

APPENDIX B. PROJECT TEAM MEMBERS' CVS

Years in Practice
16

Certifications

Nova Scotia Advanced Wetlands Delineator and Evaluator

Memberships

Nova Scotia Wetlands Delineation, Maritime College of Forest Technology

Education

- Master in Environmental Studies (MES), York University, Toronto, Ontario, 1997-1999
- BSc. (Biology), Dalhousie University, 1992-1997
- BA (Political Science), Honours, Dalhousie University, 1992-1997

Training

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

Summary

Ms. Milloy oversees, manages, and executes environmental and biophysical projects. She completes environmental baseline surveys for environmental assessment, habitat surveys, species at risk and wildlife surveys, botany and bird surveys, wetland and watercourse delineations, characterizations and functional assessment, fish habitat evaluation and bat hibernacula identification. Ms. Milloy also completes watershed evaluations, and guides clients through the environmental and permitting stages of mining, industrial and development projects. Ms. Milloy guides clients through provincial and federal environmental assessment requirements and has completed several Federal and Provincial environmental assessment registration documents in the past two years.

Ms. Milloy has worked on five mining projects and six quarry projects providing project management and regulatory consultation relating to all biophysical components and field surveys to support permitting and regulatory requirements.

Ms. Milloy regularly completes applications for wetland and watercourse alteration and development across Atlantic Canada, and has developed and implemented wetland compensation programs and wetland restoration projects. Ms. Milloy is a trained wetland evaluator, biologist, and restoration professional.

Project Experience

- Provision of biophysical project management and coordination of field surveys to support the Canadian Environmental Assessment Act (CEAA) environmental assessment process for 2 proposed mining projects in Nova Scotia (2014-current).
- Completion of biophysical field surveys to support expansion efforts for a mine in Nova Scotia (2014) to meet requirements under the provincial environmental assessment process.
- Completion of environmental baseline surveys for the provincial environmental assessment process for a proposed re-development of a gold mine in eastern Nova Scotia in 2013.
- Completion of two provincial environmental assessments for community wind projects in Nova Scotia in 2013.
- Completion of environmental baseline surveys for three Nova Scotian quarry expansion projects in 2012-2013.
- Watershed evaluation for wetlands and watercourses at a 500 hectares golf and residential development and associated wetland alteration permitting, compensation planning, wetland restoration activities, and enhancement of several wetlands to increase functionality.
- Surface water assessment and functional assessment, wetland permitting, watercourse permitting, and compensation planning and implementation at an 18 hole golf course and residential development along the south shore of Nova Scotia in 2014. Provision of environmental project management and regulatory lead role for the Project.
- Completed the Provincial Environmental Assessment for the 80 MW Glen Dhu South Wind Power Project, Nova Scotia, for Shear Wind Inc. The

Project received Ministerial approval on March 16, 2012.

- Project Management of regulatory permitting and environmental assessments for a 50 MW Wind Power Project in Nova Scotia for Sprott Power Corp.
- Evaluation of the Musquodoboit River Watershed for wetland restoration opportunities (GIS based and ecology/field based study).
- Evaluation of the Sackville River Watershed for wetland restoration opportunities (GIS based and ecology/field based study).
- Completion of 35-45 projects involving watershed evaluation, land use classification, wetland delineation and alteration and infill, and compensation planning for numerous residential and commercial large-scale developments across Nova Scotia and New Brunswick.
- Completion of wetland delineation and watercourse identification for three large scale developments (450 ha, 200 ha, 300 ha and 400 ha) from 2012 to 2014.

Work Experience

McCallum Environmental Ltd., Nova Scotia, 2010-Present

Vice President/Senior Project Manager - Provides project management expertise for site and/or route selection, constraints mapping, regulatory consultation, environmental assessments, environmental baseline surveys, wetland alteration and restoration planning, environmental protection plan development, regulatory applications, construction monitoring, and reclamation for small and large scale industrial projects. Other responsibilities include marketing, budget management, report preparation and client service.

Strum Environmental Services Ltd., Nova Scotia 2000-2010

Project Manager- From 2000- 2010, provided project management expertise for development clients across Atlantic Canada. Projects included environmental assessment, large scale commercial and residential developments, wetland alteration projects, wetland compensation planning and implementation, wetland restoration and creation projects, phased site assessments, and risk assessment and management.

Environmental Sciences Group, Kingston, ON 1998

Environmental Scientist- in 1998, provided contaminant and project management expertise to Department of National Defense in the Canadian Arctic in support of remediation of several remote military sites. Identified areas required for remediation and completed associated boundary soil and sediment confirmatory sampling and analysis.

Years in Practice

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Education

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

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

Training

- ◆ WHMIS, 2017
- ◆ Wetland Delineation Certification, 2013
- ◆ Saint John Ambulance Standard First Aid, AED, CPR(C), 2013
- ◆ Health Safety and Environmental Leadership training and Advanced Safety Audit training, 2009
- ◆ Emergency Operations Centre crisis management training, 2006-2008
- ◆ Introduction to the Fisheries Act and Navigable Waters Protection Act course – ESAA
- ◆ Bear Awareness training and ATV training – Alberta Safety Council, 2006
- ◆ Site Supervisor Safety Training, Construction Safety Training System 2005

Summary

Ms. MacDonald has been in the environmental consulting profession since 2005. She has worked on both project related and research related field assessments in Nova Scotia, Prince Edward Island, and Alberta.

Ms. MacDonald is responsible for completing biophysical assessments, including flora and fauna surveys, avian surveys, and species at risk evaluations, primarily for clients in the energy sector, mining sector, and commercial development sector. Ms. MacDonald coordinates all field staff required to complete all environmental baseline programs for Provincial Environmental Assessment registration. Ms. MacDonald has been responsible for the implementation of six environmental baseline programs for mining, quarry development and energy sector development projects in Nova Scotia in advance of environmental assessment registration.

Selected Project Experience

- Completion of environmental baseline surveys for the federal environmental assessment process for a proposed development of a gold mine in eastern Nova Scotia in 2015 and 2016
- Completion of environmental baseline surveys for Quebec based company for a proposed gold mine expansion in eastern Nova Scotia and the completion of environmental baseline surveys for four Nova Scotian quarry expansion projects in 2012-2016.
- Completed watershed planning for the Sackville River Secondary watershed and Musquodoboit River Secondary Watershed to evaluate wetland restoration potential and to aid in better land use planning, source water protection and management of water resources.
- Completion of surveys associated with wetland alteration applications and associated compensation for multiple wetlands (32 and 24) associated with residential and industrial development in Nova Scotia (2013 and 2016).
- Completion of wetland delineation and watercourse identification for five large scale developments (2 - 200 ha, 300 ha, 400 ha, and 450 ha) from 2012 to 2014.

Experience

McCallum Environmental Ltd., Halifax, Nova Scotia

Biologist and Environmental Specialist/Coordinator:

May-Aug 2011, Jan 2012-Present

- Completing biophysical assessments, including flora and fauna surveys, with emphasis on species at risk. Completing wetland and watercourse delineations and assessments and coordinating migratory bird and bat monitoring. Communicating field survey results and methodologies for Environmental Assessments and other Provincial regulatory applications. Instructed Wetland Delineation course with Fern Hills Institute, Summer 2016.

Amec Colt, Shell/Albian Sands Expansion 1 - Fort McMurray, Alberta.
Environmental Specialist and Area Environmental Lead

July 2008 – October 2009.

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

Canadian Natural Resources Ltd. - Fort McMurray, Alberta

Regulatory and Environmental Specialist: October 2005 – July 2008

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

Years in Practice
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Education

Bachelor of Natural
Resource Science,
Thompson Rivers
University, 2014

Renewable Resource
Management Diploma,
Lethbridge College, 2011

Training

- ♦ Wetland Delineation Certification, 2013
- ♦ Saint John Ambulance Standard First, AED, CPR(C), 2014
- ♦ ATV Training Course, 2015
- ♦ Certified Crew Supervisor Backpack Electrofishing, June 2015
- ♦ Wildlife Awareness, April 2015

Summary

Ms. Giroux has been in the environmental consulting profession since 2010. She has worked on project related field assessments in Alberta, British Columbia, Manitoba, Nova Scotia and Saskatchewan.

Ms. Giroux is responsible for completing biophysical assessments, including flora and fauna surveys, bird surveys, aquatic surveys, wetland monitoring and species at risk evaluations, primarily for clients in the energy sector, mining sector, and commercial development sector. Ms. Giroux coordinates field programs required to complete environmental baseline programs for Provincial Environmental Assessment registration. Ms. Giroux has been responsible for the implementation of an environmental baseline biophysical programs for mining development a project in Nova Scotia in advance of environmental assessment registration.

Selected Project Experience

- Completion of environmental baseline surveys for the federal environmental assessment process for a proposed development of a gold mine in eastern Nova Scotia in 2016
- Project Scientist; Storm Water Ponds Sediment Sampling; City of Calgary; Alberta; 2015. Conducted storm water pond sediment sampling as crew lead for a municipality-regulated project. Prepared sediment samples for the lab. Assisted in compiling field data for the technical report.
- Water Quality Monitoring; ATCO Pipeline Ltd.; Alberta; 2015. Conducted water quality monitoring on various wetlands along the pipeline corridor.

Experience

McCallum Environmental Ltd., Halifax, Nova Scotia

Biologist and Environmental Specialist:
April 2016-Present

- Completing biophysical assessments, including flora and fauna surveys, with emphasis on species at risk. Completing wetland and watercourse delineations and assessments and coordinating migratory bird and bat monitoring. Communicating field survey results and methodologies for Environmental Assessments and other Provincial regulatory applications.

CH2M Hill, Calgary, Alberta

Intermediate Wetland Ecologist:
2011-2016

- Experienced field biologist who collected field data, including soil, vegetation, noxious weeds, wildlife, hydrologic parameters for various temporary and permanent disturbances to wetlands associated with linear construction projects, including transmission line and pipeline projects, lease sites and facility projects throughout western Canada. Crew lead for wetlands surveys, water quality monitoring, sediment sampling, environmental integrity screenings and reclamation surveys, including noxious weed surveys, soil compaction and crop surveys. Assisted with compiling field data and writing technical reports for various federally, provincially and municipality-regulated projects.

APPENDIX C. PRIORITY SPECIES, ACCDC AND NSCCH REPORT

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
Hirundo rustica	Barn Swallow		T	Endangered	S3B	In the Maritimes the barn swallow breeds everywhere there are buildings and other structures that provide sheltered, dry nest-sites, even nesting on isolated cabins in deep woodland and on fishing shacks on offshore islands. A recent innovation, in remote logging areas with no alternatives, has been their basing nests on bolt-heads low in the sides of large corrugated metal culverts. However, nests in natural situations, in caves or under overhanging cliffs, usually close to water, are very rare.
Coccyzus erythrophthalmus	Black-billed Cuckoo				S3?B	In the northern parts of its range, the black-billed cuckoo's numbers vary greatly from year to year in response to outbreaks of both the forest and orchard species of tent caterpillars, on which it feeds. It is associated with open woodland and forest edge and nests in small trees and tall shrubs.
Dendroica striata	Blackpoll Warbler				S3S4B	In the Maritimes, the blackpoll warbler breeds mainly in cool, damp spruce forests. During spring and fall migration, it uses a variety of habitats, although often partial to spruces, even when they are only a small component of the habitat.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
Toxostoma rufum	Brown Thrasher				S1?B	The brown thrasher frequents shrubbery, thickets, and wood-edges rather than forest. No confirmed reports of breeding exist for Nova Scotia.
Molothrus ater	Brown-headed Cowbird				S2S3B	The brown-headed cowbird mainly breeds in settled areas, this species is widespread in the Maritimes, but is virtually absent in the forested regions of northern and central New Brunswick and eastern Nova Scotia. Farming areas in southern New Brunswick, central Nova Scotia, and central Prince Edward Island had more continuous Cowbird distribution than elsewhere. Species most frequently parasitized in the Maritimes, relative to the numbers of their nests found, were Veery, Solitary and Red-eyed Vireos; Chestnut-sided, Magnolia, Yellow-rumped, and Black-and-White Warblers; and American Redstart.
Wilsonia canadensis	Canada Warbler	T	T	Endangered	S3B	In Nova Scotia, the Canada warbler has only been found sparsely on Cape Breton Island and in the extreme southwest of the province. They are less predictable from habitat than most warblers, they are usually found in dense understory vegetation of mature to mid-aged mixed forest, most closely associated with broad-leafed trees and shrubs, but with conifers usually present too.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
Chordeiles minor	Common Nighthawk	T	T	Threatened	S3B	Common nighthawks nest on sparsely vegetated or bare ground in open "wastelands" such as pine barrens, forest cut-overs, or burns, and secondarily on flat roofs of buildings.
Accipiter cooperii	Cooper's Hawk		NAR		S1?B,SNAN	The Cooper's hawk is a bird of broad-leaved and mixed woodlands, often hunting along wood-edges in settled areas.
Sialia sialis	Eastern Bluebird		NAR		S3B	The Eastern bluebird nests in woodpecker holes, as well as nest-boxes. They forage in open areas of low vegetation with scattered trees for nesting.
Tyrannus tyrannus	Eastern Kingbird				S3S4B	In its breeding range, the eastern kingbird uses open environments; usually breeds in fields with scattered shrubs and trees, orchards, along shelterbelts, and especially along woodland edges in forested regions. A "savannah species", but given suitable nest sites and perches, will nest in many other habitats—e.g., desert riparian, quaking aspen (<i>Populus tremuloides</i>) parkland, recently burned forest, beaver ponds, golf courses and forested river valleys, and urban environments with tall trees and scattered open spaces. Also appears drawn to water; often nests densely in trees that overhang water or in dead, standing snags surrounded by water.
Sayornis phoebe	Eastern Phoebe				S3S4B	The eastern phoebe is generally thought to be a bird of woodland and edge habitats in the vicinity of water, but such features often coexist with nest sites (bridges, culverts, buildings, rock outcrops). Nevertheless, in the latter sites, phoebes sometimes nest in woodlands several hundred meters from water and openings.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
Contopus virens	Eastern Wood-Pewee		SC	Vulnerable	S3S4B	The eastern wood-peewee is a bird of openings and edges more than of closed forest, in the Maritimes, and they readily use well-spaced shade trees in rural and urban settlements. Associated with broad-leaved trees.
Passerella iliaca	Fox Sparrow				S3S4B	The fox sparrow is often associated with dense damp shrubbery of alders and other small broad-leaved trees in its inland range. On Nova Scotia's outer coasts, they will also frequent stunted spruces and shrubby bogs.
Perisoreus canadensis	Gray Jay				S3S4	The gray jay breeds in boreal regions and occurs year-round in the conifer forests. These birds are found all over the Maritimes except where extensive conifer forests are lacking. They seldom leave the spruce and fir forests where they nest.
Myiarchus crinitus	Great Crested Flycatcher				S2B	A bird of the eastern broad-leaved region. Nests in tree cavities and nest boxes. Sparse breeding records in southwestern Nova Scotia.
Charadrius vociferus	Killdeer				S3S4B	The killdeer is found throughout Nova Scotia, but scarce on the Atlantic slope and on Cape Breton Island. Breed in farmlands, gravel pits, forest clear-cut areas, and open lands along the coast.
Asio otus	Long-eared Owl				S2	The long-eared owl frequents woodlands large or small, dense or open, conifer or broad-leaved, at all seasons, but it also forages over open areas.
Accipiter gentilis	Northern Goshawk		NAR		S3S4	Though it is more generally found in the boreal forest region, likely because less often disturbed there, the Northern goshawk is also widespread in more temperate habitats. It nests in most forest types found throughout its

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
						geographic range. In eastern deciduous forests, Goshawks prefer nesting in mature, mixed hardwood–hemlock stands of birch (<i>Betula</i> sp.), beech (<i>Fagus</i> sp.), maple (<i>Acer</i> sp.), and eastern hemlock. Found scattered throughout the forests of the Maritimes. Hunts in diverse habitats ranging from open-sage steppes to dense forests, including riparian areas.
<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B	This Philadelphia vireo is found mainly in broad-leaved trees, in pure or mixed woods, but it sings and forages more often in young stands and in the sub-canopy. Breeding has never been proven in Nova Scotia.
<i>Carduelis pinus</i>	Pine Siskin				S3S4B,S5N	The pine siskin is primarily found in open coniferous forests. Also breeds in ornamental conifers in parks, cemeteries, and the like, and in mixed coniferous-deciduous and even deciduous tree associations. May forage in trees, shrubs, and grassy areas.
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S3S4B	Rose-breasted grosbeaks use a wide variety of habitats, including deciduous and mixed wooded uplands and lowlands; often at shrubby ecotones at the edge of woods at streams, ponds, marshes, roads, or pastures. Also commonly uses second-growth woodlands and well-vegetated suburban areas, parks, gardens, and orchards. Exhibits a preference for mesic woodlands, swamp forests, riparian corridors; avoids dry oak (<i>Quercus</i> spp.) woodlands. Uses a wide variety of habitats during spring and fall migration.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
Euphagus carolinus	Rusty Blackbird	SC	SC	Endangered	S2S3B	Rusty blackbirds use wet coniferous and mixed forests from northern edge of tundra southward to beginning of deciduous forests and grasslands. Frequents fens, alder (<i>Alnus</i>)–willow (<i>Salix</i>) bogs, muskegs, beaver ponds, and other openings in the forest such as swampy shores along lakes and streams. Exceptionally, on Cape Breton Island, Nova Scotia, drier sites such as pasture edges are used. During spring and fall migration, it forages in stubble, pasture, plowed fields, and edges of swamps. Fall migrants also frequent wooded areas, particularly for roosting. Occasionally roosts on the ground in open fields.
Wilsonia pusilla	Wilson's Warbler				S3S4B	Western montane, northern, and northeastern populations of Wilson's warbler are restricted to mesic shrub thickets of riparian habitats, edges of beaver ponds, lakes, bogs, and overgrown clear-cuts of montane and boreal zone; may reach into alpine zone. During spring and fall migration, occurs in most deciduous shrub habitats, but primarily riparian shrub understory. Also found in most other woodlands, suburban habitats, agricultural areas, desert scrub, and montane forests.
Hylocichla mustelina	Wood Thrush		T		S1B	The wood thrush breeds in the interior and edges of deciduous and mixed forests, especially well-developed, upland, mesic ones. Key elements of breeding sites include: trees >16 m in height, high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter. Habitat use during spring and fall migration is poorly documented, in fall probably uses second-growth and forest-edge habitats with fruit. No data for spring transients to suggest deviation from breeding season habitats.
Lynx canadensis	Canadian Lynx	NAR	NAR	Endangered	S1	Prefers old growth boreal forests with dense undercover, but the lynx will live in other habitats where undercover and prey numbers are adequate. They are often found in regenerating forests after a fire - where the snowshoe hare

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
						population has increased. When prey is scarce in the forested areas, the lynx will venture on to the tundra for food.
Perimyotis subflavus	Eastern Pipistrelle	E	E	Endangered	S1	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
Lasiurus borealis	Eastern Red Bat				S1	The red bat lives in forests, forest edges and hedgerows. It roosts among foliage, usually in deciduous trees, but it will sometimes roost in coniferous trees.
Pekania pennanti	Fisher				S2	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. Fishers commonly use hardwood stands in summer but prefer coniferous or mixed forests in winter. They generally avoid areas with little forest cover or significant human disturbance. Cape Breton Population is provincially endangered.
Lasiurus cinereus	Hoary Bat				S1	Hoary bats are thought to be rare in Nova Scotia. Insectivorous, migratory. Poorly known. Authorities disagree as to the bat's preference for coniferous versus broadleaf trees. Hoary bats are thought to prefer trees at the edge of clearings, but have been found in trees in heavy forests, open wooded glades, and shade trees along urban streets and in city parks.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
Myotis lucifugus	Little Brown Myotis	E	E	Endangered	S1	For Myotis lucifugus, the maternity colonies often exist in warm sites that facilitate pup growth rates, such as attics of buildings and under bridges, in rock crevices, or in cavities of canopy trees in forests. Males roost during daytime in a wide variety of structures, including buildings and bridges (mainly M. lucifugus), rock crevices, behind flaking bark, and within tree cavities, often at many different sites during the summer. Myotis species generally roost in tall, large-diameter snags that are in the early to middle stages of decay and located in open areas within mature-overmature forest. Myotis lucifugus congregates in caves and abandoned mines used for hibernation through the winter. About 16 hibernation sites are known in Nova Scotia.
Myotis septentrionalis	Northern Long-eared Myotis	E	E	Endangered	S1	The Northern Long-eared Bat (Myotis septentrionalis) 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
Microtus chrotorrhinus	Rock Vole				S2	Optimal habitat for the rock vole is ferns/mossy debris near flowing water in coniferous forests. It also occupies deciduous forest/spruce clearcuts (mainly recent cuts), forest ecotones, grassy balds near forest, and sterile-looking rocky road fills. Occupies shallow burrows and runways. Nests probably are placed under logs or in similar protected sites. They are made of moss with a lining of grass and have multiple entrance tunnels. Breeding season is from March to mid-October.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Vaccinium uliginosum</i>	Alpine Bilberry				S3	Wide tolerance of moisture and fertility, but generally acidic soils in Halifax, Digby & Cape Breton
<i>Fraxinus nigra</i>	Black Ash			Threatened	S1S2	Typical habitat includes poorly drained soils and swampy woods
<i>Carex tribuloides</i>	Blunt Broom Sedge				S3?	Found in wet forest soils and swales. Collected from Kings and Queens counties to Cape Breton.
<i>Carex tribuloides</i> <i>var. tribuloides</i>	Blunt Broom Sedge				S3?	Found in wet forest soils and swales.
<i>Betula pumila</i> <i>var.</i> <i>renifolia</i>	Bog Birch				S1?	Bogs and meadows amongst alders

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Betula pumila</i> var. <i>pumila</i>	Bog Birch				S2S3	Bogs and meadows amongst alders
<i>Symphotrichum boreale</i>	Boreal Aster				S2?	Lacustrine gravels, streamsides and edges of peatlands. Scattered from Yarmouth to Cape Breton and uncommon.
<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S2	Treed swamps, mossy coniferous forest, seepy coastal slopes. Scattered on Digby Neck. Common on Saint Paul Island and infrequent elsewhere.
<i>Eupatorium dubium</i>	Coastal Plain Joe-pye-weed				S2	Found in wet meadows, damp thickets, shores, and along the roadside. It grows best in full sun but can also grow in semi-shade and enjoys grows well-drained soil that is moisture retentive.
<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3	Grows in sphagnous peatlands, lacustrine peaty sands and gravels. Frequently seen in Yarmouth and Shelburne counties, becoming scarcer to Cumberland county.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Galium aparine</i>	Common Bedstraw				S2S3	Pastures, fields, ditches and streamsides. Very common throughout.
<i>Humulus lupulus</i> <i>var. lupuloides</i>	Common Hop				S1?	Anthropogenic (man-made or disturbed habitats), floodplain (river or stream floodplains), forests, shrublands or thickets.
<i>Cardamine pratensis</i> <i>var. angustifolia</i>	Cuckoo Flower				S1	Moist soil as in meadows, damp fields and other low ground. Scattered in the province, frequent along the Annapolis River and even spreading into roadsides ditches, north to Cape Breton.
<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1S2	Anthropogenic (man-made or disturbed habitats), fresh tidal marshes or flats, marshes, swamps.
<i>Ranunculus sceleratus</i> <i>var. sceleratus</i>	Cursed Buttercup				S1S2	Anthropogenic (man-made or disturbed habitats), fresh tidal marshes or flats, marshes, swamps.
<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S1S2	Floodplain (river or stream floodplains), forests, shores of rivers or lakes, swamps, wetland margins (edges of wetlands).
<i>Rudbeckia laciniata</i> <i>var. gaspereaensis</i>	Cut-Leaved Coneflower				S1S2	Floodplain (river or stream floodplains), forests, shores of rivers or lakes, swamps, wetland margins (edges of wetlands).

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Botrychium dissectum</i>	Cut-leaved Moonwort				S3	Generally in sandy, gravelly, grassy or open soils. Frequent in the southwestern counties, scattered eastward to Cape Breton
<i>Baccharis halimifolia</i>	Eastern Baccharis		T	Threatened	S1	Anthropogenic (man-made or disturbed habitats), brackish or salt marshes and flats, coastal beaches (sea beaches), marshes.
<i>Sisyrinchium atlanticum</i>	Eastern Blue-Eyed-Grass				S3S4	Found in damp peat, sandy soils that are poorly drained. Common from Yarmouth and Shelburne counties east to Lunenburg Co. Scattered elsewhere.
<i>Panicum dichotomiflorum</i> var. <i>puritanorum</i>	Fall Panic Grass				S1?	Anthropogenic (man-made or disturbed habitats), shores of rivers or lakes.
<i>Trichostema dichotomum</i>	Forked Bluecurls				S1	Anthropogenic (man-made or disturbed habitats), grassland, meadows and fields, sandplains and barrens.
<i>Carex alopecoidea</i>	Foxtail Sedge				S1	Anthropogenic (man-made or disturbed habitats), floodplain (river or stream floodplains), forests, marshes.
<i>Cyperus lupulinus</i>	Hop Flatsedge				S1	Anthropogenic (man-made or disturbed habitats), grassland, meadows and fields.
<i>Cyperus lupulinus</i> ssp. <i>macilentus</i>	Hop Flatsedge				S1	Anthropogenic (man-made or disturbed habitats), grassland, meadows and fields.
<i>Carex grisea</i>	Inflated Narrow-leaved Sedge				S1	Floodplain (river or stream floodplains), forests.
<i>Galium labradoricum</i>	Labrador Bedstraw				S2	Alkaline soils in wet meadows, bogs. Limited to Cape Breton counties.
<i>Carex lapponica</i>	Lapland Sedge				S1?	Sphagnum bogs, wet, nutrient-poor areas, mostly lowlands
<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	Grows in deciduous or mixed deciduous forests. Found from Hants Co. through the Cobequids to Cape Breton.
<i>Pyrola minor</i>	Lesser Pyrola				S3	Characteristic of mature coniferous forests. Scattered north from Digby neck to Kentville and east to Cape Breton.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Rhinanthus minor</i> <i>ssp. groenlandicus</i>	Little Yellow Rattle				S1	Alpine or subalpine zones, anthropogenic (man-made or disturbed habitats), meadows and fields, mountain summits and plateaus, talus and rocky slopes
<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	Anthropogenic (man-made or disturbed habitats), fens (calcium-rich wetlands), lacustrine (in lakes or ponds), meadows and fields, shores of rivers or lakes.
<i>Hordeum brachyantherum</i>	Meadow Barley				S1	Anthropogenic (man-made or disturbed habitats).
<i>Hordeum brachyantherum</i> <i>ssp. brachyantherum</i>	Meadow Barley				S1	Anthropogenic (man-made or disturbed habitats).
<i>Juncus stygius</i>	Moor Rush				S2	Bogs, bog pools and wet moss. Limited to Cape Breton localities, where it may be common but local.
<i>Juncus stygius</i> <i>ssp. americanus</i>	Moor Rush				S2	Bogs, bog pools and wet moss. Limited to Cape Breton localities, where it may be common but local.
<i>Betula borealis</i>	Northern Birch				S2	Bogs and wooded swamps.
<i>Spiraea septentrionalis</i>	Northern Meadowsweet				S1?	open, moist areas
<i>Platanthera flava</i> <i>var. herbiola</i>	Pale Green Orchid				S2	Anthropogenic (man-made or disturbed habitats), floodplain (river or stream floodplains), forest edges, forests, fresh tidal marshes or flats, grassland, meadows and fields, riverine (in rivers or streams), shrublands or thickets, swamps, wetland margins (edges of wetlands), woodlands.
<i>Rumex persicarioides</i>	Peach-leaved Dock				S2?	Anthropogenic (man-made or disturbed habitats), brackish or salt marshes and flats, coastal beaches (sea beaches), meadows and fields.
<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup				S1	Anthropogenic (man-made or disturbed habitats), marshes, shores of rivers or lakes, swamps.
<i>Polygonum pensylvanicum</i>	Pennsylvania Smartweed				S3	Frequently seen in roadside ditches, edges of cultivated fields and along dyked marshes. Generally northern, from Annapolis and Queens to Cape Breton counties.

ScientificName	CommonName	SARA	COSEWIC	NSESA	SRank	Habitat Requirements
<i>Crataegus submollis</i>	Quebec Hawthorn				S1?	edges of fields and thickets, Antigonish and Lunenburg Co. to Cape Breton
<i>Eleocharis nitida</i>	Quill Spikerush				S3	Moist soils, often associated with basalt. Found along the North Mountain of Kings and Annapolis counties; Cape d'Or and Economy Mountain, Cumberland Co.; Scatarie Island, Cape Breton.
<i>Fraxinus pennsylvanica</i>	Red Ash				S1	Floodplain (river or stream floodplains), forests, shores of rivers or lakes, swamps.
<i>Eleocharis erythropoda</i>	Red-stemmed Spikerush				S1	Fens (calcium-rich wetlands), marshes, shores of rivers or lakes, wetland margins (edges of wetlands).
<i>Plantago rugelii</i>	Rugel's Plantain				S2S3	Anthropogenic (man-made or disturbed habitats), grassland, meadows and fields.
<i>Plantago rugelii var. rugelii</i>	Rugel's Plantain				S2S3	Anthropogenic (man-made or disturbed habitats), grassland, meadows and fields.
<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	bog, swamp. Widely scattered localities in province
<i>Halenia deflexa ssp. brentoniana</i>	Spurred Gentian				S1?	forest edge, forests, meadows and fields
<i>Arabis hirsuta var. pycnocarpa</i>	Western Hairy Rockcress				S1S2	cliff or talus slope, dry sites and gravels. Rare in Cumberland Co., Colchester Co. and at several Victoria, Inverness and Cape Breton Co. stations.
<i>Carex wiegandii</i>	Wiegand's Sedge				S3	Treed bogs, bogs, conifer and alder thickets. Cape Breton Island, Shelburne Co.
<i>Fragaria vesca</i>	Woodland Strawberry				S3S4	shady forests and ravines. Brier Island to Kings and Cumberland counties. To northern Cape Breton
<i>Fragaria vesca ssp. americana</i>	Woodland Strawberry				S3S4	shady forests and ravines. Brier Island to Kings and Cumberland counties. To northern Cape Breton



DATA REPORT 5542: Rhodena, NS

Prepared 22 April 2016
by J. Churchill, Data Manager

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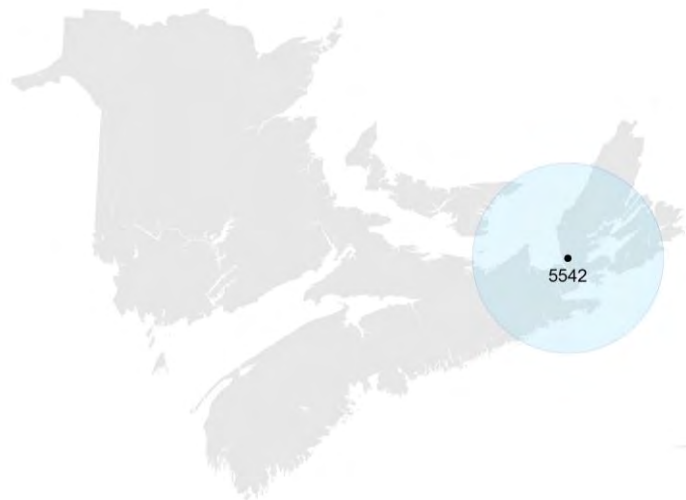
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Map 1. A 100 km buffer around the study area

1.0 PREFACE

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

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

1.1 DATA LIST

Included datasets:

Filename	Contents
RhodenaNS_5542ob.xls	All Rare and legally protected <i>Flora and Fauna</i> within 5 km of your study area
RhodenaNS_5542ob100km.xls	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area
RhodenaNS_5542ff.xls	Rare and common <i>Freshwater Fish</i> in your study area (DFO database)

1.2 RESTRICTIONS

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

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

1.3 ADDITIONAL INFORMATION

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

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

Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney, Senior Scientist, Executive Director

Tel: (506) 364-2658

sblaney@mta.ca

Animals (Fauna)

John Klymko, Zoologist

Tel: (506) 364-2660

jklymko@mta.ca

Plant Communities

Sarah Robinson, Community Ecologist

Tel: (506) 364-2664

srobinson@mta.ca

Data Management, GIS

James Churchill, Data Manager

Tel: (902) 679-6146

jlchurchill@mta.ca

Billing

Jean Breau

Tel: (506) 364-2657

jrbreau@mta.ca

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

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

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

Western: Duncan Bayne

(902) 648-3536

baynedz@gov.ns.ca

Western: Donald Sam

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samdx@gov.ns.ca

Central: Shavonne Meyer

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(902) 893-5630

georgeka@gov.ns.ca

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(902) 863-7523

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andersdg@gov.ns.ca

Eastern: Terry Power

(902) 563-3370

powertd@gov.ns.ca

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

2.0 RARE AND ENDANGERED SPECIES

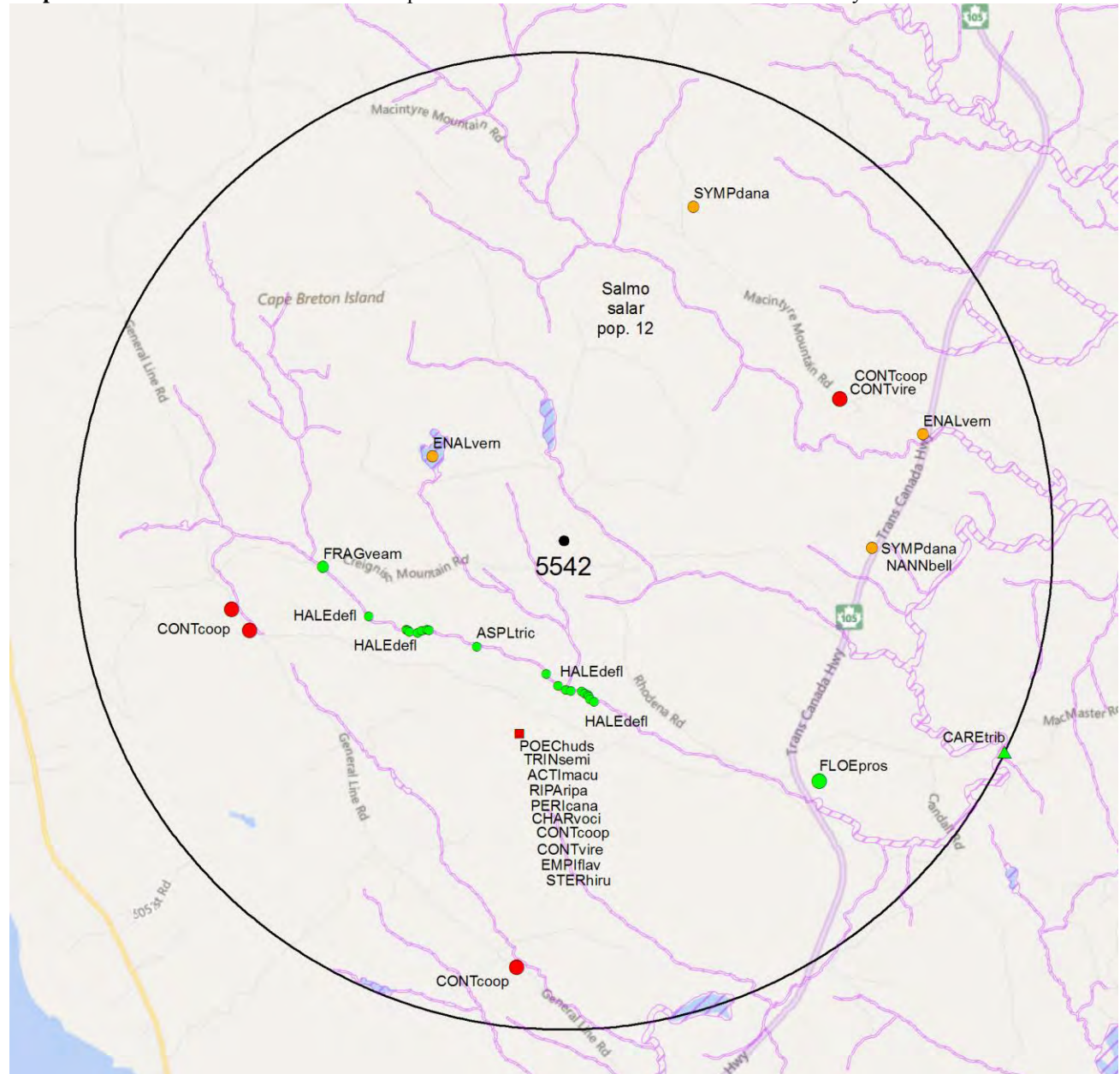
2.1 FLORA

A 5 km buffer around the study area contains 22 records of 5 vascular, no records of nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA

A 5 km buffer around the study area contains 26 records of 10 vertebrate, 5 records of 3 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within 5 km of the study area.



RESOLUTION

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

HIGHER TAXON

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

3.0 SPECIAL AREAS

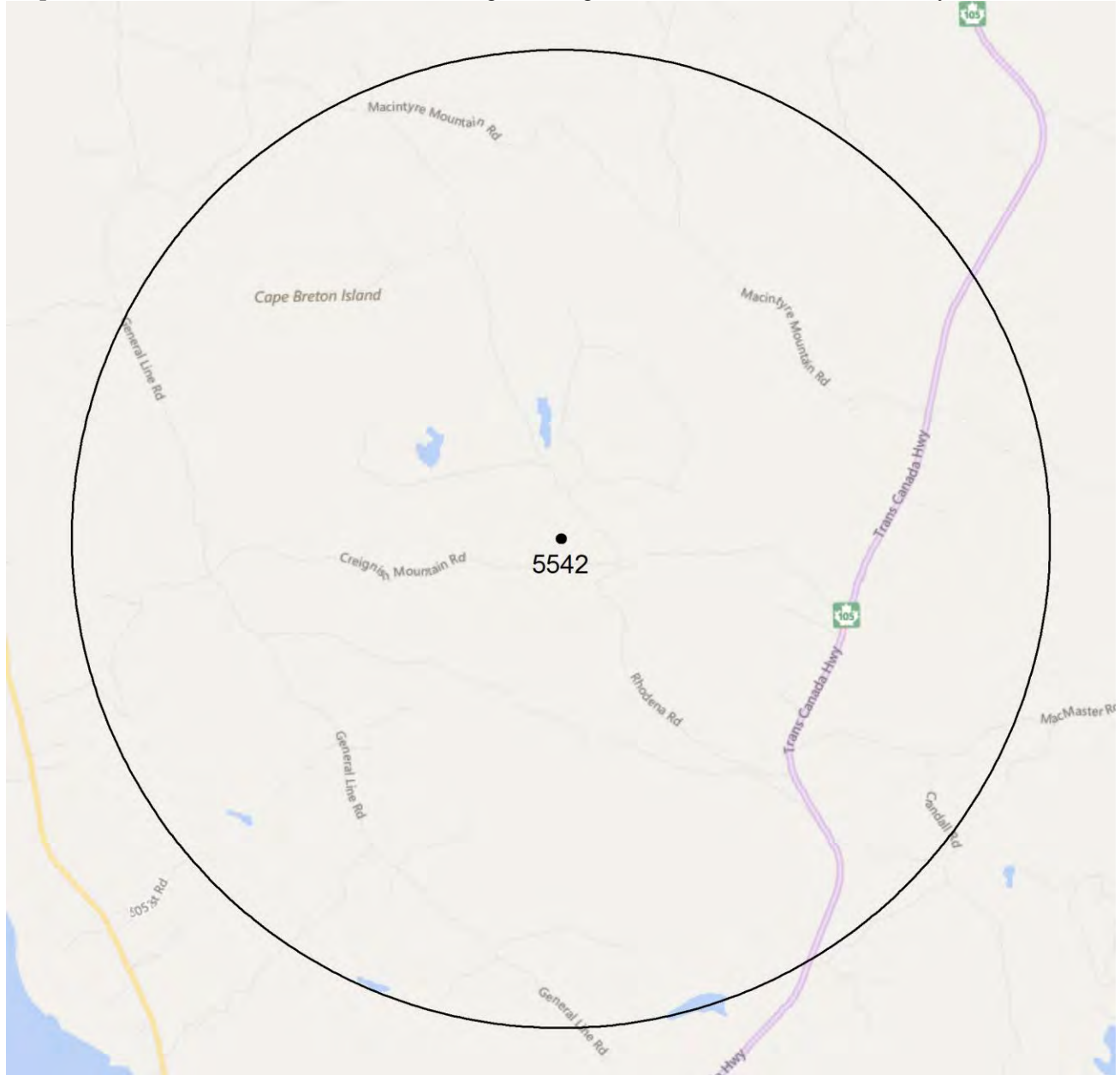
3.1 MANAGED AREAS

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






3.2 SIGNIFICANT AREAS

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

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



MANAGED AREAS SIGNIFICANT AREAS

-  boundary
-  boundary
-  approximate
-  approximate
-  point location

NATIONAL DEFENSE FIRST NATIONS

-  boundary
-  boundary
-  approximate
-  approximate
-  point location

4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding “location-sensitive” species, section 4.3) within the 5 km-buffered area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (\pm the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files *ob.xls/*ob.shp only.

4.1 FLORA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
P	<i>Floerkea proserpinacoides</i>	False Mermaidweed	Not At Risk			S2	3 Sensitive	1	3.6 \pm 0.0
P	<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort				S2	3 Sensitive	1	1.4 \pm 0.0
P	<i>Halenia deflexa</i>	Spurred Gentian				S2S3	3 Sensitive	18	1.4 \pm 0.0
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3?	4 Secure	1	5.0 \pm 1.0
P	<i>Fragaria vesca ssp. americana</i>	Woodland Strawberry				S3S4	4 Secure	1	2.5 \pm 0.0

4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	8	2.0 \pm 7.0
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S3B	2 May Be At Risk	1	2.0 \pm 7.0
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	2	2.0 \pm 7.0
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	2	2.0 \pm 7.0
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	2	2.0 \pm 7.0
A	<i>Poecile hudsonica</i>	Boreal Chickadee				S3	3 Sensitive	2	2.0 \pm 7.0
A	<i>Perisoreus canadensis</i>	Gray Jay				S3S4	3 Sensitive	2	2.0 \pm 7.0
A	<i>Charadrius vociferus</i>	Killdeer				S3S4B	3 Sensitive	2	2.0 \pm 7.0
A	<i>Actitis macularia</i>	Spotted Sandpiper				S3S4B	3 Sensitive	2	2.0 \pm 7.0
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	3	2.0 \pm 7.0
I	<i>Nannothermis bella</i>	Elfin Skimmer				S3	4 Secure	1	3.2 \pm 0.0
I	<i>Sympetrum danae</i>	Black Meadowhawk				S3	3 Sensitive	2	3.2 \pm 0.0
I	<i>Enallagma vernale</i>	Vernal Bluet				S3	5 Undetermined	2	1.6 \pm 0.0

4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species “location sensitive”. Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting a 5 km buffer of your study area are indicated below with “YES”.

Nova Scotia

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within 5 km of Study Site?
<i>Fraxinus nigra</i>	Black Ash		Threatened	No
<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Vulnerable	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	YES
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
<i>Bat Hibernaculum</i>		[Endangered] ¹	[Endangered] ¹	No

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

4.4 SOURCE BIBLIOGRAPHY

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

# recs	CITATION
25	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
20	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2014. Atlantic Canada Conservation Data Centre Fieldwork 2014. Atlantic Canada Conservation Data Centre, # recs.
5	Benjamin, L.K. 2009. D. Anderson Odonata Records for Cape Breton, 1997-2004. Nova Scotia Dept Natural Resources, 1316 recs.
1	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
1	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
1	Newell, R. E. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University. 2013.
1	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 11796 records of 112 vertebrate and 437 records of 48 invertebrate fauna; 4172 records of 252 vascular, 318 records of 32 nonvascular flora (attached: *ob100km.xls).

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

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Morone saxatilis</i>	Striped Bass	Endangered			S1	2 May Be At Risk	4	84.9 \pm 0.0	NS
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	42	21.3 \pm 0.0	NS
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	7	92.2 \pm 0.0	PE
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	1077	18.7 \pm 0.0	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	1 At Risk	40	52.8 \pm 7.0	NS
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered		Endangered	S2S3M	1 At Risk	12	30.8 \pm 0.0	NS
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened			S1?	2 May Be At Risk	1	85.8 \pm 0.0	NS
A	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	1 At Risk	2	40.5 \pm 7.0	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened			S1B	5 Undetermined	7	38.0 \pm 7.0	NS
A	<i>Sturnella magna</i>	Eastern Meadowlark	Threatened			S1B	3 Sensitive	2	52.8 \pm 7.0	NS
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Special Concern	Endangered	S1S2B	1 At Risk	33	41.3 \pm 7.0	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	3 Sensitive	125	3.3 \pm 0.0	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2S3B	1 At Risk	71	36.0 \pm 0.0	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	481	9.7 \pm 7.0	NS
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3B	1 At Risk	297	12.0 \pm 7.0	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S3B	1 At Risk	124	9.7 \pm 7.0	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	634	2.0 \pm 7.0	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S3B	2 May Be At Risk	242	2.0 \pm 7.0	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	250	9.7 \pm 7.0	NS
A	<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Vulnerable	S1B	3 Sensitive	2	11.3 \pm 0.0	NS
A	<i>Passerculus sandwichensis princeps</i>	Savannah Sparrow princeps ssp	Special Concern	Special Concern		S1B	3 Sensitive	1	78.2 \pm 7.0	NS
A	<i>Bucephala islandica (Eastern pop.)</i>	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern		S1N	1 At Risk	2	95.8 \pm 0.0	PE
A	<i>Morone saxatilis pop. 1</i>	Striped Bass- Southern Gulf of St Lawrence pop.	Special Concern			S1N	2 May Be At Risk	1	43.2 \pm 1.0	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern		S1S2	2 May Be At Risk	7	62.4 \pm 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Histrionicus histrionicus</i> pop. 1	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	10	42.3 ± 16.0	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2S3B	2 May Be At Risk	181	8.0 ± 7.0	NS
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	11	39.9 ± 0.0	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	234	2.0 ± 7.0	NS
A	<i>Phocoena phocoena</i> (NW Atlantic pop.)	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		1	97.9 ± 5.0	PE
A	<i>Tryngites subruficollis</i>	Buff-breasted Sandpiper	Special Concern			SNA	8 Accidental	1	57.7 ± 0.0	NS
A	<i>Lynx canadensis</i>	Canadian Lynx	Not At Risk		Endangered	S1	1 At Risk	56	11.1 ± 1.0	NS
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B,SNAN	5 Undetermined	1	97.3 ± 7.0	NS
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1B	5 Undetermined	2	92.9 ± 7.0	PE
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S1B	5 Undetermined	7	39.9 ± 0.0	NS
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	9	40.1 ± 0.0	NS
A	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk			S3	4 Secure	18	9.3 ± 1.0	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	393	2.0 ± 7.0	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	11	24.3 ± 7.0	NS
A	<i>Gavia immer</i>	Common Loon	Not At Risk			S3B,S4N	2 May Be At Risk	597	9.7 ± 7.0	NS
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	4 Secure	69	12.0 ± 7.0	NS
A	<i>Martes americana</i>	American Marten			Endangered	S1	1 At Risk	18	42.5 ± 1.0	NS
A	<i>Alces americanus</i>	Moose			Endangered	S1	1 At Risk	19	45.9 ± 1.0	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1?B	5 Undetermined	3	30.5 ± 0.0	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1?B	5 Undetermined	7	9.7 ± 7.0	NS
A	<i>Tringa solitaria</i>	Solitary Sandpiper				S1?B,S4S5M	4 Secure	5	42.5 ± 0.0	NS
A	<i>Larus delawarensis</i>	Ring-billed Gull				S1?B,S5N	4 Secure	16	58.4 ± 0.0	NS
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1B	2 May Be At Risk	1	40.5 ± 7.0	NS
A	<i>Haematopus palliatus</i>	American Oystercatcher				S1B	5 Undetermined	7	51.3 ± 7.0	NS
A	<i>Progne subis</i>	Purple Martin				S1B	2 May Be At Risk	3	92.7 ± 0.0	NS
A	<i>Alca torda</i>	Razorbill				S1B,S4N	3 Sensitive	10	68.6 ± 7.0	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S5M	4 Secure	68	21.4 ± 0.0	NS
A	<i>Picoides dorsalis</i>	American Three-toed Woodpecker				S1S2	5 Undetermined	9	39.9 ± 0.0	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1S2B	5 Undetermined	4	36.6 ± 0.0	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1S2B,S5M	4 Secure	143	21.4 ± 0.0	NS
A	<i>Asio otus</i>	Long-eared Owl				S2	2 May Be At Risk	29	12.0 ± 7.0	NS
A	<i>Salmo salar</i>	Atlantic Salmon				S2	2 May Be At Risk	79	8.6 ± 0.0	NS
A	<i>Microtus chrotorrhinus</i>	Rock Vole				S2	4 Secure	14	40.1 ± 0.0	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B	5 Undetermined	9	50.5 ± 7.0	NS
A	<i>Anas acuta</i>	Northern Pintail				S2B	2 May Be At Risk	8	39.6 ± 1.0	NS
A	<i>Anas clypeata</i>	Northern Shoveler				S2B	2 May Be At Risk	5	91.0 ± 7.0	PE
A	<i>Anas strepera</i>	Gadwall				S2B	2 May Be At Risk	7	32.7 ± 7.0	NS
A	<i>Rallus limicola</i>	Virginia Rail				S2B	5 Undetermined	9	24.0 ± 7.0	NS
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	3 Sensitive	6	42.2 ± 7.0	NS
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B	5 Undetermined	8	34.6 ± 7.0	NS
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S2B,S4S5N	3 Sensitive	10	89.5 ± 0.0	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S2B,S5N	4 Secure	137	20.3 ± 9.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B	3 Sensitive	2	92.9 ± 7.0	PE
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	376	2.0 ± 7.0	NS
A	<i>Pooecetes gramineus</i>	Vesper Sparrow				S2S3B	2 May Be At Risk	9	9.7 ± 7.0	NS
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2S3B	4 Secure	33	15.3 ± 7.0	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B	2 May Be At Risk	12	12.0 ± 7.0	NS
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S3	3 Sensitive	232	29.9 ± 7.0	NS
A	<i>Poecile hudsonica</i>	Boreal Chickadee				S3	3 Sensitive	587	2.0 ± 7.0	NS
A	<i>Synaptomys cooperi</i>	Southern Bog Lemming				S3	4 Secure	6	40.1 ± 0.0	NS
A	<i>Pekania pennanti</i>	Fisher				S3	3 Sensitive	1	67.4 ± 0.0	NS
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3?B	2 May Be At Risk	37	20.4 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Dendroica tigrina</i>	Cape May Warbler				S3?B	3 Sensitive	60	15.9 ± 7.0	NS
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S3?B,S5N	2 May Be At Risk	127	12.0 ± 7.0	NS
A	<i>Podilymbus podiceps</i>	Pied-billed Grebe				S3B	3 Sensitive	51	15.9 ± 7.0	NS
A	<i>Anas discors</i>	Blue-winged Teal				S3B	2 May Be At Risk	100	20.8 ± 7.0	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	2 May Be At Risk	66	10.6 ± 7.0	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S3B	2 May Be At Risk	127	9.7 ± 7.0	NS
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	152	12.0 ± 7.0	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S3B	4 Secure	17	12.0 ± 7.0	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S5M	3 Sensitive	173	21.4 ± 0.0	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3B,S5N	4 Secure	133	10.6 ± 7.0	NS
A	<i>Branta bernicla</i>	Brant				S3M	3 Sensitive	1	42.3 ± 16.0	NS
A	<i>Pluvialis dominica</i>	American Golden-Plover				S3M	3 Sensitive	17	40.0 ± 0.0	NS
A	<i>Numenius phaeopus hudsonicus</i>	Hudsonian Whimbrel				S3M	3 Sensitive	40	40.0 ± 0.0	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit				S3M	3 Sensitive	6	40.0 ± 0.0	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	106	21.4 ± 0.0	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3N	3 Sensitive	21	17.0 ± 10.0	NS
A	<i>Cephus grylle</i>	Black Guillemot				S3S4	4 Secure	95	29.9 ± 7.0	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	71	15.2 ± 0.0	NS
A	<i>Perisoreus canadensis</i>	Gray Jay				S3S4	3 Sensitive	309	2.0 ± 7.0	NS
A	<i>Cardinalis cardinalis</i>	Northern Cardinal				S3S4	4 Secure	3	51.0 ± 7.0	NS
A	<i>Sorex palustris</i>	American Water Shrew				S3S4	4 Secure	1	98.7 ± 0.0	PE
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B	3 Sensitive	149	12.0 ± 7.0	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3S4B	3 Sensitive	150	2.0 ± 7.0	NS
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B	3 Sensitive	537	2.0 ± 7.0	NS
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3S4B	3 Sensitive	351	6.4 ± 0.0	NS
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	594	2.0 ± 7.0	NS
A	<i>Sayornis phoebe</i>	Eastern Phoebe				S3S4B	3 Sensitive	77	12.0 ± 7.0	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3S4B	3 Sensitive	89	9.7 ± 7.0	NS
A	<i>Vermivora peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	149	12.0 ± 7.0	NS
A	<i>Dendroica castanea</i>	Bay-breasted Warbler				S3S4B	3 Sensitive	228	9.7 ± 7.0	NS
A	<i>Dendroica striata</i>	Blackpoll Warbler				S3S4B	3 Sensitive	123	12.0 ± 7.0	NS
A	<i>Wilsonia pusilla</i>	Wilson's Warbler				S3S4B	3 Sensitive	77	12.0 ± 7.0	NS
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S3S4B	3 Sensitive	178	9.7 ± 7.0	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B	4 Secure	130	7.3 ± 0.0	NS
A	<i>Carduelis pinus</i>	Pine Siskin				S3S4B,S5N	3 Sensitive	261	9.7 ± 7.0	NS
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M	4 Secure	33	6.1 ± 0.0	NS
I	<i>Lampsilis cariosa</i>	Yellow Lampmussel	Special Concern	Special Concern	Threatened	S1	1 At Risk	37	90.4 ± 0.0	NS
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Threatened	S1S2	3 Sensitive	8	42.6 ± 0.0	NS
I	<i>Danaus plexippus</i>	Monarch	Special Concern	Special Concern		S2B	3 Sensitive	20	34.9 ± 1.0	NS
I	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern			SNR	3 Sensitive	1	89.9 ± 0.0	NS
I	<i>Papilio brevicauda</i>	Short-tailed Swallowtail				S1	3 Sensitive	11	63.2 ± 1.0	NS
I	<i>Papilio brevicauda bretonensis</i>	Short-tailed Swallowtail				S1	1 At Risk	1	99.4 ± 0.0	NS
I	<i>Neurocordulia michaeli</i>	Broadtailed Shadowdragon				S1		22	75.9 ± 0.0	NS
I	<i>Somatochlora albicincta</i>	Ringed Emerald				S1	2 May Be At Risk	3	99.8 ± 0.0	NS
I	<i>Coenagrion interrogatum</i>	Subarctic Bluet				S1	2 May Be At Risk	2	81.4 ± 0.0	NS
I	<i>Leptodea ochracea</i>	Tidewater Mucket				S1	3 Sensitive	17	88.1 ± 1.0	NS
I	<i>Lycaena dorcas</i>	Dorcas Copper				S1?	6 Not Assessed	13	44.7 ± 0.0	NS
I	<i>Strymon melinus</i>	Grey Hairstreak				S1S2	4 Secure	1	35.5 ± 0.0	NS
I	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S1S2	4 Secure	1	46.0 ± 1.0	NS
I	<i>Coenagrion resolutum</i>	Taiga Bluet				S1S2	2 May Be At Risk	4	98.1 ± 1.0	PE
I	<i>Lycaena dospassosi</i>	Salt Marsh Copper				S2	1 At Risk	1	35.2 ± 0.0	NS

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I	<i>Boloria chariclea</i>	Arctic Fritillary				S2	3 Sensitive	2	69.0 ± 1.0	NS
I	<i>Aglais milberti</i>	Milbert's Tortoiseshell				S2	4 Secure	1	63.2 ± 1.0	NS
I	<i>Somatochlora septentrionalis</i>	Muskeg Emerald				S2	3 Sensitive	13	61.3 ± 0.0	NS
I	<i>Somatochlora williamsoni</i>	Williamson's Emerald				S2	2 May Be At Risk	10	66.8 ± 0.0	NS
I	<i>Lampsilis radiata</i>	Eastern Lampmussel				S2	3 Sensitive	20	21.8 ± 0.0	NS
I	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	3 Sensitive	2	67.9 ± 0.0	NS
I	<i>Thorybes pylades</i>	Northern Cloudywing				S2S3	3 Sensitive	9	41.5 ± 0.0	NS
I	<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper				S2S3	4 Secure	1	87.1 ± 0.0	NS
I	<i>Euphydryas phaeton</i>	Baltimore Checkerspot				S2S3	4 Secure	9	34.1 ± 1.0	NS
I	<i>Gomphus descriptus</i>	Harpoon Clubtail				S2S3	3 Sensitive	16	6.3 ± 0.0	NS
I	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S2S3	2 May Be At Risk	5	6.3 ± 0.0	NS
I	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S2S3	2 May Be At Risk	4	62.2 ± 0.0	NS
I	<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S2S3	2 May Be At Risk	37	75.9 ± 0.0	NS
I	<i>Somatochlora forcipata</i>	Forcipate Emerald				S2S3	2 May Be At Risk	7	55.7 ± 1.0	NS
I	<i>Somatochlora franklini</i>	Delicate Emerald				S2S3	3 Sensitive	1	99.7 ± 1.0	PE
I	<i>Alasmidonta undulata</i>	Triangle Floater				S2S3	4 Secure	5	38.0 ± 0.0	NS
I	<i>Callophrys henrici</i>	Henry's Elfin				S3	4 Secure	1	68.2 ± 0.0	NS
I	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	3	40.2 ± 1.0	NS
I	<i>Polygonia faunus</i>	Green Comma				S3	4 Secure	14	18.1 ± 0.0	NS
I	<i>Oeneis jutta</i>	Jutta Arctic				S3	2 May Be At Risk	6	18.1 ± 0.0	NS
I	<i>Aeshna clepsydra</i>	Mottled Darner				S3	4 Secure	1	7.5 ± 0.0	NS
I	<i>Aeshna constricta</i>	Lance-Tipped Darner				S3	4 Secure	1	99.9 ± 0.0	PE
I	<i>Boyeria grafiana</i>	Ocellated Darner				S3	3 Sensitive	4	80.3 ± 0.0	NS
I	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	3 Sensitive	3	8.3 ± 0.0	NS
I	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S3	4 Secure	2	76.9 ± 0.0	NS
I	<i>Nannothemis bella</i>	Elfin Skimmer				S3	4 Secure	3	3.2 ± 0.0	NS
I	<i>Sympetrum danae</i>	Black Meadowhawk				S3	3 Sensitive	11	3.2 ± 0.0	NS
I	<i>Enallagma vernale</i>	Vernal Bluet				S3	5 Undetermined	8	1.6 ± 0.0	NS
I	<i>Amphiagrion saucium</i>	Eastern Red Damselfly				S3	4 Secure	12	23.8 ± 0.0	NS
I	<i>Polygonia interrogatoris</i>	Question Mark				S3B	4 Secure	22	35.5 ± 0.0	NS
I	<i>Erynnis juvenalis</i>	Juvenal's Duskywing				S3S4	4 Secure	1	47.7 ± 1.0	NS
I	<i>Polygonia progne</i>	Grey Comma				S3S4	4 Secure	17	8.6 ± 0.0	NS
I	<i>Lanthus parvulus</i>	Northern Pygmy Clubtail				S3S4	4 Secure	44	36.1 ± 1.0	NS
I	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1S2	1 At Risk	238	31.5 ± 0.0	NS
N	<i>Peltigera hydrothyria</i>	Eastern Waterfan	Threatened			S1S2	2 May Be At Risk	1	97.6 ± 1.0	NS
N	<i>Sclerophora peronella</i> (Nova Scotia pop.)	Frosted Glass-whiskers Lichen - Nova Scotia pop.	Special Concern	Special Concern		S1?		4	84.6 ± 1.0	NS
N	<i>Degelia plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S2	4 Secure	27	18.6 ± 0.0	NS
N	<i>Seligeria diversifolia</i>	a Moss				S1		1	85.2 ± 0.0	NS
N	<i>Parmeliella parvula</i>	Poor-man's Shingles Lichen				S1?	2 May Be At Risk	6	70.8 ± 0.0	NS
N	<i>Nephroma arcticum</i>	Arctic Kidney Lichen				S1S2	2 May Be At Risk	1	56.2 ± 0.0	NS
N	<i>Atrichum angustatum</i>	Lesser Smoothcap Moss				S2?	3 Sensitive	2	49.6 ± 3.0	NS
N	<i>Bryum uliginosum</i>	a Moss				S2?	3 Sensitive	1	78.5 ± 3.0	NS
N	<i>Buxbaumia minakatae</i>	Hump-Backed Elves				S2?	3 Sensitive	1	68.1 ± 100.0	NS
N	<i>Conardia compacta</i>	Coast Creeping Moss				S2?	3 Sensitive	2	36.5 ± 2.0	NS
N	<i>Fontinalis sullivantii</i>	a Moss				S2?	3 Sensitive	1	68.1 ± 100.0	NS
N	<i>Grimmia anomala</i>	Mountain Forest Grimmia				S2?	3 Sensitive	1	83.9 ± 0.0	NS

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N	<i>Paludella squarrosa</i>	Tufted Fen Moss				S2?	3 Sensitive	1	63.6 ± 5.0	NS
N	<i>Platydictya confervoides</i>	a Moss				S2?	3 Sensitive	1	92.7 ± 3.0	NS
N	<i>Platydictya jungermannioides</i>	False Willow Moss				S2?	3 Sensitive	1	26.2 ± 0.0	NS
N	<i>Scorpidium scorpioides</i>	Hooked Scorpion Moss				S2?	3 Sensitive	7	42.7 ± 0.0	NS
N	<i>Syntrichia ruralis</i>	a Moss				S2?	3 Sensitive	1	92.6 ± 1.0	NS
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2?	3 Sensitive	1	69.5 ± 0.0	NS
N	<i>Calliergon giganteum</i>	Giant Spear Moss				S2S3	3 Sensitive	1	42.8 ± 0.0	NS
N	<i>Leucodon andrewsianus</i>	a Moss				S2S3	3 Sensitive	3	69.5 ± 0.0	NS
N	<i>Sphagnum teres</i>	Rigid Peat Moss				S2S3	3 Sensitive	1	43.5 ± 5.0	NS
N	<i>Tortella fragilis</i>	Fragile Twisted Moss				S2S3	3 Sensitive	2	69.1 ± 0.0	NS
N	<i>Limprichtia revolvens</i>	a Moss				S2S3	3 Sensitive	1	45.6 ± 0.0	NS
N	<i>Hylocomiastrum pyrenaicum</i>	a Feather Moss				S2S3	3 Sensitive	1	51.7 ± 3.0	NS
N	<i>Flavocetraria nivalis</i>	Crinkled Snow Lichen				S2S3	3 Sensitive	1	98.2 ± 0.0	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S2S3	3 Sensitive	1	96.2 ± 0.0	NS
N	<i>Usnea mutabilis</i>	Bloody Beard Lichen				S2S3	3 Sensitive	1	19.7 ± 0.0	NS
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S2S3	3 Sensitive	4	18.6 ± 0.0	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3?	3 Sensitive	2	70.5 ± 0.0	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3?	3 Sensitive	1	56.2 ± 0.0	NS
N	<i>Collema furfuraceum</i>	Blistered Tarpaper Lichen				S3?	3 Sensitive	1	56.2 ± 0.0	NS
P	<i>Juncus caesariensis</i>	New Jersey Rush	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	239	54.7 ± 0.0	NS
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	11	95.8 ± 0.0	NS
P	<i>Floerkea proserpinacoides</i>	False Mermaidweed	Not At Risk			S2	3 Sensitive	21	3.6 ± 0.0	NS
P	<i>Salix candida</i>	Sage Willow			Endangered	S1	2 May Be At Risk	34	44.5 ± 0.0	NS
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S1	1 At Risk	3	51.9 ± 7.0	NS
P	<i>Sanicula odorata</i>	Clustered Sanicle				S1	2 May Be At Risk	6	35.4 ± 3.0	NS
P	<i>Zizia aurea</i>	Golden Alexanders				S1	2 May Be At Risk	7	39.3 ± 5.0	NS
P	<i>Arnica lonchophylla</i>	Northern Arnica				S1	2 May Be At Risk	1	31.9 ± 7.0	NS
P	<i>Bidens hyperborea</i>	Estuary Beggarticks				S1	2 May Be At Risk	3	42.5 ± 1.0	NS
P	<i>Ageratina altissima</i>	White Snakeroot				S1	2 May Be At Risk	2	41.7 ± 1.0	NS
P	<i>Barbarea orthoceras</i>	American Yellow Rocket				S1	2 May Be At Risk	7	40.7 ± 0.0	NS
P	<i>Cardamine pratensis</i> var. <i>angustifolia</i>	Cuckoo Flower				S1	2 May Be At Risk	5	21.5 ± 0.0	NS
P	<i>Cochlearia tridactylites</i>	Limestone Scurvy-grass				S1	2 May Be At Risk	4	58.9 ± 0.0	NS
P	<i>Draba norvegica</i> var. <i>clivicola</i>	Norwegian Whitlow-Grass				S1	2 May Be At Risk	1	83.5 ± 2.0	NS
P	<i>Stellaria crassifolia</i>	Fleshy Stitchwort				S1	2 May Be At Risk	2	28.5 ± 2.0	NS
P	<i>Suaeda maritima</i> ssp. <i>richii</i>	White Sea-blite				S1	5 Undetermined	4	36.0 ± 2.0	NS
P	<i>Hudsonia tomentosa</i>	Woolly Beach-heath				S1	2 May Be At Risk	12	34.6 ± 1.0	NS
P	<i>Utricularia ochroleuca</i>	Yellowish-white Bladderwort				S1	5 Undetermined	1	94.5 ± 1.0	NS
P	<i>Polygonum viviparum</i>	Alpine Bistort				S1	2 May Be At Risk	1	40.3 ± 1.0	NS
P	<i>Montia fontana</i>	Water Blinks				S1	2 May Be At Risk	2	14.6 ± 1.0	NS
P	<i>Scrophularia lanceolata</i>	Lance-leaved Figwort				S1	5 Undetermined	2	36.0 ± 1.0	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S1	2 May Be At Risk	1	84.1 ± 6.0	NS
P	<i>Carex alopecoidea</i>	Foxtail Sedge				S1	2 May Be At Risk	2	33.3 ± 0.0	NS
P	<i>Carex granularis</i>	Limestone Meadow Sedge				S1	2 May Be At Risk	20	39.8 ± 0.0	NS
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S1	2 May Be At Risk	4	26.7 ± 0.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1	2 May Be At Risk	2	66.3 ± 5.0	NS
P	<i>Carex livida</i> var. <i>radicaulis</i>	Livid Sedge				S1	2 May Be At Risk	23	44.3 ± 5.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Carex tenuiflora</i>	Sparse-Flowered Sedge				S1	2 May Be At Risk	3	54.6 ± 0.0	NS
P	<i>Carex tinctoria</i>	Tinged Sedge				S1	2 May Be At Risk	2	30.6 ± 1.0	NS
P	<i>Carex viridula</i> var. <i>elaticior</i>	Greenish Sedge				S1	2 May Be At Risk	21	39.7 ± 0.0	NS
P	<i>Carex grisea</i>	Inflated Narrow-leaved Sedge				S1	2 May Be At Risk	6	44.0 ± 0.0	NS
P	<i>Cyperus lupulinus</i> ssp. <i>macilentus</i>	Hop Flatsedge				S1	2 May Be At Risk	10	34.5 ± 1.0	NS
P	<i>Eleocharis erythropoda</i>	Red-stemmed Spikerush				S1	2 May Be At Risk	5	33.0 ± 0.0	NS
P	<i>Rhynchospora capillacea</i>	Slender Beakrush				S1	2 May Be At Risk	6	39.6 ± 10.0	NS
P	<i>Blysmus rufus</i>	Red Bulrush				S1	2 May Be At Risk	1	99.4 ± 1.0	NS
P	<i>Iris prismatica</i>	Slender Blue Flag				S1	2 May Be At Risk	4	50.0 ± 0.0	NS
P	<i>Trientalis glutinosa</i>	Sticky False-Asphodel				S1	2 May Be At Risk	10	44.6 ± 0.0	NS
P	<i>Malaxis brachypoda</i>	White Adder's-Mouth				S1	2 May Be At Risk	1	24.3 ± 7.0	NS
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S1	2 May Be At Risk	11	7.9 ± 0.0	NS
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1	2 May Be At Risk	18	7.9 ± 0.0	NS
P	<i>Elymus wiegandii</i>	Wiegand's Wild Rye				S1	2 May Be At Risk	8	8.5 ± 0.0	NS
P	<i>Phleum alpinum</i>	Alpine Timothy				S1	2 May Be At Risk	2	88.7 ± 0.0	NS
P	<i>Torreyochloa pallida</i> var. <i>pallida</i>	Pale False Manna Grass				S1	0.1 Extirpated	2	90.2 ± 1.0	NS
P	<i>Trisetum melicoides</i>	Purple False Oats				S1	2 May Be At Risk	3	77.2 ± 0.0	NS
P	<i>Potamogeton nodosus</i>	Long-leaved Pondweed				S1	2 May Be At Risk	1	95.6 ± 5.0	NS
P	<i>Cystopteris laurentiana</i>	Laurentian Bladder Fern				S1	2 May Be At Risk	6	34.2 ± 10.0	NS
P	<i>Equisetum palustre</i>	Marsh Horsetail				S1	2 May Be At Risk	8	33.3 ± 0.0	NS
P	<i>Botrychium lunaria</i>	Common Moonwort				S1	2 May Be At Risk	2	96.0 ± 1.0	NS
P	<i>Halenia deflexa</i> ssp. <i>brentoniana</i>	Spurred Gentian				S1?	5 Undetermined	1	99.4 ± 1.0	NS
P	<i>Crataegus robinsonii</i>	Robinson's Hawthorn				S1?	5 Undetermined	1	91.2 ± 50.0	NS
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S1?	5 Undetermined	2	61.6 ± 7.0	NS
P	<i>Rubus flagellaris</i>	Northern Dewberry				S1?	5 Undetermined	2	54.6 ± 5.0	NS
P	<i>Schoenoplectus robustus</i>	Sturdy Bulrush				S1?	5 Undetermined	2	62.8 ± 5.0	NS
P	<i>Dichanthelium acuminatum</i> var. <i>lindheimeri</i>	Woolly Panic Grass				S1?	5 Undetermined	1	97.0 ± 0.0	NS
P	<i>Fraxinus nigra</i>	Black Ash			Threatened	S1S2	1 At Risk	54	8.4 ± 0.0	NS
P	<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	2	42.2 ± 7.0	NS
P	<i>Arabis hirsuta</i> var. <i>pycnocarpa</i>	Western Hairy Rockcress				S1S2	2 May Be At Risk	7	94.4 ± 0.0	NS
P	<i>Chenopodium rubrum</i>	Red Pigweed				S1S2	2 May Be At Risk	4	40.5 ± 7.0	NS
P	<i>Cornus suecica</i>	Swedish Bunchberry				S1S2	3 Sensitive	1	56.9 ± 6.0	NS
P	<i>Anemone virginiana</i> var. <i>alba</i>	Virginia Anemone				S1S2	3 Sensitive	8	32.2 ± 0.0	NS
P	<i>Ranunculus sceleratus</i>	Cursed Buttercup				S1S2	2 May Be At Risk	1	61.2 ± 7.0	NS
P	<i>Parnassia palustris</i> var. <i>parviflora</i>	Marsh Grass-of-Parnassus				S1S2	2 May Be At Risk	14	37.4 ± 1.0	NS
P	<i>Juncus greenei</i>	Greene's Rush				S1S2	2 May Be At Risk	1	34.6 ± 1.0	NS
P	<i>Juncus alpinoarticulatus</i> ssp. <i>nodulosus</i>	Richardson's Rush				S1S2	2 May Be At Risk	11	18.7 ± 5.0	NS
P	<i>Calamagrostis stricta</i>	Slim-stemmed Reed Grass				S1S2	3 Sensitive	5	92.8 ± 0.0	PE
P	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	Slim-stemmed Reed Grass				S1S2	3 Sensitive	1	63.7 ± 1.0	NS
P	<i>Sparganium hyperboreum</i>	Northern Burreed				S1S2	3 Sensitive	4	36.8 ± 1.0	NS
P	<i>Cryptogramma stelleri</i>	Steller's Rockbrake				S1S2	2 May Be At Risk	17	34.2 ± 0.0	NS
P	<i>Woodsia alpina</i>	Alpine Cliff Fern				S1S2	2 May Be At Risk	4	97.6 ± 2.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Selaginella selaginoides</i>	Low Spikemoss				S1S2	2 May Be At Risk	2	49.4 ± 0.0	NS
P	<i>Carex vacillans</i>	Estuarine Sedge				S1S3	5 Undetermined	1	33.3 ± 0.0	NS
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2	2 May Be At Risk	21	17.5 ± 1.0	NS
P	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				S2	3 Sensitive	7	34.6 ± 7.0	NS
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S2	3 Sensitive	8	84.9 ± 1.0	NS
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S2	3 Sensitive	10	18.3 ± 1.0	NS
P	<i>Solidago multiradiata</i>	Multi-rayed Goldenrod				S2	2 May Be At Risk	1	98.8 ± 2.0	NS
P	<i>Symphotrichum ciliolatum</i>	Fringed Blue Aster				S2	3 Sensitive	2	65.6 ± 7.0	NS
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2	3 Sensitive	10	7.7 ± 1.0	NS
P	<i>Caulophyllum thalictroides</i>	Blue Cohosh				S2	2 May Be At Risk	21	8.3 ± 0.0	NS
P	<i>Betula borealis</i>	Northern Birch				S2	3 Sensitive	2	39.2 ± 7.0	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S2	3 Sensitive	6	71.3 ± 0.0	NS
P	<i>Arabis drummondii</i>	Drummond's Rockcress				S2	3 Sensitive	4	85.4 ± 0.0	NS
P	<i>Cardamine parviflora</i> var. <i>arenicola</i>	Small-flowered Bittercress				S2	3 Sensitive	2	95.3 ± 1.0	NS
P	<i>Draba arabisans</i>	Rock Whitlow-Grass				S2	3 Sensitive	11	34.4 ± 1.0	NS
P	<i>Lobelia kalmii</i>	Brook Lobelia				S2	2 May Be At Risk	46	21.0 ± 0.0	NS
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2	3 Sensitive	6	90.0 ± 1.0	PE
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	1	7.9 ± 0.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	3 Sensitive	9	89.9 ± 0.0	PE
P	<i>Hypericum majus</i>	Large St John's-wort				S2	3 Sensitive	2	49.4 ± 1.0	NS
P	<i>Crassula aquatica</i>	Water Pygmyweed				S2	3 Sensitive	3	41.3 ± 7.0	NS
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2	3 Sensitive	4	15.9 ± 7.0	NS
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S2	3 Sensitive	2	48.6 ± 0.0	NS
P	<i>Utricularia resupinata</i>	Inverted Bladderwort				S2	3 Sensitive	1	62.3 ± 0.0	NS
P	<i>Oenothera fruticosa</i> ssp. <i>glauca</i>	Narrow-leaved Evening Primrose				S2	5 Undetermined	1	54.7 ± 1.0	NS
P	<i>Rumex salicifolius</i> var. <i>mexicanus</i>	Triangular-valve Dock				S2	3 Sensitive	8	9.7 ± 10.0	NS
P	<i>Anemone canadensis</i>	Canada Anemone				S2	2 May Be At Risk	3	13.1 ± 3.0	NS
P	<i>Anemone quinquefolia</i>	Wood Anemone				S2	3 Sensitive	7	59.0 ± 1.0	NS
P	<i>Anemone virginiana</i>	Virginia Anemone				S2	3 Sensitive	23	24.8 ± 0.0	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2	3 Sensitive	31	36.5 ± 1.0	NS
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2	3 Sensitive	46	39.8 ± 0.0	NS
P	<i>Salix pedicellaris</i>	Bog Willow				S2	3 Sensitive	12	20.0 ± 0.0	NS
P	<i>Comandra umbellata</i>	Bastard's Toadflax				S2	2 May Be At Risk	13	33.5 ± 0.0	NS
P	<i>Saxifraga paniculata</i> ssp. <i>neogaea</i>	White Mountain Saxifrage				S2	3 Sensitive	7	29.6 ± 7.0	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S2	3 Sensitive	6	16.4 ± 1.0	NS
P	<i>Carex atratifomis</i>	Scabrous Black Sedge				S2	3 Sensitive	3	34.2 ± 7.0	NS
P	<i>Carex bebbii</i>	Bebb's Sedge				S2	3 Sensitive	26	32.0 ± 0.0	NS
P	<i>Carex castanea</i>	Chestnut Sedge				S2	2 May Be At Risk	5	84.9 ± 5.0	NS
P	<i>Carex comosa</i>	Bearded Sedge				S2	3 Sensitive	1	58.8 ± 1.0	NS
P	<i>Carex hystericina</i>	Porcupine Sedge				S2	2 May Be At Risk	38	17.9 ± 0.0	NS
P	<i>Carex scirpoidea</i>	Scirpuslike Sedge				S2	3 Sensitive	4	86.0 ± 4.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S2	3 Sensitive	3	17.9 ± 1.0	NS
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S2	3 Sensitive	2	67.0 ± 0.0	NS
P	<i>Eleocharis quinqueflora</i>	Few-flowered Spikerush				S2	3 Sensitive	26	26.5 ± 0.0	NS
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S2	3 Sensitive	1	67.6 ± 1.0	NS
P	<i>Vallisneria americana</i>	Wild Celery				S2	2 May Be At Risk	1	89.9 ± 10.0	NS
P	<i>Juncus stygius</i> ssp.	Moor Rush				S2	3 Sensitive	30	49.3 ± 1.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>americanus</i> <i>Allium schoenoprasum</i> <i>var. sibiricum</i>	Wild Chives				S2	2 May Be At Risk	3	36.8 ± 7.0	NS
P	<i>Lilium canadense</i>	Canada Lily				S2	2 May Be At Risk	30	12.4 ± 0.0	NS
P	<i>Cypripedium parviflorum var. pubescens</i> <i>Cypripedium parviflorum var. makasin</i>	Yellow Lady's-slipper				S2	3 Sensitive	4	12.0 ± 7.0	NS
P	<i>Cypripedium reginae</i>	Small Yellow Lady's-Slipper				S2	3 Sensitive	3	36.3 ± 0.0	NS
P	<i>Spiranthes lucida</i>	Showy Lady's-Slipper				S2	2 May Be At Risk	250	13.4 ± 0.0	NS
P	<i>Potamogeton friesii</i>	Shining Ladies'-Tresses				S2	2 May Be At Risk	26	24.9 ± 0.0	NS
P	<i>Potamogeton richardsonii</i>	Fries' Pondweed				S2	2 May Be At Risk	11	8.1 ± 0.0	NS
P	<i>Asplenium trichomanes-ramosum</i>	Richardson's Pondweed				S2	2 May Be At Risk	8	6.6 ± 1.0	NS
P	<i>Dryopteris fragrans var. remotiuscula</i>	Green Spleenwort				S2	3 Sensitive	28	1.4 ± 0.0	NS
P	<i>Polystichum lonchitis</i>	Fragrant Wood Fern				S2	3 Sensitive	4	22.0 ± 7.0	NS
P	<i>Woodsia glabella</i>	Northern Holly Fern				S2	3 Sensitive	5	19.0 ± 5.0	NS
P	<i>Symphytotrichum boreale</i>	Smooth Cliff Fern				S2?	3 Sensitive	12	34.2 ± 7.0	NS
P	<i>Cuscuta cephalanthi</i>	Boreal Aster				S2?	3 Sensitive	33	23.2 ± 0.0	NS
P	<i>Epilobium coloratum</i>	Buttonbush Dodder				S2?	5 Undetermined	3	32.7 ± 7.0	NS
P	<i>Amelanchier fernaldii</i>	Purple-veined Willowherb				S2?	3 Sensitive	3	41.4 ± 0.0	NS
P	<i>Eleocharis ovata</i>	Fernald's Serviceberry				S2?	5 Undetermined	5	57.3 ± 1.0	NS
P	<i>Scirpus pedicellatus</i>	Ovate Spikerush				S2?	3 Sensitive	2	48.8 ± 0.0	NS
P	<i>Betula pumila</i>	Stalked Bulrush				S2S3	3 Sensitive	4	7.9 ± 0.0	NS
P	<i>Betula pumila var. pumila</i>	Bog Birch				S2S3	3 Sensitive	13	45.6 ± 0.0	NS
P	<i>Sagina nodosa</i>	Bog Birch				S2S3	3 Sensitive	1	99.5 ± 0.0	NS
P	<i>Sagina nodosa ssp. borealis</i>	Knotted Pearlwort				S2S3	4 Secure	2	54.6 ± 5.0	NS
P	<i>Hypericum dissimulatum</i>	Knotted Pearlwort				S2S3	4 Secure	1	90.6 ± 5.0	PE
P	<i>Triosteum aurantiacum</i>	Disguised St John's-wort				S2S3	3 Sensitive	2	43.9 ± 1.0	NS
P	<i>Shepherdia canadensis</i>	Orange-fruited Tinker's Weed				S2S3	3 Sensitive	118	17.8 ± 0.0	NS
P	<i>Empetrum eamesii ssp. atropurpureum</i>	Soapberry				S2S3	3 Sensitive	73	33.0 ± 0.0	NS
P	<i>Chamaesyce polygonifolia</i>	Pink Crowberry				S2S3	3 Sensitive	2	54.9 ± 3.0	NS
P	<i>Halenia deflexa</i>	Seaside Spurge				S2S3	3 Sensitive	11	16.6 ± 0.0	NS
P	<i>Hedeoma pulegioides</i>	Spurred Gentian				S2S3	3 Sensitive	24	1.4 ± 0.0	NS
P	<i>Polygala sanguinea</i>	American False Pennyroyal				S2S3	3 Sensitive	2	54.1 ± 5.0	NS
P	<i>Polygonum buxiforme</i>	Blood Milkwort				S2S3	3 Sensitive	3	98.2 ± 7.0	NS
P	<i>Polygonum raii</i>	Small's Knotweed				S2S3	5 Undetermined	2	80.4 ± 7.0	NS
P	<i>Potentilla canadensis</i>	Sharp-fruited Knotweed				S2S3	5 Undetermined	12	16.8 ± 3.0	NS
P	<i>Galium aparine</i>	Canada Cinquefoil				S2S3	3 Sensitive	1	28.8 ± 2.0	NS
P	<i>Salix pellita</i>	Common Bedstraw				S2S3	3 Sensitive	2	44.2 ± 0.0	NS
P	<i>Veronica serpyllifolia ssp. humifusa</i>	Satiny Willow				S2S3	3 Sensitive	5	18.1 ± 1.0	NS
P	<i>Carex adusta</i>	Thyme-Leaved Speedwell				S2S3	3 Sensitive	4	85.4 ± 0.0	NS
P	<i>Carex hirtifolia</i>	Lesser Brown Sedge				S2S3	3 Sensitive	1	98.3 ± 5.0	NS
P	<i>Eleocharis olivacea</i>	Pubescent Sedge				S2S3	3 Sensitive	9	8.3 ± 0.0	NS
P	<i>Elodea canadensis</i>	Yellow Spikerush				S2S3	3 Sensitive	3	48.7 ± 5.0	NS
P		Canada Waterweed				S2S3	4 Secure	4	55.9 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Juncus trifidus</i>	Highland Rush				S2S3	3 Sensitive	6	42.7 ± 0.0	NS
P	<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper				S2S3	3 Sensitive	71	15.9 ± 0.0	NS
P	<i>Poa glauca</i>	Glaucous Blue Grass				S2S3	3 Sensitive	14	34.4 ± 0.0	NS
P	<i>Stuckenia filiformis</i>	Thread-leaved Pondweed				S2S3	3 Sensitive	1	39.8 ± 0.0	NS
P	<i>Stuckenia filiformis ssp. alpina</i>	Thread-leaved Pondweed				S2S3	3 Sensitive	36	13.5 ± 0.0	NS
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S2S3	3 Sensitive	12	42.8 ± 7.0	NS
P	<i>Botrychium lanceolatum var. angustisegmentum</i>	Lance-Leaf Grape-Fern				S2S3	3 Sensitive	8	17.9 ± 3.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	3 Sensitive	3	21.4 ± 5.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	1	89.6 ± 5.0	NS
P	<i>Angelica atropurpurea</i>	Purple-stemmed Angelica				S3	4 Secure	26	7.9 ± 0.0	NS
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	3 Sensitive	50	37.8 ± 5.0	NS
P	<i>Megalodonta beckii</i>	Water Beggarticks				S3	4 Secure	9	42.9 ± 0.0	NS
P	<i>Packera paupercula</i>	Balsam Groundsel				S3	4 Secure	103	10.5 ± 5.0	NS
P	<i>Campanula aparinoides</i>	Marsh Bellflower				S3	3 Sensitive	5	32.8 ± 5.0	NS
P	<i>Viburnum edule</i>	Squashberry				S3	3 Sensitive	5	83.4 ± 7.0	NS
P	<i>Empetrum eamesii</i>	Pink Crowberry				S3	3 Sensitive	4	68.6 ± 0.0	NS
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3	3 Sensitive	16	29.6 ± 7.0	NS
P	<i>Vaccinium caespitosum</i>	Dwarf Bilberry				S3	4 Secure	23	75.7 ± 0.0	NS
P	<i>Vaccinium uliginosum</i>	Alpine Bilberry				S3	3 Sensitive	3	81.8 ± 0.0	NS
P	<i>Bartonia virginica</i>	Yellow Bartonia				S3	4 Secure	1	40.9 ± 0.0	NS
P	<i>Proserpinaca palustris</i>	Marsh Mermaidweed				S3	4 Secure	7	12.6 ± 0.0	NS
P	<i>Proserpinaca palustris var. crebra</i>	Marsh Mermaidweed				S3	4 Secure	17	8.0 ± 0.0	NS
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	28	29.9 ± 0.0	NS
P	<i>Decodon verticillatus</i>	Swamp Loosestrife				S3	4 Secure	3	27.1 ± 7.0	NS
P	<i>Epilobium hornemannii</i>	Hornemann's Willowherb				S3	4 Secure	11	66.7 ± 2.0	NS
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	3 Sensitive	15	14.7 ± 5.0	NS
P	<i>Polygonum pennsylvanicum</i>	Pennsylvania Smartweed				S3	4 Secure	9	8.3 ± 0.0	NS
P	<i>Polygonum scandens</i>	Climbing False Buckwheat				S3	3 Sensitive	16	7.9 ± 0.0	NS
P	<i>Primula laurentiana</i>	Laurentian Primrose				S3	4 Secure	1	78.7 ± 7.0	NS
P	<i>Samolus valerandi ssp. parviflorus</i>	Seaside Brookweed				S3	3 Sensitive	7	39.9 ± 0.0	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3	4 Secure	9	20.5 ± 0.0	NS
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	3 Sensitive	6	34.6 ± 2.0	NS
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	60	7.8 ± 0.0	NS
P	<i>Rhamnus alnifolia</i>	Alder-leaved Buckthorn				S3	4 Secure	163	8.2 ± 0.0	NS
P	<i>Agrimonia gryposepala</i>	Hooked Agrimony				S3	4 Secure	197	6.6 ± 1.0	NS
P	<i>Galium kamtschaticum</i>	Northern Wild Licorice				S3	4 Secure	6	36.4 ± 1.0	NS
P	<i>Salix petiolaris</i>	Meadow Willow				S3	4 Secure	4	20.0 ± 0.0	NS
P	<i>Geocaulon lividum</i>	Northern Comandra				S3	4 Secure	5	16.1 ± 2.0	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	6	50.6 ± 5.0	NS
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	4 Secure	2	8.1 ± 0.0	NS
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	3 Sensitive	17	8.2 ± 0.0	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3	4 Secure	23	32.1 ± 0.0	NS
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	3 Sensitive	116	41.9 ± 0.0	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	7	42.2 ± 0.0	NS
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	5	49.2 ± 2.0	NS
P	<i>Juncus subcaudatus var. planisepalus</i>	Woods-Rush				S3	3 Sensitive	4	55.2 ± 1.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Juncus dudleyi</i>	Dudley's Rush				S3	4 Secure	76	24.9 ± 0.0	NS
P	<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain				S3	3 Sensitive	13	58.8 ± 10.0	NS
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3	3 Sensitive	31	8.7 ± 0.0	NS
P	<i>Listera australis</i>	Southern Twayblade				S3	4 Secure	35	13.1 ± 0.0	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	4 Secure	13	13.2 ± 0.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	4 Secure	3	18.0 ± 0.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3	4 Secure	6	27.1 ± 5.0	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3	4 Secure	4	91.6 ± 5.0	PE
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3	4 Secure	15	8.1 ± 0.0	NS
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3	4 Secure	79	75.7 ± 0.0	NS
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	23	8.1 ± 0.0	NS
P	<i>Sparganium natans</i>	Small Burreed				S3	4 Secure	6	21.2 ± 0.0	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3	4 Secure	11	18.0 ± 0.0	NS
P	<i>Equisetum pratense</i>	Meadow Horsetail				S3	3 Sensitive	15	15.7 ± 0.0	NS
P	<i>Equisetum variegatum</i>	Variegated Horsetail				S3	4 Secure	33	24.9 ± 0.0	NS
P	<i>Isoetes acadensis</i>	Acadian Quillwort				S3	3 Sensitive	4	48.1 ± 1.0	NS
P	<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	3 Sensitive	4	30.1 ± 1.0	NS
P	<i>Botrychium dissectum</i>	Cut-leaved Moonwort				S3	4 Secure	2	69.9 ± 1.0	NS
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S3	4 Secure	7	46.4 ± 1.0	NS
P	<i>Asclepias incarnata</i> <i>ssp. pulchra</i>	Swamp Milkweed				S3?	5 Undetermined	15	23.3 ± 0.0	NS
P	<i>Amelanchier stolonifera</i>	Running Serviceberry				S3?	4 Secure	7	29.3 ± 5.0	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3?	4 Secure	15	7.7 ± 0.0	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3?	4 Secure	4	5.0 ± 1.0	NS
P	<i>Carex foenea</i>	Fernald's Hay Sedge				S3?	4 Secure	1	68.0 ± 0.0	NS
P	<i>Triglochin gaspensis</i>	Gasp ⌊- Arrowgrass				S3?	5 Undetermined	8	16.2 ± 0.0	NS
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S3?	3 Sensitive	18	37.6 ± 0.0	NS
P	<i>Lycopodium sabinifolium</i>	Ground-Fir				S3?	4 Secure	11	34.7 ± 1.0	NS
P	<i>Lycopodium sitchense</i>	Sitka Clubmoss				S3?	4 Secure	8	50.3 ± 1.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3?	5 Undetermined	2	31.9 ± 0.0	NS
P	<i>Atriplex franktonii</i>	Frankton's Saltbush				S3S4	4 Secure	5	53.9 ± 2.0	NS
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	5	79.2 ± 1.0	NS
P	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3S4	4 Secure	13	41.8 ± 0.0	NS
P	<i>Sanguinaria canadensis</i>	Bloodroot				S3S4	4 Secure	143	8.2 ± 0.0	NS
P	<i>Polygonum fowleri</i>	Fowler's Knotweed				S3S4	4 Secure	1	41.8 ± 0.0	NS
P	<i>Rumex maritimus</i>	Sea-Side Dock				S3S4		6	91.0 ± 0.0	PE
P	<i>Fragaria vesca</i> ssp. <i>americana</i>	Woodland Strawberry				S3S4	4 Secure	57	2.5 ± 0.0	NS
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	4 Secure	1	54.2 ± 0.0	NS
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	3	14.9 ± 5.0	NS
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	4 Secure	3	31.9 ± 0.0	NS
P	<i>Luzula parviflora</i>	Small-flowered Woodrush				S3S4	4 Secure	10	58.8 ± 10.0	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	4 Secure	14	16.4 ± 5.0	NS
P	<i>Panicum tuckermanii</i>	Tuckerman's Panic Grass				S3S4	4 Secure	1	22.1 ± 0.0	NS
P	<i>Trisetum spicatum</i>	Narrow False Oats				S3S4	4 Secure	8	43.0 ± 0.0	NS
P	<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern				S3S4	4 Secure	314	15.7 ± 0.0	NS
P	<i>Equisetum hyemale</i> <i>var. affine</i>	Common Scouring-rush				S3S4	4 Secure	22	27.2 ± 0.0	NS
P	<i>Equisetum scirpoides</i>	Dwarf Scouring-Rush				S3S4	4 Secure	47	16.2 ± 0.0	NS
P	<i>Lycopodium</i>	Northern Clubmoss				S3S4	4 Secure	4	27.1 ± 5.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>complanatum</i> <i>Solidago simplex</i> var. <i>randii</i>	Sticky Goldenrod				SH	0.1 Extirpated	2	40.9 ± 5.0	NS
P	<i>Viola canadensis</i>	Canada Violet				SH	0.1 Extirpated	1	34.4 ± 0.0	NS
P	<i>Botrychium</i> <i>minganense</i>	Mingan Moonwort				SH	0.1 Extirpated	1	96.9 ± 1.0	NS

5.1 SOURCE BIBLIOGRAPHY (100 km)

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

# recs	CITATION
7114	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
1709	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
943	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2014. Atlantic Canada Conservation Data Centre Fieldwork 2014. Atlantic Canada Conservation Data Centre, # recs.
807	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
471	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
470	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
460	Blaney, C.S.; Mazerolle, D.M. 2009. Fieldwork 2009. Atlantic Canada Conservation Data Centre. Sackville NB, 13395 recs.
453	Blaney, C.S.; Mazerolle, D.M. 2012. Fieldwork 2012. Atlantic Canada Conservation Data Centre, 13,278 recs.
415	Blaney, C.S.; Mazerolle, D.M. 2010. Fieldwork 2010. Atlantic Canada Conservation Data Centre. Sackville NB, 15508 recs.
341	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
267	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
253	Wilhelm, S.I. et al. 2011. Colonial Waterbird Database. Canadian Wildlife Service, Sackville, 2698 sites, 9718 recs (8192 obs).
216	Hicks, Andrew. 2009. Coastal Waterfowl Surveys Database, 2000-08. Canadian Wildlife Service, Sackville, 46488 recs (11149 non-zero).
184	Pronych, G. & Wilson, A. 1993. Atlas of Rare Vascular Plants in Nova Scotia. Nova Scotia Museum, Halifax NS, I:1-168, II:169-331. 1446 recs.
162	Klymko, J.J.D.; Robinson, S.L. 2012. 2012 field data. Atlantic Canada Conservation Data Centre, 447 recs.
155	Blaney, C.S.; Mazerolle, D.M.; Hill, N.M. 2011. Nova Scotia Crown Share Land Legacy Trust Fieldwork. Atlantic Canada Conservation Data Centre, 5022 recs.
145	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 records.
140	Quigley, E.J. & Neily, P.D., 2012. Botanical Discoveries in Inverness County, NS. Nova Scotia Dept Natural Resources. Pers. comm. to C.S. Blaney, Nov. 29, 141 rec.
116	Newell, R. E. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University. 2013.
105	Klymko, J.J.D. 2012. Insect fieldwork & submissions, 2011. Atlantic Canada Conservation Data Centre. Sackville NB, 760 recs.
97	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: http://luxor.acadiu.ca/library/Herbarium/project/ . 582 recs.
92	Amirault, D.L. & McKnight, J. 2003. Piping Plover Database 1991-2003. Canadian Wildlife Service, Sackville, unpublished data. 7 recs.
81	Canadian Wildlife Service, Dartmouth. 2010. Piping Plover censuses 2007-09, 304 recs.
78	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
66	Benjamin, L.K. 2009. D. Anderson Odonata Records for Cape Breton, 1997-2004. Nova Scotia Dept Natural Resources, 1316 recs.
65	Williams, M. Cape Breton University Digital Herbarium. Cape Breton University Digital Herbarium. 2013.
64	Benjamin, L.K. 2012. NSDNR fieldwork & consultant reports 2008-2012. Nova Scotia Dept Natural Resources, 196 recs.
59	Benjamin, L.K. (compiler). 2001. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources, 15 spp, 224 recs.
59	Klymko, J.J.D. 2014. Maritimes Butterfly Atlas, 2012 submissions. Atlantic Canada Conservation Data Centre, 8552 records.
56	Scott, F.W. 2002. Nova Scotia Herpetofauna Atlas Database. Acadia University, Wolfville NS, 8856 recs.
52	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
46	Brunelle, P.-M. (compiler). 2009. ADIP/MDDS Odonata Database: data to 2006 inclusive. Atlantic Dragonfly Inventory Program (ADIP), 24200 recs.
45	Roland, A.E. & Smith, E.C. 1969. The Flora of Nova Scotia, 1st Ed. Nova Scotia Museum, Halifax, 743pp.
39	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001. Atlantic Canada Conservation Data Centre. Sackville NB, 981 recs.
37	Neily, T.H. 2010. Erioderma Pedicellatum records 2005-09. Mersey Tobiatic Research Institute, 67 recs.
36	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
29	Blaney, C.S.; Spicer, C.D.; Mazerolle, D.M. 2005. Fieldwork 2005. Atlantic Canada Conservation Data Centre. Sackville NB, 2333 recs.
28	Klymko, J.J.D. 2012. Maritimes Butterfly Atlas, 2010 and 2011 records. Atlantic Canada Conservation Data Centre, 6318 recs.
28	Parker, G.R., Maxwell, J.W., Morton, L.D. & Smith, G.E.J. 1983. The ecology of Lynx, Lynx canadensis, on Cape Breton Island. Canadian Journal of Zoology, 61:770-786. 51 recs.
24	Catling, P.M., Erskine, D.S. & MacLaren, R.B. 1985. The Plants of Prince Edward Island with new records, nomenclatural changes & corrections & deletions, 1st Ed. Research Branch, Agriculture Canada, Ottawa, Publication 1798. 22pp.
24	Neily, T.H. 2013. Email communication to Sean Blaney regarding <i>Listera australis</i> observations made from 2007 to 2011 in Nova Scotia. , 50.
23	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of <i>C. insculpta</i> sightings. Acadia University, Wolfville NS, 88 recs.

# recs	CITATION
23	Benjamin, L.K. 2009. Boreal Felt Lichen, Mountain Avens, Orchid and other recent records. Nova Scotia Dept Natural Resources, 105 recs.
23	Pepper, C. 2013. 2013 rare bird and plant observations in Nova Scotia. , 181 records.
22	Benjamin, L.K. (compiler). 2002. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources, 32 spp, 683 recs.
22	Cameron, R.P. 2011. Lichen observations, 2011. Nova Scotia Environment & Labour, 731 recs.
20	Benjamin, L.K. 2011. NSDNR fieldwork & consultant reports 1997, 2009-10. Nova Scotia Dept Natural Resources, 85 recs.
20	Cameron, R.P. 2012. Rob Cameron 2012 vascular plant data. NS Department of Environment, 30 recs.
20	Gillis, J. 2015. Rare plant records from Cape Breton gypsum sites. Pers. comm., 25 rare plant records.
20	Porter, C.J.M. 2014. Field work data 2007-2014. Nova Scotia Nature Trust, 96 recs.
20	Pulsifer, M.D. 2002. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 369 recs.
19	Cameron, R.P. 2013. 2013 rare species field data. Nova Scotia Department of Environment, 71 recs.
18	Knapton, R. & Power, T.; Williams, M. 2001. SAR Inventory: Fortress Louisbourg NP. Parks Canada, Atlantic, SARINV01-13. 157 recs.
18	Misc. rare species records gathered by NSDNR staff or communicated to NSDNR and forwarded to ACCDC
18	Sollows, M.C., 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.
17	anon. 2001. S. H.. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 76 recs.
17	Busby, D.G. 1999. 1997-1999 Bicknell's Thrush data, unpublished files. Canadian Wildlife Service, Sackville, 17 recs.
16	Basquill, S.P. 2012. 2012 rare vascular plant field data. Nova Scotia Department of Natural Resources, 37 recs.
16	Cameron, R.P. 2009. Erioderma pedicellatum database, 1979-2008. Dept Environment & Labour, 103 recs.
16	Nelly, T.H. 2012. 2012 Erioderma pedicellatum records in Nova Scotia.
15	Newell, R.E. 2004. Assessment and update status report on the New Jersey Rush (<i>Juncus caesariensis</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 15 recs.
14	Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
14	Robinson, S.L. 2011. 2011 ND dune survey field data. Atlantic Canada Conservation Data Centre, 2715 recs.
13	Blaney, C.S. 2000. Fieldwork 2000. Atlantic Canada Conservation Data Centre. Sackville NB, 1265 recs.
13	Blaney, C.S.; Mazerolle, D.M. 2008. Fieldwork 2008. Atlantic Canada Conservation Data Centre. Sackville NB, 13343 recs.
13	Burns, L. 2013. Personal communication concerning bat occurrence on PEI. Winter 2013. Pers. comm.
13	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
10	Murphy, S. 2006. <i>Juncus caesariensis</i> data from Yava Technologies In Situ Leach Mining Environmental Assessment. Jacques Whitford Inc., 10 recs.
9	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
9	MacDonald, M. 2008. PEI Power Corridor Floral Surveys, 2004-08. Jacques Whitford Ltd, 2238 recs (979 rare).
8	Gilhen, J. 1984. Amphibians & Reptiles of Nova Scotia, 1st Ed. Nova Scotia Museum, 164pp.
7	Blaney, C.S.; Mazerolle, D.M.; Oberdorfer, E. 2007. Fieldwork 2007. Atlantic Canada Conservation Data Centre. Sackville NB, 13770 recs.
7	Goltz, J.P. & Bishop, G. 2005. Confidential supplement to Status Report on Prototype Quillwort (<i>Isoetes prototypus</i>). Committee on the Status of Endangered Wildlife in Canada, 111 recs.
7	Nova Scotia Nature Trust. 2013. Nova Scotia Nature Trust 2013 Species records. Nova Scotia Nature Trust, 95 recs.
7	Oldham, M.J. 2000. Oldham database records from Maritime provinces. Oldham, M.J.; ONHIC, 487 recs.
7	Robinson, S.L. 2014. 2013 Field Data. Atlantic Canada Conservation Data Centre.
7	Whittam, R.M. 1999. Status Report on the Roseate Tern (update) in Canada. Committee on the Status of Endangered Wildlife in Canada, 36 recs.
6	Amirault, D.L. 1997-2000. Unpublished files. Canadian Wildlife Service, Sackville, 470 recs.
6	Basquill, S.P. 2012. 2012 Bryophyte specimen data. Nova Scotia Department of Natural Resources, 37 recs.
6	Dibblee, R.L. 1999. PEI Cormorant Survey. Prince Edward Island Fisheries, Aquaculture & Environment, 1p. 21 recs.
6	Plissner, J.H. & Haig, S.M. 1997. 1996 International piping plover census. US Geological Survey, Corvallis OR, 231 pp.
5	Blaney, C.S.; Mazerolle, D.M.; Klymko, J.; Spicer, C.D. 2006. Fieldwork 2006. Atlantic Canada Conservation Data Centre. Sackville NB, 8399 recs.
5	Curley, F.R. 2005. PEF&W Collection 2003-04. PEI Fish & Wildlife Div., 716 recs.
5	Erskine, D. 1960. The plants of Prince Edward Island, 1st Ed. Research Branch, Agriculture Canada, Ottawa., Publication 1088. 1238 recs.
5	Whittam, R.M. 1997. Status Report on the Roseate Tern (<i>Sterna dougallii</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 5 recs.
4	Cameron, R.P. 2009. Cyanolichen database. Nova Scotia Environment & Labour, 1724 recs.
4	Marshall, L. 1998. Atlantic Salmon: Cape Breton SFA 18 (part) & SFA 19. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-09. 5 recs.
4	Newell, R.E. 2001. Fortress Louisbourg Species at Risk Survey 2001. Parks Canada, 4 recs.
4	Rousseau, J. 1938. Notes Floristiques sur l'est de la Nouvelle-Ecosse in Contributions de l'Institut Botanique de l'Universite de Montreal. Universite de Montreal, 32, 13-62. 11 recs.
3	Baechler, Lynn. 2012. Plant observations & photos, 2012. Pers. comm. to S. Blaney, July 2012, 4 recs.
3	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
3	Blaney, C.S.; Mazerolle, D.M.; Belliveau, A.B. 2013. Atlantic Canada Conservation Data Centre Fieldwork 2013. Atlantic Canada Conservation Data Centre, 9000+ recs.
3	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
3	Christie, D.S. 2000. Christmas Bird Count Data, 1997-2000. Nature NB, 54 recs.
3	Clayden, S.R. 2007. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, download Mar. 2007, 6914 recs.
3	LaPaix, R.W.; Crowell, M.J.; MacDonald, M. 2011. Stantec rare plant records, 2010-11. Stantec Consulting, 334 recs.
3	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
3	O'Neil, S. 1998. Atlantic Salmon: Northumberland Strait Nova Scotia part of SFA 18. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-08. 9 recs.
3	Powell, B.C. 1967. Female sexual cycles of <i>Chrysemy spicta</i> & <i>Clemmys insculpta</i> in Nova Scotia. Can. Field-Nat., 81:134-139. 26 recs.

# recs	CITATION
3	Scott, F.W. 1988. Status Report on the Gaspé Shrew (<i>Sorex gaspensis</i>) in Canada. Committee on the Status of Endangered Wildlife in Canada, 12 recs.
2	Archibald, D.R. 2003. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 213 recs.
2	Bagnell, B.A. 2001. New Brunswick Bryophyte Occurrences. B&B Botanical, Sussex, 478 recs.
2	Benedict, B. Connell Herbarium Specimens (Data) . University New Brunswick, Fredericton. 2003.
2	Blaney, C.S. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 1042 recs.
2	Blaney, C.S. Miscellaneous specimens received by ACCDC (botany). Various persons. 2001-08.
2	Boyne, A.W. & Grecian, V.D. 1999. Tern Surveys. Canadian Wildlife Service, Sackville, unpublished data. 23 recs.
2	Bridgland, J. 2006. Cape Breton Highlands National Park Digital Database. Parks Canada, 190 recs.
2	Daury, R.W. & Bateman, M.C. 1996. The Barrow's Goldeneye (<i>Bucephala islandica</i>) in the Atlantic Provinces and Maine. Canadian Wildlife Service, Sackville, 47pp.
2	Doucet, D.A. 2007. Lepidopteran Records, 1988-2006. Doucet, 700 recs.
2	Edsall, J. 2007. Personal Butterfly Collection: specimens collected in the Canadian Maritimes, 1961-2007. J. Edsall, unpubl. report, 137 recs.
2	Gillis, J. 2007. Botanical observations from bog on Skye Mountain, NS. Pers. comm., 8 recs.
2	Hall, R.A. 2001. S.. NS Freshwater Mussel Fieldwork. Nova Scotia Dept Natural Resources, 178 recs.
2	Hill, N. 2003. Floerkea proserpinacoides at Heatherdale, Antigonish Co. 2002. , Pers. comm. to C.S. Blaney. 2 recs.
2	O'Neil, S. 1998. Atlantic Salmon: Eastern Shore Nova Scotia SFA 20. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-10. 4 recs.
2	Olsen, R. Herbarium Specimens. Nova Scotia Agricultural College, Truro. 2003.
2	Popma, T.M. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 113 recs.
2	Quigley, E.J. 2006. Plant records, Mabou & Port Hood. Pers. comm. to S.P. Basquill, Jun. 12. 4 recs, 4 recs.
2	Selva, S.B. 2002. Status Report on frosted glass-whiskers, <i>Sclerophora peronella</i> . Committee on the Status of Endangered Wildlife in Canada, Draft Revision, May 2002. 2 recs.
2	Sollows, M.C.. 2009. NBM Science Collections databases: molluscs. New Brunswick Museum, Saint John NB, download Jan. 2009, 6951 recs (2957 in Atlantic Canada).
2	Whittam, R.M. et al. 1998. Country Island Tern Restoration Project. Canadian Wildlife Service, Sackville, 2 recs.
1	Anderson, D.G. 2011. New site for showy lady'slipper on Cape Breton. Nova Scotia Department of Natural Resources, pers.comm. to R. Lautenschlager, Jul 5, 2011.
1	Benjamin, L.K. 2009. NSDNR Fieldwork & Consultants Reports. Nova Scotia Dept Natural Resources, 143 recs.
1	Blaney, C.S & Spicer, C.D.; Popma, T.M.; Basquill, S.P. 2003. Vascular Plant Surveys of Northumberland Strait Rivers & Amherst Area Peatlands. Nova Scotia Museum Research Grant, 501 recs.
1	Cameron, R.P. 2009. Nova Scotia nonvascular plant observations, 1995-2007. Nova Scotia Dept Natural Resources, 27 recs.
1	Cameron, R.P. 2014. 2013-14 rare species field data. Nova Scotia Department of Environment, 35 recs.
1	Clayden, S.R. 1998. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 19759 recs.
1	Crowell, M. 2013. email to Sean Blaney regarding <i>Listera australis</i> at Bear Head and Mill Cove Canadian Forces Station. Jacques Whitford Environmental Ltd., 2.
1	Curley, F.R. 2003. Glen Kelly records for <i>Betula pumila</i> & <i>Asclepias syriaca</i> on PEI. , Pers. comm. to C.S. Blaney. 9 recs.
1	Doucet, D.A. 2009. Census of Globally Rare, Endemic Butterflies of Nova Scotia Gulf of St Lawrence Salt Marshes. Nova Scotia Dept of Natural Resources, Species at Risk, 155 recs.
1	Frittaion, C. 2012. NSNT 2012 Field Observations. Nova Scotia Nature Trust, Pers comm. to S. Blaney Feb. 7, 34 recs.
1	Kelly, Glen 2004. Botanical records from 2004 PEI Forestry fieldwork. Dept of Environment, Energy & Forestry, 71 recs.
1	Klymko, J.J.D. 2012. Insect field work & submissions. Atlantic Canada Conservation Data Centre, 852 recs.
1	New York Botanical Garden. 2006. Virtual Plant Herbarium - Vascular Plant Types Catalog. Sylva, S.; Kallunki, J. (ed.) International Plant Science Centre, Web site: http://sciweb.nybg.org/science2/vii2.asp . 4 recs.
1	Newell, R.B.; Sam, D. 2014. 2014 Bloodroot personal communication report, Antigonish, NS. NS Department of Natural Resources.
1	Spicer, C.D. 2004. Specimens from CWS Herbarium, Mount Allison Herbarium Database. Mount Allison University, 5939 recs.
1	Standley, L.A. 2002. <i>Carex haydenii</i> in Nova Scotia. , Pers. comm. to C.S. Blaney. 4 recs.
1	Thomas, H.H., Jones, G.S. & Diblee, R.L. 1980. <i>Sorex palustris</i> on Prince Edward Island. Can. Field Nat., vol 94:329-331. 2 recs.
1	Whittam, R.M. 2000. <i>Senecio pseudoarnica</i> on Country Island. , Pers. comm. to S. Gerriets. 1 rec.



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October 5, 2016

Melanie MacDonald
McCallum Environmental Ltd
135, 2 Bluewater Road
Bedford, NS B4B 1G7

Dear Ms. MacDonald:

**RE: Environmental Screening 16-06-16c
Rhodena Quarry Expansion**

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

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

Botany

Staff has reviewed the records for plant species-at-risk and report that the following species-at-risk may be found within the Rhodena area as outlined in the request or from adjacent areas.

Anenome Canadensis (provincially Orange listed)
Bromus latiglumis (provincially Orange listed)
Caulophyllum thalictroides (provincially Orange listed)
Fallopia scandens (provincially Yellow Listed)
Impatiens pallida (provincially Yellow Listed)
Polystichum lonchitis (provincially Yellow Listed)
Potamogeton obtusifolius (provincially Yellow Listed)
Viola nephrophylla (provincially Yellow Listed)
Zizia aurea (provincially Orange listed)

The presence/absence of these species should be noted during any field assessment report. It is recommended that onsite determination be done during the growing season when the plants can be identified with some certainty.

Zoology

Staff reviewed records as well as the distributional data on species with conservation considerations for the area you indicate. We note that we do not have any records for the "foot-printed" site or immediate area.

However, there are records of several species with Conservation considerations in the general area.

The following bird species with such consideration are recorded as nesting, or possibly nesting in the area:

Killdeer
Common Tern
Spotted Sandpiper
Semipalmated Sandpiper
Wilson's Snipe
Willet
American Bittern
Tree Swallow
Bobolink
Rusty Blackbird
Boreal Chickadee
Blackpoll Warbler
Ruby-crowned Kinglet
Golden-crowned Kinglet
Olive-sided Flycatcher
Eastern Wood-Pee-wee
Yellow-bellied Flycatcher

The only other group of concern are the Mammals, with several species of note.

It should be noted that although there are Moose in the area, these are a different sub-species than the Mainland Moose that do have a Conservation status. The Cape Breton Moose were introduced from Western Canada in the middle of the last century and do not appear to have any of the Mainland genetics.

There are restricted records of the Rock Vole, *Microtus chrotorrhinus* from upland areas of Cape Breton Island. Although they do not have a specific Conservation status, their limited distribution is of potential concern.

The only other group that should be considered are the Myotine bats. This includes the Little Brown bat (*Myotis lucifugus*), the Northern Long-eared Bat (*Myotis septentrionalis*) and the Tri-coloured Bat - also known as the Eastern Pipistrelle (*Perimyotis subflavus*). These are the three species that have been decimated on the mainland with the advent of White-Nose Syndrome, and relatively unaffected populations in the province are restricted to parts of Cape Breton Island. Consideration should be given, when evaluating their presence or absence to potential hibernation sites, nursery areas as well as significant foraging areas.

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

Sincerely,

A handwritten signature in blue ink, appearing to read 'SW-McKeane', with a long horizontal stroke extending to the right.

Sean Weseloh-McKeane
Coordinator, Special Places

Enclosure

APPENDIX D. MBBA

Square Summary (20PR26)

#species (1st atlas)				#species (2nd atlas)				#hours	#pc done		
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
48	8	10	66	33	30	9	72	10	26.5	16	0

Region summary (#24: Southwest Cape Breton Island)

#squares	#sq with data		#species		#pc done	target	#pc
	1st	2nd	1st	2nd			
61	52	59	137	147	420	228	

Target number of point counts in this square: 13 road side, 2 off road (2 in Mature deciduous). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
<u>Canada Goose</u>			7	50	Northern Goshawk			7	16	Yellow-bellied Sapsucker	H	H	19	50
Wood Duck			9	23	Broad-winged Hawk ‡			3	11	Downy Woodpecker	H	T	40	77
American Wigeon ‡			3	13	Red-tailed Hawk	H	T	40	67	Hairy Woodpecker	A	T	40	77
American Black Duck	FY		40	67	Sora			15	18	Black-back Woodpecker			11	6
Mallard			3	20	Piping Plover †			0	6	Northern Flicker	P	H	57	94
Mallard x Am. Black Duck			0	5	Killdeer		FY	25	13	<u>Pileated Woodpecker</u>	H		25	55
Blue-winged Teal			21	13	Spotted Sandpiper	H	DD	53	72	<u>American Kestrel</u>			48	59
Northern Pintail ‡			0	0	Greater Yellowlegs †			1	6	<u>Merlin</u>	H		26	33
Green-winged Teal	H		17	27	Willet	A		17	20	Olive-sided Flycatcher †	H	T	42	67
Ring-necked Duck	P		32	61	<u>Wilson's Snipe</u>			46	64	Eastern Wood-Pewee	H	S	38	30
Common Eider §			5	10	American Woodcock	D		15	47	Yellow-bellied Flycatcher	H	S	44	57
Common Goldeneye			17	18	Ring-billed Gull ‡§			0	1	Alder Flycatcher	H	T	61	86
Hooded Merganser ‡			0	1	Herring Gull §	H		36	45	Least Flycatcher	H	T	32	74
Common Merganser			11	30	Great Black-backed Gull §			46	47	Eastern Phoebe			5	3
Red-breast Merganser			15	25	Common Tern §	H		36	32	Eastern Kingbird			23	15
Ring-necked Pheasant			3	11	Arctic Tern ‡§			1	1	Blue-headed Vireo	A	A	55	91
<u>Ruffed Grouse</u>			30	67	Razorbill ‡§			1	0	Philadelphia Vireo ‡			1	0
Spruce Grouse			9	16	Black Guillemot ‡§			7	11	Red-eyed Vireo	AY	A	57	93
Common Loon			25	35	<u>Rock Pigeon</u>			19	59	Gray Jay	FL	H	44	47
Pied-billed Grebe			11	8	Mourning Dove	P		9	50	Blue Jay	H	T	50	91
Northern Gannet ‡			0	0	Black-billed Cuckoo ‡			1	1	American Crow	H	T	63	98
<u>Double-crest Cormorant</u> §	H		36	30	Great Horned Owl			11	25	Common Raven	H	FY	57	84
Great Cormorant ‡§			9	1	Barred Owl	S		11	54	Tree Swallow	ON	NB	59	88
American Bittern			9	16	Short-eared Owl †			0	0	Bank Swallow §	H	H	50	25
Great Blue Heron §	H	H	48	35	North Saw-whet Owl			1	28	Cliff Swallow §			23	23
Osprey		H	36	49	Common Nighthawk †			23	13	<u>Barn Swallow</u>	H		67	55
Bald Eagle ¶	H	H	71	81	Chimney Swift †			17	6	Black-capp Chickadee	H	S	51	93
Northern Harrier		H	32	38	Ruby-thr Hummingbird		H	34	77	Boreal Chickadee	H	S	50	86
Sharp-shinned Hawk			23	23	Belted Kingfisher	ON	H	55	84	Red-breast Nuthatch		P	40	76

Maritimes Breeding Bird Atlas - Summary Sheet for Square 20PR26 (page 2 of 2)

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
White-breast Nuthatch			0	6	Blackpoll Warbler			13	25	<u>Pine Siskin</u>	H		46	44
Brown Creeper			13	28	<u>Black-thr Blue Warbler</u>	H		7	8	American Goldfinch	P	T	61	91
Winter Wren	H	S	36	38	Palm Warbler	H	A	25	40	Evening Grosbeak	H	H	30	55
Golden-crown Kinglet	H	A	46	84	Yellow-rumped Warbler	P	S	51	91	House Sparrow			32	37
Ruby-crown Kinglet	AY	S	55	91	Black-thr Green Warbler	H	T	38	77					
Veery			7	25	<u>Canada Warbler</u> †	H		32	15					
Bicknell's Thrush †			1	0	Wilson's Warbler			7	11					
Swainson's Thrush	H	S	59	84	<u>Chipping Sparrow</u>	H		50	42					
Hermit Thrush	H	P	57	91	Vesper Sparrow †			3	0					
American Robin	AY	S	65	100	<u>Savannah Sparrow</u>			57	77					
Gray Catbird			13	18	Nelson's Sh.-tail Sparrow		T	7	13					
Northern Mockingbird †			5	3	Fox Sparrow			17	25					
European Starling		CF	55	81	Song Sparrow	AY	A	63	98					
Cedar Waxwing	H	T	48	93	Lincoln's Sparrow	A	S	51	74					
Ovenbird	H	S	48	79	Swamp Sparrow	H	S	53	77					
North Waterthrush		S	21	47	White-throat Sparrow	H	CF	59	94					
Black-white Warbler	H	S	55	89	Dark-eyed Junco	H	CF	61	93					
<u>Tennessee Warbler</u>	H		48	15	Scarlet Tanager †			3	1					
Nashville Warbler		S	42	71	Rose-breast Grosbeak			32	25					
Mourning Warbler	AY	A	46	76	<u>Bobolink</u>	H		36	30					
Common Yellowthroat	AY	T	59	93	Red-wing Blackbird	P	S	61	81					
American Redstart	H	P	57	88	<u>Rusty Blackbird</u> †	H		26	8					
Cape May Warbler			15	5	Common Grackle	H	CF	61	86					
Northern Parula	H	S	53	89	Brown-head Cowbird			17	1					
Magnolia Warbler	AY	T	59	94	Baltimore Oriole ‡			1	0					
<u>Bay-breasted Warbler</u>	H		30	28	<u>Pine Grosbeak</u>	H		26	33					
Blackburnian Warbler	H	T	50	77	Purple Finch	P	D	51	91					
Yellow Warbler	H	S	57	86	Red Crossbill †			1	5					
Chestn-sided Warbler		T	15	47	White-winged Crossbill			21	23					

This list includes all species found during the Maritimes Breeding Bird Atlas (1st atlas: 1986-1990, 2nd atlas: 2006-2010) in the region #24 (Southwest Cape Breton Island). Underlined species are those that you should try to add to this square (20PR26). They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. "Code" is the code for the highest breeding evidence for that species in square 20PR26 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #24). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), † (rare in the Maritimes) or ¶ (rare in the Maritimes, documentation only required for confirmed records). Current as of 26/01/2017. An up-to-date version of this sheet is available from <http://www.mba-aom.ca/jsp/summaryform.jsp?squareID=20PR26?lanq=en>

APPENDIX E. WETLAND CHARACTERISTICS TABLE

Wetland Characteristics, Rhodena Quarry Expansion Project

WETLAND ID	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE HYDROLOGY	WETLAND BOUNDARY/BUFFER	DOMINANT VEGETATION			WATER INPUT OBSERVATIONS	POTENTIAL FOR FISH PRESENCE
								Herbs	Shrubs	Trees		
WL1	Mixed wood treed swamp	Terrene	Basin	Isolated	1) Moderately decomposed organic - over rock 2) 32cm depth 3) A1 Histosol	1) High water table 2) Saturation 3) Water stained leaves	Low (100%) slope, natural buffer with forestry activities >100m	<i>Carex trisperma;</i> <i>Osmunda cinnamomea;</i> <i>Carex atlantica</i>	<i>Alnus incana;</i> <i>Abies balsamea</i>	<i>Acer rubrum;</i> <i>Pinus strobus</i>	Water provided by passive overland drainage from adjacent uplands	None in wetland
WL2	Mixed wood treed swamp	Terrene	Basin	Isolated	1) Moderately decomposed organic - depth 8cm- over clay mineral- depth 25cm- over rock 2) 33cm depth 3) F3 Depleted Matrix	1) High water table 2) Surface Water 3) Saturation 4) Water-stained leaves	Low (100%) slope, natural buffer with forestry activities >100m	<i>Carex trisperma;</i> <i>Osmunda cinnamomea;</i> <i>Oclemena blakei</i>	<i>Acer rubrum;</i> <i>Picea mariana;</i> <i>Abies balsamea</i>	<i>Acer rubrum</i>	Water provided by passive overland drainage from adjacent uplands	None in wetland
WL3	Coniferous treed swamp	Terrene	Basin	Outflow	1) Moderately decomposed organic - depth 18cm- over clay mineral- depth 30cm 2) 48cm depth 3) A2 Histic Epipedon	1) High water table 2) Saturation 3) Water stained leaves	Moderate (100%) slope, natural buffer with forestry activities >100m	<i>Carex trisperma;</i> <i>Osmunda cinnamomea</i>	<i>Alnus incana</i>	<i>Picea mariana;</i> <i>Abies balsamea</i>	Water provided by passive overland drainage from adjacent uplands	None in wetland
WL4	Mixed wood treed swamp	Lotic	Basin	Throughflow	1) Highly decomposed organic - depth 10cm- over clay mineral- depth 30cm- over hard pan 2) 40cm depth 3) F3 Depleted Matrix	1) High water table 2) Surface Water 3) Saturation 4) Water-stained leaves	Moderate (90%) and low (10%) slope, natural buffer with forestry activities >100m	<i>Carex trisperma;</i> <i>Osmunda cinnamomea</i>	<i>Alnus incana</i>	<i>Acer rubrum;</i> <i>Abies balsamea</i>	Water provided by watercourse from W3 and passive overland drainage from adjacent uplands	Connectivity to fish resource
WL5	Coniferous treed swamp	Terrene	Basin	Isolated	1) Low decomposed organic 2) 60cm depth 3) A1 Histosol	1) High water table 2) Surface Water 3) Saturation 4) Water-stained leaves	Moderate (90%) and low (10%) slope, natural buffer with forestry activities and quarry >75m	<i>Carex gynandra;</i> <i>Osmunda cinnamomea</i>	<i>Acer rubrum</i>	<i>Acer rubrum</i>	Water provided by passive overland drainage from adjacent uplands	None in wetland
WL6	Clearcut swamp	Terrene	Basin	Isolated	1) Low decomposed organic - over rock 2) 40cm depth 3) A1 Histosol	1) High water table 2) Surface Water 3) Saturation	Low (100%) slope, natural buffer with forestry activities and quarry >75m	<i>Carex trisperma;</i> <i>Osmunda cinnamomea</i>	None	None	Water provided by passive overland drainage from adjacent uplands	None in wetland

APPENDIX F. ARCHAEOLOGICAL REPORT



Rhodena Road Quarry Expansion

Archaeological Resource Impact Assessment

A2016NS03318
September 2016



DAVIS
MACINTYRE
& ASSOCIATES
ARCHAEOLOGICAL CONSULTANTS

109 John Stewart Drive
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RHODENA ROAD QUARRY EXPANSION
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT

Heritage Research Permit A2016NS033
Category C

Davis MacIntyre & Associates Limited
Project No.: 16-013.1MCE

Principal Investigator: Laura de Boer
Report Compiled by: Laura de Boer and Emily Redden

Submitted to:

McCallum Environmental Ltd.
208 Kingswood Drive
Hammonds Plains, NS B4B 1L2

-and-

Coordinator, Special Places
Communities, Culture and Heritage
1747 Summer Street
Halifax, NS B3H 3A6

Cover: A rough road bisecting the study area, looking southeast.

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EXECUTIVE SUMMARY

In April 2016, Davis MacIntyre & Associates Limited was contracted by McCallum Environmental Ltd. on behalf of Ideal Concrete Ltd. to conduct an archaeological resource impact assessment of the proposed expansion of a quarry on Rhodena Road, Inverness County, Cape Breton. The assessment included a historic background study as well as a field reconnaissance of all areas to be impacted.

This assessment has identified the presence of a probable nineteenth and twentieth century farmstead at the southern extents of the study area. The only archaeological features identified within the defined work area are three stone piles likely resulting from field clearing, which are usually considered of minimal significance beyond indicating the presence of historic farming nearby. The building foundations and well are located within or just beyond the border of the study area. However, given that an associated privy and other outbuildings has not been identified, it is required that a buffer be established of approximately 20m to the north of the stone piles to ensure that archaeological material is not impacted during the quarry expansion. This buffer would impact only the southern-most corner of the work area. In order to ensure that the buffer is maintained, it is recommended that the buffer be flagged with high-visibility material during any heavy equipment activity in proximity to this area.

If this buffer zone is considered too large, additional archaeological testing is required in order to ensure that features not visible on the surface are identified, and that a date range for the occupation of the homestead can be more firmly established. Details of this testing should be determined by a qualified archaeologist upon reviewing proposed impact in proximity to the features.

Archaeological features relating to First Nations activity have not been identified within or in proximity to the study area, nor are significant archaeological resources of this type suspected. The study area is not located in proximity to navigable water bodies, and is in fact positioned in a relatively high and hilly portion of Cape Breton. While it would not be unexpected that First Nations groups may have travelled through the area for hunting and other activities, it is unlikely that such activities have resulted in substantial archaeological deposits.

In the event that additional archaeological resources are encountered that were not identified during this assessment, it is recommended that any ground-disturbing activity be halted immediately and the Coordinator of Special Places (902-424-6475) be contacted immediately regarding a suitable method of mitigation.

1.0 INTRODUCTION

In April 2016, Davis MacIntyre & Associates Limited was contracted by McCallum Environmental Ltd. on behalf of Ideal Concrete Ltd. to conduct an archaeological resource impact assessment of the proposed expansion of a quarry on Rhodena Road, Inverness County, Cape Breton. The assessment included a historic background study as well as a field reconnaissance of all areas to be impacted.

This assessment was conducted under Category C (Archaeological Resource Impact Assessment) Heritage Research Permit A2016NS033 issued by the Department of Communities, Culture and Heritage. This report conforms to the standards required by the Culture and Heritage Development Division under the Special Places Protection Act (*R.S., c. 438, s. 1*).

2.0 STUDY AREA

Ideal Concrete (1993) Ltd., a subsidiary of Zutphen Contractors Inc., is proposing to expand their existing quarry on Rhodena Road near Queensville in Richmond County. The quarry expansion encompasses 16.6 hectares, which includes the current 3.9 hectare quarry, on PID 50193390 and part of PID 50297316.

The study area is part of the North Bras d'Or Uplands Natural Theme Region of Nova Scotia (#313), Creignish Hills sub-Unit. The Uplands form a series of elongated fault blocks of Avalon crustal material orientated northeast-southwest, along the northern side of Bras d'Or Lake. The Creignish Hills sub-Unit is comprised of metamorphosed volcanic Precambrian and sedimentary Ordovician rocks and granite. Fresh water in this sub-Unit is predominantly found in the Inhabitants River and Mabou River and their tributaries.

The soils of this region are characterized by strong podzol development and a thick iron humate B horizon. The predominant soil is a well-drained, stony, sandy loam known as Thom, with small areas of peat found in depressions in this soil. Trees include Sugar Maple, Yellow Birch, American Beach, and shade-intolerant hardwoods on the high slopes and ridges, while flatter areas and ravine slopes include softwoods like Balsam Fir, White Spruce, and Black Spruce.¹

¹ Davis and Browne 1996:34-35.

3.1 Maritime Archaeological Resource Inventory

The Maritime Archaeological Resource Inventory, a database of known archaeological sites in the Maritime Provinces, was consulted in August 2016. No archaeological sites have been reported within a 10km radius of the study area.

The absence of previously recorded archaeological sites within or in proximity to the study area is likely the result of few archaeological assessments being conducted in this region, rather than a reflection of the presence or absence of archaeological material in the area.

3.2 Historical Background

3.2.1 The Precontact Period

Nova Scotia has been home to the Mi'kmaq and their ancestors for at least 11,500 years. A legacy of experience built over millennia shaped cultural beliefs and practices, creating an intimate relationship between populations and the land itself. The complexity of this history, culturally and ecologically, is still being explored.

The earliest period is *Sa'qiwe'k L'nu'k* (the Ancient People) or the Paleo-Indian period (11,500 – 9,000BP). The changing ecology following deglaciation allowed the entrance of large herds of migratory caribou into Nova Scotia, followed by Paleoindian groups from the south.³ Currently, the Debert/Belmont Sites provide the only significant evidence of Paleo-Indian settlement in the province. Commonly believed to be big-game hunters, research is now aimed at exploring the diverse subsistence patterns that may have supported populations, and what adaptations were made when the environment shifted once again in the early Holocene.⁴

Succeeding the *Sa'qiwe'k L'nu'k* is the *Mu Awsami Kejikawe'k L'nu'k* (the Not so Recent People) or the Archaic Period (9,000-3,000 BP). This time saw a reorientation to a more maritime subsistence, with settlement pivoting more towards coastal areas, lakes and bountiful riverine resources.⁵ Remnants of these sites along the coast have largely been engulfed by rising seas or battered by wind and wave, though interior sites are increasingly being discovered.⁶ Ground stone tools, specialized for wood-working, appear at this time and may have been used to create dug-out canoes. Numerous traditions and distinct technologies have been documented throughout Maine and the Atlantic provinces. A growing catalogue of exotic cultural components demonstrates

³ Newby et al. 2005: 151

⁴ Lothrop et al. 2011: 562

⁵ Tuck 1975

⁶ Deal et al. 2006

that groups within Nova Scotia were engaged in spheres of interaction spanning hundreds of kilometers. Unfortunately, a lack of formally excavated sites within Nova Scotia still obscures the degree to which these traditions were present.

By the *Kejikawe'k L'nu'k* (the Recent People) or Woodland/Ceramic period (3,000-500 BP), the Mi'kmaq were a maritime people.⁷ Known Woodland/Ceramic sites concentrate along coasts shorelines, and navigable watercourses. Migration of ideas and people introduced new worldviews and technologies from groups originating in places like northern New England and the Great Lakes area, to local populations, including the earliest ceramic forms. Harvesting of marine molluscs and shellfish appears in this period, and substantial shell-middens have gifted archaeologists with well-preserved records of these past lives.⁸ Fish weirs populating the province's rivers and streams speak to the importance of migrating fish species to Mi'kmaq life. Terrestrial hunting and foraging was practiced with varying degrees of intensity depending on seasonality and region. A generally stable cultural form is believed to have developed by 2,000 BP, forming the way of life first encountered by Europeans arriving on our shores.⁹

Mi'kmaw life was substantially altered in the *Kiskukewe'k L'nu'k* (Today's People) or Contact Period (500 BP- Present). Trade and European settlement introduced change and upheaval to the traditional way of First Nation life. Mobile hunting and gathering still defined Mi'kmaw life, with identity residing within family households.¹⁰ Trading posts and fishing villages became intersections of European and Mi'kmaq interaction, affecting traditional seasonal rounds and access to land. The hunting of fur-bearing mammals intensified to satisfy the mutual exchange of skins for European goods (Whitehead 1993:89).¹¹ It is not accurate, however, to say that Mi'kmaq *adopted* European goods and culture, but rather *adapted* it. The Mi'kmaq remained an influential social and political force well into the 18th century, forming a triadic narrative of contention with the English and French. However, disease, conflict, and alienation from the land wreaked a ruinous effect on the Mi'kmaq by the 19th century, pushing people to the margins of colonial society.¹²

⁷ Davis 1993: 100

⁸ Davis 2005: 18

⁹ Wicken 2004: 26

¹⁰ Ibid: 30

¹¹ Whitehead 1993: 89

¹² Reid 2009

Mi'kmaq Period	Archaeological Period	Years
Sa'qiwe'k L'nu'k (the Ancient People)	Paleo-Indian	11,500 – 9,000 BP
Mu Awsami Kejikawe'k L'nu'k (the Not so Recent People)	Archaic	9,000 –3,000 BP
Kejikawe'k L'nu'k (the Recent People)	Woodland/Ceramic Period	3,000 –500 BP
Kiskukewe'k L'nu'k (Today's People)	Contact	500 BP – present

Table 3.2-1: Mi'kmaq/Archaeological Cultural Periods

Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO) was contacted on 8 August 2016 as part of this assessment in order to illicit information regarding past and traditional Mi'kmaq land use in or near the study area. At the time of the printing of this report, a response had not been received.

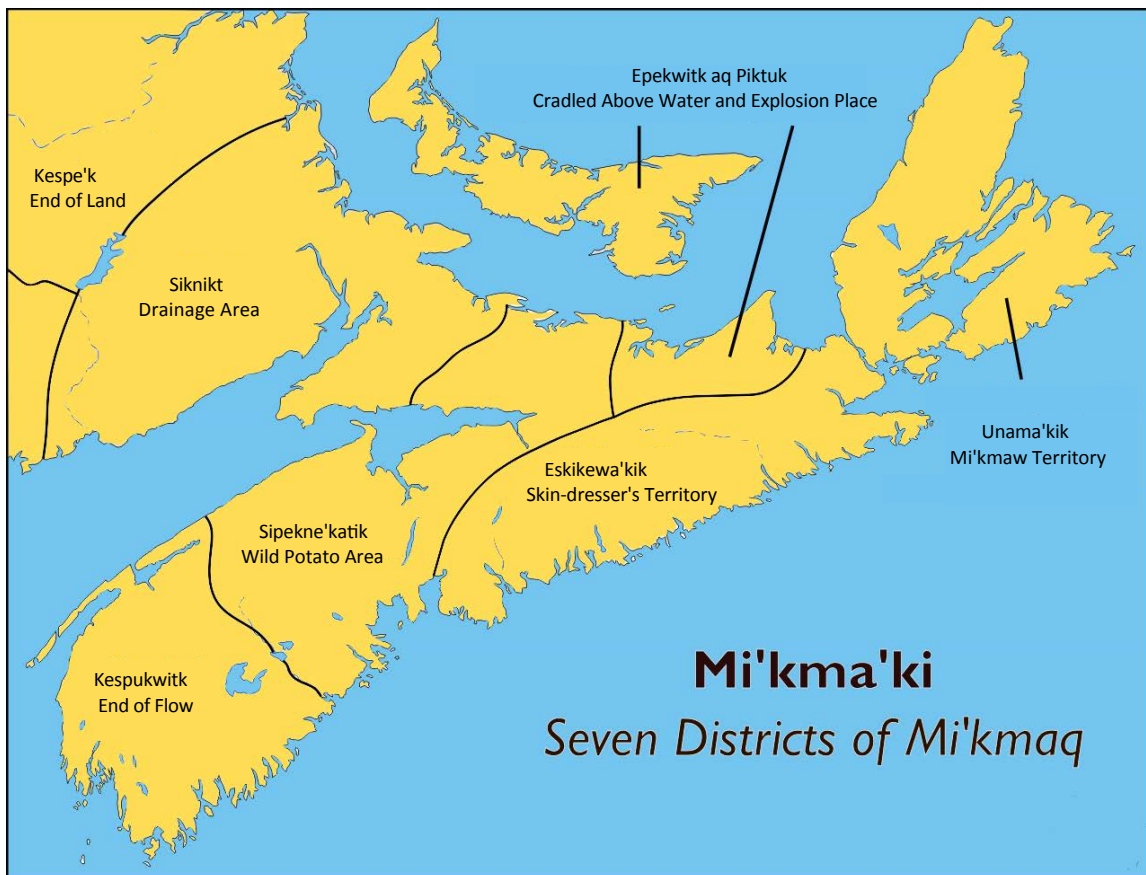


Figure 3-1: A map of the Mi'kmaq districts.¹³

¹³ Based upon Confederacy of Mainland Mi'kmaq 2007:11.
Davis MacIntyre & Associates Limited

3.2.2 European Settlement

The relatively isolated, inland position of Rhodena means that there is minimal historical documentation of this area available in the public archives sources consulted during this assessment. Nearby Queensville is known to have been settled by Donald McDonald and John McMaster. McDonald petitioned for, and received, a warrant in 1825 for land initially granted to his late brother, receiving a full grant the following year. McMaster's warrant was awarded in 1819 and his full grant of land was made in 1835.¹⁴

A land grant map of the area shows that the entirety of the study area, with additional land surrounding it, was part of a 200-acre grant made to Hugh McMaster. This was likely one of two Hughs in the nineteenth century: Hugh the son of Iain Ruadh (Red John) McMaster of Creignish (possibly the same 1819-1835 grantee of Queensville mentioned previously), or his son Hugh (grandson of Iain Ruadh).¹⁵ The elder Hugh was known to have settled at Rhodena, and his grant is side-by-side with 200 acres granted to Angus McMaster – both the elder Hugh and the younger Hugh had brothers of this name. The elder Hugh's sons Hugh and Angus reportedly lived at Newtown, near Port Hastings,¹⁶ but this does not rule out the possibility that they were granted land at Rhodena, as the elder Hugh may have purchased a grant there and thus his name would not appear on the original grant map.

¹⁴ Fergusson 1967:568.

¹⁵ MacDougall 1922:592.

¹⁶ MacDougall 1922:592.

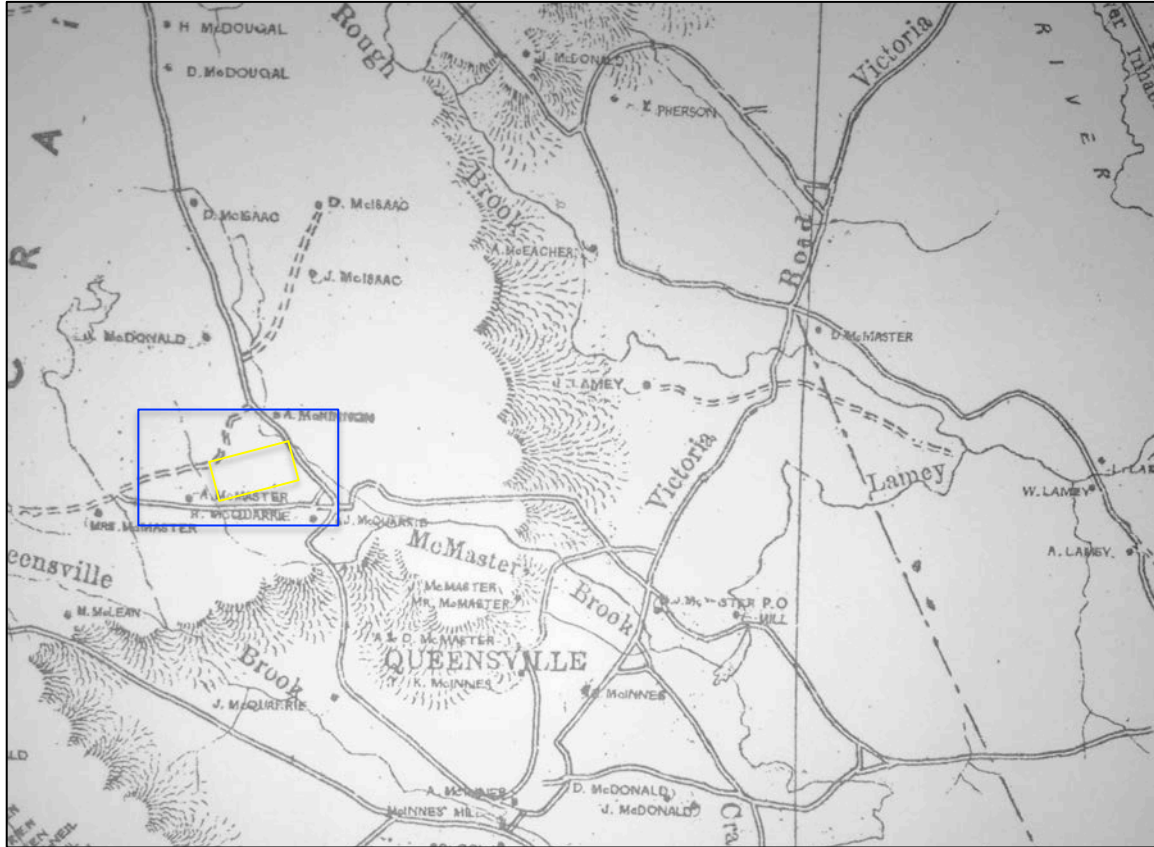


Figure 3-3: A section of Ambrose Church’s 1864 map of Inverness County does not indicate a homestead within the study area (yellow), though the home of A. McMaster is shown on the west side of the brook that forms the study area’s western edge.

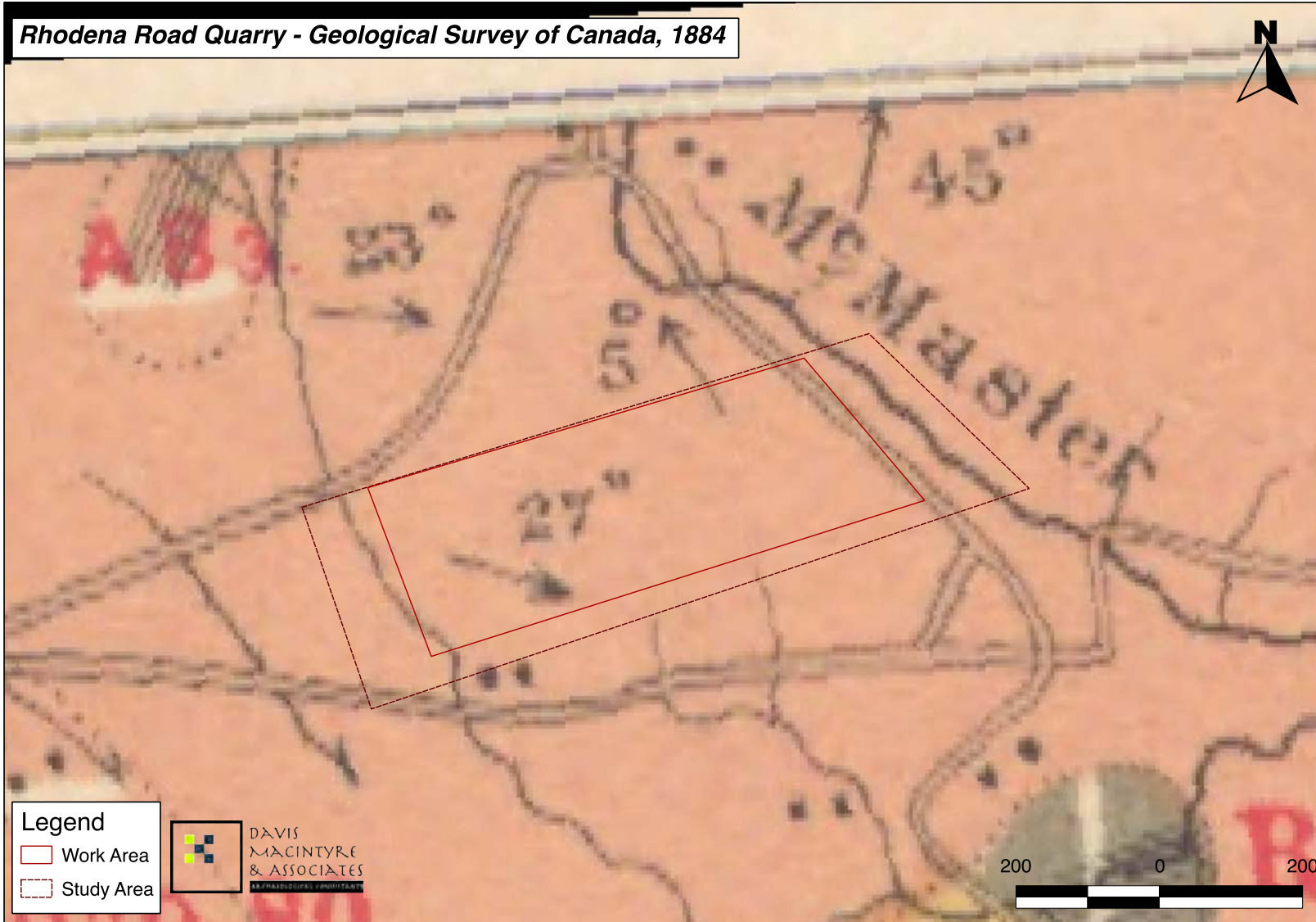


Figure 3-4: A georeferenced copy of the 1884 Geological Survey of Canada map appears to show two structures along Creignish Mountain Road immediately south of the study area.

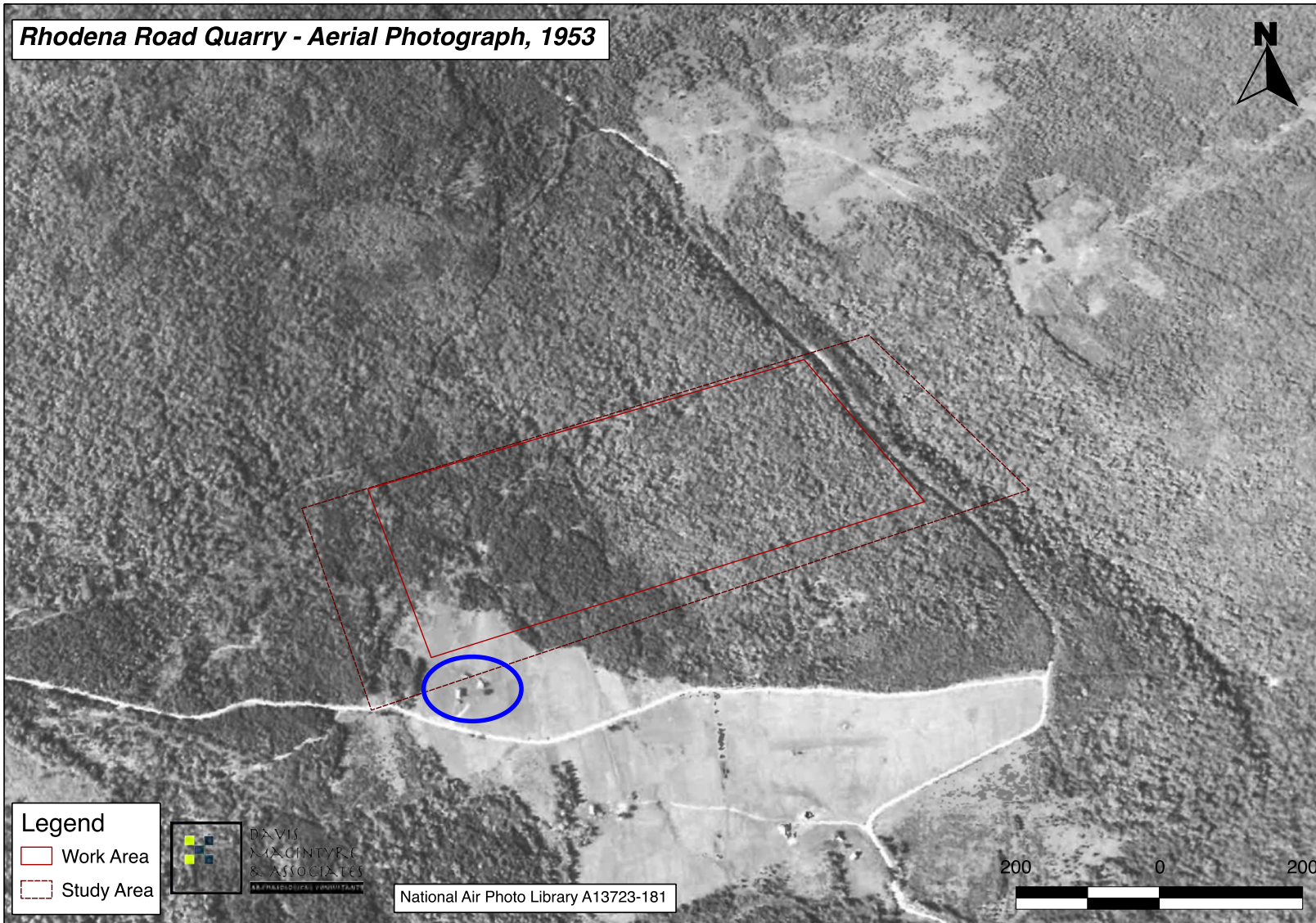


Figure 3-5: A georeferenced aerial photo shows a small cluster of buildings at the southern extents of the study area.

3.3 Field Reconnaissance

A field reconnaissance was conducted by Laura de Boer, Vanessa McKillop, and Courtney Mac Neil in August 2016. The survey was facilitated by two hand-help GPS units programmed with the appropriate study area and work area boundaries. Rough transects were walked, angling from the northeast end of the property (Rhodena Road) to the southwest (Creignish Mountain Road), varying in width based upon site visibility and terrain.

Although aerial photographs indicated that the study area was forested with a quarry located in the northern corner, field survey revealed that most of the property has been clear-cut within the last year (Plate 1), while the quarry itself appears to have expanded since the 2009 aerial photograph available online through Google Earth.

Recent clear-cutting within a study area represents a potential blessing and a potential problem, as heavy equipment used for harvesting timber often creates deep ruts in the soil's surface, exposing soil for examination but also potentially damaging archaeological sites. In this case, it has proven to be helpful in providing negative evidence for archaeological deposits throughout most of the site. The soils visible were a mixture of sand, gravel, and rock, with a very thin layer of organic matter at the surface (Plate 2). The strong orange-brown, culturally sterile tone of the soil contributes to the conclusion that little cultural activity has taken place within the impact zone prior to cutting.

The cleared forest appears to have been mixed-wood and mature, as both spruce and hardwood limbs and branches were present on the ground. Much of the gravel in the soil beneath is fractured granite.

The edges of the existing quarry are clearly defined by large mounds of aggregate pushed against a thin belt of trees that were not harvested this year (Plate 3). A single well-defined road made from the existing aggregate is present forming a loop from the quarry's northwest end, bisecting the site from the northwest to the southeast near the middle of the property, and proceeding farther southeast from the study area, most likely to Creignish Mountain Road to the south.

Aside from the belt of trees at the quarry and a few patches of younger growth, the only significant standing forest is located at the southwest end of the property, forming a belt around McInnis Brook and a band of trees around a cluster of small buildings that belong to an on-site squatter who was not present during the reconnaissance. The buildings are modern (Plate 4), but as aerial photographs and historic mapping suggested, they fall very close to the edge of a nineteenth and twentieth century farmstead located farther southwest (Figures 3-6 and 3-7).

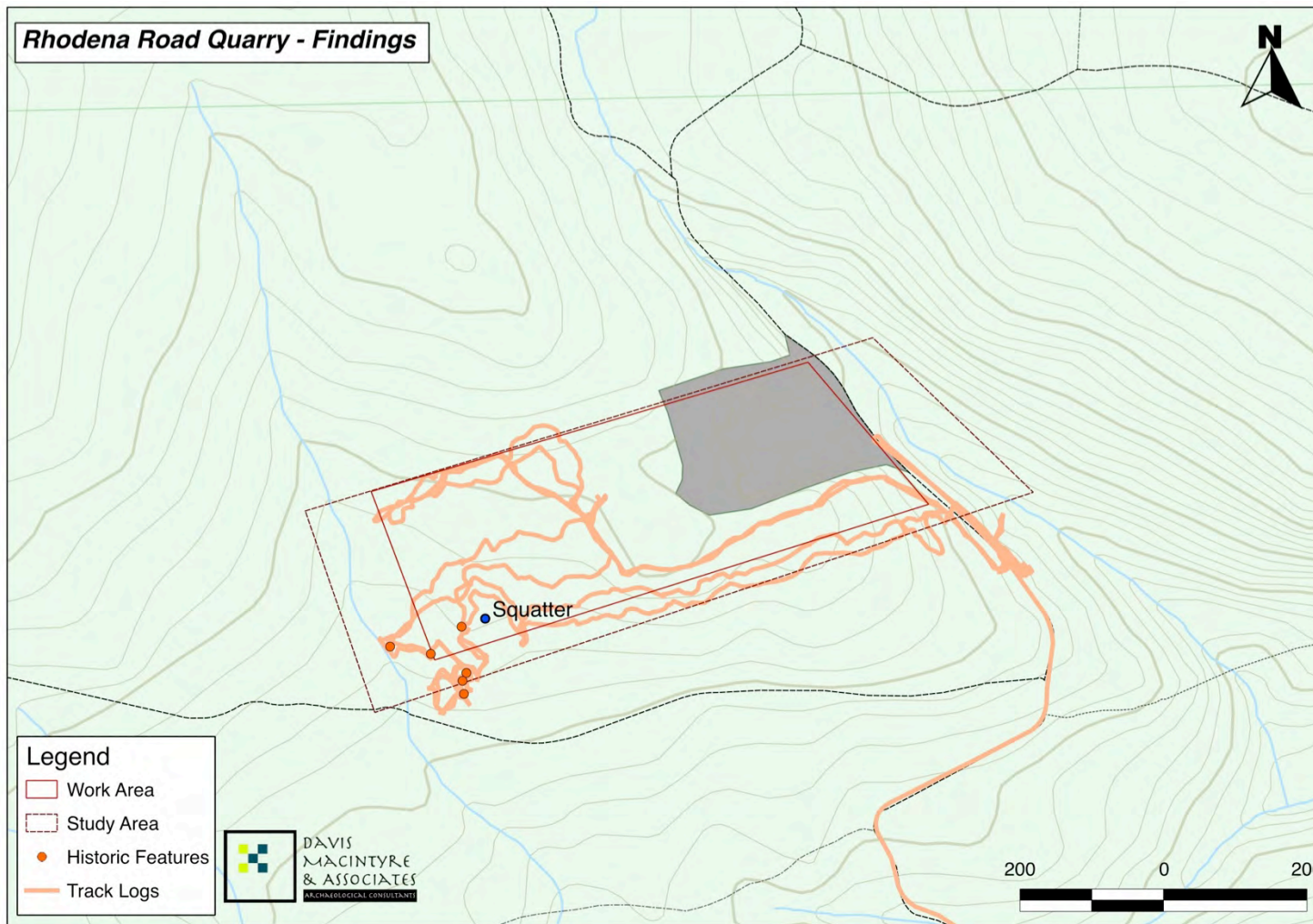


Figure 3-6: A map showing historic features in relation to the squatter’s residence. Note that the existing quarry now extends much farther to the southeast than is shown on the map data – the orange track log represents the current edge.

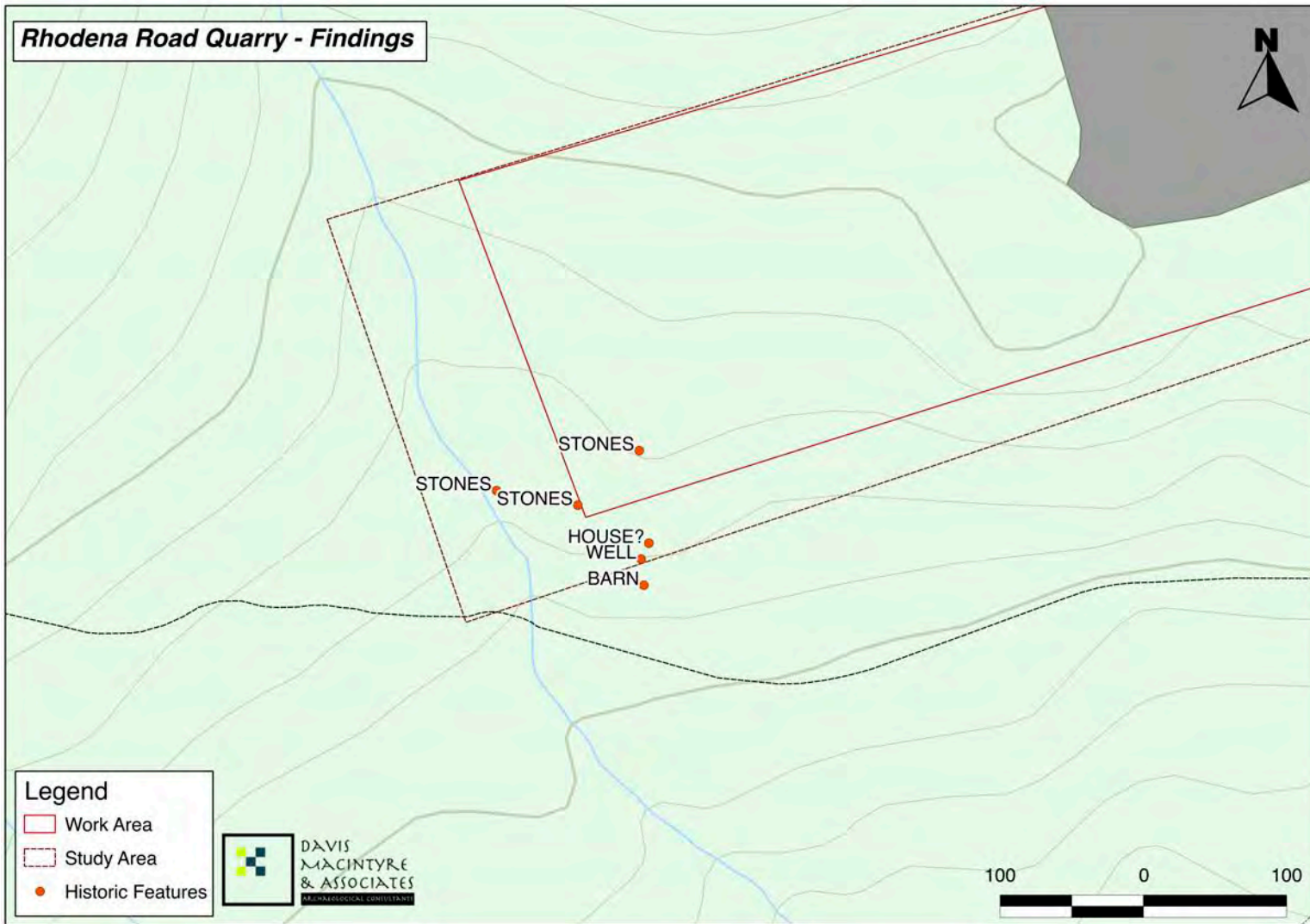


Figure 3-7: A map showing historic findings in relation to the study area.

At the southern extents of a band of standing trees between the squatter’s buildings and another clear cut area, a cluster of three stone piles most likely resulting from field clearing (Plate 5) marks the edge of ground that lacks natural forest undulations, indicating that it was once ploughed field or pasture. A fragment of cast iron stove plate on one pile (Plate 6) suggested a nineteenth or twentieth century domestic site would be found nearby. An exploration of more of this area – proceeding south from the work area into the more general study area – revealed the presence of two stone foundations without cellars, and a narrow stone-lined well (Figure 3-8).

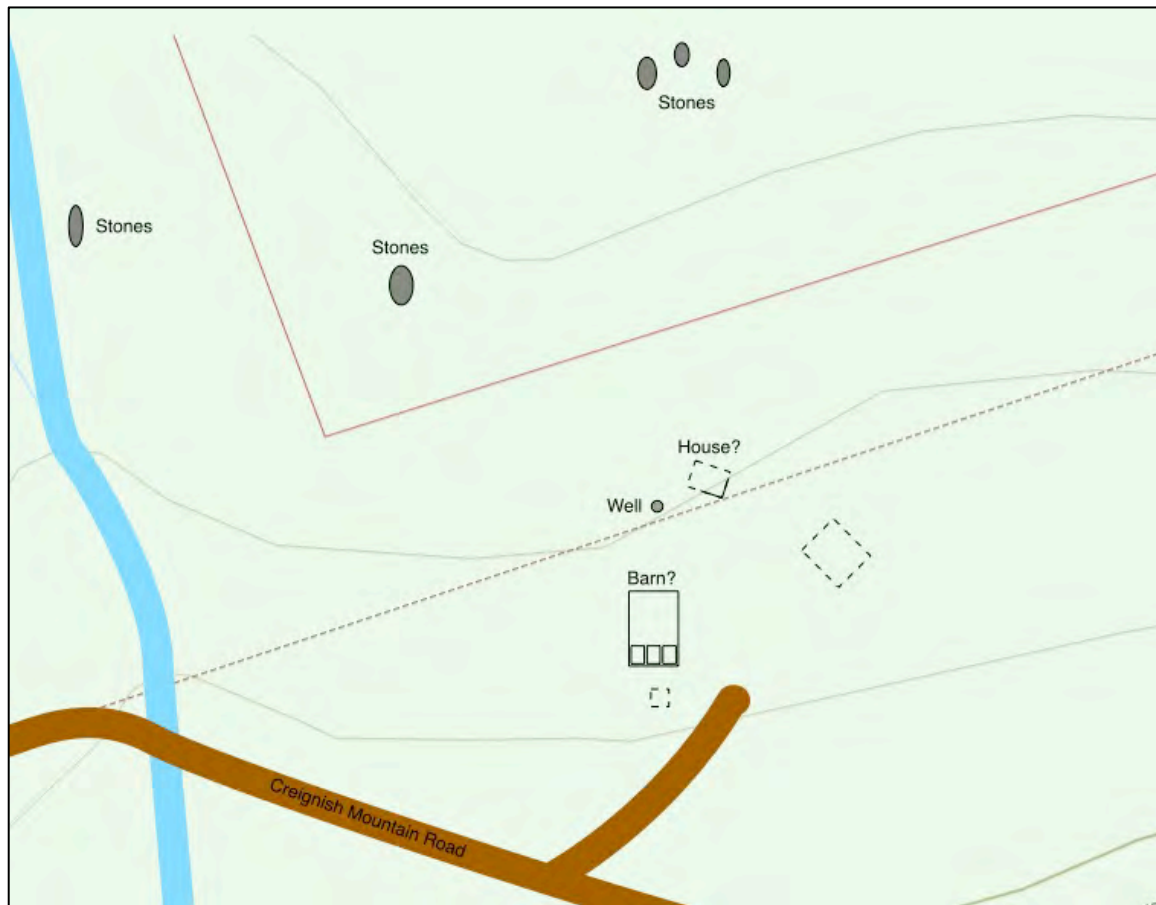


Figure 3-8: A sketch plan of the layout of historic features observed at the southern extents of the study area. Two buildings not observed in the field but visible on a 1953 aerial photograph are shown in dashed lines.

The smaller foundation is very faint and only portions of two perpendicular sides are visible on the surface, each section less than three metres in length (Plate 7). The less substantial nature of this foundation suggests it may have been a small house or small outbuilding rather than a large barn, and that it either lacked a cellar or the cellar was filled in after the house collapsed or was torn down.

The larger and more substantial foundation appears to be that of a barn, and notably the footings for three large stone platforms or pillars are visible at the southern extent of the building (Plate 8). The function of these elements is unclear. A small collection of bottles from the second half of the twentieth century, predominantly alcohol bottles, is clustered in the narrow channels between the platforms. Also observed was a metal hook most likely originating from farm machinery (Plate 9).

The well that once serviced the farmstead is approximately 50cm in diameter and is stone-lined (Plate 10). The feature presents a modern hazard as it is visibly at least 1m in depth and likely much deeper beneath a layer of vegetation, and it is well disguised by blackberry canes and weeds nearly 1.5m high. The field team chose to tie flagging tape to the thorn bushes above the well in an effort to make the well's entrance more visible.

The road used to access the squatter's camp from Creignish Mountain Road is present immediately southeast of these features. Heavy mats and iron grates have been used to stabilize sections of the road against potholes (Plate 11). Another open area of ground was present on the southeast side of this roadway, and the 1953 aerial photograph overlay (Figure 3-5) suggests that another large building was positioned there in relation to the homestead. However, due to a combination of this open ground being significantly beyond the defined study area, and an incomplete understanding of the site layout's relation to the aerial photo while in the field, this area was not explored.

Another stone pile related to field clearing is positioned farther to the northwest, surrounded by smooth ground that was once field or pasture but had overgrown in forest and has recently been harvested (Plate 12). A fragment of a small ceramic plate (Plate 13) as well as a possible iron barrel hoop and the top of an iron or steel bucket were scattered over the top of the stones. The plate included a fragment of maker's mark identified as British Pottery Ltd., manufactured 1920-26.¹⁸

Finally, a long berm-like pile of stones bordering the brook at the southwestern end of the study area was observed (Plate 14), along with a small assortment of medicine or alcohol bottles (Plate 15). The shape and position of the stone pile is notable, as it may represent the remnant of a small dam used to create a small holding pond upstream, given the shallow ravine that the brook flows through would be suitable for this purpose. If a mill was associated with the possible dam, no signs of it were visible on the surface.

¹⁸ Cushion 1959:247.

4.0 RESULTS AND DISCUSSION

This assessment has identified the presence of a probable nineteenth and twentieth century farmstead at the southern extents of the study area. The only archaeological features identified within the defined work area are three stone piles likely resulting from field clearing, which are usually considered of minimal significance beyond indicating the presence of historic farming nearby. The building foundations and well are located within or just beyond the border of the study area. However, given that an associated privy and other outbuildings has not been identified, it is recommended that a buffer be established of approximately 20m to the north of the stone piles to ensure that archaeological material is not impacted during the quarry expansion. This buffer would impact only the southern-most corner of the work area.

Feature	Coordinates (UTM NAD83)	Significance
Stone Piles (3)	20 T 625248 5066799	Low
Possible House	20 T 625255 5066735	Unknown
Well	20 T 625250 5066724	Unknown
Probable Barn	20 T 625252 5066705	Unknown
Stone Pile	20 T 625206 5066761	Low
Stone Berm by Stream	20 T 625149 5066771	Unknown

Archaeological features relating to First Nations activity have not been identified within or in proximity to the study area, nor are significant archaeological resources of this type suspected. The study area is not located in proximity to navigable water bodies, and is in fact positioned in a relatively high and hilly portion of Cape Breton. While it would not be unexpected that First Nations groups may have travelled through the area for hunting and other activities, it is unlikely that such activities have resulted in substantial archaeological deposits.

5.0 RECOMMENDATIONS AND CONCLUSIONS

It is required that a buffer zone of approximately 20m be established around the archaeological features indicated in section 4.0 above in order to ensure that those features, and any additional features not visible on the surface, are not disturbed or destroyed during the quarry expansion. In order to ensure that the buffer is maintained, it is recommended that the buffer be flagged with high-visibility material during any heavy equipment activity in proximity to this area. A MARI form has been completed for this site and submitted to the Department of Communities, Culture and Heritage.

If this buffer zone is considered too large, additional archaeological testing is required in order to ensure that features not visible on the surface are identified, and that a date range for the occupation of the homestead can be more firmly established. Details of

this testing should be determined by a qualified archaeologist upon reviewing proposed impact in proximity to the features.

In the event that additional archaeological resources are encountered that were not identified during this assessment, it is recommended that any ground-disturbing activity be halted immediately and the Coordinator of Special Places (902-424-6475) be contacted immediately regarding a suitable method of mitigation.

6.0 REFERENCES CITED

- Church, Ambrose F. 1864. Topographical Township Map of County. Bedford: A. F. Church & Co.
- Confederacy of Mainland Mi'kmaq. 2007. Kekina'muek: Learning about the Mi'kmaq of Nova Scotia. Truro: Eastern Woodland Publishing.
- Cushion, John Patrick. 1959. British Ceramic Marks. Toronto: Coles Publishing Company Limited.
- Davis, Derek and Sue Browne. 1996. Natural History of Nova Scotia, Volume II: Theme Regions. Halifax: Nimbus Publishing and Nova Scotia Museum.
- Davis, Stephen. 1993. The Ceramic Period of Nova Scotia *In* The Maritime Provinces: Past & Present Research. Reports in Archaeology No.8, Michael Deal & Susan Blair eds. Pp. 85-100. Fredericton: New Brunswick Archaeological Services.
- Davis, Stephen. 2005. Early Sequences of Change *In* The Atlantic Region to Confederation: A History. Phillip Buckner and John G. Reid, eds. Pp. 3-22. Halifax: Acadiensis Press.
- Deal, Michael, Douglas Rutherford, Brent Murphy and Scott Buchanan. 2006 Rethinking the Archaic Sequence for the Maritime Provinces *In* The Archaic of the Far Northeast. David Sanger and M.A.P. Renouf eds. Pp. 253-283. Orono: University of Maine Press.
- Department of Lands and Forests. 1960. "Crown Lands Index Sheet, Antigonish Guysborough Inverness and Richmond Counties." Sheet No. 110.
- Fergusson, C. Bruce. 1967. Place-Names and Places of Nova Scotia. Halifax; Public Archives of Nova Scotia.
- Fletcher, Hugh 1884. "Province of Nova Scotia, Island of Cape Breton, Strait of Canso Sheet No.22." Geological Survey of Canada, Map No. 205.

- Lothrop, Jonathan C., Paige E. Newby, Arthur E. Spiess, and James W. Bradley. 2011. Paleoindians and the Younger Dryas in the New England-Maritimes Region. *Quaternary International* 242: 546-569.
- MacDougall, John L. 1922. *History of Inverness County Nova Scotia*. Truro: No publisher information provided.
- Newby, Paige, James Bradley, Arthur Spiess, Bryan Shuman, and Phillip Leduc. 2005. A Paleoindian response to Younger Dryas climate change. *Quaternary Science Reviews* 24: 141-154.
- Reid, John G. 2009. Empire, the Maritime Colonies, and the Supplanting of Mi'kma'ki/Wulstukwik, 1780-1820. *Acadiensis* XXXVIII, no. 2: 78-97.
- Tuck, James A. 1975. The Northeastern Maritime Continuum: 8000 Years of Cultural Development in the Far Northeast. *Arctic Anthropology* 12(2): 139-147. <http://www.jstor.org/stable/40315879>.
- Wicken, William C. 2004. *Mi'kmaq Treaties on Trial: History, Land, and Donald Marshall Jr.* Toronto: University of Toronto Press.
- Whitehead, Ruth Holmes. 1993. *Nova Scotia: The Protohistoric Period 1500-1630*. Curatorial Report Number 75. Halifax: Nova Scotia Museum

PLATES



Plate 1: Recent clear cutting within the study area, looking north.



Plate 2: Exposed soil resulting from clear cutting shows a thin layer of darker organic soil over orange-brown rocky soil. Looking southeast.



Plate 3: A thin belt of trees divides the cleared area from the existing quarry. Looking north.



Plate 4: Recent cutting borders a small cluster of modern buildings belonging to a squatter. Looking southwest.



Plate 5: Two of three stone piles present in the band of standing forest between the squatter's residence and the historic building foundations, looking south.



Plate 6: A fragment of a cast iron plate designed for the top of a stove, observed on one of the three stone piles clustered to the north of the historic building foundations.



Plate 7: The smaller building foundation, obscured by ferns, looking southeast.



Plate 8: The more clearly-defined (western-most) of the three platforms or bases at the southern end of the large foundation. Looking south.



Plate 9: A fragment of iron or steel appears likely to have originated from farm machinery.



Plate 10: A narrow stone-lined well presents a significant hazard due to its overgrown state.



Plate 11: The road used to access the squatter's residence, likely an extension of the old farmstead driveway. Looking southwest.



Plate 12: A stone pile at what appears to have been the centre of a cleared field, now the centre of a clear cut swath. looking northwest.



Plate 13: A plate bearing the partial maker's mark "British Pottery," c. 1920-26, noted on the stone pile.



Plate 14: A small stone berm at the eastern side of the brook, looking west.



Plate 15: A selection of the bottles present on the stone berm, including one clear bottle with graduated markings on its sides and a screw cap still in place.

APPENDIX A: HERITAGE RESEARCH PERMIT



Heritage Research Permit (Archaeology)

Special Places Protection Act 1989

(Original becomes Permit when approved by
Communities, Culture and Heritage)

Office Use Only
Permit Number:

A2016NS033

<i>Greyed out fields will be made publically available. Please choose your project name accordingly</i>	
Surname de Boer	First Name Laura
Project Name Rhodena Road Quarry Expansion	
Name of Organization Davis MacIntyre & Associates Limited	
Representing (if applicable)	
Permit Start Date 16 May 2016	Permit End Date 31 August 2016
General Location: Queensville, Richmond County	
Specific Location: <i>(cite Borden numbers and UTM designations where appropriate and as described separately in accordance with the attached Project Description. Please refer to the appropriate Archaeological Heritage Research Permit Guidelines for the appropriate Project Description format)</i> 20 T 625531.48 m E 5066984.99 m N (WGS84)	
Permit Category: Please choose one <input type="checkbox"/> Category A – Archaeological Reconnaissance <input type="checkbox"/> Category B – Archaeological Research <input checked="" type="checkbox"/> Category C – Archaeological Resource Impact Assessment <input checked="" type="checkbox"/> I certify that I am familiar with the provisions of the <i>Special Places Protection Act</i> of Nova Scotia and that I have read, understand and will abide by the terms and conditions listed in the Heritage Research Permit Guidelines for the above noted category.	
Signature of applicant <i>A MacIntyre</i> for Laura de Boer	Date 29 April 2016
Approved by Executive Director <i>[Signature]</i>	Date <i>May 12-16</i>

APPENDIX G: OPEN HOUSE FLYER AND NOTICE, OPEN HOUSE POSTER BOARDS, SIGN IN SHEET AND COMMENT CARDS

NOTICE

Open House March 21, 2017 (5-8pm) Skye Lodge

160 Highway 4, Port Hastings, NS B9A 1M5

This is to advise that **Zutphen Resources Inc.** is proposing to expand the existing Rhodena Quarry.

Project Location: PID 50193390 and 50297316, Rhodena Road, Rhodena, Nova Scotia

On March 21, 2017, an open house will be held from 5-8pm at the Skye Lodge in Port Hastings, NS, to share information on the project and provide details relating to Provincial Environmental Assessment activities currently underway.

For Additional Information, please contact:

Project Coordinator: Peter Archibald
Zutphen Resources Inc.
10442 Route 19
Southwest Mabou, Nova Scotia, B0E 2W0
(902) 945 2300

Comments may also be sent to:

Nova Scotia Environment: Sydney Office
PO Box 714, 295 Charlotte Street
Sydney, Nova Scotia, B1P 6H7
(902) 563-2100

March 13, 2017

To: The residents of Rhodena, Queensville and Creignish Rear and surrounding areas.

**RE: Open House, Tuesday March 21, 2017 5-8pm
 Skye Lodge -160 Highway 4, Port Hastings, NS B9A 1M5**

Zutphen Resources Inc. operates quarries throughout northeastern Nova Scotia and specializes in aggregate production.

Zutphen Resources Inc. is planning to expand their existing quarry on Rhodena Road south of Rhodena, Nova Scotia. The map below shows the location of the Rhodena Quarry, currently operating under a Nova Scotia Environment industrial approval. Zutphen Resources Inc. is planning to expand their quarry operations west and south from its current location. Quarry expansion requires a Provincial Environmental Assessment registration (Class I undertaking).

On March 21, 2017, an open house will be held at the Skye Lodge in Port Hastings, to discuss the expansion of the quarry and provide details relating to the Provincial Environmental Assessment activities currently underway. We would like to invite you to come learn about our development.

For more information, please contact us at peter@zutphen.ca or call 902.945.2300.

Hope to see you there!

Regards,

Peter Archibald
 Zutphen Resources Inc.

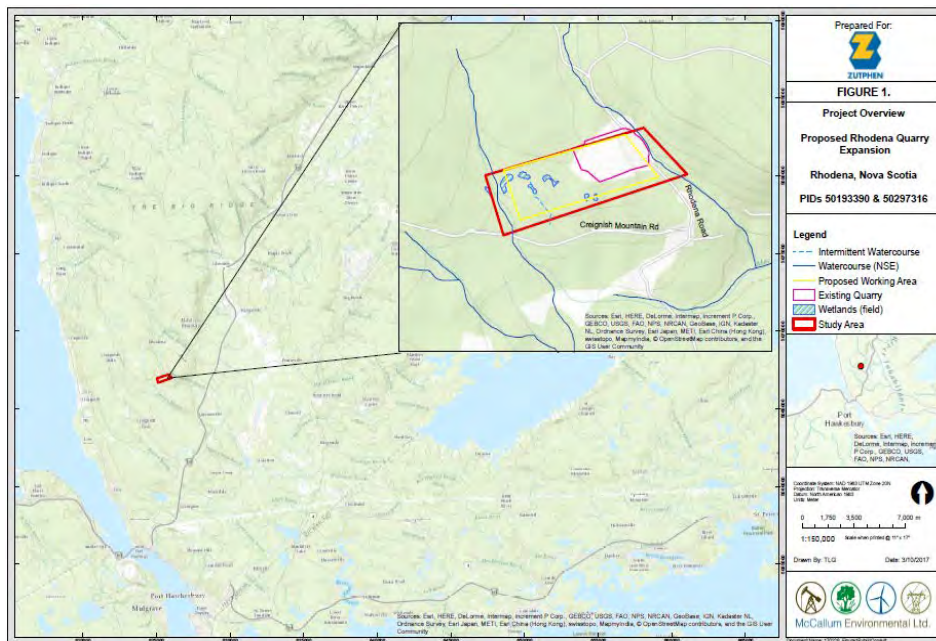


Figure 1: Project Location with an inset to show the Project Overview

Rhodena Quarry Expansion Project
Public Open House
Sign In Sheet
March 21, 2017





Rhodena Quarry Expansion Project

March 21, 2017

	Print Name	Address	Phone Number	E-mail address
1	John Dowling			Conuel John E
2	DAN DE MONE			THE DEMONES @ N.S. SYNTHETIC.CA.
3	ROBERT BELYEA	161 BLUE RIDGE RD QUEENSVILLE N.S. 1391179	902-625-2047	N/A
4	Louise Belyea	NS	NS	N/A
5	Neil Mayde	Port Hastings NS P1S 6	907-675-1427	---
6	William Gamba	LEXINGTON	902-625-0994	---
7				
8				
9				
10				



ZUTPHEN

**RHODENA QUARRY EXPANSION PROJECT
OPEN HOUSE**

Name:

Steve MacLellan

Address:

Aulds Cove

Phone:

747-2590

Email:

Please provide your comments

All t's best

Additional Questions?

Please contact Peter at peter@zutphen.ca or call us at (902) 945-2300



ZUTPHEN

RHODENA QUARRY EXPANSION PROJECT
OPEN HOUSE

Name:

DAN DeMONE.

Address:

834 LONG STRETCH
RD.

Phone:

902-625-0544.

Email:

the.demon@
NS.SYMPATCO.
CA.

Please provide your comments

MAJOR THAT THE FRONT BORDERS
ABNTIN THE PROJECT ARE
KEPT TO THE STANDARD THEY
ARE PRESENTLY IN.
NICE TO SEE THAT THEY HAD
A INFORMATION SESSION.

Additional Questions?

Please contact Peter at peter@zutphen.ca or call us at (902) 945-2300



ZUTPHEN

**RHODENA QUARRY EXPANSION PROJECT
OPEN HOUSE**

Name:

Neil Marsel

Address:

27 Brown St
Port Harstump
B7A 1L6

Phone:

902-675-1477

Email:

Please provide your comments

Very Good Project Plan!

Additional Questions?

Please contact Peter at peter@zutphen.ca or call us at (902) 945-2300