



DATA REPORT 4772: East Bay Hills, NS

Prepared 28 March, 2012
by S.H. Gerriets



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1.0 PREFACE

The Atlantic Canada Conservation Data Centre (ACCDC) is part of a network of circa 85 NatureServe data centres and heritage programs in 50 states, 10 provinces and 1 territory, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The ACCDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador. Although a non-governmental agency, the ACCDC is supported by 6 federal agencies, plus 4 provincial governments, outside grants and data processing fees. URL: www.ACCDC.com.

Upon request and for a fee, the ACCDC reports known observations of rare and endangered flora and fauna, in and near a specified study area. As a supplement to that data, the ACCDC includes locations of managed areas with some level of protection, and also known sites of ecological interest. Data summarised in each report is attached as DBF files which may be opened from within data software (Excel, Access) or mapped in GIS (ArcView, MapInfo, AutoCAD).

1.1 RESTRICTIONS

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

- a.) Data is restricted to use by trained personnel who are sensitive to its potential threat to rare and endangered taxa.
- b.) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
- c.) The ACCDC requires Data Users to cease using and delete data 12 months after receipt.
- d.) ACCDC data responses are restricted to that data in our Data System at the time of the data request.
- e.) Data is qualified as to location (Precision) and time (SurveyDate); cf Data Dictionary for details.
- f.) ACCDC data reports are not to be construed as exhaustive inventories of taxa in an area.
- g.) The non-occurrence of a taxon cannot be inferred by its absence in an ACCDC data report.

1.2 ADDITIONAL INFORMATION

Please direct biological questions about ACCDC data to: Sean Blaney, ACCDC: (506) 364-2658, and technical data queries to: Stefen Gerriets, ACCDC: (506) 364-2657.

For provincial information on rare taxa and protected areas, or information on game animals, deer yards, old growth forest, archeological sites, fish habitat etc, please contact Sherman Boates, NSDNR: (902) 679-6146.

2.0 RARE AND ENDANGERED TAXA

A 100km buffer around the study area contains 4207 records of 394 taxa from 70 sources, a relatively low-to-moderate density of records (quintile 2): 0.13 rec/km².

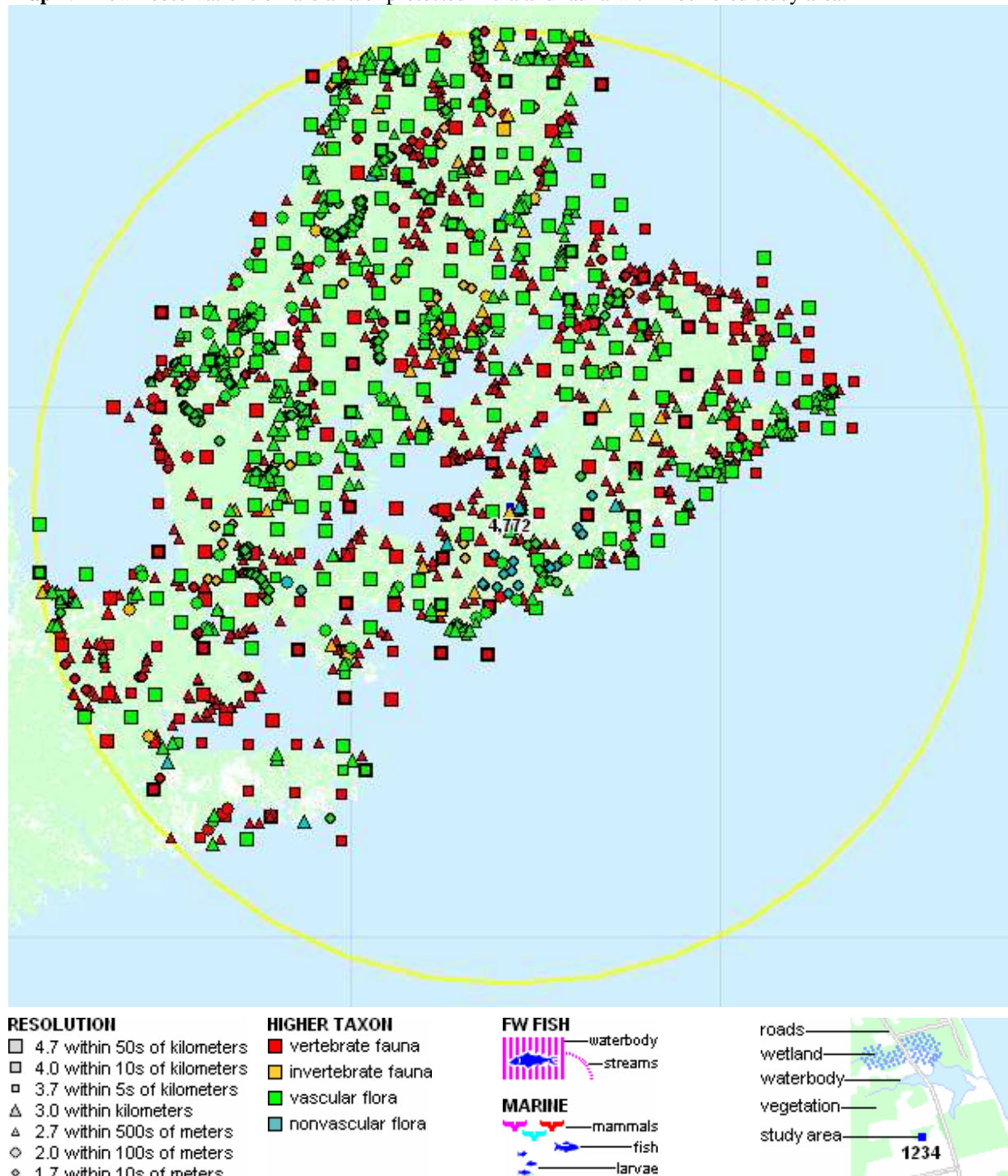
2.1 FLORA

A 100km buffer around the study area contains 1081 records of 232 vascular, 42 records of 16 nonvascular flora (see attached *ob.dbf).

2.2 FAUNA

A 100km buffer around the study area contains 2950 records of 105 vertebrate, 134 records of 41 invertebrate fauna (cf attached *ob.dbf). Sensitive data: Wood Turtles are PRESENT in the study area (cf attached WOTU.rtf).

Map 1: Known observations of rare and/or protected flora and fauna within buffered study area.



3.0 SPECIAL AREAS

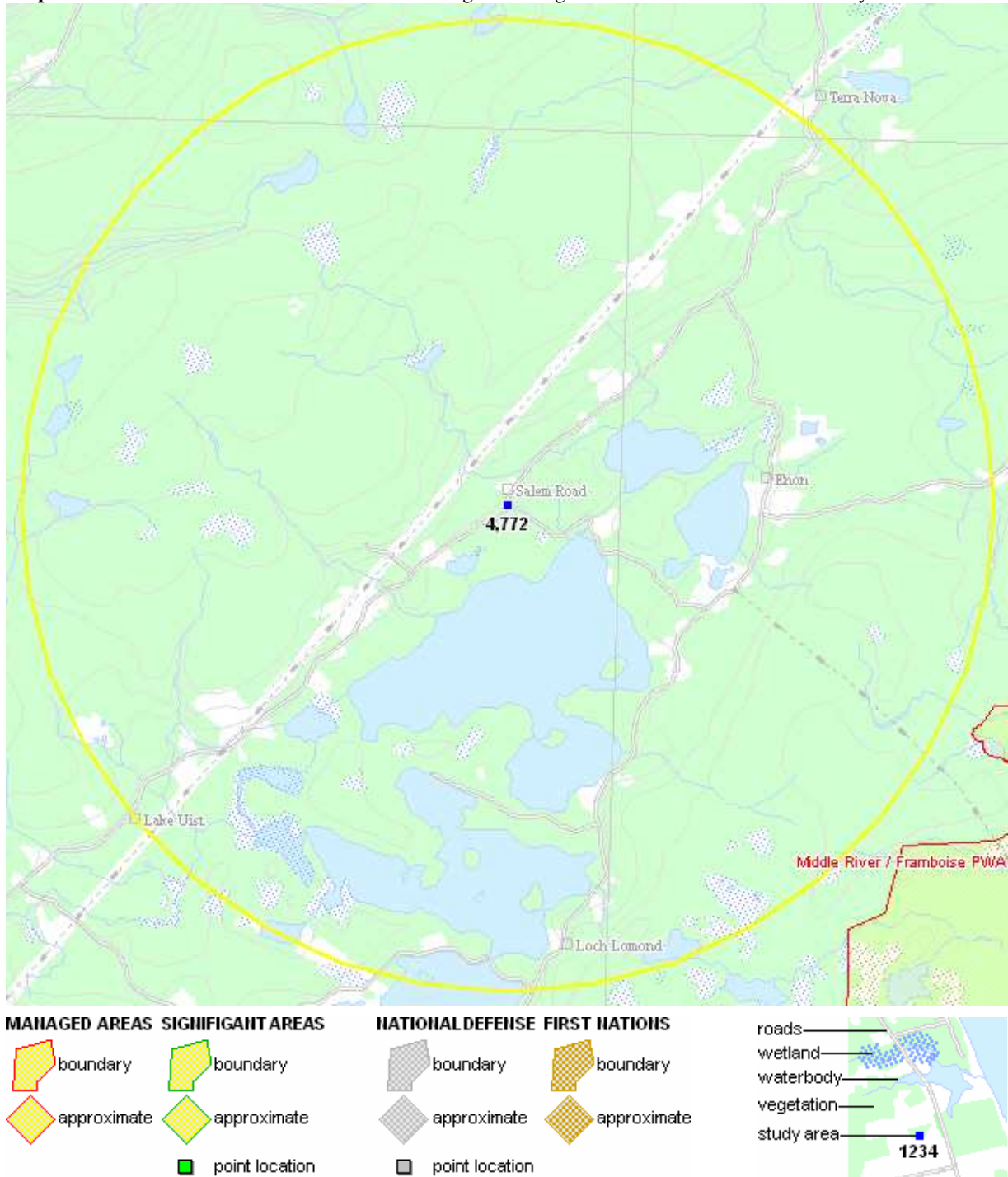
3.1 MANAGED AREAS

No Managed Areas identified.

3.2 SIGNIFICANT AREAS

No biologically significant sites were identified.

Map 2: Boundaries and/or locations of known Managed and Significant Areas within 5km of study area.



4.0 TAXON LISTS

Rare and/or endangered taxa within the buffered area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation. [p] = vascular plant, [n] = nonvascular plant, [a] = vertebrate animal, [i] = invertebrate animal, [c] = community.

4.1 FLORA

scientific name	common name	prov. rarity	prov. status	COSEWIC	obs	dist.km
n Erioderma pedicellatum (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	S1S2	Endangered	E	19	2 ±1
p Isoetes prototypus	Prototype Quillwort	S2	Vulnerable	SC	4	45 ±0.1
p Juncus caesariensis	New Jersey Rush	S2	Vulnerable	SC	20	9 ±0
n Sclerophora peronella (Nova Scotia pop.)	Frosted Glass-whiskers Lichen - Nova Scotia pop.	S1?		SC	3	73 ±10
n Degelia plumbea	Blue Felt Lichen	S2		SC	5	14 ±0
p Floerkea proserpinacoides	False Mermaidweed	S2		NAR	12	39 ±10
p Botrychium lunaria	Common Moonwort	S1			2	63 ±1
p Equisetum palustre	Marsh Horsetail	S1			1	73 ±0
p Cystopteris laurentiana	Laurentian Bladder Fern	S1			4	46 ±10
p Cryptogramma stelleri	Steller's Rockbrake	S1			5	46 ±5
p Trisetum melicoides	Purple False Oats	S1			3	63 ±1
p Torreyochloa pallida var. pallida	Pale False Manna Grass	S1			1	28 ±10
p Phleum alpinum	Alpine Timothy	S1			5	77 ±0
p Elymus wiegandii	Wiegand's Wild Rye	S1			8	49 ±1
p Cinna arundinacea	Sweet Wood Reed Grass	S1			3	54 ±0
p Bromus latiglumis	Broad-Glumed Brome	S1			2	56 ±0
p Malaxis brachypoda	White Adder's-Mouth	S1			1	74 ±10
p Triantha glutinosa	Sticky False Asphodel	S1			5	67 ±0.1
p Juncus bulbosus	Bulbous Rush	S1			5	45 ±0.5
p Iris prismatica	Slender Blue Flag	S1			2	36 ±10
p Blysmus rufus	Red Bulrush	S1			1	94 ±1
p Scirpus pedicellatus	Stalked Bulrush	S1			2	55 ±0
p Rhynchospora capillacea	Slender Beakrush	S1			5	41 ±0.1
p Cyperus lupulinus ssp. macilentus	Hop Flatsedge	S1			1	98 ±1
p Carex wiegandii	Wiegand's Sedge	S1			3	95 ±0
p Carex viridula var. elatior	Greenish Sedge	S1			2	67 ±0
p Carex tinctoria	Tinged Sedge	S1			2	93 ±1
p Carex tenuiflora	Sparse-Flowered Sedge	S1			2	28 ±0.5
p Carex rariflora	Loose-flowered Alpine Sedge	S1			4	60 ±0.5
p Carex livida var. radicaulis	Livid Sedge	S1			8	21 ±0.5
p Carex gynocrates	Northern Bog Sedge	S1			1	67 ±0.1
p Carex alopecoidea	Foxtail Sedge	S1			1	97 ±0.5
p Viola canadensis	Canada Violet	S1			1	68 ±1
p Scrophularia lanceolata	Lance-leaved Figwort	S1			2	41 ±10
p Pedicularis palustris	Marsh Lousewort	S1			1	60 ±0.5
p Salix candida	Sage Willow	S1			2	67 ±0
p Anemone parviflora	Small-flowered Anemone	S1			1	98 ±0.5
p Anemone multifida	Cut-leaved Anemone	S1			1	99 ±1
p Montia fontana	Water Blinks	S1			1	65 ±1
p Polygonum viviparum	Alpine Bistort	S1			1	30 ±1
p Utricularia ochroleuca	Yellowish-white Bladderwort	S1			1	71 ±1
p Pinguicula vulgaris	Common Butterwort	S1			4	90 ±10
p Diapensia lapponica	Diapensia	S1			1	90 ±10
p Cuscuta cephalanthi	Buttonbush Dodder	S1			3	90 ±10
p Hypericum majus	Large St John's-wort	S1			2	30 ±1
p Suaeda maritima ssp. richii	White Sea-blite	S1			3	63 ±10
p Lobelia kalmii	Brook Lobelia	S1			10	25 ±10
p Draba norvegica var. clivicola	Norwegian Whitlow-Grass	S1			1	73 ±10
p Cochlearia tridactylites	Limestone Scurvy-grass	S1			2	75 ±0
p Cardamine pratensis var. angustifolia	Cuckoo Flower	S1			4	44 ±10
p Cardamine pratensis	Cuckoo Flower	S1			5	41 ±0.1
p Betula glandulosa	Glandular Birch	S1			3	94 ±10
p Ageratina altissima	White Snakeroot	S1			1	100 ±10
p Bidens hyperborea	Estuary Beggarticks	S1			2	75 ±10
p Arnica lonchophylla	Northern Arnica	S1			1	33 ±10
p Sanicula odorata	Clustered Sanicle	S1			4	40 ±1
n Parmeliella parvula	a lichen	S1?			2	14 ±0
p Triglochin gaspensis	Gaspé Arrowgrass	S1?			3	38 ±1
p Schoenoplectus robustus	Sturdy Bulrush	S1?			2	32 ±5
p Spiraea septentrionalis	Northern Meadowsweet	S1?			1	95 ±0.5
p Rubus flagellaris	Northern Dewberry	S1?			2	41 ±1
p Halenia deflexa ssp. brentoniana	Spurred Gentian	S1?			1	94 ±1
p Chenopodium rubrum	Red Pigweed	S1?			2	75 ±10
p Atriplex acadensis	Maritime Saltbush	S1?			1	54 ±10
n Cavernularia hultenii	a Lichen	S1S2			1	59 ±10
n Nephroma arcticum	a lichen	S1S2			1	4 ±10
p Woodsia alpina	Alpine Cliff Fern	S1S2			4	45 ±0.5
p Sparganium hyperboreum	Northern Burreed	S1S2			8	41 ±10
p Potamogeton pulcher	Spotted Pondweed	S1S2			1	95 ±10
p Festuca prolifera	Proliferous Fescue	S1S2			2	92 ±10
p Calamagrostis stricta ssp. stricta	Slim-stemmed Reed Grass	S1S2			1	41 ±1
p Juncus alpinoarticulatus ssp. nodulosus	Alpine Rush	S1S2			7	48 ±1
p Juncus stygius ssp. americanus	Moor Rush	S1S2			9	9 ±0.1
p Juncus greenei	Greene's Rush	S1S2			2	98 ±1
p Carex tenera	Tender Sedge	S1S2			3	63 ±1
p Carex bebbii	Bebb's Sedge	S1S2			5	47 ±5

p	Ranunculus sceleratus	Cursed Buttercup	S1S2	3	60 ±1
p	Anemone virginiana var. alba	Virginia Anemone	S1S2	6	32 ±1
p	Utricularia resupinata	Inverted Bladderwort	S1S2	1	12 ±0.1
p	Cornus suecica	Swedish Bunchberry	S1S2	16	38 ±0.5
p	Arabis hirsuta var. pycnocarpa	Western Hairy Rockcress	S1S2	4	45 ±0.1
p	Solidago multiradiata	Multi-rayed Goldenrod	S1S2	2	60 ±0.1
p	Huperzia selago	Northern Firmoss	S1S3	9	63 ±1
p	Carex vacillans	Estuarine Sedge	S1S3	1	97 ±0.5
p	Selaginella selaginoides	Low Spikemoss	S2	2	27 ±1
p	Equisetum pratense	Meadow Horsetail	S2	5	42 ±0
p	Woodsia glabella	Smooth Cliff Fern	S2	7	35 ±10
p	Polystichum lonchitis	Northern Holly Fern	S2	8	23 ±10
p	Dryopteris fragrans var. remotiuscula	Fragrant Wood Fern	S2	6	64 ±10
p	Asplenium trichomanes-ramosum	Green Spleenwort	S2	8	23 ±10
p	Asplenium trichomanes	Maidenhair Spleenwort	S2	11	43 ±1
p	Potamogeton friesii	Fries' Pondweed	S2	3	56 ±0
p	Piptatherum canadense	Canada Rice Grass	S2	1	84 ±0.1
p	Spiranthes lucida	Shining Ladies'-Tresses	S2	6	5 ±1
p	Listera australis	Southern Twayblade	S2	4	46 ±10
p	Cypripedium reginae	Showy Lady's-Slipper	S2	19	33 ±1
p	Cypripedium parviflorum var. makasin	Yellow Lady's-slipper	S2	1	67 ±0.1
p	Cypripedium parviflorum var. pubescens	Yellow Lady's-slipper	S2	2	61 ±10
p	Allium schoenoprasum var. sibiricum	Wild Chives	S2	6	39 ±10
p	Allium schoenoprasum	Wild Chives	S2	1	32 ±10
p	Juncus trifidus	Highland Rush	S2	6	39 ±5
p	Vallisneria americana	Wild Celery	S2	2	46 ±10
p	Eleocharis quinqueflora	Few-flowered Spikerush	S2	12	23 ±1
p	Carex scirpoidea	Scirpuslike Sedge	S2	5	62 ±0.5
p	Carex hystericina	Porcupine Sedge	S2	7	39 ±10
p	Carex comosa	Bearded Sedge	S2	1	73 ±10
p	Carex castanea	Chestnut Sedge	S2	6	64 ±10
p	Carex capillaris	Hairlike Sedge	S2	1	94 ±1
p	Carex atratiformis	Scabrous Black Sedge	S2	7	46 ±10
p	Carex atlantica ssp. capillacea	Atlantic Sedge	S2	10	36 ±10
p	Viola nephrophylla	Northern Bog Violet	S2	4	55 ±1
p	Saxifraga paniculata ssp. neogaea	White Mountain Saxifrage	S2	4	48 ±0.1
p	Parnassia palustris var. parviflora	Marsh Grass-of-Parnassus	S2	4	37 ±0.1
p	Comandra umbellata	Bastard's Toadflax	S2	2	55 ±10
p	Salix pedicellaris	Bog Willow	S2	2	50 ±0
p	Galium labradoricum	Labrador Bedstraw	S2	8	35 ±0.5
p	Caltha palustris	Yellow Marsh Marigold	S2	16	39 ±10
p	Anemone virginiana	Virginia Anemone	S2	3	64 ±0
p	Anemone quinquefolia	Wood Anemone	S2	2	50 ±1
p	Anemone canadensis	Canada Anemone	S2	4	79 ±0.1
p	Pyrola minor	Lesser Pyrola	S2	7	4 ±10
p	Primula mistassinica	Mistassini Primrose	S2	4	91 ±1
p	Rumex salicifolius var. mexicanus	Triangular-valve Dock	S2	6	44 ±10
p	Myriophyllum verticillatum	Whorled Water Milfoil	S2	2	75 ±10
p	Myriophyllum farwellii	Farwell's Water Milfoil	S2	1	71 ±10
p	Vaccinium uliginosum	Alpine Bilberry	S2	14	20 ±10
p	Vaccinium caespitosum	Dwarf Bilberry	S2	10	22 ±10
p	Vaccinium boreale	Northern Blueberry	S2	21	21 ±0.5
p	Shepherdia canadensis	Soapberry	S2	11	36 ±1
p	Crassula aquatica	Water Pygmyweed	S2	5	25 ±10
p	Triosteum aurantiacum	Orange-fruited Tinker's Weed	S2	18	46 ±10
p	Stellaria humifusa	Saltmarsh Starwort	S2	4	47 ±10
p	Draba arabisans	Rock Whitlow-Grass	S2	4	54 ±1
p	Cardamine parviflora var. arenicola	Small-flowered Bittercress	S2	6	62 ±1
p	Arabis drummondii	Drummond's Rockcress	S2	4	42 ±1
p	Betula michauxii	Newfoundland Dwarf Birch	S2	2	59 ±0.5
p	Betula borealis	Northern Birch	S2	2	57 ±0.1
p	Caulophyllum thalictroides	Blue Cohosh	S2	5	53 ±0
p	Impatiens pallida	Pale Jewelweed	S2	6	35 ±10
p	Senecio pseudoarnica	Seabeach Ragwort	S2	9	29 ±1
p	Rudbeckia laciniata var. gaspereaensis	Cut-Leaved Coneflower	S2	1	100 ±10
p	Iva frutescens ssp. oraria	Big-leaved Marsh-elder	S2	1	74 ±10
p	Hieracium robinsonii	Robinson's Hawkweed	S2	9	57 ±0.5
p	Erigeron philadelphicus	Philadelphia Fleabane	S2	4	30 ±10
p	Osmorhiza longistylis	Smooth Sweet Cicely	S2	7	51 ±10
n	Syntrichia ruralis	a Moss	S2?	1	61 ±1
n	Scorpidium scorpioides	a Moss	S2?	1	25 ±10
n	Platydictya jungermannioides	a Moss	S2?	1	69 ±0
n	Paludella squarrosa	a Moss	S2?	1	39 ±5
p	Juncus dudleyi	Dudley's Rush	S2?	8	64 ±5
p	Amelanchier fernaldii	Fernald's Serviceberry	S2?	4	46 ±0.5
p	Symphotrichum boreale	Boreal Aster	S2?	2	25 ±10
n	Peltigera collina	a lichen	S2S3	2	16 ±0
n	Usnea mutabilis	an Old Man's Beard Lichen	S2S3	1	55 ±10
n	Flavocetraria nivalis	a lichen	S2S3	1	82 ±10
p	Ophioglossum pusillum	Northern Adder's-tongue	S2S3	1	45 ±5
p	Botrychium simplex	Least Moonwort	S2S3	2	72 ±1
p	Botrychium lanceolatum var. angustisegmentum	Triangle Moonwort	S2S3	5	5 ±1
p	Potamogeton zosteriformis	Flat-stemmed Pondweed	S2S3	8	52 ±10
p	Potamogeton richardsonii	Richardson's Pondweed	S2S3	3	59 ±5
p	Potamogeton obtusifolius	Blunt-leaved Pondweed	S2S3	10	52 ±1
p	Stuckenia filiformis ssp. alpina	Thread-leaved Pondweed	S2S3	13	32 ±0.1

p	<i>Stuckenia filiformis</i>	Thread-leaved Pondweed	S2S3	3	54 ±0
p	<i>Poa glauca</i>	Glaucous Blue Grass	S2S3	4	49 ±0
p	<i>Alopecurus aequalis</i>	Short-awned Foxtail	S2S3	7	56 ±0
p	<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper	S2S3	9	25 ±10
p	<i>Lilium canadense</i>	Canada Lily	S2S3	9	11 ±10
p	<i>Carex hirtifolia</i>	Pubescent Sedge	S2S3	3	43 ±0
p	<i>Carex adusta</i>	Lesser Brown Sedge	S2S3	1	100 ±5
p	<i>Veronica serpyllifolia</i> ssp. <i>humifusa</i>	Thyme-Leaved Speedwell	S2S3	4	44 ±1
p	<i>Salix pellita</i>	Satiny Willow	S2S3	1	67 ±1
p	<i>Polygonum raii</i>	Sharp-fruited Knotweed	S2S3	9	23 ±1
p	<i>Polygonum buxiforme</i>	Small's Knotweed	S2S3	1	84 ±10
p	<i>Polygala sanguinea</i>	Blood Milkwort	S2S3	1	74 ±10
p	<i>Fraxinus nigra</i>	Black Ash	S2S3	21	19 ±10
p	<i>Hedeoma pulegioides</i>	American False Pennyroyal	S2S3	1	45 ±1
p	<i>Halenia deflexa</i>	Spurred Gentian	S2S3	15	28 ±10
p	<i>Hypericum dissimulatum</i>	Disguised St John's-wort	S2S3	1	89 ±1
p	<i>Suaeda calceoliformis</i>	Horned Sea-blite	S2S3	3	44 ±1
p	<i>Betula pumila</i> var. <i>pumila</i>	Bog Birch	S2S3	1	92 ±10
p	<i>Betula pumila</i>	Bog Birch	S2S3	6	68 ±0.5
p	<i>Symphotrichum ciliolatum</i>	Fringed Blue Aster	S2S3	1	79 ±10
p	<i>Asclepias incarnata</i> ssp. <i>pulchra</i>	Swamp Milkweed	S2S3	5	38 ±1
p	<i>Schizaea pusilla</i>	Little Curlygrass Fern	S3	8	26 ±5
p	<i>Botrychium dissectum</i>	Cut-leaved Moonwort	S3	2	45 ±5
p	<i>Isoetes acadensis</i>	Acadian Quillwort	S3	4	49 ±5
p	<i>Equisetum variegatum</i>	Variiegated Horsetail	S3	5	64 ±0
p	<i>Sparganium natans</i>	Small Burreed	S3	4	37 ±5
p	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid	S3	3	39 ±5
p	<i>Platanthera hookeri</i>	Hooker's Orchid	S3	1	69 ±0.1
p	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid	S3	6	48 ±5
p	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain	S3	9	4 ±10
p	<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain	S3	8	49 ±10
p	<i>Corallorhiza trifida</i>	Early Coralroot	S3	3	41 ±1
p	<i>Eleocharis nitida</i>	Quill Spikerush	S3	1	67 ±0.5
p	<i>Carex eburnea</i>	Bristle-leaved Sedge	S3	2	35 ±0.1
p	<i>Verbena hastata</i>	Blue Vervain	S3	1	47 ±0.1
p	<i>Laportea canadensis</i>	Canada Wood Nettle	S3	6	56 ±0
p	<i>Limosella australis</i>	Southern Mudwort	S3	8	25 ±5
p	<i>Geocaulon lividum</i>	Northern Comandra	S3	7	62 ±10
p	<i>Salix petiolaris</i>	Meadow Willow	S3	1	50 ±0
p	<i>Galium kamtschaticum</i>	Northern Wild Licorice	S3	8	43 ±5
p	<i>Agrimonia gryposepala</i>	Hooked Agrimony	S3	11	50 ±0
p	<i>Rhamnus alnifolia</i>	Alder-leaved Buckthorn	S3	11	34 ±1
p	<i>Pyrola asarifolia</i>	Pink Pyrola	S3	2	67 ±0
p	<i>Primula laurentiana</i>	Laurentian Primrose	S3	1	67 ±10
p	<i>Polygonum scandens</i>	Climbing False Buckwheat	S3	3	55 ±0
p	<i>Polygonum pensylvanicum</i>	Pennsylvania Smartweed	S3	4	47 ±0.1
p	<i>Epilobium strictum</i>	Downy Willowherb	S3	6	43 ±5
p	<i>Epilobium hornemannii</i>	Hornemann's Willowherb	S3	7	65 ±10
p	<i>Decodon verticillatus</i>	Swamp Loosestrife	S3	1	39 ±5
p	<i>Teucrium canadense</i>	Canada Germander	S3	2	47 ±0.1
p	<i>Proserpinaca palustris</i> var. <i>crebra</i>	Marsh Mermaidweed	S3	4	51 ±0
p	<i>Proserpinaca palustris</i>	Marsh Mermaidweed	S3	1	55 ±0
p	<i>Bartonia virginica</i>	Yellow Bartonia	S3	1	29 ±0.1
p	<i>Empetrum eamesii</i>	Pink Crowberry	S3	4	89 ±10
p	<i>Viburnum edule</i>	Squashberry	S3	8	77 ±0
p	<i>Stellaria longifolia</i>	Long-leaved Starwort	S3	1	57 ±0
p	<i>Campanula aparinoides</i>	Marsh Bellflower	S3	2	48 ±5
p	<i>Packera pauperula</i>	Balsam Groundsel	S3	4	38 ±0
p	<i>Megalodonta beckii</i>	Water Beggarticks	S3	5	35 ±1
p	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane	S3	12	30 ±10
p	<i>Asclepias incarnata</i>	Swamp Milkweed	S3	9	35 ±10
n	<i>Collema furfuraceum</i>	a lichen	S3?	1	4 ±10
n	<i>Nephroma bellum</i>	a lichen	S3?	1	4 ±10
n	<i>Sticta fuliginosa</i>	a lichen	S3?	1	15 ±0
p	<i>Lycopodium sitchense</i>	Sitka Clubmoss	S3?	5	46 ±5
p	<i>Lycopodium sabinifolium</i>	Ground-Fir	S3?	6	54 ±1
p	<i>Potamogeton praelongus</i>	White-stemmed Pondweed	S3?	8	27 ±1
p	<i>Lycopodium complanatum</i>	Northern Clubmoss	S3S4	2	39 ±5
p	<i>Equisetum scirpoides</i>	Dwarf Scouring-Rush	S3S4	4	32 ±1
p	<i>Equisetum hyemale</i> var. <i>affine</i>	Common Scouring-rush	S3S4	9	40 ±10
p	<i>Equisetum hyemale</i>	Common Scouring-rush	S3S4	1	68 ±0
p	<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern	S3S4	13	32 ±1
p	<i>Trisetum spicatum</i>	Narrow False Oats	S3S4	5	63 ±0.5
p	<i>Liparis loeselii</i>	Loesel's Twayblade	S3S4	12	27 ±1
p	<i>Luzula parviflora</i>	Small-flowered Woodrush	S3S4	9	46 ±5
p	<i>Juncus acuminatus</i>	Sharp-fruited Rush	S3S4	1	50 ±0
p	<i>Sisyrinchium angustifolium</i>	Narrow-leaved Blue-eyed-grass	S3S4	2	52 ±0
p	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel	S3S4	1	57 ±0
p	<i>Polygonum robustius</i>	Stout Smartweed	S3S4	2	56 ±0
p	<i>Sanguinaria canadensis</i>	Bloodroot	S3S4	15	41 ±0
p	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil	S3S4	1	67 ±0.1
p	<i>Atriplex franktonii</i>	Frankton's Saltbush	S3S4	1	54 ±0.1
p	<i>Angelica atropurpurea</i>	Purple-stemmed Angelica	S3S4	6	54 ±0
p	<i>Botrychium minganense</i>	Mingan Moonwort	SH	1	59 ±10
p	<i>Poa alpina</i>	Alpine Blue Grass	SH	1	63 ±0.5
p	<i>Solidago simplex</i> var. <i>randii</i>	Sticky Goldenrod	SH	1	86 ±5

4.2 FAUNA

	scientific name	common name	prov. rarity	prov. status	COSEWIC	obs	dist.km
a	<i>Sterna dougallii</i>	Roseate Tern	S1B	Endangered	E	5	81 ±5
a	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	S1B	Endangered	E	41	23 ±0.5
a	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	S2S3M	Endangered	E	7	19 ±0.5
a	<i>Rangifer tarandus pop. 2</i>	Woodland Caribou (Atlantic-Gaspésie pop.)	SX	Extirpated	E	1	95 ±0.5
a	<i>Chaetura pelagica</i>	Chimney Swift	S2S3B	Endangered	T	17	4 ±5
a	<i>Chordeiles minor</i>	Common Nighthawk	S3B	Threatened	T	29	4 ±5
a	<i>Catharus bicknelli</i>	Bicknell's Thrush	S1S2B	Vulnerable	T	31	11 ±5
a	<i>Glyptemys insculpta</i>	Wood Turtle	S3	Vulnerable	T	23	4 ±10
a	<i>Morone saxatilis</i>	Striped Bass	S1		T	3	18 ±10
a	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	S1?		T	1	18 ±10
a	<i>Wilsonia canadensis</i>	Canada Warbler	S3B		T	46	11 ±5
a	<i>Hirundo rustica</i>	Barn Swallow	S3B		T	107	4 ±5
a	<i>Contopus cooperi</i>	Olive-sided Flycatcher	S3B		T	100	4 ±5
a	<i>Dolichonyx oryzivorus</i>	Bobolink	S3S4B		T	54	4 ±5
a	<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	S2N	Endangered	SC	4	63 ±10
i	<i>Lampsilis cariosa</i>	Yellow Lampmussel	S1	Threatened	SC	3	36 ±0.1
a	<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius	S1B	Vulnerable	SC	1	68 ±10
a	<i>Bucephala islandica (Eastern pop.)</i>	Barrow's Goldeneye - Eastern pop.	S1N		SC	1	58 ±10
a	<i>Asio flammeus</i>	Short-eared Owl	S1S2		SC	3	59 ±5
i	<i>Alasmidonta varicosa</i>	Brook Floater	S1S2		SC	1	90 ±0.1
i	<i>Danaus plexippus</i>	Monarch	S2B		SC	1	22 ±1
a	<i>Euphagus carolinus</i>	Rusty Blackbird	S2S3B		SC	43	4 ±5
a	<i>Chelydra serpentina</i>	Snapping Turtle	S5		SC	1	26 ±10
a	<i>Anguilla rostrata</i>	American Eel	S5		SC	1	61 ±10
a	<i>Puma concolor pop. 1</i>	Cougar - Eastern pop.	SH		DD	31	9 ±1
a	<i>Lynx canadensis</i>	Canada Lynx	S1	Endangered	NAR	34	4 ±10
a	<i>Sorex dispar</i>	Long-tailed Shrew	S1		NAR	9	39 ±10
a	<i>Accipiter cooperii</i>	Cooper's Hawk	S1?B,SNAN		NAR	1	39 ±5
a	<i>Aegolius funereus</i>	Boreal Owl	S1B		NAR	3	64 ±5
a	<i>Globicephala melas</i>	Long-finned Pilot Whale	S2S3		NAR	1	97 ±1
a	<i>Hemidactylium scutatum</i>	Four-toed Salamander	S3		NAR	15	35 ±5
a	<i>Sialia sialis</i>	Eastern Bluebird	S3B		NAR	2	4 ±5
a	<i>Sterna hirundo</i>	Common Tern	S3B		NAR	128	7 ±0.5
a	<i>Gavia immer</i>	Common Loon	S3B,S4N		NAR	200	2 ±0.5
a	<i>Accipiter gentilis</i>	Northern Goshawk	S3S4		NAR	23	4 ±5
a	<i>Martes americana</i>	American Marten	S1	Endangered		14	41 ±10
i	<i>Leptodea ochracea</i>	Tidewater Mucket	S1			3	33 ±10
i	<i>Coenagrion interrogatum</i>	Subarctic Bluet	S1			1	61 ±10
i	<i>Leucorrhinia patricia</i>	Canada Whiteface	S1			1	84 ±0.1
i	<i>Somatochlora williamsoni</i>	Williamson's Emerald	S1			2	44 ±0.1
i	<i>Somatochlora albicincta</i>	Ringed Emerald	S1			3	79 ±10
i	<i>Ophiogomphus aspersus</i>	Brook Snaketail	S1			3	53 ±0.1
i	<i>Oeneis jutta</i>	Jutta Arctic	S1			2	92 ±10
i	<i>Polygonia gracilis</i>	Hoary Comma	S1			1	35 ±1
i	<i>Polygonia satyrus</i>	Satyr Comma	S1			1	49 ±1
i	<i>Satyrium liparops</i>	Striped Hairstreak	S1			1	65 ±0
a	<i>Vireo gilvus</i>	Warbling Vireo	S1?B			4	32 ±5
a	<i>Tringa solitaria</i>	Solitary Sandpiper	S1?B,S4S5M			2	63 ±0.5
a	<i>Larus delawarensis</i>	Ring-billed Gull	S1?B,S5N			6	45 ±0.5
a	<i>Hylocichla mustelina</i>	Wood Thrush	S1B			2	93 ±5
a	<i>Gallinula chloropus</i>	Common Moorhen	S1B			2	47 ±5
a	<i>Alca torda</i>	Razorbill	S1B,S4N			10	61 ±10
a	<i>Fratercula arctica</i>	Atlantic Puffin	S1B,S4S5N			4	61 ±10
a	<i>Calidris minutilla</i>	Least Sandpiper	S1B,S5M			16	19 ±0.5
a	<i>Picoides dorsalis</i>	American Three-toed Woodpecker	S1S2			2	45 ±5
i	<i>Nymphalis vaualbum j-album</i>	Compton Tortoiseshell	S1S2			1	22 ±1
i	<i>Papilio breviceauda bretonensis</i>	Short-tailed Swallowtail	S1S2			1	96 ±0
i	<i>Papilio breviceauda</i>	Short-tailed Swallowtail	S1S2			5	32 ±10
a	<i>Eremophila alpestris</i>	Horned Lark	S1S2B,S4N			1	53 ±5
a	<i>Charadrius semipalmatus</i>	Semipalmated Plover	S1S2B,S5M			21	19 ±0.5
a	<i>Martes pennanti</i>	Fisher	S2			1	59 ±10
a	<i>Microtus chrotorrhinus</i>	Rock Vole	S2			5	39 ±10
a	<i>Salmo salar</i>	Atlantic Salmon	S2			57	4 ±10
a	<i>Asio otus</i>	Long-eared Owl	S2			2	32 ±5
i	<i>Lampsilis radiata</i>	Eastern Lampmussel	S2			5	34 ±0.1
i	<i>Somatochlora septentrionalis</i>	Muskeg Emerald	S2			4	55 ±0.1
i	<i>Somatochlora forcipata</i>	Forcipate Emerald	S2			3	35 ±1
i	<i>Gomphus descriptus</i>	Harpoon Clubtail	S2			7	47 ±1
i	<i>Nymphalis milberti</i>	Milbert's Tortoiseshell	S2			1	35 ±1
i	<i>Boloria chariclea</i>	Arctic Fritillary	S2			2	9 ±1
i	<i>Pieris oleracea</i>	Mustard White	S2			3	22 ±1
a	<i>Vireo philadelphicus</i>	Philadelphia Vireo	S2?B			1	30 ±5
a	<i>Piranga olivacea</i>	Scarlet Tanager	S2B			1	35 ±5
a	<i>Empidonax traillii</i>	Willow Flycatcher	S2B			1	70 ±0.5
a	<i>Rallus limicola</i>	Virginia Rail	S2B			2	73 ±5
a	<i>Anas strepera</i>	Gadwall	S2B			1	54 ±0.1
a	<i>Anas clypeata</i>	Northern Shoveler	S2B			1	54 ±0.1
a	<i>Anas acuta</i>	Northern Pintail	S2B			3	60 ±10
i	<i>Pantala hymenaea</i>	Spot-Winged Glider	S2B			2	53 ±0.1
a	<i>Rissa tridactyla</i>	Black-legged Kittiwake	S2B,S4S5N			29	28 ±0.5
a	<i>Bucephala clangula</i>	Common Goldeneye	S2B,S5N			29	23 ±0.1
i	<i>Alasmidonta undulata</i>	Triangle Floater	S2S3			2	20 ±10
a	<i>Icterus galbula</i>	Baltimore Oriole	S2S3B			1	67 ±5

a	<i>Molothrus ater</i>	Brown-headed Cowbird	S2S3B	17	11 ±5
a	<i>Poocetes gramineus</i>	Vesper Sparrow	S2S3B	2	55 ±5
a	<i>Tringa semipalmata</i>	Willet	S2S3B	74	10 ±10
a	<i>Phalaropus fulicaria</i>	Red Phalarope	S2S3M	1	53 ±0.5
a	<i>Phalaropus lobatus</i>	Red-necked Phalarope	S2S3M	1	63 ±0.5
a	<i>Poecile hudsonica</i>	Boreal Chickadee	S3	138	4 ±5
a	<i>Phalacrocorax carbo</i>	Great Cormorant	S3	63	22 ±10
i	<i>Amphiagron saucium</i>	Eastern Red Damsel	S3	8	35 ±1
i	<i>Sympetrum danae</i>	Black Meadowhawk	S3	10	31 ±1
i	<i>Nannothemis bella</i>	Elfin Skimmer	S3	2	61 ±0.1
i	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald	S3	2	47 ±0.1
i	<i>Gomphaeschna furcillata</i>	Harlequin Damer	S3	2	47 ±0.1
i	<i>Boyeria grafiana</i>	Ocellated Darner	S3	1	37 ±1
i	<i>Aeshna clepsydra</i>	Mottled Darner	S3	1	65 ±0.1
i	<i>Ophiogomphus carolus</i>	Riffle Snaketail	S3	24	13 ±0.1
i	<i>Lanthus parvulus</i>	Northern Pygmy Clubtail	S3	9	1 ±1
i	<i>Polygonia faunus</i>	Green Comma	S3	1	22 ±1
i	<i>Euphydryas phaeton</i>	Baltimore Checkerspot	S3	5	19 ±1
i	<i>Hesperia comma laurentina</i>	Laurentian Skipper	S3	2	35 ±1
i	<i>Hesperia comma</i>	Common Branded Skipper	S3	1	51 ±0
a	<i>Dendroica tigrina</i>	Cape May Warbler	S3?B	16	4 ±5
a	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S3?B	5	39 ±5
a	<i>Pinicola enucleator</i>	Pine Grosbeak	S3?B,S5N	52	11 ±5
a	<i>Mimus polyglottos</i>	Northern Mockingbird	S3B	9	32 ±5
a	<i>Dumetella carolinensis</i>	Gray Catbird	S3B	29	21 ±5
a	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S3B	34	4 ±5
a	<i>Riparia riparia</i>	Bank Swallow	S3B	69	4 ±5
a	<i>Sterna paradisaea</i>	Arctic Tern	S3B	36	18 ±10
a	<i>Anas discors</i>	Blue-winged Teal	S3B	42	11 ±5
a	<i>Podilymbus podiceps</i>	Pied-billed Grebe	S3B	13	35 ±0.1
i	<i>Polygonia interrogationis</i>	Question Mark	S3B	2	22 ±1
a	<i>Tringa melanoleuca</i>	Greater Yellowlegs	S3B,S5M	46	4 ±5
a	<i>Mergus serrator</i>	Red-breasted Merganser	S3B,S5N	52	10 ±10
a	<i>Calidris pusilla</i>	Semipalmated Sandpiper	S3M	18	19 ±0.5
a	<i>Limosa haemastica</i>	Hudsonian Godwit	S3M	8	19 ±0.5
a	<i>Numerius phaeopus hudsonicus</i>	Hudsonian Whimbrel	S3M	6	28 ±10
a	<i>Pluvialis dominica</i>	American Golden-Plover	S3M	8	28 ±0.5
a	<i>Branta bernicla</i>	Brant	S3M	1	67 ±10
a	<i>Calidris maritima</i>	Purple Sandpiper	S3N	9	28 ±0.5
a	<i>Synaptomys cooperi</i>	Southern Bog Lemming	S3S4	4	39 ±10
a	<i>Cardinalis cardinalis</i>	Northern Cardinal	S3S4	1	25 ±5
a	<i>Perisoreus canadensis</i>	Gray Jay	S3S4	92	3 ±0.5
a	<i>Picoides arcticus</i>	Black-backed Woodpecker	S3S4	15	12 ±5
a	<i>Cephus grylle</i>	Black Guillemot	S3S4	54	36 ±10
i	<i>Polygonia progne</i>	Gray Comma	S3S4	3	22 ±1
i	<i>Callophrys polios</i>	Hoary Elfin	S3S4	2	29 ±1
a	<i>Passerella iliaca</i>	Fox Sparrow	S3S4B	58	12 ±5
a	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S3S4B	36	11 ±5
a	<i>Wilsonia pusilla</i>	Wilson's Warbler	S3S4B	29	3 ±0.5
a	<i>Dendroica striata</i>	Blackpoll Warbler	S3S4B	62	4 ±5
a	<i>Dendroica castanea</i>	Bay-breasted Warbler	S3S4B	57	4 ±5
a	<i>Vermivora peregrina</i>	Tennessee Warbler	S3S4B	47	4 ±5
a	<i>Tyrannus tyrannus</i>	Eastern Kingbird	S3S4B	25	11 ±5
a	<i>Sayornis phoebe</i>	Eastern Phoebe	S3S4B	9	11 ±5
a	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	S3S4B	159	2 ±0.5
a	<i>Contopus virens</i>	Eastern Wood-Pewee	S3S4B	39	10 ±0.5
a	<i>Gallinago delicata</i>	Wilson's Snipe	S3S4B	36	4 ±5
a	<i>Actitis macularius</i>	Spotted Sandpiper	S3S4B	146	4 ±5
a	<i>Charadrius vociferus</i>	Killdeer	S3S4B	36	11 ±5
a	<i>Botaurus lentiginosus</i>	American Bittern	S3S4B	21	4 ±5
a	<i>Carduelis pinus</i>	Pine Siskin	S3S4B,S5N	77	4 ±5
a	<i>Morus bassanus</i>	Northern Gannet	SHB,S5M	12	28 ±0.5
a	<i>Aythya americana</i>	Redhead	SHB,SNAM	2	60 ±10

4.3 RANGE MAPS

The legally protected taxa listed below are linked to the study area by predictive range maps based upon expert estimates of distribution. Taxa listed here but not in the observation data above, are unknown within the study area but perhaps present. Ranges of rank 1 indicate possible occurrence, those of rank 2 and 3 increasingly less probable.

scientific name	common name	prov. rarity	prov. status	COSEWIC	range	
a	<i>Glyptemys insculpta</i>	Wood Turtle	S3	Vulnerable	T	1
p	<i>Listera australis</i>	Southern Twayblade	S2			1
p	<i>Isoetes prototypus</i>	Prototype Quillwort	S2	Vulnerable	SC	1
n	<i>Erioderma pedicellatum</i>	Boreal Felt Lichen (Atlantic pop.)	S1S2	Endangered	E	2
p	<i>Juncus caesariensis</i>	New Jersey Rush	S2	Vulnerable	SC	2
a	<i>Lynx canadensis</i>	Canada Lynx	S1	Endangered	NAR	1
n	<i>Erioderma pedicellatum</i>	Boreal Felt Lichen (Atlantic pop.)	S1S2	Endangered	E	1
p	<i>Eriocaulon parkeri</i>	Parker's Pipewort			NAR	2
a	<i>Martes americana</i>	American Marten	S1	Endangered		1
p	<i>Juncus caesariensis</i>	New Jersey Rush	S2	Vulnerable	SC	1

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Latin Name	Common Name	COSEWIC	SARA	NSEA	GSRANK	Habitat Requirements
<i>Mammals</i>						
<i>Lynx canadensis</i>	Lynx			E	RED	Elusive and have a large home range. Found where deep snow is present and good snowshoe hare populations
<i>Martes americana</i>	American Marten			E	RED	Restricted to high elevation areas in the north of Cape Breton
<i>Martes pennanti</i>	Fisher				YELLOW	Fishers inhabit upland and lowland forests, including coniferous, mixed, and deciduous forests. They occur primarily in dense coniferous or mixed forests, including early successional forest with dense overhead cover (Thomas et al. 1993). They generally avoid areas with little forest cover or significant human disturbance and conversely prefer large areas of contiguous interior forest (see USFWS 2004). Cape Breton Population is provincially endangered.
<i>Myotis lucifugus</i>	Little Brown Bat	E			YELLOW	The little brown bat can be found in most of the United States and Canada except for the south central and south eastern United States and northern Alaska and Canada. The little brown bat lives along streams and lakes. It forms nursery colonies in buildings. In the winter it hibernates in caves and mines.
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	E			YELLOW	The Northern Long-eared Bat (<i>Myotis septentrionalis</i>) is found in many regions of Canada. Although there are numerous records of its presence in eastern Canada and the United States, it has only been recorded sporadically in the west. This particular type of bat has two habitats: a winter hibernation habitat as well as a summer roosting and foraging habitat. The Northern Long-eared Bat hibernates in caves or abandoned mines during the cold winter months. During the summer months the Bats commonly use crevices behind peeling bark or cavities in partially-decayed trees as summer day roosts. Within thick forests, summer activity may be focused along watercourses and small ponds
<i>Perimyotis subflavus</i>	Eastern Pipistrelle (Tri-colored Bat)	E			YELLOW	Prefers partly open country with large trees and woodland edges. Avoids deep woods and open fields. Probably roosts in the summer in tree foliage and occasionally in buildings; may use cave as night roost between foraging forays. Usually hibernates in caves and mines with high humidity. Generally, maternity colonies utilize manmade structures or tree cavities; often in open sites that would not be tolerated by most other bats
<i>Sorex dispar</i>	Long-tailed Shrew				YELLOW	Mountainous, forested areas (deciduous or evergreen) with loose talus. Rocky damp areas with deep crevices covered by leaf mold and roots are preferred. May occur along small mountain streams. Will use artificial talus created by road construction and pit mines. "SOREX DISPAR is probably the most stenotopic mammal in eastern North America..." (Webster 1987). Trapping results reported by Richmond and Grimm (1950) suggest that Long-tailed Shrews spend most of their time in the labyrinth of spaces between rocks about a foot beneath the surface. Nest sites are usually associated with natural subterranean tunnels among boulder crevices.
<i>Sorex gaspensis</i>	Gaspé Shrew				YELLOW	The Gaspé Shrew prefers rock outcrops and talus slopes in highlands where there are steep slopes. Habitat loss and degradation seems to be the major limiting factors for this species. In particular, fire and clear-cutting, which change the forest habitat of talus slopes, are major threats to Gaspé Shrews. Found only in Gaspé Peninsula, New Brunswick and Cape Breton Island
<i>Birds</i>						
<i>Accipiter gentilis</i>	Northern Goshawk				YELLOW	BREEDING: Nests in a wide variety of forest types including deciduous, coniferous, and mixed forests. Has a complexity of habitat needs in the breeding season, which vary among forest types and region (Johnsgard 1990). Typically nests in mature or old-growth forests (Hayward and Escano 1989, Reynolds et al. 1982, Speiser and Bosakowski 1987, Squires and Ruggiero 1996, Squires and Reynolds 1997, McClaren 1998, Daw and Stefano 2001), and generally selects larger tracts of forest over smaller tracts (Bosakowski and Speiser 1994, Woodbridge and Detrich 1994).
<i>Actitis macularia</i>	Spotted Sandpiper				YELLOW	Breeds from northern Alaska and Canada across most of the continent to southern U.S. Spends winters along the pacific coast from British Columbia and across southern states south to South America. Preferred habitats include ponds, streams, and other waterways, both inland and along coasts.
<i>Anas acuta</i>	Northern Pintail				RED	Lakes, rivers, marshes and ponds in grasslands, barrens, dry tundra, open boreal forest or cultivated fields. Most breeding associated with seasonal and semi-permanent wetlands (Suchy and Anderson 1987). Often nests near freshwater lakes and ponds, but may nest some distance from water. Readily uses stock-watering ponds in North Dakota (Suchy and Anderson 1987); uses all sorts of man-made ponds in Quebec (Belanger and Couture 1989). May nest under cover of low vegetation or in open. Broods use emergent vegetation for escape cover. Nest is a depression lined with plant material and down.

<i>Anas clypeata</i>	Northern Shoveler				RED	NON-BREEDING: In migration and winter in both freshwater and brackish habitats, and in cultivated fields (not typical) Occasionally seen in NS for breeding.
<i>Anas discors</i>	Blue-winged Teal				RED	Marshes, ponds, sloughs, lakes, and sluggish streams
<i>Anas strepera</i>	Gadwall				RED	Lakes, ponds, rivers, marshes. Prefers freshwater but may be found on any open water during migration and winter. Moderate- to large sized wetland of a permanent or semi-permanent nature, expanded
<i>Asio flammeus</i>	Short-eared Owl	SC	SC		RED	Open grassy habitats including open peat lands, coastal and inland marshes, dykeland, dunes, pastures hayfields, grain stubble, airports and young conifer plantations. Mainly in coastal maritime regions especially Upper Bay of Fundy dykelands, Acadian peninsula (NB) coastal bogs and saltmarshes and northern PEI dunes and saltmarshes.
<i>Asio otus</i>	Long-eared Owl				RED	Occurs Throughout the northern hemisphere. Preferred habitats include dense vegetation close to grasslands or shrub lands, as well as open forests.
<i>Botaurus lentiginosus</i>	American Bittern				YELLOW	Breeds from southeastern Alaska, Manitoba, and Newfoundland south to California, New Mexico, Arkansas, and the Carolinas. Spends winters from coastal British Columbia, Illinois, and along the Atlantic coast to Long Island, and south to Costa Rica (rarely) and Greater Antilles. Preferred habitats include freshwater wetlands with tall emergent vegetation.
<i>Cathartes aura</i>	Turkey Vulture				YELLOW	Breeds from southern B.C., central Saskatchewan, the Great Lakes, and New Hampshire southward. Spends winters in the Southwest and eastern U.S. northward to southern New England. Preferred habitats include deciduous forests, woodlands and scrublands; often seen over adjacent farmlands.
<i>Chaetura pelagica</i>	Chimney Swift	T	T	Endangered	RED	This species was restricted to nesting in hollow trees and caves but now nests in chimneys and other human structures as well. All across Maritimes were appropriate nesting sites exist. Colonies in forested areas tend to be smaller and much harder to detect, but more mature forests tend to have larger and more abundant hollow trees and tend to support more birds.
<i>Charadrius vociferus</i>	Killdeer				YELLOW	Preferred habitat includes open areas such as plowed fields, golf courses, and short-grass prairies
<i>Chlidonias niger</i>	Black Tern	NAR			RED	Nests across northern U.S. and southern Canada; spends winters in South America. Preferred habitats include lakes, ponds, marshes, and coastal areas.
<i>Chordeiles minor</i>	Common Nighthawk	T	T	Threatened	RED	Nest throughout Maritimes with the exception of PEI. Nest on the ground in a variety of habitats having little or no tree cover and a limited cover of taller shrubs and herbs, and then can also nest on flat gravel roofs in urban settings. Forest clearings created by forestry or fire are probably the most widely used habitats in the region, but sand dunes, river bars, open forests; commercial blueberry fields, mining and aggregate excavation sites, rocky outcrops and drier peat lands are all potential nesting habitats. Easily observable at dusk or dawn- as they forage in the air for insects
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				RED	Breeds from Alberta and Montana east to Maritime Provinces, and south to northern Texas, Arkansas, and South Carolina. Spends winters in South America. Preferred habitats include moist thickets in low overgrown pastures and orchards; also occurs in thicker undergrowth and sparse woodlands.
<i>Contopus cooperi</i>	Olive-sided Flycatcher	T	T		RED	Breeds throughout the maritime provinces. Is most associated with openings or edges in coniferous forest containing tall trees or snags for perching. Bog margins, river valleys, beaver ponds and meadows, slow moving streams with broad floodplains and cut over areas with some standing trees are frequently used habitats.
<i>Contopus virens</i>	Eastern Wood-Pewee				YELLOW	Breeds from eastern Great Plains to the Atlantic ocean, ranging from southern Canada to northern Florida, the gulf coast and central Texas. Winters in the tropics. Preferred habitats include northern hardwood, pine-oak, oak-hickory, bottomland hardwood, southern pine savannah, and Midwestern forests; also found in orchards, parks, roadsides and suburban areas.
<i>Coturnicops noveboracensis</i>	Yellow Rail	SC	SC			In NB on grand lake meadows and the NB/NS border - extensive marshy sedge meadows. Any large, sedge or grass dominated open wetland with shallow water. Also other areas include damp fields, meadows, and herbaceous veg in bogs and at the drier margins or estuarine and salt marshes.
<i>Dendroica castanea</i>	Bay-breasted Warbler				YELLOW	Breeds from northeastern B.C. east to Maritime provinces and south to the northern Great Lakes region and northern New England. Spends winters in the tropics. Preferred habitats include open spruce forests and deciduous woodlands.
<i>Dendroica striata</i>	Blackpoll Warbler				YELLOW	Breeds from Alaska and northern Canada to southern Canada and northern New England. Spends winters in the tropics. Preferred breeding habitat is coniferous forests; during migration found chiefly in tall trees.

<i>Dendroica tigrina</i>	Cape May Warbler					YELLOW	Breeds from southern Mackenzie, Manitoba, Ontario and Quebec south to North Dakota, Michigan, northern New York, Maine and Nova Scotia. Spends winters in southern Florida and the West Indies. Preferred habitats, but during migration also found in evergreen or deciduous woodlands, and often parks or suburban yards.
<i>Dolichonyx oryzivorus</i>	Bobolink	T				YELLOW	Breeds from southern B.C. and across southern Canada to Nova Scotia and south to eastern Oregon, central Colorado, central Illinois, western Virginia, and western North Carolina. Spends winters in southern South America. Preferred habitats include prairies and meadows; stays on marshes during migration.
<i>Dumetella carolinensis</i>	Gray Catbird					RED	Breeds from southern Canada to central New Mexico, the Gulf states and Bermuda. Winters in the southeastern U.S., Panama, and the West Indie. Prefers low, dense vegetation or vine tangles at the edges of forests, marshes and streams; does not occur in forest interiors. Suburban landscapes often contain good habitat for this species.
<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher					YELLOW	Breeds from central Canada and Newfoundland south to Great Lakes region, northern New York, northern New England, and maritime provinces. Spends winters from Mexico to Panama.
<i>Empidonax traillii</i>	Willow Flycatcher					YELLOW	Breeds from southern B.C., Ab., North Dakota, New York, and Maine south to central California, Nevada, the southwest, Arkansas, and Virginia. Preferred habitats include swampy thickets, upland pastures, and old abandoned orchards; also occurs along wooded lakeshores and streams.
<i>Euphagus carolinus</i>	Rusty Blackbird	SC	SC			RED	Breed in wet forest and thicket habitats, generally in conifer dominated landscapes. Lake and river shore swamps, streamside thickets beaver ponds, peat lands, and shrubby or forested margins of sedge meadows and marshes are typical habitats. Most likely to be found in the more boreal habitats at higher elevations or coast influenced areas. Breeds from Alaska across northern Canada to southern Canada, northern New York, and northern New England. Spends winters from southeastern South Dakota and southern New England to the Gulf Coast. Preferred habitats include beaver ponds, roadsides, landfills, wet meadows, and shrubby shorelines.
<i>Falco peregrinus</i>	Peregrine Falcon					YELLOW	Breeds from Alaska and the Canadian arctic south locally through the mountainous west, and sparingly in the east. Spends winters on coasts north to B.C., and Massachusetts. Preferred habitats include tundra, savannas, coasts, mountains, and tall buildings.
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	SC		Vulnerable		RED	Breed around the Bay of Fundy shore, both in NB and NS on cliff ledges at sites where there is a steady supply of mid-sized birds such as small ducks or shorebirds. Ledges on tall buildings and bridges can also serve as suitable nest sites in urban areas.
<i>Gallinago delicata</i>	Wilson's Snipe					YELLOW	Breeds in northern U.S. and Canada. Spends winters as far south as northern South America. Prefers freshwater marshes and swamps, frequents open landscapes.
<i>Gavia immer</i>	Common Loon	NAR				RED	Breeding habitat includes usually clear lakes (McIntyre 1988) containing both shallow and deep water areas (McIntyre 1975, 1988; Strong 1985). In studies comparing lakes with and without loons, higher turbidity was suggested as a factor influencing lack of occupancy.
<i>Hirundo rustica</i>	Barn Swallow					YELLOW	Breeds from Alaska east across Canada to Newfoundland and south throughout most of the U.S.; spends winters in the tropics and Eurasia. Preferred habitats include agricultural lands, suburban areas, marshes and lakeshores.
<i>Histrionicus histrionicus pop. 1</i>	Harlequin Duck - Eastern pop.	SC	SC	Endangered		RED	Breed in northern Quebec and Labrador but few breed in turbulent rivers along the northern shores of Gulf of St. Lawrence, and northeast NB. Winter on sea coasts in the Maritimes
<i>Icterus galbula</i>	Baltimore Oriole					RED	Arrive in the northern states and Canada in April-May; males precede females by a few days. Southward migration begins in late July or early August. Habitat includes open woodland, deciduous forest edge, riparian woodland, partly open situations with scattered trees, orchards, and groves of shade trees. In migration and winter this oriole also occurs in humid forest edge, second growth, and scrub; treetop level in coffee and cacao plantations, and savannah groves. Nests are placed in trees, an average of around 25-30 feet (8-9 meters) above ground, usually at the end of a drooping branch.
<i>Ixobrychus exilis</i>	Least Bittern	T	T				Impoundment marshes (southern NB mostly). Might be present in natural marshes with the right mix of open water, cattails and some woody vegetation- and bigger than 5 ha.
<i>Limosa haemastica</i>	Hudsonian Godwit					YELLOW	Nests on mixed tundra/wetlands in northern Canada and Alaska. Migrates south off the Atlantic coast to South America for the winter. Preferred habitats include muddy, sandy or rocky shores, freshwater marshes, mudflats, and flooded fields.

<i>Molothrus ater</i>	Brown-headed Cowbird				YELLOW	Habitat Comments: Breeding habitat includes woodland, forest (primarily deciduous), forest edge, city parks, suburban gardens, farms, and ranches. Cowbirds often are associated with forest-field edge habitat and clearings in forests. Feedlots, pastures, and fields with livestock also attract cowbirds, especially in predominately forested areas. Permanent resident in NS
<i>Myiarchus crinitus</i>	Great Crested Flycatcher				RED	Uncommon with few confirmed breeding records broadly scattered over central and southern Nova Scotia (Erskine 1992). BREEDING: deciduous (mainly), mixed, or pine woodland or somewhat open forest (Hamel et al. 1982, Hamel 1992), parks, orchards, wooded residential areas, areas of scattered trees in cultivated regions, clearings and edges of wooded areas, and swamps. Frequents upper levels of trees. Research on canopy selection and flight length indicates a preference for open canopies where unhampered foraging flights can occur (Via 1979). Preferred perches are tall trees, but may also be found on utility lines and short shrub-like growth in recent clear-cuts (Via 1979).
<i>Numenius phaeopus</i>	Whimbrel				YELLOW	Breeds in the Arctic and winters in Africa, southern North America, South America and south Asia. Preferred habitats include tundra, marshes, prairies, shorelines and mud flats.
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				RED	Arrives in northern breeding areas March-May, departs by September-November. Extensive post breeding dispersal to areas outside breeding range (Palmer 1962). Marshes, swamps, wooded streams, mangroves, shores of lakes, ponds, lagoons; salt water, brackish, and freshwater situations. Roosts by day in mangroves or swampy woodland. Eggs are laid in a platform nest in groves of trees near coastal marshes or on marine islands, swamps, marsh vegetation, clumps of grass on dry ground, orchards, and in many other situations. Nests usually with other heron species.
<i>Perisoreus canadensis</i>	Gray Jay				YELLOW	Resident from Alaska east to Labrador and south across the northern U.S. Most commonly found in coniferous forests.
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				RED	Cliff swallows inhabit open to semi wooded habitat, cliffs, canyons, and farm country, generally near meadows, marshes, and water. They build bottle-shaped mud nest in colonies on cliffs, under eaves of buildings, under bridges, and similar sites sheltered by an overhang. Many return to same nesting areas in successive years, but colonies tend to switch nesting sites between seasons, evidently due to a buildup of insect parasites in the nests. Cliff swallows commonly repair and use old nests.
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				YELLOW	Breeds from northeastern B.C. Manitoba, and Nova Scotia to southern Alberta, North Dakota, Oklahoma, and New Jersey, and as far south as Georgia; regular visitor on the west coast and winters from central into northern South America. Preferred habitats include moist woodlands, open fields and old, overgrown orchards.
<i>Picoides arcticus</i>	Black-backed Woodpecker				YELLOW	Resident in Alaska, Canada, and northern U.S. Preferred habitat includes coniferous forests in the boreal zone, especially where burned, logged, or swampy.
<i>Pinicola enucleator</i>	Pine Grosbeak				RED	Open coniferous (less commonly mixed coniferous-deciduous) forest and forest edge; in migration and winter also in deciduous forest, woodland, second growth and shrubbery. Nests in trees or shrubs in open coniferous woods, 2-9 m above ground. Non breeding resident in NS.
<i>Podilymbus podiceps</i>	Pied-billed Grebe				YELLOW	Breeds from British Columbia, southern Mackenzie, and Nova Scotia southward. Spends winters in the southern states or wherever water remains open. Preferred habitats include marshes and ponds.
<i>Poecile hudsonica</i>	Boreal Chickadee				YELLOW	Boreal coniferous and mixed forests, muskeg bogs, vicinity of white cedar and hemlock swamps, birches and streamside willows. Nests in natural cavities or abandoned woodpecker holes, or in cavity dug by pair in rotten tree stub, usually within 1 m of ground. Permanent resident. Breeds from northern Alaska east to Labrador and Newfoundland, south to northern edge of U.S. Occasionally wanders southward during winter. Usually found in coniferous forests.
<i>Pooecetes gramineus</i>	Vesper Sparrow				RED	Habitats include plains, prairies, dry shrub lands, savannas, weedy pastures, fields, sagebrush, arid scrub, and woodland clearings. Breeding bird in northern NS
<i>Regulus calendula</i>	Ruby-crowned Kinglet				YELLOW	Breeds from Alaska east across Canada to Newfoundland, south California and New Mexico, and to the Great Lakes region and southern New England in the east. Spends winters south from southern B.C. and California across the southern tier of the states to southern New England. Preferred habitats include coniferous and deciduous forests.
<i>Regulus satrapa</i>	Golden-crowned Kinglet				YELLOW	Common from southern Alaska to central Canada and southeast to the Carolinas; spends winters south to Florida and the Gulf Coast. Preferred habitats include dense conifer forests; also found in deciduous and mixed forests.

<i>Riparia riparia</i>	Bank Swallow				RED	Habitat includes open and partly open situations, frequently near flowing water (AOU 1983). Nests are in steep sand, dirt, or gravel banks, in burrows dug near the top of the bank, along the edge of inland water, or along the coast, or in gravel pits, road embankments, etc. Both sexes construct the nest burrow. Pairs usually dig a new burrow each year, but sometimes they use old bank swallow burrows or abandoned cavities of the belted kingfisher. Individuals tends to return to same nesting area in successive years, though they may move several kilometers away, especially if nesting was unsuccessful the previous year; yearlings often return to the natal area or nearby Breeding Bird NS
<i>Sayornis phoebe</i>	Eastern Phoebe				YELLOW	Breeds north of Mason-Dixon lines in North America; spends winters as far north as the Ohio River.
<i>Sialia sialis</i>	Eastern Bluebird	NAR			YELLOW	Habitat includes forest edge, open woodland, and partly open situations with scattered trees, from coniferous or deciduous forest to riparian woodland, also pine woodland or savannah in the tropics. Nests are in natural cavities, old woodpecker holes, bird boxes, or similar sites, mostly 3-20 feet (1-6 meters) above ground. Breeding Bird- NS- northern portions only - towards Amherst and Pictou/Antigonish counties. Breeds east of the Rockies from southeast Canada to the Gulf of Mexico; winters in southern portion of breeding range. Inhabits open woodlands, clearings, farmlands, parks, orchards, gardens, fields, often seen along roadsides on utility wires & fences.
<i>Spinus pinus</i>	Pine Siskin				YELLOW	Breeds from southern Alaska, Mackenzie, Quebec, and Newfoundland south to California, Arizona, New Mexico, Texas, Great Lakes region, and northern New England; wanders southward throughout the U.S. during winter. Preferred habitats include coniferous and deciduous forests, woodlands, parks, alder thickets, and brushy pastures.
<i>Sterna paradisaea</i>	Arctic Tern				RED	Nests on ground on rocky, sandy, gravelly, or grass-covered coasts and islands, in far north on islands in lakes and ponds and in marshes and on riverine gravel bars, sometimes on open tundra. Breeding Bird NS.
<i>Sturnella magna</i>	Eastern Meadowlark				YELLOW	Breeds from southeastern Canada through eastern U.S. west to Arizona; resident in the Bahamas and Mexico. Spends winters mostly within breeding range. Preferred habitats include pastures, meadows, grassy fields, prairies, open country and country roadsides. Often seen singing from fence posts or utility wires.
<i>Tachycineta bicolor</i>	Tree Swallow				YELLOW	Breeds from Alaska east through northern Manitoba to Newfoundland and south to California, Colorado, Nebraska, and Maryland. Spends winters north to southern California, the Gulf Coast, and the Carolinas. Preferred habitats include open areas near water, such as fields, marshes, meadows, shorelines, beaver ponds, and wooded swamps and standing dead trees.
<i>Tringa semipalmata</i>	Willet				RED	Marshes, tidal mudflats, beaches, lake margins, mangroves, tidal channels, river mouths, coastal lagoons, sandy or rocky shores, and, less frequently, open grassland (AOU 1983, Stiles and Skutch 1989). Nests along marshy lake margins in western North America, salt marshes in eastern North America. Nests on the ground in open places, coastal marshes, beaches, or islands; and inland in wet grassland by lakes, or short grass or bare ground by water.
<i>Tyrannus tyrannus</i>	Eastern Kingbird				YELLOW	Breeds from British Columbia across interior Canada to Maritime Provinces and south to Northern California, central Texas, the Gulf coast, and Florida. Spends winters in the tropics. Inhabits open woodlands, clearings, rural roadsides, farms, orchards, edges of fields, streams, and suburbs.
<i>Vermivora peregrina</i>	Tennessee Warbler				YELLOW	Breeds from Yukon, Manitoba, and Labrador south to B.C., Wisconsin, southern Ontario, and Maine. Spends winters in the tropics. Preferred habitats include open mixed woodlands in the breeding season; trees and bushes during migration.
<i>Wilsonia canadensis</i>	Canada Warbler	T	T		RED	Found throughout the Maritimes- breeds in a variety of forest types- always in areas with a well-developed shrub layer and frequently in moist to wet sites. Forested swamps with some combination of white cedar, black spruce, red maple, and tamarack and dense mixed forests on steep river valley slopes are favoured habitat.
<i>Wilsonia pusilla</i>	Wilson's Warbler				YELLOW	Breeds from Alaska eastward to Newfoundland and south to southern California, New Mexico, central Ontario, and Nova Scotia. Spends winters in the tropics. Preferred habitats include moist thickets in woodlands and along streams as well as alder, willow thickets, and bogs.
Herpetofauna						
<i>Chelydra serpentina</i>	Snapping Turtle	SC	SC		GREEN	southern new Brunswick and parts of mainland nova scotia in ponds, lakes, slow-moving streams and sometimes in brackish water if these water bodies have soft mud bottoms and abundant aquatic vegetation

<i>Glyptemys insculpta</i>	Wood Turtle	T	T	V	YELLOW	Habitat destruction and fragmentation due to intense development and accompanying stream alterations are serious problems in the southeastern portion of the Wood Turtle's range. protection of wooded stream corridors, nesting, feeding, basking, and overwintering sites, and an upland buffer would be necessary to include in preserve design. Lives along permanent streams during much of each year, but in summer may roam widely overland and can be found in a variety of terrestrial habitats adjacent to streams, from deciduous woods, cultivated fields, and woodland bogs, to marshy pastures. Use of woodland bogs and marshy fields is most common in the northern part of the range.
Fishes						
<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon				RED	Primarily marine, but close to shore, when not breeding; migrates to rivers for spawning, moves downstream afterward (may stay upstream in winter in some northern areas).
<i>Alosa pseudoharengus</i>	Gaspereau (Alewife)				YELLOW	The alewife is found in rivers and lakes along the eastern coast of North America, from Newfoundland to North Carolina, and the adults live in coastal marine waters 56 to 110 m (180 to 350 ft.) deep. Landlocked populations exist in several Ontario and New York lakes. Since the Welland Canal was built in 1824, the alewife has spread throughout the Great Lakes.
<i>Anguilla rostrata</i>	American Eel	SC			GREEN	Move from salt water into fresh water when quite young and spend their adult life in fresh water returning to spawn in tropical oceans up to several decades later. Widely distributed in freshwaters, estuaries and coastal marine waters connected to the Atlantic Ocean. Although small streams may be critical to the persistence of eels in a watershed, they may use these streams only once or twice a year, while moving to and from more preferred habitats.
<i>Culaea inconstans</i>	Brook Stickleback				YELLOW	This species generally occupies cool, clear, heavily weeded, spring-fed creeks, small rivers, lakes, and ponds, usually in shallow, quiet to flowing pools and backwaters over sand or mud. Sometimes it burrows into soft bottoms. Occasionally this fish can be found in brackish water. In a lake in Manitoba, adults were most abundant at the outer margin of emergent vegetation (Moodie 1986). Eggs are deposited in a nest made of plant material by the male just above the bottom in shallow water.
<i>Margariscus margarita</i>	Pearl Dace				YELLOW	Cool, clear headwater streams in the south, bog drainage streams, ponds and small lakes in the north, and in stained, peaty waters of beaver ponds" (Scott and Crossman 1973). Usually over sand or gravel (Page and Burr 1991). Spawns in clear water over sand or gravel in weak or moderate current (Scott and Crossman 1973).
<i>Salvelinus fontinalis</i>	Brook Trout (Char)				YELLOW	They grow and survive best in temperatures between 13° and 18°C (55° and 65°F). Brook trout, which like other char and trout are a cold-water species, can survive a wide range of temperatures, from near 0°C (32°F) to around 22°C (72°F). Many mistakenly consider deep, cold-water lakes the ideal habitat for brook trout. However, brook trout are not a deep-water species. They can tolerate that environment, but seldom will they use depths greater than 4.6 to 6 meters (15 to 20 feet) unless temperatures in shallower water are too high and no other cold-water refuge areas exist. Brook trout can be found in even the smallest spring-fed streams, especially where cover is available. Fingerlings prefer shallow water about 41 cm (16 in.) deep, and adults do not need much more than that. In streams, they prefer areas where the substrate consists of gravel and cobble with diameters of between 2 and 25 cm.
<i>Salvelinus namaycush</i>	Lake Trout (Char)				YELLOW	From a zoogeographical perspective, lake trout are quite rare. They are native only to the northern parts of North America, principally Canada but also Alaska and, to some extent, the northeastern United States. Lake trout have been introduced into many other parts of the world, mainly into Europe but also into South America and certain parts of Asia. In Canada, approximately 25% of the world's lake trout lakes are found in the province of Ontario. Even at that, only 1% of Ontario's lakes contain lake trout.
Plants						
<i>Adiantum pedatum</i>	Northern Maidenhair Fern				RED	hardwood forest, intervale
<i>Ageratina altissima</i>	White Snakeroot				RED	mixed wood forest, river or stream
<i>Allium schoenoprasum</i>	Wild Chives				RED	Rocky pastures and damp meadows, preferring calcareous soils
<i>Allium tricoccum</i>	Wild Leek				RED	hardwood forest, intervale
<i>Amelanchier nantucketensis</i>	Nantucket Serviceberry				RED	Pine barrens, pond margins, fields, edges, and thickets
<i>Anemone americana</i>	Round-lobed Hepatica				RED	rocky woods
<i>Anemone canadensis</i>	Canada Anemone				RED	alluvial floodplain, field meadow
<i>Anemone parviflora</i>	Small-flowered Anemone				RED	cliff or talus slope
<i>Anemone quinquefolia</i>	Wood Anemone				YELLOW	intervale, river or stream

<i>Anemone virginiana</i>	Virginia Anemone			YELLOW	cliff or talus slope, intervalle, river or stream
<i>Antennaria parlinii</i>	Parlin's Pussytoes			RED	hard wood, mixed wood, river or stream
<i>Antennaria rosea</i>	Rosy Pussytoes			RED	Dry, open places, meadows, and open woods
<i>Arabis drummondii</i>	Drummond's Rockcress			YELLOW	cliff or talus slope
<i>Arabis hirsuta</i>	Western Hairy Rockcress			RED	cliff or talus slope
<i>Arnica lonchophylla</i>	Northern Arnica			RED	cliff or talus slope
<i>Artemisia campestris</i>	Field Wormwood			RED	cliff or talus slope
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort			YELLOW	cliff or talus slope, river or stream
<i>Astragalus robbinsii</i>	Robbins' Milkvetch			RED	cliff or talus slope, headland
<i>Betula glandulosa</i>	Glandular Birch			RED	barrens, bog
<i>Betula michauxii</i>	Newfoundland Dwarf Birch			YELLOW	Sphagnum bogs, around pools, and wet peaty meadows
<i>Betula minor</i>	Dwarf White Birch			YELLOW	Acidic rocky barrens, peats and alpine summits of higher mountains.
<i>Betula pumila</i>	Bog Birch			YELLOW	bog
<i>Bistorta vivipara</i>	Alpine Bistort			RED	Moist to wet spruce or mixed woods along shorelines, moist subalpine woods and meadows, alpine meadows, heaths, nutrient-rich sites
<i>Boehmeria cylindrica</i>	Small-spike False-nettle			RED	Moist and shady ground, in deciduous woods, swamps, bogs, marshes, wet meadows and ditches
<i>Botrychium lanceolatum</i>	Triangle Moonwort			YELLOW	field meadow, hardwood forest, swamp
<i>Botrychium lunaria</i>	Common Moonwort			RED	field meadow, lake or pond shore
<i>Botrychium simplex</i>	Least Moonwort			YELLOW	beach or coastal shore, field meadow, lake or pond shore, river or stream, swamp
<i>Bromus latiglumis</i>	Broad-glumed Brome			RED	alluvial floodplain
<i>Calamagrostis stricta</i>	Slim-stemmed Reed Grass			YELLOW	bog, cliff or talus slope, lakeshore wetland
<i>Caltha palustris</i>	Yellow Marsh Marigold			YELLOW	field meadow, river or stream, swamp
<i>Campanula aparinoides</i>	Marsh Bellflower			YELLOW	field meadow, river or stream
<i>Cardamine maxima</i>	Large Toothwort			RED	hardwood forest, river or stream
<i>Cardamine parviflora</i>	Small-flowered Bittercress			YELLOW	coastal island, headland, mixed wood forest
<i>Cardamine pratensis</i>	Cuckoo Flower			RED	Moist, slightly shady places in meadows and by streams
<i>Carex adusta</i>	Lesser Brown Sedge			YELLOW	Dry, open places. [Rocky coastal (non-forested, upland)]
<i>Carex atratiformis</i>	Scabrous Black Sedge			YELLOW	Brook sides, ravines, and damp slopes. [Rocky summits and outcrops (nonforested, upland)]; Non-tidal river shore (non-forested, seasonally wet)
<i>Carex bebbii</i>	Bebb's Sedge			RED	Wet meadows and stream sides
<i>Carex capillaris</i>	Hairlike Sedge			YELLOW	calcium-rich, wet habitats, including ledges, talus slopes, ditches, cedar swamps, and bogs
<i>Carex castanea</i>	Chestnut Sedge			RED	cliff or talus slope, field meadow, swamp
<i>Carex chordorrhiza</i>	Creeping Sedge			RED	bog
<i>Carex comosa</i>	Bearded Sedge			YELLOW	Marshes, lake shores, and wet meadows
<i>Carex digitalis</i>	Slender Wood Sedge			RED	softwood forests
<i>Carex eburnea</i>	Bristle-leaved Sedge			YELLOW	cliff or talus slope
<i>Carex gynocrates</i>	Northern Bog Sedge			RED	bog, coastal island, swamp
<i>Carex haydenii</i>	Hayden's Sedge			RED	open habitats of bogs/poor fens, moist meadows, and seasonally wet soils
<i>Carex hirtifolia</i>	Pubescent Sedge			YELLOW	upland deciduous woodlands, upland oak savannas, thinly wooded bluffs and slopes, woodland openings
<i>Carex houghtoniana</i>	Houghton's Sedge			YELLOW	Dry to moist sandy or gravelly soils in open, disturbed sites, ledges
<i>Carex hystericina</i>	Porcupine Sedge			RED	wet prairies, swamps, grassy fens, sedge meadows, calcareous seeps, edges of marshes (sandy & non-sandy), and ditches
<i>Carex laxiflora</i>	Loose-flowered Sedge			RED	forests, mixed wood
<i>Carex livida</i>	Livid Sedge			RED	bog or field meadow
<i>Carex longii</i>	Long's Sedge			RED	wet sandy soils
<i>Carex ormostachya</i>	Necklace Spike Sedge			RED	Moist to dry deciduous, evergreen, or mixed deciduous-evergreen forests, frequently sandy gravel or disturbed soils
<i>Carex peckii</i>	Peck's Sedge			RED	Well-drained openings, usually on calcareous substrates; rocky woods and borders, rock exposures, hemlock woods
<i>Carex pellita</i>	Woolly Sedge			RED	moist to wet prairies and dolomite prairies, prairie swales, sedge meadows, seeps and calcareous seeps, swamps and openings in floodplain woodlands, poorly drained fields, and roadside ditches
<i>Carex plantaginea</i>	Plantain-leaved Sedge			RED	mixed wood forests
<i>Carex prairea</i>	Prairie Sedge			RED	disturbed sites, swamps
<i>Carex rariflora</i>	Loose-flowered Alpine Sedge			RED	beach or coastal shore, bog
<i>Carex rostrata</i>	Narrow-leaved Beaked Sedge			RED	wet meadows, marshes, edges of lakes, ponds, and streams, and other riparian areas
<i>Carex saxatilis</i>	Russet Sedge			RED	lake or pond shore, lakeshore wetland
<i>Carex scirpoidea</i>	Scirpuslike Sedge			YELLOW	moist meadows, stream banks, rivers, lakeshores and open rocky slopes in the mountains
<i>Carex swanii</i>	Swan's Sedge			YELLOW	Boggy pastures, dry peaty barrens, forests, clearings and the edges of woods.
<i>Carex tenera</i>	Tender Sedge			YELLOW	wet prairies, swamps, and floodplain woods
<i>Carex tenuiflora</i>	Sparse-flowered Sedge			RED	fen and mixed wood forest
<i>Carex tincta</i>	Tinged Sedge			RED	disturbed sites, hardwood forests
<i>Carex tuckermanii</i>	Tuckerman's Sedge			RED	field meadow, marsh, river or stream
<i>Carex wiegandii</i>	Wiegand's Sedge			RED	bogs and poor fens, disturbed sites, swamps

<i>Caulophyllum thalictroides</i>	Blue Cohosh				RED	alluvial floodplain, hardwood forest, intervale
<i>Ceratophyllum echinatum</i>	Prickly Hornwort				RED	fresh water of lakes, ponds, marshes and swamps
<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				RED	alluvial floodplain
<i>Clematis occidentalis</i>	Purple Clematis				RED	mixed wood forest, river or stream
<i>Coeloglossum viride</i>	Long-bracted Frog Orchid				RED	Alluvial floodplain, bog, coastal island, mixed and softwood forests
<i>Comandra umbellata</i>	Bastard's Toadflax				RED	Occur in plains and foothills in dry or moist soils that are sandy and well drained
<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				YELLOW	coastal island, hardwood forest, headland, marsh, softwood forest, swamp
<i>Conopholis americana</i>	American Cancer-root				RED	hardwood forest
<i>Crataegus flabellata</i>	Fan-leaved Hawthorn				YELLOW	open woods
<i>Cryptogramma stelleri</i>	Steller's Rockbrake				RED	cliff or talus slope, softwood forest
<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				RED	moist thickets, marshes
<i>Cynoglossum virginianum</i>	Wild Comfrey				RED	hardwood forest
<i>Cypripedium arietinum</i>	Ram's-Head Lady's-Slipper		Endangered		RED	Ram's-head Lady Slipper is found in moderately open forests possessing cool, sub-acid or neutral soils. In Nova Scotia, it is largely associated with gypsum bedrock, and is found in moderately open, mesic woods on outcrops, cliff tops, river banks, moderate to steep slopes and in sinkholes. Forest cover at known sites includes deciduous-dominated, conifer-dominated and mixed stands of young-intermediate to mature forest. Elsewhere in its range, the species is also known from conifer swamps and fens, and open forests on limestone bedrock.
<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper				YELLOW	hardwood and mixed wood forest
<i>Cypripedium reginae</i>	Showy Lady's-slipper				RED	bog, swamp
<i>Cystopteris laurentiana</i>	Laurentian Bladder Fern				RED	Cracks and ledges on cliffs, often on calcareous substrates
<i>Desmodium glutinosum</i>	Large Tick-trefoil				RED	hardwood forest, intervale
<i>Diapensia lapponica</i>	Diapensia				RED	cliff or talus slope
<i>Dirca palustris</i>	Eastern Leatherwood				RED	hardwood, mixed wood
<i>Draba arabisans</i>	Rock Whitlow-grass				YELLOW	cliff or talus slope
<i>Draba glabella</i>	Rock Whitlow-grass				RED	cliff or talus slope
<i>Draba norvegica</i>	Norwegian Whitlow-grass				RED	cliff or talus slope
<i>Draba pycnosperma</i>	Dense Whitlow-grass				RED	cliff or talus slope
<i>Dryopteris fragrans</i>	Fragrant Wood Fern				YELLOW	cliff or talus slope
<i>Eleocharis fallax</i>	Creeping Spikerush				RED	marsh, lakeshore wetlands
<i>Eleocharis flavescens</i>	Yellow Spikerush				YELLOW	lakeshore wetland, swamp
<i>Eleocharis ovata</i>	Ovate Spikerush				YELLOW	sandy freshwater margins, including lakes, ponds and rivers
<i>Eleocharis quinqueflora</i>	Few-flowered Spikerush				RED	sparsely vegetated wet habitats found in graminoid fens, shorelines of ponds and small lakes, and occasionally in wet prairie openings
<i>Eleocharis rostellata</i>	Beaked Spikerush				YELLOW	Saline, limy or brackish marshes. [Non-tidal river shore (non-forested, seasonally wet); Open wetland, not coastal nor river shore (non-forested, wetland)]
<i>Elymus wiegandii</i>	Wiegand's Wild Rye				RED	field meadow, river or stream
<i>Empetrum eamesii</i>	Pink Crowberry				YELLOW	barrens, beach or coastal shore, bog, exposed rock or sand, headland
<i>Epilobium coloratum</i>	Purple-veined Willowherb				YELLOW	lake or pond shore, marsh
<i>Epilobium strictum</i>	Downy Willowherb				YELLOW	bog, field meadow
<i>Erigeron compositus</i>	Cut-leaved Fleabane				RED	Rocky embankments and sunny sandy slopes
<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				YELLOW	cliff or talus slope, river or stream
<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				YELLOW	fields, open woods, grassy areas
<i>Eriophorum gracile</i>	Slender Cottongrass				YELLOW	bog, field meadow, lakeshore wetland, swamp
<i>Eutrochium dubium</i>	Coastal Plain Joe-pye-weed				RED	swamps and other wet habitats with acidic sandy soils
<i>Fallopia scandens</i>	Climbing False Buckwheat				YELLOW	Open woodlands in floodplain areas, woodland borders, thickets, riverbanks, ditches, sloping ground along bridges, and fence rows. Moist areas- disturbed sites
<i>Festuca prolifera</i>	Proliferous Fescue				YELLOW	cliff or talus slope
<i>Festuca subverticillata</i>	Nodding Fescue				RED	alluvial floodplain, hardwood forest
<i>Floerkea proserpinacoides</i>	False Mermaidweed				YELLOW	hardwood forest, intervale
<i>Fraxinus nigra</i>	Black Ash				YELLOW	swamp
<i>Fraxinus pennsylvanica</i>	Red Ash				RED	bogs and seepages or bottomland forests or disturbed and weedy areas or mesic upland forests or mixed forest edges or suburban plantings
<i>Galium boreale</i>	Northern Bedstraw				RED	woodlands, fields, edges of streams and lakes
<i>Galium labradoricum</i>	Labrador Bedstraw				YELLOW	Bogs, mossy thickets, woods. [Conifer forest (forest, upland)]
<i>Galium obtusum</i>	Blunt-leaved Bedstraw				RED	Swamps, swampy grounds, wet areas of prairies, wet woods and thickets, roadside ditches.
<i>Gentianella amarella</i>	Northern Gentian				RED	field meadow, lake or pond shore (possibly)
<i>Geocaulon lividum</i>	Northern Comandra				YELLOW	bog, coastal island, exposed rock or sand, mixed wood forest
<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain				YELLOW	hardwood, mixed wood and softwood forest
<i>Goodyera pubescens</i>	Downy Rattlesnake-plantain				RED	hardwood, mixed wood, and softwood forests
<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				YELLOW	coniferous swamps and bogs, cool, shady, moist coniferous forests with a mossy understory
<i>Gratiola neglecta</i>	Clammy Hedge-hyssop				YELLOW	marsh, river or stream

<i>Halenia deflexa</i>	Spurred Gentian				YELLOW	edges of moist forest, and wet, forest road ditches
<i>Hedeoma pulegioides</i>	American False Pennyroyal				YELLOW	Dry soil in open woods and fields
<i>Hieracium robinsonii</i>	Robinson's Hawkweed				YELLOW	cliff or talus slope, river or stream
<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				YELLOW	barrens, coastal island, exposed rock or sand
<i>Hypericum majus</i>	Large St. John's-wort				RED	wet meadows, shores, ditches, fens
<i>Impatiens pallida</i>	Pale Jewelweed				YELLOW	alluvial floodplain, coastal island, intervale
<i>Juncus alpinoarticulatus</i>	Alpine Rush				RED	Wet meadows, sandy and gravelly, often calcareous shores, fens, and clayey pools over rock
<i>Juncus brachycephalus</i>	Short-headed Rush				RED	This plant grows on calcareous shores, wet fields and in marshes.
<i>Juncus dudleyi</i>	Dudley's Rush				YELLOW	wet prairies, prairie swales, fens, gravelly seeps, calcareous springs, and ditches
<i>Juncus marginatus</i>	Grass-leaved Rush				YELLOW	disturbed sites, field meadows, river or stream
<i>Juncus secundus</i>	One-sided Rush				RED	Exposed sites, usually with well-drained sandy soil, often associated with shallow bedrock
<i>Juncus stygius</i>	Moor Rush				YELLOW	bog
<i>Juncus subcaudatus</i>	Woodland Rush				YELLOW	Marshes, edges of streams, and peaty acidic and basic wetlands including fens
<i>Juncus trifidus</i>	Highland Rush				YELLOW	cliff or talus slope
<i>Juncus vaseyi</i>	Vasey's Rush				RED	intermittent wetlands of various types, including wet prairies, moist sandy barrens and open marshy flats or swales
<i>Lactuca hirsuta</i>	Hairy Lettuce				YELLOW	disturbed sites, lake or pond shore, mixed wood forest
<i>Laportea canadensis</i>	Canada Wood Nettle				YELLOW	alluvial floodplain, hardwood forest, intervale, mixed wood forest
<i>Lilium canadense</i>	Canada Lily				YELLOW	field meadow, river or stream
<i>Listera australis</i>	Southern Twayblade				RED	Bog, mixed wood forest
<i>Lobelia kalmii</i>	Brook Lobelia				RED	bog, cliff or talus slope, field meadow
<i>Lobelia spicata</i>	Pale-spiked Lobelia				RED	prairies, glades, open woods, bluffs, wet meadows
<i>Malaxis monophyllos</i>	White Adder's-mouth				RED	cliff or talus slope
<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				YELLOW	Quiet waters of lakes, ponds, streams, and deep marshes, or rooting on muddy shores
<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				YELLOW	field meadow, lake or pond shore, swamp
<i>Osmorhiza depauperata</i>	Blunt Sweet Cicely				RED	woodlands - plains to higher mountain elevations
<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				RED	rich woods and thickets Eastern N. America; in sun or partial shade
<i>Oxyria digyna</i>	Mountain Sorrel				RED	northern coniferous forest
<i>Oxytropis campestris</i>	Field Locoweed				RED	cliff or talus slope, headland
<i>Panicum tuckermanii</i>	Tuckerman's Panic Grass				YELLOW	Open, moist sandy shores and fields
<i>Parnassia palustris</i>	Marsh Grass-of-Parnassus				RED	More alkaline habitats, such as meadows and in damp calcareous sands on lakeshores. Swamps, lakeshores, bogs
<i>Pedicularis palustris</i>	Marsh Lousewort				RED	field meadow, marsh
<i>Persicaria arifolia</i>	Halberd-leaved Tearthumb				YELLOW	swampy, calcareous or fen habitats
<i>Pilea pumila</i>	Dwarf Clearweed				RED	hardwood, mixed wood, river or stream
<i>Pinguicula vulgaris</i>	Common Butterwort				RED	coastal island, cliff or talus slope, river or stream
<i>Piptatherum canadense</i>	Canada Rice Grass				YELLOW	barrens, exposed rock or sand
<i>Piptatherum pungens</i>	Slender Rice Grass				YELLOW	Open areas in dry (or occasionally moist), sandy or very rocky, nutrient-poor soils. Openings in coniferous forests, talus cliffs, and rocky lakeshores
<i>Platanthera flava</i>	Tuberclad Orchid				YELLOW	bog, field meadow, lake or pond shore, lakeshore wetland, river or stream, swamp
<i>Platanthera macrophylla</i>	Large Round-leaved Orchid				YELLOW	hardwood, mixed wood and softwood forest
<i>Poa glauca</i>	Glaucous Blue Grass				YELLOW	coastal island, cliff or talus slope
<i>Polygala sanguinea</i>	Blood Milkwort				YELLOW	field meadow, mixed wood forest
<i>Polystichum lanchitis</i>	Northern Holly Fern				YELLOW	cliff or talus slope
<i>Primula mistassinica</i>	Mistassini Primrose				YELLOW	cliffs, rock splash pools
<i>Proserpinaca intermedia</i>	Intermediate Mermaidweed				RED	sandy bogs and savannas, and especially along the periphery of sandy, acid ponds, lakes, streams, ditches, and also in wet pine savannas and flat woods, cypress-black gum ponds, swamps, and damp clearings
<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				YELLOW	shallow waters of bogs, marshes, swamps, and along the muddy shores and banks of ponds and streams
<i>Pyrola minor</i>	Lesser Pyrola				YELLOW	damp woodlands, heaths, plantations, disused railways, on rock ledges and in sand-dunes
<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup				RED	field meadow
<i>Rhamnus alnifolia</i>	Alder-leaved Buckthorn				YELLOW	bog, field meadow, swamp
<i>Rhododendron lapponicum</i>	Lapland Rosebay				RED	cliff or talus slope
<i>Rhynchospora capillacea</i>	Slender Beakrush				RED	bogs
<i>Rudbeckia laciniata</i>	Cut-leaved Coneflower				YELLOW	intervale, lake or pond shore
<i>Salix candida</i>	Sage Willow				RED	bog
<i>Salix pedicellaris</i>	Bog Willow				YELLOW	bog, lake or pond shore, lakeshore wetland, marsh
<i>Salix reticulata</i>	Net-veined Willow				RED	barrens, cliff or talus slope
<i>Salix uva-ursi</i>	Bearberry Willow				RED	barrens, cliff or talus slope
<i>Salix vestita</i>	Hairy Willow				RED	cliff or talus slope
<i>Sanicula odorata</i>	Clustered Sanicle				RED	alluvial flood plain only
<i>Saxifraga aizoides</i>	Yellow Mountain Saxifrage				RED	cliff or talus slope

<i>Saxifraga cernua</i>	Nodding Saxifrage				RED	seepage areas, moist crevices, and along stream banks, creeks and lakeshores, on moist ledges and in exposed dry sites
<i>Saxifraga oppositifolia</i>	Purple Mountain Saxifrage				RED	cliff or talus slope
<i>Saxifraga paniculata</i>	White Mountain Saxifrage				YELLOW	cliff or talus slope
<i>Selaginella selaginoides</i>	Low Spikemoss				RED	bog, river or stream
<i>Shepherdia canadensis</i>	Soapberry				YELLOW	cliff or talus slope
<i>Silene acaulis</i>	Moss Campion				RED	long streams, river terraces, tundra, slopes, ridges, cliffs; on seepage slopes, or dry, or moderately well drained areas; calcareous; gravel, sand, silt, till; with low organic content
<i>Silene antirrhina</i>	Sleepy Catchfly				RED	roadsides, railways, pastures, fields waste grounds, alluvial woods
<i>Solidago hispida</i>	Hairy Goldenrod				RED	Woods and forest edges
<i>Solidago multiradiata</i>	Multi-rayed Goldenrod				RED	Meadows, pastures, disturbed areas, roadsides
<i>Spiranthes casei</i>	Case's Ladies'-tresses				YELLOW	Dry to moderately moist sandy soils, deep to shallow and sand filled crevices of igneous rock, roadsides and pastures.
<i>Spiranthes lucida</i>	Shining Ladies'-tresses				RED	Saturated, calcareous, usually gravelly or sandy soils. Typical habitats include stream and river banks or floodplain terraces, fens, and old quarries or gravel pits
<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				YELLOW	barrens, disturbed sites, field meadow, river or stream
<i>Stellaria crassifolia</i>	Fleshy Stitchwort				RED	Fens, fen meadows, meadows, springs, waterside meadow shores that are prone to flooding, seashore kelp banks
<i>Symphyotrichum boreale</i>	Boreal Aster				YELLOW	bogs, fens
<i>Symphyotrichum ciliolatum</i>	Fringed Blue Aster				YELLOW	Open woods and meadows in poor soils
<i>Symphyotrichum undulatum</i>	Wavy-leaved Aster				YELLOW	beach or coastal shore, field meadow, softwood forest
<i>Thuja occidentalis</i>	Northern White Cedar			Vulnerable	RED	Cedar is an uncommon tree in Nova Scotia and currently only 32 stands in five counties have been identified. The population is fragmented and comprised of mostly small stands that appear genetically separate from each. Most populations are different from populations in NB and PEI. Almost all of the cedars are located on private land and only one stand is formally protected.
<i>Tiarella cordifolia</i>	Heart-leaved Foamflower				YELLOW	hardwood forest, intervale
<i>Triantha glutinosa</i>	Sticky False Asphodel				RED	beach or coastal shore, bog, swamp
<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				YELLOW	intervale (low tract of land along a river)
<i>Vaccinium caespitosum</i>	Dwarf Bilberry				YELLOW	cliff or talus slope, disturbed sites, field meadow
<i>Vaccinium ovalifolium</i>	Oval-leaved Bilberry				RED	softwood forest
<i>Vaccinium uliginosum</i>	Alpine Bilberry				YELLOW	barrens, beach or coastal shore, bog, exposed rock or sand, headlands, field meadow
<i>Viburnum edule</i>	Squashberry				YELLOW	hardwood forest, mixed wood forest, river or stream
<i>Viola nephrophylla</i>	Northern Bog Violet				YELLOW	barrens, bog, river or stream
<i>Woodsia alpina</i>	Alpine Cliff Fern				RED	cliff or talus slope
<i>Woodsia glabella</i>	Smooth Cliff Fern				YELLOW	cliff or talus slope, river or stream
<i>Woodwardia areolata</i>	Netted Chain Fern				YELLOW	bog, river or stream, swamp
<i>Zizia aurea</i>	Golden Alexanders				RED	field meadow, lake or pond shore, river or stream

Possible risks to birds of the proposed wind farm and hydro project near East Bay, Nova Scotia

Prepared for CBCL Ltd.
by Andrew G. Horn, PhD
Research Adjunct
Department of Biology
Dalhousie University
Halifax, NS B3H 4J1

Summary

Here I identify possible risks to birds that may need to be examined in planning the proposed wind farm and hydro project near East Bay, Nova Scotia. Available published information shows at least two federally listed species (Bicknell's Thrush and Rusty Blackbird) and several species of raptor (notably Bald Eagle) that might breed within the project area. As well, the topography of the site (a northeast-southwest oriented ridge along water) might attract concentrations of migrating raptors. If background surveys were to support these possibilities, then the project area would fit Environment Canada's criteria for a high sensitivity site. For a medium size wind farm such as this proposed project, these criteria recommend comprehensive background fieldwork, the details of which are outlined in this document.

Background

Wind turbines present three main risks to birds: habitat destruction from turbine construction, disruption of breeding, foraging, and migratory activities because turbines are avoided, and collision with turbines and associated structures (Kingsley and Whittam 2005). Of these risks, the latter two, disturbance and collision, distinguish turbine projects from other construction projects, and have been the chief concern of regulators, conservationists, and the general public.

The key action that reduces the threat of disturbance and collision is careful placement of turbine projects, to avoid sensitive areas, for example colonies, staging areas, breeding areas for species at risk, migration flyways, or areas otherwise recognized as important to birds (e.g. Wildlife Sanctuaries and Important Bird Areas). Environment Canada has produced guidelines to evaluate the risk of turbines to birds (EC 2006b), which are also recommended for environmental assessments in Nova Scotia (NSDEL 2007). In this report I evaluate the East Bay project in terms of these guidelines.

Methods

I evaluated the previously recognized important bird areas within the region around the project area by a search of the Important Bird Areas database (<http://www.ibacanada.com/>), Environment Canada's seabird colony database (courtesy of Carina Gjerdum, Wildlife Biologist, CWS Dartmouth, Nova Scotia), and books on local birding sites (Murrant 1995, NSBS 1996, Maybank 2005). I identified species likely to breed at the site from the Maritime Breeding Bird Atlas (Erksine 1992 and <http://www.mba-aom.ca/english/index.html>) and the Breeding Bird Survey database (<http://www.pwrc.usgs.gov/bbs/retrieval/menu.cfm>). Habitats were assessed from aerial photos and topographic maps.

I evaluated the status of each species at the federal (source: Committee on the Status of Endangered Wildlife in Canada; http://www.speciesatrisk.gc.ca/map/default_e.cfm) and provincial (sources: Nova Scotia Species at Risk Working Group available at <http://www.gov.ns.ca/natr/wildlife/endngrd/> and Nova Scotia General Status Ranks available at <http://www.gov.ns.ca/natr/wildlife/genstatus/ranks.asp>) levels. Subnational ranks and presence in the county were obtained from the Atlantic Conservation Data Centre (<http://www.accdc.com/>), although in some cases (see Table) subnational ranks were from NatureServe (<http://www.natureserve.org/explorer/>). Because of the confidentiality of the site's location, I was unable to interview birders familiar with the area. Such interviews should be conducted as the project proceeds.

Results

Recognized values of the area

Cape Breton is well surveyed by birders, both experienced local individuals and skilled tourists, so common knowledge about birding sites is fairly reliable. The project area does not lie in any of the foremost birding sites on Cape Breton, the nearest being Isle Madame, Point Michaud, Forchu Head and the Sydney/Glace Bay area (the latter three include Important Bird Areas). All of these sites are best known for coastal species that are unlikely to cross the project area. Nor are any seabird colonies on the adjacent shores of Bras d'Or listed in the Colonial Bird Database.

Nonetheless, the east shore of Bras d'Or is valued for its high density of nesting Bald Eagles (see also below) and the forest habitats near and similar to the project area are known for their richness in boreal species, including the federally listed Rusty Blackbird, wetland species such as rails and bitterns (specifically, along Loch Lomond Road), several species of owls (specifically, near Glendarry and along Salmon River Road) and concentrations of migrant raptors stopping to forage (specifically, near Glendarry; NSBS 1991, Maybank 2005). The most notable of these features, the presence of Rusty Blackbirds and of nesting and migrating raptors, are discussed further below.

Breeding species

Six federally listed species at risk breed in Cape Breton Regional Municipality or Richmond County: Piping Plover (subspecies *melodus*; Endangered), Short-eared Owl (Special Concern), Common Nighthawk (Threatened), Chimney Swift (Threatened), Bicknell's Thrush (Special Concern) and Rusty Blackbird (Special Concern; ACCDC, Erskine 1992). The project area does not contain suitable habitat for Piping Plover or Short-eared Owl, and does not have any more suitable habitat for Common Nighthawk or Chimney Swift (respectively gravelly substrates near open areas and hollow trees or chimneys) than would be expected anywhere else in the province.

Bicknell's Thrush and Rusty Blackbird, however, are both known to have bred in similar areas nearby. Bicknell's Thrush is a habitat specialist, occurring almost exclusively in dense stands of low spruce-fir forest above 300 m (Erskine 1992). The nearest record of breeding evidence for the species is over 10 km from the project area, and there appears to be little suitable habitat within the project area, but the species' absence should be confirmed. Rusty Blackbirds breed along the shores of boreal forest ponds, which are common within the project area, and breeding has been confirmed within 10 km of the project. Thus they almost certainly breed within the project area, and the location of any breeding birds relative to potential turbine sites should be checked.

Relatively few species of raptor have been recorded as breeding within 10 km of the project area (Bald Eagle, Northern Harrier, Red-tailed Hawk, Merlin, and no owls; Erskine 1992). However forests east of the project site are known for high concentrations of owls (see above), and the project area lies within the highest breeding concentration of Bald Eagle in the Maritimes (Erskine 1992). Thus the configuration of the project in relation to nesting raptors should be carefully considered.

Migrants and transients

Although the site itself has not been previously identified as a migration or transient route, several locations near the site are known as important stopover or breeding sites for shorebirds and attendant raptors, notably Point Michaud to the southeast and the Sydney/Glace Bay area to the northeast. Whether these species pass through the site is purely speculative, but should be checked. The configuration of the site, a southwest-northeast oriented ridge along a wide area of water (Bras d'Or), would favour its use by migrant raptors (and, less likely, waterbirds) using the updrafts along the ridge for lift.

Wintering birds

Based on absence of reports of major concentrations of birds in the sources examined here, and on the apparent absence of features that concentrate wintering birds (e.g., agricultural fields, food-rich saltwater bays), there seems no reason to suspect that the project is in a sensitive wintering area. This conclusion is worth checking, however,

through interviews with local birders.

Recommendations

In terms of Environment Canada guidelines (EC 2006b), the area could potentially be one of very high sensitivity if the habitat of the listed species that might be present (most likely Rusty Blackbird) cannot be avoided. Presuming it can, however (e.g., Rusty Blackbirds breed at low sites unsuitable for turbine placement), the site might fit the next lower, "high" sensitivity category, mainly because, as suggested above, it might have "landform factors that concentrate birds", might "disrupt large contiguous wetland or forest habitat that maybe of importance to birds", or might have "species of high conservation concern (EC 2006b)."

Combining this high site sensitivity with the medium size of the project (11-40 turbines), the project fits the Environment Canada criteria for an elevated (albeit not the highest) level of potential risk to birds (Level of Concern Category 3). In such cases, Environment Canada recommends "comprehensive surveys to gather baseline information (EC 2006b)." Since this desktop survey identifies breeding birds (e.g. owls, eagles, Rusty Blackbirds) and migrants (notably raptors) as the main contributors to the site's sensitivity, such comprehensive surveys would likely consist of a breeding bird survey and passage migration counts (preferably in the fall, when migration in Nova Scotia is most concentrated).

Following, in turn, Environment Canada protocols for each of these activities (EC 2006a), the breeding bird survey should last 4-10 days and include point counts to assess relative abundance and to provide a background against which any effect of the project can be assessed. The passage migration count would consist of up to ten days during the peak of migration (particularly fall).

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Table. Species found in Richmond or Cape Breton County that have an ACCDC subnational ranking of S4 (uncommon or rarer) or a provincial ranking of Yellow or Red (strictly coastal species are excluded). For species marked "MBBA", breeding evidence has been observed within the atlas squares (10X10 km squares) that include the project area; for species marked "BBS", the species has been detected on the nearest Breeding Bird Survey route, which passes through similar habitat.

Species	S rank	NS status	Canada status	Breeding evidence?
Common Loon	S4	Yellow		MBBA, BBS
Common Goldeneye	S2B			
Red-breasted Merganser	S2S3B			BBS
Northern Goshawk	S3B	Yellow		
Merlin	S3S4B			MBBA, BBS
Short-eared Owl	S1S2B	Yellow		
Long-eared Owl	S1S2			
Boreal Owl	S1B			
Common Nighthawk*	S4	Yellow	Threatened	MBBA
Chimney Swift*	S5	Yellow	Threatened	MBBA
Olive-sided Flycatcher*	S4	Yellow		MBBA, BBS
Eastern Phoebe	S2S3B			
Gray Jay*	S5	Yellow		MBBA, BBS
Boreal Chickadee	S3S4	Yellow		MBBA, BBS
Barn Swallow*	S5	Yellow		MBBA, BBS
Bicknell's Thrush	S1S2B	Yellow	Vulnerable	
Northern Mockingbird	S3B			
Philadelphia Vireo	S2B			
Warbling Vireo	S2B			
Bobolink	S3B	Yellow		BBS
Rusty Blackbird	S3S4B	Yellow	Special Concern	MBBA, BBS
Red Crossbill	S3S4	Undetermined		MBBA
White Crossbill*	S5	Undetermined		MBBA, BBS

*These species have provincial status ranks of yellow ("Sensitive to human activities or natural events") or undetermined, but do not appear in the ACCDC list, so the subnational rank is from NatureServe (<http://www.natureserve.org/explorer/>).

Survey for autumn raptor migration at the proposed East Bay wind farm and hydro project

Prepared for CBCL Ltd.

23 November, 2007

by Andrew G. Horn, PhD

Research Adjunct

Department of Biology

Dalhousie University

Halifax, NS B3H 4J1

Summary and Introduction

A desktop background survey of the proposed East Bay wind farm and hydro project (Horn 2007) noted that the project might be in a sensitive site for birds because rare species might breed on the site and because the site is near a landform, the East Bay Hills, whose steep west slope and northeast-southwest orientation might concentrate migrating diurnal raptors. This report summarizes a ground truthing of the latter possibility through three days of field observations at the site during the peak of raptor migration, as well as interviews with birders familiar with the area.

Although the survey yielded several sightings of Bald Eagles and Red-tailed Hawks, and individual sightings of American Kestrel and Northern Harrier, only one individual raptor (an Osprey) was a likely migrant. This finding and the interviews with birders contradict the desktop survey's suggestion that this area is a major migration route for raptors. Nonetheless, the sighting of several flocks of migrant passerines, mainly along the east shore of Bras D'Or but also north along the same landform as the project, raise the possibility that many passerines migrate through the area, even though the site is not on a known migration corridor. Further work to explore this possibility, ideally including some radar or acoustic monitoring, might be advisable.

Methods

Watches for raptors were conducted on September 30 and October 1, between 9:00 and 16:00. These dates were selected because they were during the peak of raptor migration in Nova Scotia (Tufts 1986, E. Mills pers. comm.), and were the first and second days after the passage of a cold front, when accipiters and buteos, respectively, are most likely to migrate (Allen et al. 1996). These days also had winds which would produce updrafts along the west side of the East Bay Hills, and which might make any birds passing over East Bay drift toward the study area (Table 1).

During these hours two observers (AGH and Greg Breed) scanned from vantage points selected to collectively provide coverage of the whole study site (Figure 1), spending approximately one hour at each site. For each raptor seen, they recorded its approximate location, height (0-10 m, 10-50 m, 50-100 m, and 100 m intervals thereafter), flight direction (to nearest 45 degrees), and behaviour (perched, circling, powered flight, gliding, or kiting -- i.e., hanging in an oncoming wind). Birds were identified by AGH using 10X50 binoculars and a 15X-60X spotting scope.

One reason for suspecting raptor migration through the East Bay Hills is the report (NSBS 1996) that, particularly during the migration period, raptors forage along the Glengarry Road, just to the north of the proposed project. Therefore, on October 2nd, we searched along the road from Big Pond to Lochside, an area topographically and ecologically similar to the Glengarry Road. We also used this day to search for possible songbird stopover sites and for other significant habitats in the area in and surrounding the project area, especially habitats suitable for nesting of the uncommon species identified in the desktop report (Horn 2007).

Throughout all observations we kept a cumulative species list of all birds sighted, taking particular note of all apparent songbird migrants, i.e. passerines in large flocks and/or not in seasonally appropriate nesting or wintering habitat.

In addition to the above fieldwork, birders were asked whether they knew of any migratory movements through the East Bay Hills, especially of raptors or waterbirds as suggested in the desktop report (Horn 2007), or of nesting species at risk or other notable avian issues related to the project. The birders included three experts with experience throughout the province (Fulton Lavender, environmental consultant from Halifax, Ian McLaren, Dalhousie University professor from Halifax, and David McCorquodale, Cape Breton University professor from Sydney) and two particularly experienced in the Big Pond – Loch Lomond area (John MacInnis of Big Pond and Susann Myers of Halifax, formerly of Louisbourg).

Results

Raptors

The raptors seen on each day are mapped in Figure 1. Sightings were somewhat concentrated along the windward slopes of the hills, as expected, although at least three Red-tailed Hawks, possibly a lingering family group, were seen repeated in the middle of the study area (Figure 1). Only one individual, the Osprey, was likely a migrant, judging from its presence well after the southward departure of most of its conspecifics from the province. The remaining individuals, Bald Eagles, Red-tailed Hawks, a Northern Harrier, and an American Kestrel, gave no clear evidence (e.g., extended flight paths southward) that they were migrants. The latter two individuals, and two of the Red-tailed Hawks, were found foraging during our search of the road from Big Pond to Lochside on October 2. The other individuals were found during our more formal raptor watches, and were circling or kiting, with no clear flight trajectory.

Other observations

While most passerines (songbirds) encountered were likely residents, several flocks of migrants were seen during the raptor watches from MacLeod's Hill (9-10AM, October 1) and the quarry in Irish Cove (10:20-11:20AM, October 1; westmost asterisks in Figure

1). The composition of the flocks, all headed southward, and some stopping near the quarry (circled in Figure 1) before moving on, were: 10 Cedar Waxwings, 3 American Robins, 5 Common Grackles, 3 Rusty Blackbirds, 5 Yellow-rumped Warblers, and 30 American Goldfinches. The quarry area appeared to be a stopover location for migrants, judging from these birds as well as other birds in the area, including a Red-eyed Vireo, Blue-headed Vireo, Blackpoll Warbler, and Common Yellowthroat. Speculating that similar wet areas along the Bras D'Or shore might also be stopover areas, on October 2nd, at 0930AM, we checked the mouth of Breac Brook, below Marble Hill (northmost circle in Figure 1), and found a concentration of passerines that included 2 Common Yellowthroats, 1 Yellow-rumped Warbler, and 15 Song Sparrows. Similarly, at a small bog on Loch Lomond Road at 10 AM the same day (eastmost circle in Figure 1), we found a large migrant flock of 50-75 Yellow-rumped Warblers, 4 Palm Warblers, 1 Black-throated Green Warbler, 2 Hermit Thrushes, and 4 Swamp Sparrows.

All the species seen during this survey are listed in Table 2.

Interviews with birders

None of the birders interviewed knew of any significant raptor movements through the East Bay Hills. One (D. McCorquodale) judged them unlikely because there is so little landmass to the north. Another (F. Lavender) speculated that some waterbirds (specifically, Red-throated Loons) might conceivably “shortcut” over the hills during migration. Both local birders (J. MacInnis and S. Myers) noted that the area around the East Bay Hills had a diversity of nesting birds, including the federally listed Rusty Blackbird and perhaps the highest concentration of nesting owls in the province. Boreal and Long-eared Owls, both rare in the province, have been heard calling in the breeding season within 5 km of the project area (*fide* J. MacInnis). Both local informants also noted, however, that the project area itself has been so disturbed by logging that it is unlikely to contain extensive habitat for any of these species, an impression borne out by our own, albeit unsystematic, examination of the area.

One birder (J. MacInnis) reported that he, too, has seen migrant passerine flocks travel along the Bras D'Or shore as described above, albeit mainly during spring, rather than fall, migration.

Discussion

Raptors

In contrast to the speculation in the desktop report, the East Bay site does not appear to be a major raptor migration route. The present survey was relatively brief (three days), but it was conducted in good conditions at the peak time of migration, and yet very few individuals were found and all but one showed no clear evidence of migratory behaviour. Also, although the survey found several foraging hawks along the road from Big Pond to Lochside, none of the birders interviewed supported the contention (NSBS 1996, cited in Horn 2007) that the area is particularly heavily used during migration.

Passerines (songbirds)

The site is not known for being a main migration route for passerines, but our sightings of migrant passerines along the east shore of Bras D'Or, corroborated by one local observer's recollections, suggest that this may be a corridor for migrating passerines. These sightings are consistent with the general pattern that diurnal passerine migrants may concentrate along such topographical features that constrain movement in the direction of migration ("leading lines"; Kingsley and Whittam 2005). Also consistent with this pattern was the fact that few diurnal migrant passerines were sighted on the plateau where the turbines will be located.

However, the one large flock of migrants that was encountered on the plateau (north of the project site, on Loch Lomond Road) consisted mainly of nocturnal migrants (warblers and thrushes, as opposed to the blackbirds, sparrows, and finches seen along the shore). The flight paths of nocturnal migrants are still poorly understood, but they

might be less constrained by topography than diurnal species (Kingsley and Whittam 2005), so their flight paths cannot be accurately inferred from daytime observations. More specialized methods, such as radar or acoustic monitoring, are needed to map their movements. Given emerging evidence that nocturnal migrants travel at relatively low elevations in Nova Scotia (P. Taylor, Acadia University pers. comm.) and that the plateau would raise the effective height of turbines by about 150 m, a check for concentrations of nocturnal migrants at this site, using radar or acoustic monitoring, might be advisable.

Conclusions

The desktop report on this site (Horn 2007) suggested that this project might “disrupt large continuous wetland or forest habitat that may be of importance to birds (EC 2007b)”, which would lead to a categorization by EC (2007b) as a “high sensitivity” site. Upon visiting the site, however, it was immediately apparent that habitats throughout the site are so disrupted by logging that any further impact of the wind energy project on habitat continuity would be comparatively trivial.

The two other factors identified as making the site highly sensitive remain, however. First, although “landform factors that concentrate birds” do not concentrate migrating raptors, as originally speculated (Horn 2007), they might concentrate migrant passerines, as shown here. Second, the site might have “species of high conservation concern”, because the present site visit confirmed it has suitable habitat for at least two federally listed species (bogs and clearcuts for Olive-sided Flycatcher and boreal ponds for Rusty Blackbird), and, as reported in the desktop report, Bald Eagles indeed nest in the ravines leading west from the site (Cyril MacPherson of Big Pond, pers. comm.). Thus the need remains for the breeding bird and migration work outlined in the desktop report (Horn 2007), although, as shown here, the latter could be done in spring (as opposed to fall, as originally suggested) and should ideally incorporate some monitoring of night migrants.

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Table 1. Weather conditions (median, with range in parentheses) at Sydney, NS, during raptor watches (and for the same time period on October 2).

Date	Wind speed (km/h)	Wind direction (°)	Temperature (°C)	Weather
September 30	19 (17-20)	320 (290-340)	10.9 (9.9-11.5)	Mostly cloudy
October 1	12 (11-15)	220 (190-250)	13.0 (9.3-14.4)	Mostly cloudy- mostly clear
October 2	18 (13-24)	245 (230-270)	15.8 (12.8-18.4)	Mostly cloudy- mostly clear

Table 2. Species seen in study area (or near it, as noted). Species not seen in the project area (i.e., on the plateau) are in grey.

American Black Duck
Ring-necked Duck (Cemetery Lake)
Spruce Grouse
Pied-billed Grebe (Cemetery Lake)
Osprey
Bald Eagle
Northern Harrier
Red-tailed Hawk
American Kestrel
Pileated Woodpecker
Hairy Woodpecker
Blue-headed Vireo
Red-eyed Vireo
Gray Jay
Common Raven
Black-capped Chickadee
Boreal Chickadee
Red-breasted Nuthatch
Golden-crowned Kinglet
Ruby-crowned Kinglet
Hermit Thrush
American Robin
Cedar Waxwing
Yellow-rumped Warbler
Black-throated Green Warbler
Palm Warbler
Blackpoll Warbler
Common Yellowthroat
Song Sparrow
Swamp Sparrow
Dark-eyed Junco
Rusty Blackbird
Common Grackle
Pine Grosbeak
Purple Finch
American Goldfinch

Figure 1. The study area, showing all raptors seen, with likely resightings (judged from proximity in space and time) in grey. Asterisks show vantage points for raptor watches; circles show where concentrations of migrant passerines were found (see text). AMKE = American Kestrel; BAEA = Bald Eagle; NOHA = Northern Harrier; OSPR = Osprey; RTHA = Red-tailed Hawk. All birds were seen below turbine height except the southmost Bald Eagle (c. 300 m) and Osprey (c. 500 m).



Spring Migration and Breeding Bird Survey of the Proposed East Bay Wind Power/Hydro Project Site

for CBCL Ltd.
20 August, 2008
Andrew G. Horn
Department of Biology
Dalhousie University

Summary

The proposed East Bay Wind Power/Hydro Project site, and adjoining areas, were surveyed for birds on 11 days between April 20 to June 18 2008. Spring surveys consisted of migration searches and dawn surveys for nocturnal migrants. Breeding bird surveys consisted of point counts at 20 points in the project area and 20 points around the lakes to the east, followed by area searches of all habitats, focusing on sensitive species.

Spring migrants were not encountered as often as would be expected of acknowledged migration “hotspots” elsewhere in the province, but movement through the area was occasionally heavy, likely dependent on prevailing winds. Breeding birds included two species designated by COSEWIC, Olive-sided Flycatcher (Threatened) and Rusty Blackbird (Special Concern), although breeding density was not notably high relative to comparable areas elsewhere in the province.

Methods

Migration surveys

The goal of the migration surveys was a qualitative assessment of whether the project area and environs contained areas where migrants concentrated, for example migration pathways or stopover sites. The surveys were planned based on EC’s general guidelines (2006a, 2006b), together with EC’s more specific comments on this particular project (J. Chardine, pers. comm.).

Migration surveys were conducted between 20 April and 4 June, with the most frequent sampling during the peak of migration in late May (Table 1). Surveys included standardized, 20 minute area searches of the three potential stopover/passage sites identified in the fall preliminary survey (Horn 2007b) and 9 additional sites that were identified as being potential stopover/passage sites for migrants and as being representative of the affected habitats (Figure 1). Also, nocturnal flight call surveys were conducted along Loch Lomond Road from Route 4 to Salem Road. These surveys consisted listening for migrant flight calls during 10 minute point counts at stations spaced every kilometer along the road. This particular route was chosen because it offered an efficiently accessed

transect across the plateau where the project will be placed, thus providing a snapshot of the distribution of night migrants passing over the plateau.

Breeding bird searches

The purpose of the breeding bird searches:

... is to determine the consequences of the turbines to species diversity, to evaluate the predictions made during the EA process, to evaluate the cumulative effects of the industry on bird diversity and numbers, and to detect significant changes in numbers at single sites. (EC 2006a)

CWS protocols recommend breeding bird searches survey take 4-10 days and include point counts, so given the large size of the present project, at least 10 days were planned for the present survey.

Four visits began with 10-minute, unlimited radius point counts completed by 9 AM from 20 of 40 sampling stations that were evenly spaced through the study area: 20 in the area where turbines are proposed and 20 others in the area from Munroe Lake to Loch Lomond (Figure 1). Sampling was rotated so that each point was sampled twice, at least 10 days apart, as recommended by EC (2006a). For each count, distances to detected birds were estimated as 0-50m, 50-100m, and >100m (EC 2006a). Conditions were calm and without precipitation for all counts.

Point counts were followed by area searches for additional species in each habitat type within the project area, with particular attention to more extensive patches of habitat that appeared suitable for rare and/or sensitive species, and using playback to search for relatively secretive raptors (Long-eared Owl, Northern Goshawk) and species of conservation concern (Olive-sided Flycatcher, Bicknell's Thrush, Rusty Blackbird) where appropriate nesting habitat was found.

Results

Species found during the surveys are listed in Table 2.

Obvious migrants were encountered on five days (Table 1), with the most obvious movement on 13 May. On that day, small flocks of Yellow-rumped Warblers, some mixed with one or two other species in the same genus (*Dendroica*), passed through the area in a northerly direction at or within 50m above tree top height, particularly concentrated on the east side of the plateau (Figure 2). Winds were strong and contrary to northward movement that day. The laboured and drifting flight of the birds suggested that the winds were forcing them to fly low along the lee side of the plateau.

During the breeding bird searches, several species of raptors were found, albeit without firm evidence of breeding (Figure 3). There are wetlands suitable for marsh specialist species (and thus ones sensitive to changes in water levels) at three sites off the plateau: the Irish Cove quarry (where Sora likely nests), the Lake Enon end of MacIvor Road (on both the north and south sides, the latter of which has nesting Wilsons Snipe and likely nesting Sora and American Bittern), and the northmost end of Lake Uist (likely nesting American Bittern).

Two species designated at risk by COSEWIC (though not yet on Schedule 1) were found: a pair of Rusty Blackbirds (Special Concern) near the proposed reservoir site and singing Olive-sided Flycatchers (Threatened) throughout the site (Figure 1). Boreal Chickadees and Gray Jays, both Yellow ranked species in Nova Scotia, were encountered wherever suitable habitat occurred and likely breed (pairs and fledglings, respectively, were encountered). Two other Yellow ranked species, Common Loon and Northern Goshawk, were noted flying over the site (see Figure 3 for goshawk location), on two occasions each, with no further evidence of breeding.

Discussion

The East Bay Hills are not known to be a major migration pathway through the province (Horn 2007a). With little land to their north and no topographic features (e.g. ridges or peninsulas) that would strongly channel migrants, the hills are not geographically situated or configured as expected of such a site, nor were migrants frequently found on either this or a previous fall survey (Horn 2007b). The present survey suggests that, on some days, small flocks of migrating passerines pass through parts of the project area, their location and numbers likely depending on prevailing winds. Mapping these migration pathways would require specialized methods such as radar, applied across multiple days with varying weather conditions.

Although two species designated at risk by COSEWIC (Rusty Blackbird and Olive-sided Flycatcher) and two provincially ranked species (Boreal Chickadee and Gray Jay) breed in suitable habitat on the site, their level of abundance seemed typical of similar areas throughout the province. Depending on the exact configuration of facilities on the site, these species may be relatively unaffected by the proposed construction. Nonetheless, follow-up surveys, using similar protocols to the breeding bird searches reported here, will probably be needed to double-check this conclusion, and to determine mitigating actions if it is incorrect.

Literature cited

Environment Canada (EC). 2006a. Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds. Final version, April 2007. Environment Canada, Canadian Wildlife Service, Gatineau, Quebec. Available at http://www.cws-scf.ec.gc.ca/publications/eval/index_e.cfm

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Horn, A.G. 2007a. Possible risks to birds of the proposed wind farm and hydro project near East Bay, Nova Scotia. Unpublished report for CBCL, Ltd.

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Table 1. Summary of activities by date. Column “Breeding search” indicates where effort was concentrated, where “Site” is the area where point counts on the project site were concentrated and “Lakes” is the area where point counts along Lake Uist and associated lakes were concentrated (see Figure 1).

Date	Migration survey		Breeding search	Migrants found
	Night calls	Area searches		
20 April		X	Site	One likely migrant Northern Harrier
13 May		X	Lakes	Warblers throughout (Fig. 2)
18 May		X	Site	Warblers locally (Fig. 2)
19 May	X		Site	Warblers locally (Fig. 2)
24 May		X	Site	
25 May		X	Site	
26 May	X		Site (w/ pt. cts.)	One migrant warbler heard
3 June			MacNeill’s Brook	
4 June	X	X	Lakes (w/ pt. cts.), Irish Cove Lakes	
17 June			Site (w/ pt. cts.)	
18 June			Lakes (w/ pt. cts.)	

Table 2. Species listed as possible, probable, or confirmed breeders in or near project area (i.e., within the 10X10km atlas squares that include the area), with species not found during the present bird surveys in grey and species suspected of breeding in the project area in bold (species in normal typeface were only encountered along the shore of Bras D'Or or Lake Uist and associated lakes).

Wood Duck

American Black Duck

Green-winged Teal

Ring-necked Duck

Common Merganser

Red-breasted Merganser

Ruffed Grouse

Spruce Grouse

Common Loon

Double-crested Cormorant

Osprey

Bald Eagle

Northern Harrier

Northern Goshawk

Sharp-shinned Hawk

Red-tailed Hawk

American Kestrel

Merlin

American Bittern

Great Blue Heron

Sora

Greater Yellowlegs

Spotted Sandpiper

Wilson's Snipe

American Woodcock

Herring Gull

Great Black-backed Gull

Common Tern

Mourning Dove

Great Horned Owl

Barred Owl

Northern Saw-whet Owl

Common Nighthawk

Chimney Swift

Ruby-throated Hummingbird

Belted Kingfisher

Yellow-bellied Sapsucker

Downy Woodpecker

Hairy Woodpecker

Northern Flicker

Pileated Woodpecker

Olive-sided Flycatcher

Eastern Wood-Pewee

Yellow-bellied Flycatcher

Alder Flycatcher

Least Flycatcher

Blue-headed Vireo

Red-eyed Vireo

Gray Jay

Blue Jay

American Crow

Common Raven

Tree Swallow

Bank Swallow

Cliff Swallow

Barn Swallow

Black-capped Chickadee

Boreal Chickadee

Red-breasted Nuthatch

Brown Creeper

Winter Wren

Golden-crowned Kinglet

Ruby-crowned Kinglet

Swainson's Thrush

Hermit Thrush

American Robin

European Starling

Cedar Waxwing

Tennessee Warbler

Nashville Warbler

Northern Parula

Yellow Warbler

Chestnut-sided Warbler

Magnolia Warbler

Cape May Warbler

Yellow-rumped Warbler

Black-throated Green Warbler

Black-throated Blue Warbler

Blackpoll Warbler

Blackburnian Warbler

Palm Warbler

Bay-breasted Warbler

Black-and-white Warbler

American Redstart

Ovenbird

Mourning Warbler

Common Yellowthroat

Wilson's Warbler

Chipping Sparrow

Savannah Sparrow

Song Sparrow

Lincoln's Sparrow

Swamp Sparrow

White-throated Sparrow

Dark-eyed Junco

Nelson's Sharp-tailed Sparrow

Red-winged Blackbird

Rusty Blackbird

Common Grackle

Bobolink

Purple Finch

White-winged Crossbill

Evening Grosbeak

Pine Siskin

American Goldfinch

House Sparrow

Figure 1. Migration search areas (circles) and point count locations (filled dots). Black dot indicates point count within 100m of a pair of likely nesting Rusty Blackbirds; dark grey dots indicate point counts within 250 m of singing Olive-sided Flycatchers.

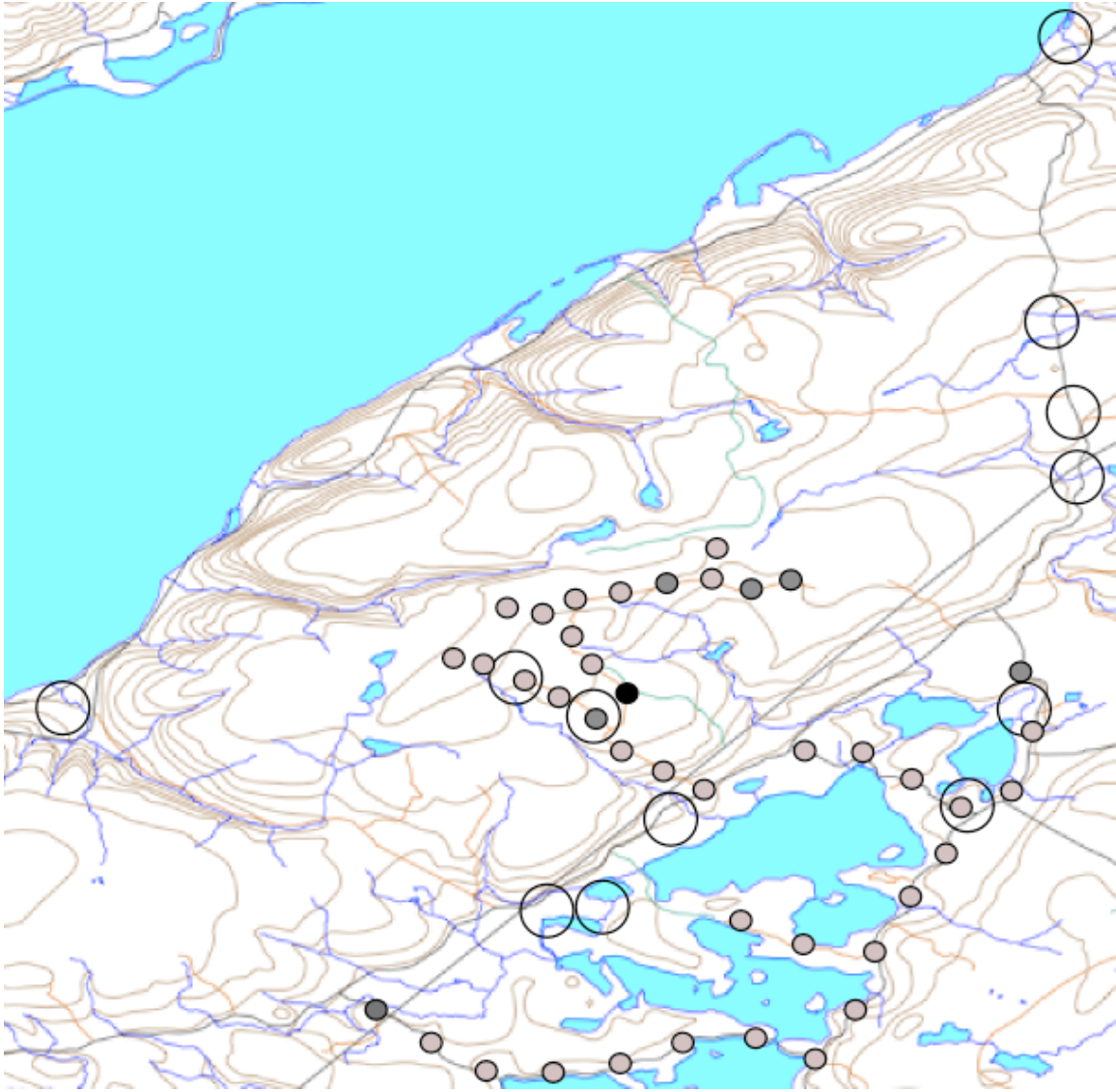


Figure 2. Flock sizes of Yellow-rumped Warblers encountered in 20 min area searches on May 13 and (in parentheses) May 18 (only obvious migrants, i.e. non-residents, included), plus calls/min of warbler (*Dendroica* spp.) flight calls heard at listening stations along Loch Lomond Road near dawn, May 19.



Figure 3. Locations of hawks detected during surveys, with repeat registrations across two days in italics.

