting (2008-2009).
- Kuhn Marsh Wetland Alteration Application - HRM: Delineation, classification and mapping of a large wetland in Dartmouth, NS, in preparation for wetland alteration application (2008).
- Industrial Site –Confidential Client: Site reconnaissance, species at risk analysis, wetland delineation, habitat mapping and preliminary constraints identification in preparation for environmental assessment registration (2009).

- Point Tupper Wind Farm Environmental Assessment - Renewable Energy Services Ltd.: Design and execution of habitat, vegetation and wetlands field programs, species at risk screening, and preparation of associated reports and maps (2007-2009).
- State of NS Coast Report – Government of Nova Scotia: Author of chapter on sensitive coastal ecosystems of Nova Scotia (2009).
- Atwater Wetland Baseline Study & Monitoring Plan - NSTIR: Wetland delineation, vascular plant inventory, habitat mapping and watershed-level functional analysis for a Ducks Unlimited wetland site (2009).
- Donkin Mine Environmental Assessment - Xstrata Coal: Design and execution of habitat, vegetation and wetlands field programs, species at risk screening, and associated reports and mapping (2007-2009).
- Fortress of Louisbourg Flood Risk Mapping – PWGSC: Performed LiDAR-based flood risk mapping of coastal areas surrounding the historic Fortress of Louisbourg National Park. Modelling was undertaken under various combined scenarios of sea level rise and extreme storm events in order to determine priority areas for preserving archaeological resources (2009).
- Lake Uist Wind/Hydro Energy Project Environmental Assessment - Cape Breton Explorations Ltd.: Habitat modelling and field program design, including plant community sampling, wetland delineation and constraints mapping (2007-2008).
- Point Pleasant Park Forest Management Plan - Halifax Regional Municipality: Design and execution of forest sampling program, and preparation of site-specific management techniques for native reforestation of an urban park (2008).
- Northeast Avalon Regional Plan – Newfoundland and Labrador Department of Municipal Affairs: Performed multi-criteria suitability analysis to support land-use planning decisions (2008-2009).
- Corner Brook – Humber Valley Regional Plan – Newfoundland and Labrador Department of Municipal Affairs: Performed GIS-based multi-criteria suitability analyses, watershed analyses and developed spatial database schemas to support regional land-use plan development (2008-2009).
- Atwater Wetland Baseline Study & Monitoring Plan - NSTIR: Wetland delineation, vascular plant inventory, habitat mapping and watershed-level functional analysis for a Ducks Unlimited wetland site (2009).
- Pubnico Point Wind Farm Wetland Monitoring - Atlantic Wind Power Corporation: Five-year wetland vegetation monitoring program of a construction-modified wetland. Executed inter-annual vegetation abundance tracking twice annually in permanent vegetation plots, performed statistical analysis of wetland plant abundance and prepared all associated reports and mapping for submission to client and regulators (2005-2007 with Taylor-Mazier; 2007-2009 with CBCL).

KEY AREAS OF SPECIALTY

- Wildlife and species at risk assessments
- Avifauna assessments
- Environmental Impact Assessments
- Environmental Permitting
- Industrial Approvals
- Technical Writing
- Team Leadership and Resourcing
- Project Management

PROFESSIONAL PROFILE

Scott Dickey joins Fraxinus with over 15 years of diverse experience in the environmental consulting sector, having held leadership and technical roles at leading organizations.

His expertise spans environmental assessment and permitting, renewable energy development, wetland restoration, wildlife ecology, and environmental research.

Scott has managed multidisciplinary teams, led large-scale environmental assessment projects, and delivered innovative solutions for clients in industries such as wind energy, tidal energy, and hydroelectric systems. His experience includes obtaining regulatory approvals, developing compensation projects for habitat alteration, and mentoring environmental professionals to build high-performing teams.

With a Master's in Resource and Environmental Management from Dalhousie University and a Bachelor's in Biology, Chemistry, and Environmental Science from Mount Saint Vincent University, Scott brings both academic rigour and practical expertise to his role at Fraxinus. His leadership, technical knowledge, and commitment to sustainable development make him a valuable addition to the team.

REPRESENTATIVE CLIENTS

Private Landowners; Non-Government Organizations; Municipalities; Utilities; Renewable Energy Developers; Provincial and Federal Government; Environmental Consulting Firms; Surveying and Engineering Firms.

EDUCATION

- 2012 Master of Resource and Environmental Management – Dalhousie University
2009 Bachelor of Science with Honours in Biology – Mount Saint Vincent University

EMPLOYMENT HISTORY

- 2012 – 2024
Strum Consulting
Senior Environmental Scientist
Key Responsibilities: Managing a multidisciplinary team of environmental professionals in completing environmental assessments, environmental component studies, and environmental permitting programs.
- 2013 – 2014
Government of Nova Scotia
Environmental Assessment Review Panel Member
Reviewed environmental assessments for major projects, considering regulatory, public, NGO, and First Nations inputs. Provided recommendations for sustainable development in line with environmental impact considerations.
- May – Dec 2011
Nova Scotia Power Inc.
Ecological Management Consulting
Key Responsibilities: Developed sustainable ecological management strategies for hydroelectric operations, integrating biodiversity conservation measures into operational practices.
- May – Dec 2008
Environment and Climate Change Canada
Environmental Researcher
Key Responsibilities: Conducted research on watershed management and sustainable pesticide use, contributing to environmental policy recommendations for Atlantic Canada.

REPRESENTATIVE PROJECTS

- Weavers Mountain Wind Project - SWEB Developments: Managed the full environmental assessment process, including biophysical studies, regulatory consultation, and public engagement, while overseeing ongoing environmental compliance.

- NS- NB Provincial Intertie Transmission Line Project - Nova Scotia Power Inc.: Managed all biophysical studies, including avifauna and wildlife assessments, wetland and vegetation assessments and species at risk component studies, for this major capital transmission project, and managed permit application data collection programs.
- Everwind Fuels Green Hydrogen Project - Everwind Fuels: Contributed to environmental assessments, regulatory compliance, and public engagement for Everwind's proposed green hydrogen facility and associated wind-power projects located throughout Nova Scotia.

KEY AREAS OF SPECIALTY

- Wetland Science
- Assessment and Analysis for Species at Risk (SAR) & Species of Conservation Interest (SOCI)
- Botany
- Avian species identification by sight and sound
- Aquatic habitat assessment and electrofishing
- Geographic Information Systems (GIS)
- Environmental Impact Assessment & Regulatory Permitting
- Biophysical Assessments
- Construction Monitoring
- Technical Writing
- Project Management

PROFESSIONAL PROFILE

Zach has a Bachelor of Science with Honours in Biology from Dalhousie University and brings a variety of expertise to Fraxinus. With five years of professional experience, he has executed a diverse array of biophysical field programs across Atlantic Canada, Ontario, and Nunavut - including wetland delineation, wetland functional assessments, migratory bird surveys, electrofishing, fish habitat characterization, Species at Risk surveys, bat acoustic monitoring, construction monitoring, and more.

Zach has also developed his project management and report writing skills and has been an integral part of gaining approvals for provincial and federal EA/EIA's. He is committed to further developing himself into a respected ecologist who finds innovative solutions to complex problems.

REPRESENTATIVE CLIENTS

Private Landowners; Non-Government Organizations; Municipalities; Utilities; Renewable Energy Developers; Provincial and Federal Government; Environmental Consulting Firms; Surveying and Engineering Firms.

EDUCATION

2019 Bachelor of Science with Honours in Biology – Dalhousie University
First Class Honours, 3.8/4.0 GPA

EMPLOYMENT HISTORY

- March 2025 – Present
Fraxinus Environmental & Geomatics
Environmental Scientist
Key Responsibilities: Field work, technical writing, and project management for a range of environmental services such as wetland assessment and restoration, environmental permitting, and ecological monitoring.
- Apr 2022 – Mar 2025
Dillon Consulting Ltd. – Halifax, NS
Biologist / Project Manager
Key Responsibilities: Project management, biological fieldwork, and technical reporting for infrastructure projects across Atlantic Canada and Nunavut. Duties included client and public engagement, team leadership, and efficient project delivery in remote and diverse environments. Work required balancing biological expertise with logistical challenges, stakeholder communication, and overseeing multidisciplinary teams.
- Apr 2021 – Apr 2022
McCallum Environmental Ltd. – Halifax, NS
Junior Environmental Scientist
Fieldwork, environmental construction monitoring, and reporting for a variety of development projects, including wind farms, gold mines, highways, and residential developments across Nova Scotia. Responsibilities included independent work in remote areas, effective teamwork, equipment maintenance, and direct communication with regulatory agencies and construction personnel to ensure environmental compliance.
- Dec 2020 – Apr 2021
McCallum Environmental Ltd. – Northern Ontario
Environmental Construction Monitor
Key Responsibilities: Environmental monitoring and wildlife surveying during the Wataynikaneyap Transmission Line Project. Mentored local workers, ensured environmental compliance during construction, managed hazardous waste,

and performed detailed reporting. Work involved remote camp living, operation of snowmobiles, and navigation through challenging northern terrain.

- Apr 2020 – Nov 2020
McCallum Environmental Ltd. – Northern Ontario
Field Biologist
Key Responsibilities: Biological surveys on the Ontario East-West Tie Transmission Line Project, in collaboration with Indigenous organizations. Duties included terrestrial field surveys (on foot and ATV), communication with construction teams regarding environmental best practices, navigation of remote landscapes, and preparation of detailed biological reports.
- Sept 2018 – Dec 2018
Dalhousie University – Halifax, NS
Field Course Demonstrator
Key Responsibilities: Supported third-year field ecology courses by demonstrating field methods (e.g., quadrat sampling, tree coring) in remote locations such as Kejimikujik National Park. Guided students in remote fieldwork, promoted safety, and enhanced engagement and understanding of ecological field techniques.
- Jun 2018 – Sept 2018
Dalhousie University – Halifax, NS
Species at Risk Technician
Key Responsibilities: Conducted field research for an honours thesis focusing on the breeding habitats of three bird species at risk in Nova Scotia. Utilized methods such as point counts, playback surveys, and vegetation transects. Developed skills in bird and plant identification, GPS navigation, study design, statistical analysis, and scientific writing.

CONTINUING EDUCATION

- 2024 Internal Project Management Training, Dillon Consulting Ltd.
- 2023 Remote First Aid and CPR/ AED Level C (Recert), Canadian Red Cross
- 2022 Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC), MCFT
- 2021 Wetland Assessment Program, NRTG
- 2021 Electrofishing Certification – Crew Supervisor, NRTG
- 2020 ATV Safe Operation Training, TBTE
- 2020 Helicopter Hover Exit/ Entry Training, Valard Construction

PUBLICATIONS AND POSTER PRESENTATIONS

- 2019 Simai, Z. *The Forested Wetland Breeding Habitat Characteristics of Three Landbird Species at Risk in Nova Scotia*. B.Sc. Thesis, Dalhousie University.
- 2019 Simai, Z. and Staicer, C. Characteristics of forested wetland habitat for three land bird species at risk in Nova Scotia. Forested Wetlands in Atlantic Canada Concluding Project Workshop
- 2019 Simai, Z. and Staicer, C. Characteristics of forested wetland habitat for three land bird species at risk in Nova Scotia. 33rd Annual Cameron Conference.
- 2018 Simai, Z., Baker, T., Setchell, A. and Staicer, C. Study of Forested Wetlands in Nova Scotia: Landbird SAR and Habitat Structure and Composition. Kespukwitk Two-Eyed Seeing Gathering.

CONFERENCES & MEETINGS ATTENDED

- 2019 Dalhousie's 33rd Annual Cameron Conference, Halifax, NS
- 2019 Forested Wetlands in Atlantic Canada Project Conclusion, Halifax, NS
- 2018 Kespukwitk Two-Eyed Seeing Gathering, Bear River First Nation, NS

VOLUNTEER ACTIVITIES

- 2023 Troop Island Cleanup, St. Margaret's Bay Stewardship Association
- 2018 Chair of the Dalhousie Association of Biology Students, Dalhousie University

KEY AREAS OF SPECIALTY

- Data Collection & Analysis
- Environmental Management and Monitoring
- Environmental Assessment (EA) & Regulatory Permitting
- Environmental Noise Monitoring
- Technical Writing and Editing
- Geographic Information Systems (GIS) & Spatial Analysis
- Ecological Surveys
- Project Coordination

PROFESSIONAL PROFILE

Cuun Niesink is an EA & Permitting Specialist with approximately five years of combined academic and professional experience in environmental research, fieldwork, and consulting. She supports clients across Atlantic Canada in the renewable energy and aggregate sectors, with a focus on regulatory applications, environmental assessments, and technical reporting.

Her work includes drafting and coordinating permitting documents, conducting baseline studies, and interpreting environmental regulations. Cuun has contributed to a range of field programs, including wetland delineations, watercourse assessments, old-growth forest evaluations, and noise monitoring, and collaborates closely with multidisciplinary teams to ensure compliance with regulatory requirements.

Cuun holds a Master's in Resource and Environmental Management from Dalhousie University and a Bachelor of Science in Biology from UPEI. As part of her graduate studies, she completed an internship with Halifax Regional Municipality's Urban Forestry division, where she developed operational guidelines for arboricultural practices during the bird breeding season. She built on this work for her final MREM research project, which focused on identifying knowledge gaps and improving urban forest management practices to support biodiversity. Cuun also worked as a Teaching Assistant in GIS and scientific writing, supporting students with spatial analysis and communication skills.

With strong analytical, writing, and coordination abilities, Cuun delivers practical, science-based solutions tailored to the permitting and environmental needs of her clients.

REPRESENTATIVE CLIENTS

Private Landowners; Non-Government Organizations; Municipalities; Utilities; Provincial and Federal Government;
Environmental Consulting Firms; Surveying and Engineering Firms

EDUCATION

2023 Master of Resource and Environmental Management – Dalhousie University
2021 Bachelor of Science, Major in Biology – University of Prince Edward Island

EMPLOYMENT HISTORY

- Apr 2025 – Present
Fraxinus Environmental & Geomatics
EA & Permitting Specialist
Key Responsibilities: Coordinate and prepare EAs, permits, wetland compensation proposals, and monitoring reports; Support field programs for wetland, vegetation, and wildlife assessments; Contribute to environmental research and regulatory documentation; Assist with spatial data management and map preparation using GIS tools; Plan and resource environmental fieldwork.
- Jan – Apr 2025
Independent Contractor
Environmental Scientist
Key Responsibilities: Conducted baseline environmental research and authored EA sections for various projects; Analyzed datasets and spatial data using QGIS, Google Earth, and Excel; Reviewed and synthesized scientific literature to inform environmental assessments and regulatory strategies.
- Apr 2023 – Dec 2024
Strum Consulting
Environmental Scientist
Key Responsibilities: Conducted data collection, analysis, and reporting for EAs; Authored regulatory reports, including post-approval management and monitoring plans; Led baseline and post-construction noise monitoring (data collection, analysis, reporting); Conducted GIS habitat modeling research for species (e.g., bats, lichens, turtles) to inform EA planning; Completed wetland, watercourse, fish habitat, old-growth forest, and winter tracking assessments.
- Jan – May 2023
Dalhousie University

Teaching Assistant - Exploring Geographic Information Systems

Key Responsibilities: Assisted graduate students with weekly ArcGIS workshops on map-making, spatial analyses, and database/GPS integration; Graded weekly workshop assignments.

- Jan – May 2023

Dalhousie University

Teaching Assistant - Integrated Science Program (DISP) Writing in Science

Key Responsibilities: Supported first-year undergraduate students with writing and research projects; Guided the preparation of team posters and presentations; Provided feedback on research reports and oral presentations.

- May – Sep 2022

Halifax Regional Municipality (HRM) Urban Forestry

Urban Forest Research Assistant

Key Responsibilities: Conducted field research and data management for HRMs urban forest research program; Developed guidelines for arboricultural practices during the songbird breeding season in HRM.

- Jun – Aug 2021

PEI Department of Environment, Energy, and Climate Action

Surface Water Monitoring Technician

Key Responsibilities: Conducted water quality sampling across rivers and estuaries in PEI using various monitoring equipment and software; Gained marine navigation skills and experience operating boats and trailers.

- Jun – Sep 2020

Stratford Area Watershed Improvement Group

Summer Field Crew Worker

Key Responsibilities: Contributed to stream enhancement, tree planting, water quality monitoring, invasive species management, and benthic macroinvertebrate surveys; Co-authored the 2020 Field Report and created social media content.

CONTINUING EDUCATION & CERTIFICATIONS

2024 Wetland Ecosystem Services Protocol - Atlantic Canada (WESP-AC)

2023 UTV Certification, Canada Safety Council

2023 Bear Awareness, Worksite Safety

2023 Emergency First Aid & CPR/AED Level C, St. John Ambulance NS/PEI

2023 Workplace Hazardous Materials Information System (WHMIS) Training, Health Canada

2021 Pleasure Craft Operator License, Transport Canada

PUBLICATIONS

- 2023 Niesink, C. *A Review of Best Management Practices for Urban Birds in the Tree Care Industry: Is More Research Needed?* MREM Final Project Report. Halifax Tree Project, 34 pp. Available at [https://static1.squarespace.com/static/5b3babac70e802454aede034/t/643ddc93b194f85277968d25/1681775766398/Niesink Final MREM Report 2023.pdf](https://static1.squarespace.com/static/5b3babac70e802454aede034/t/643ddc93b194f85277968d25/1681775766398/Niesink+Final+MREM+Report+2023.pdf)
- 2022 Niesink, C., & Duinker, P. *Protecting Migratory Birds in the Urban Core of Halifax Regional Municipality: Best Management Practices for Tree Work*. Unpublished report to Halifax Regional Municipality. School for Resource and Environmental Studies, Dalhousie University, Halifax, NS
- 2021 Westwood, A. R., Baillie, J., Ceci, S., Collison, B., Machat, H., McLean, S., MacNeill, B., Niesink, C., Shaw, J., Sodeinde, O., Suppanz, S., Sutton, P., & Vail, C. ENVI5050: Special Topics - Forest Ecology & Management class submission to the Government of Nova Scotia regarding the *Revised Old Growth Forest Policy*. Westwood Lab, Dalhousie University, 11 pp. Available at <https://westwoodlab.ca/2021/12/08/dalhousies-forest-ecology-management-graduate-class-submits-comment-on-nova-scotias-revised-old-forest-policy/>
- 2020 VanInderstine, E., Fisher, M., Niesink, C., & Triantafillou, J. *2020 Field Report*. Stratford Area Watershed Improvement Group, 23 pp. Available at <https://drive.google.com/file/d/1yMOKkvXFU9jhz12BTZV0tgxkf1enJYu2/view>

CONFERENCES ATTENDED

- 2022 Canadian Urban Forest Conference, Charlottetown, PE

SELECTED PROJECT EXPERIENCE

- Morden Road Sandpit Expansion Project – Kenneth Lutz Trucks Ltd. | EA & Permitting Specialist
Drafted the EA for a proposed sandpit expansion in Nova Scotia. Tasks included analyzing desktop and field data, drafting baseline conditions, and preparing the environmental effects assessment for regulatory submission.
- Wind Power Environmental Assessments – Various Clients | Environmental Scientist
Conducted field surveys for multiple 100 MW+ proposed wind farms across Nova Scotia, including wetland, watercourse, old-growth, flora, and wildlife assessments. Supported the preparation of EA documentation, including baseline summaries, desktop reviews, and effects assessments.
- Post-Approval Work – Various Clients | Environmental Scientist

Compiled data and co-authored reports to fulfill post-approval conditions for various wind farm projects, including the Goose Harbour Lake Wind Farm, Mersey River Wind Farm, and Weavers Wind Farm. Prepared Wildlife Management Plans and Baseline Noise Monitoring Plans in alignment with regulatory expectations.

- **Post-Approval Work – EverWind | Environmental Scientist**
Prepared post-approval deliverables for the Kmt nuk Wind Power Project and the Bear Lake Wind Power Project, including Bird and Bat Mortality Monitoring Plans, Mainland Moose Monitoring Plans, and Wildlife Management Plans to satisfy regulatory conditions.
- **Environmental Noise Monitoring – EverWind, NSPI | Environmental Scientist**
Aided in the development of Strum's noise monitoring program through the familiarization of NSECCs Guidelines for Environmental Noise Measurement and Assessment. Created a standard operating procedure for deployment purposes, data analysis, and report compilation. Analyzed baseline and post-construction noise data via NoiseTools and Microsoft Excel for various projects, including the Mersey River Wind Farm, the EverWind Point Tupper Green Hydrogen/Ammonia Project, and the South Canoe Wind Power Project and led the writing of noise monitoring plans for these projects.