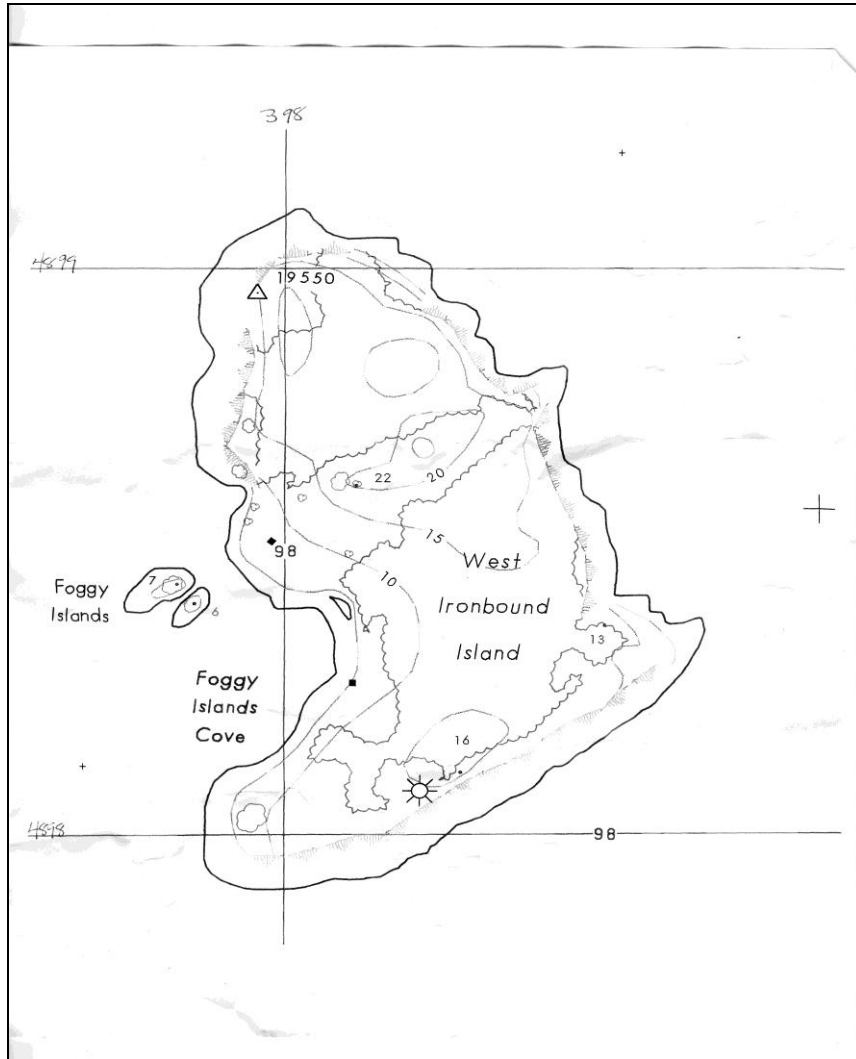


Lichens of West Ironbound Island, Lunenburg County, Nova Scotia



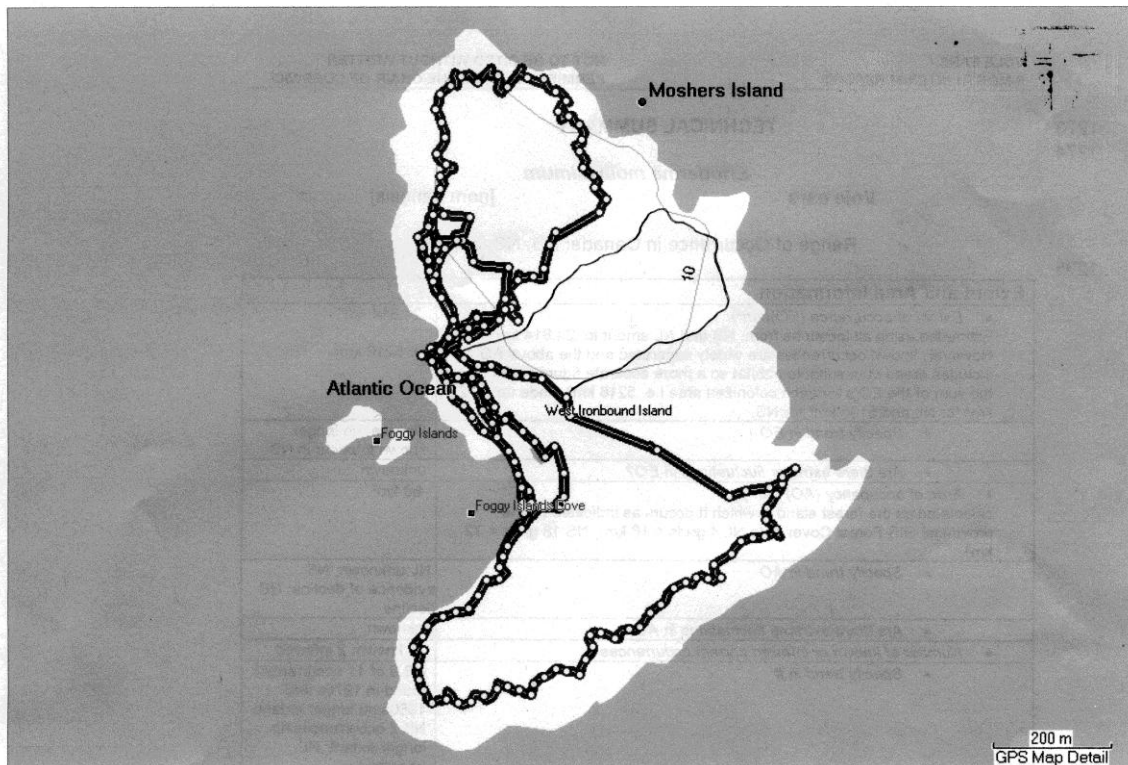
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October 2009

Lichens of West Ironbound Island, Lunenburg County, Nova Scotia, October 2009

Summary:

The lichen flora of West Ironbound Island is diverse and interesting. It contains species that are common elsewhere in the province, some that are uncommon there and elsewhere in the northeast, and possibly an altogether new species. Though few Nova Scotia coastal islands have published inventories of lichens (Isle Haute, Sable and Scatarie being the exceptions), and few appear to have been inventoried at all, most are unlikely to have the variety of habitats present on West Ironbound. Human interference there has been minimal for nearly 20 years. The grazing sheep have maintained the open fields and headlands that provide habitat margins not found on completely forested or undisturbed islands.

The GPS map below shows the areas explored for lichens in two visits, June 18 and September 3/4, 2009, including two low-lying forested swampy areas between the headlands and the central field/hill, much of the island's perimeter, and the transition zones between field and forest. The narrow line is the June exploration.



There is still interior forest to explore, as well as the edges of two of the open fields on the north and south headlands.

Habitat diversity:

West Ironbound Island (WIB) lies exposed at the mouth of the LaHave River. Never more than 1 km wide at any point, it is open to Atlantic wind and water on its east, southeast and south coasts. The island is shaped like a horse's head, with the long nose flank that faces the Atlantic spectacular for its rough, broken shale ledges.



The white spruce that forms the Atlantic forest edge on the east end has shattered shale as groundcover 10-20 m in under the trees.



Few lichens grow in such an exposed and battered environment. Further into the interior, in open areas where trees have fallen or where shrubs grow in wet areas, there is sufficient protection for lichens to grow.

Woodland interior

Species	Substrate	Habitat
Alectoria sarmentosa	tree	standing white spruce in forest opening
?Bryoria lanestris	tree rotting	Sent to Ottawa
Cladonia cristatella	stump	Not collected
Cladonia maxima	soil upturned	Not collected
Cladonia squamosa	root	wet seep in white spruce woods
Hypogymnia tubulosa*	tree	Not collected
Lecanora thysanophora	tree	Not collected
Loxospora ochrophaea	tree upturned	Not collected
Ochrolechia androgyna	root	wet seep in white spruce woods
Peltigera aphthosa	soil	in fir woods toward east end
Peltigera neopolydactyla	soil	fir woods toward east end
Physcia millegrana	dead fir	white spruce forest
Platismatia glauca*	tree	Not collected
Platismatia tuckermanii*	tree	Not collected
Tuckermannopsis orbata	tree branch white	white spruce woods
Usnea cornuta*	spruce white	SE
Usnea cf. flammea	spruce	west end
Usnea longissima	tree	open area in spruce forest
Usnea merrillii	tree	open area in spruce forest
Usnea cf. silesiaca		spruce/fir woods

* denotes found in more than one habitat

On the east/northeast coasts toward Hell Point, an impenetrable area of blowdown possibly from Hurricane Juan has opened the forest edge back to c.60m from the cliffs.



Neither the topographic maps nor the GPS map show the many small rises and drops in the topography along the eastern and northeastern cliffs. There is typical coastal barren flora growing on some of the cliff tops; between them there are small seeps and stunted trees.



Most of the cliffs are shale, with some sandstone (far spit in photo) and the occasional granite erratic (middle left in photo).

Headlands

Species	Substrate	Habitat
Acarospora smaragdula	rock	cliff near house, shaded sandstone
Amandinea punctata	lignum	dead white spruce on Atlantic coast
Cladonia chlorophaea	lignum	fallen log on west headland
Cladonia pyxidata	soil	between woods & rock, east end
Heterodermia neglecta	falling fir, east face	headland, west end
Hypogymnia physodes*	tree, rock	Not collected
Lecanora orae-frigidae	log	in grass, west end headland
Lecanora xylophila	wood	dead spruce, Atlantic headland
Leptogium imbricatum*	soil	cliff edge
Parmelia squarrosa*	white spruce falling fir, east	on headland west end
Parmotrema sp.	face	headland, west end
Physcia millegrana*	tree	not collected
Physcia tenella	falling fir	west headland
Placynthiella icmalea	log	in grass, west end headland
Protopannaria pezizoides	soil	dangling moss on cliff edge
Punctelia rudecta ?	lignum	exposed fallen log in NW facing clearing
Ramalina farinacea*	tree	Not collected
Ramalina roesleri*	tree	Not collected. Very common
Xanthoparmelia cumberlandia	granite boulder	east end, on shale cliffs
Xanthoria elegans	rock	exposed shale cliffs, west side
Xanthoria parietina	rock	Not collected
Xanthoria polycarpa*	tree	Not collected

* denotes found in more than one habitat

Sheltered by topography and trees on the north, east and south coasts, the interior open field is a hill rising from the sea on the island's west coast. It is flanked by low wet areas on its northwest and southeast boundaries. Grazing sheep keep the fields and the headlands open. The views below are looking north/northeast from the Atlantic side of the island.



Field

Species

Species	Substrate	Habitat
<i>Acarospora fuscata</i>	rock	in open field west end of island above house
<i>Acaraospora veronensis?</i>	rock	in open field west end of island above house
<i>Baeomyces rufus</i>	soil	under spruce at field edge
<i>Candelaria vitellina</i>	rock	in open field west end of island above house
<i>Lecanora polytropa</i>	rock	in open field west end of island above house
<i>Lecidella scabra</i>	rock	in open field west end of island above house
<i>Leptogium imbricatum*</i>	soil	cliff edge and between rocks in sandy area at field edge
<i>Melanelia subaurifera</i>	rock	slope toward water facing mainland
<i>Parmelia sulcata*</i>	tree,rock	Not collected
<i>Peltigera canina</i>	soil	next to rock in field high hill west end
<i>Peltigera didactyla</i> var <i>extenuata</i>	soil	near rock in field, west end
<i>Peltigera rufescens</i>	soil	next to rock in open field
<i>Physcia caesia</i>	rock	granite in open field
<i>Physcia dubia</i>	rock	in open field west end of island above house
<i>Physcia millegrana*</i>	rock	in grass west end
<i>Rhizocarpon eupetraeum</i>	rock	in open field west end of island above house
<i>Stereocaulon pileatum</i>	rock white	sandstone at field edge
<i>Usnea</i> cf. <i>subscabrosa</i> type c	spruce	edge of field
<i>Xanthoparmelia conspersa</i>	rock	in open field
<i>Xanthoria polycarpa*</i>	rock	in open field west end of island above house
<i>Xylographa opegraphella</i>	lignum	log in grass, west headland

Wet areas between hills

Species

Species	Substrate	Habitat
<i>Arthonia leucopallea</i>	tree	conifer and birch in wet area
<i>Cladonia maxima</i>	soil upturned	Not collected
<i>Cladonia ochrochlora</i>	root rotting	wet seep in white spruce woods
<i>Cladonia pleurota</i>	stump	wet boggy area
<i>Cladonia rangiferina</i>	soil mossy	mossy soil at open edge of bog/forest
<i>Cladonia scabriuscula</i>	stump	edge of wet area near fir forest
<i>Evernia mesomorpha</i>	tree	Not collected
<i>Everniastrum catawbiense</i>	tree	fir stand in swamp, opened by windfalls
<i>Hypogymnia physodes*</i>	tree,rock	Not collected
<i>Hypogymnia tubulosa*</i>	tree tree	Not collected
<i>Mycoblastus sanguinarius</i>	branch	edge of wet area midway across island
<i>Parmelinopsis minarum</i>	rock, tree	edge of northernmost wet area

Parmotrema crinitum	tree	swampy fir stand. FERTILE; also on spruce
Parmotrema perlatum	tree	edge of northerly wet area
Platismatia glauca*	tree	Not collected
Sphaerophorous globosus	tree	old fir near swampy area
Usnea cornuta*	tree	not collected
Usnea cf. trichodea		

* denotes found in more than one habitat

This interior protected area contains pockets of high humidity and older trees in the wet areas, forest/field edges in low and high elevations, and sun-exposed granite boulders in the fields that have disturbed soil at their bases. These transitional habitats contribute to the wide variety of lichens, many of which are not present at Gaff Point across the channel on the mainland.

Island comparisons:

A list of the 78 (59 macrolichens, 19 crustose species) lichens noted and/or collected on WIB is appended, though it is not exhaustive. Some specimens collected remain unidentified. Further investigations would undoubtedly reveal additional species.

Comparison of the WIB species list with those of the few published studies of NS islands that have been studied for lichens will show some species overlap. Sable Island has virtually no trees and is covered with sand dunes. Its lichen flora of 39 macrolichen species and 42 crustose species (Richardson et al. 2009) is really not comparable to that of WIB, since the conditions and substrates are not at all similar. More closely related are Scatarie Island, off the Atlantic coast of Cape Breton (Cameron et al. 09) and Isle Haute in the Bay of Fundy (Grantham et al. 2000).

Isle Haute is just over 1 degree of latitude north of WIB and is approximately 2km long by .5 km wide. It has white spruce, fir, ash, birch and alder, cobble beaches and primarily basalt geology in the form of dramatically high inaccessible cliffs, and a small grassy plateau where the former lighthouse was. Of the fifty-six species recorded (30 macrolichens, 16 crustose), fifteen lichen species found there occur on WIB. The island is not comparable to WIB in habitat types, tree composition or geology.

Scatarie Island is nearly 2 degrees of latitude north of WIB and approximately 7.5 x 5 km in size. Habitats are more similar to WIB, with barrens, wetlands, rocky shores, cliffs and forests, though forest composition differs with a higher percentage of balsam fir in the forests (low on WIB) and with the underlying rock types (shale and sandstone predominate on WIB). Notably absent are WIB's open fields with grazing sheep. Sixty lichen species were reported after a four

day survey from Scatarie (53 macrolichens, 7 crustose). Both islands have few deciduous tree species, with birch and mountain ash dominating. I saw only two red maples on WIB, both of which were young. There are 21 lichen species found on both islands

A total of 28 lichen species overlap between WIB and the other two islands (12 species overlap between them). A more southerly location, closeness to the mainland (less than 1 km to Gaff Point), geology and habitat diversity contribute to the richness of WIB's lichen flora.

The showy leafy cyanolichens (lichens with a blue-green algal component) found in humid coastal forests such as *Lobaria* (Lungwort) species and *Pseudocyphellaria perpetua* (brown with yellow edges) are apparently absent from WIB. The absence of maple of any age may be a partial explanation since in our area these lichens prefer old red maples. Red maples normally have a higher bark Ph (less acid) than conifers and birch. Though there is evidence that salt exposure can raise Ph levels on rocks and trees, most of these lichens would likely be unable to tolerate the salt. There are a few lichen species present that require old trees and high humidity as do the cyanolichens, such as *Sphaerophorous globosus* and *Heterodermia neglecta*. There are only a few studies of salt tolerance/preference in lichens, so one can only assume those present are reasonably salt-tolerant.

The following discussions of particular species focus on those whose presence was unexpected or unusual.

Lichens of note on WIB:

Leptogium imbricatum P.M.Jørg.



Photo Catherine Pross

Known in the northeast only from an island in Maine (Hinds 2007) and from two unpublished locations in Nova Scotia (Anderson 2007, 2008) and confirmed by the Norwegian cyanolichen specialist who described it, Per Magnus Jørgensen, this tiny grey lichen may be rare, but is likely overlooked because of its size. It is composed of many tiny (to .5 mm wide) lobes.

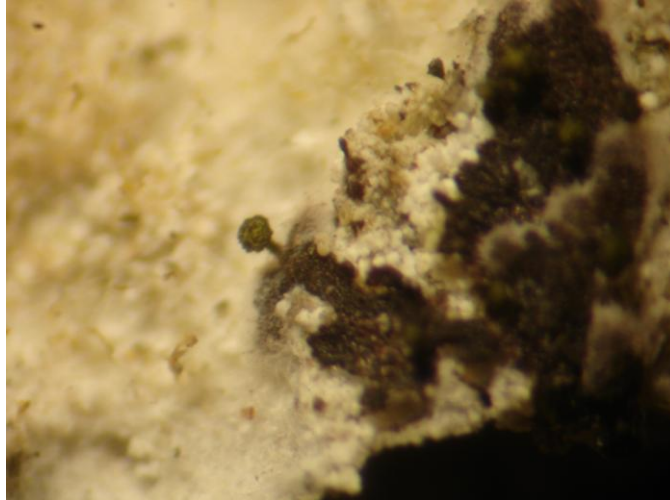
It grows on somewhat calcareous soil, usually among other vegetation or lichens. The Nova Scotia discoveries have been on soil over sandstone. It occurs in two locations on WIB. The first is a tiny c.3 x4 cm patch at the edge of the vegetation over the sandstone cliffs on the northeast side of the island.



The second surprising location is between two sandstone outgrowths on the edge of the field above the house (see above). The sheep graze and wander nearby, apparently not harming the lichen. This patch is surprisingly large, approximately 20 x 14 cm.

Unknown stubble

Found growing on another lichen on a conifer branch in the northerly swampy area, this lichen may be an undescribed species. It was first sent to Steve Selva at the University of Maine, the North American expert in calicioid lichens, because I could not identify it. He sent it to Leif Tibell in Sweden, the world expert in calicioid lichens, since it didn't fit known species. Tibell also reports it as unknown, but has not yet described it. There was very little material to work with.



Calicioid lichens look like beard stubble .with a knob on top and are about the same size. This very tiny lichen is less than .5 mm high. The lichen it was growing on occurred again not far away on a birch, but the stubble was absent. The very humid habitat of this wet area, protected by two hills and forest from the wind and drying sun, produced several of the more interesting lichens on the island.

Everniastrum catawbiense (Degel.) Hale ex Sipman

Found in boreal forests and at high elevations, this lichen was thought to be rare in North America (Brodo 2001) and the northeast, but it has pockets of abundance in New Brunswick and Nova Scotia. The closest known location is Indian Path Common. There are scattered unpredictable occurrences along Nova Scotia's Atlantic coast from Shelburne County to the Aspotogan peninsula.

Sphaerophorus globosus (Huds.)Vain.

Rare in New England (Hinds 2007) and restricted to humid sites with old trees, this lichen was a surprise on the island. Most of the trees don't appear old enough, but there is abundant *S. globosus* on Gaff Point in an old bog and there are a few old firs deep in the wet area of WIB, so its presence is explainable.

Parmelinopsis minarum (Vain.) Elix & Hale

This large leafy lichen is known from only two recent sites in New England and was only discovered in NS in 2004 (Hinds 2007) There are records from 5 counties in the province, with one location from Upper LaHave. It rarely occurs on rocks, but one specimen on WIB was found on rock.

Alectoria sarmentosa Ach. and *Usnea longissima* Ach.

Both species hang threadlike from trees. They occur in humid old forests and are thought to be declining as old forests disappear. They are considered old-growth forest indicators, among other lichen species. Each of these specimens occurred in a humid portion of the forest on the Atlantic side of the island, in an area where wind had blown a few fir down. They also occur on Scatarie Island.

West Ironbound Island's diverse lichen flora is due to its topography and variety of habitats. Unlike strictly forested islands, its habitat edges greatly expand favourable conditions for lichens usually known only from the mainland. It is worth further exploration.

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Richardson, D, Lucas, Z., and Anderson, F. 2009 The lichen flora of Sable Island, Nova Scotia: its past, present and likely future status. Bryologist 112(3): 558-571

List of Lichens

Species	Substrate	Habitat
<i>Acarospora fuscata</i>	rock	in open field west end of island above house

<i>Acarospora smaragdula</i>	rock	cliff near house, shaded sandstone in open field west end of island above house
<i>Acaraospora veronensis?</i>	rock	house
<i>Alectoria sarmentosa</i>	tree	standing white spruce in forest opening
<i>Amandinea punctata</i>	lignum	dead white fir on Atlantic coast
<i>Arthonia leucopallea</i>	tree	conifer and birch in wet area
<i>Baeomyces rufus</i>	soil	under spruce at field edge
<i>Bryoria trichodes ssp.trichodes</i>	tree	fir in woods in open field west end of island above house
<i>Candelaria vitellina</i>	rock	house
<i>Cladonia chlorophaea</i>	lignum	fallen log on west headland
<i>Cladonia coniocraea</i>		
<i>Cladonia cristatella</i>	rotting stump	Not collected
<i>Cladonia maxima</i>	soil	Not collected
<i>Cladonia pleurota</i>	rotting stump	wet boggy area
<i>Cladonia pyxidata</i>	soil	between woods & rock, east end
<i>Cladonia ochrochlora</i>	upturned root	wet seep in white spruce woods
<i>Cladonia rangiferina</i>	soil	mossy soil at open edge of bog/forest
<i>Cladonia scabriuscula</i>	mossy stump	edge of wet area near fir forest
<i>Cladonia squamosa</i>	upturned root	wet seep in white spruce woods
<i>Evernia mesomorpha</i>	tree	Not collected
<i>Everniastrum catawbiense</i>	tree	fir stand in swamp, opened by windfalls
<i>Flavoparmelia caperata</i>	tree	Not collected
	east side of falling	
<i>Heterodermia neglecta</i>	fir	headland, west end
<i>Hypogymnia physodes</i>	tree,rock	Not collected
<i>Hypogymnia tubulosa</i>	tree	Not collected
<i>Lecanora orae-frigidae</i>	log	in grass, west end headland in open field west end of island above house
<i>Lecanora polytropa</i>	rock	house
<i>Lecanora thysanophora</i>	tree	Not collected
<i>Lecanora xylophila</i>	wood	dead spruce, Atlantic headland in open field west end of island above house
<i>Lecidella scabra</i>	rock	house cliff edge and between rocks in sandy area
<i>Leptogium imbricatum</i>	soil	edge
<i>Loxospora ochrophaea</i>	tree	Not collected
<i>Melanelia subaurifera</i>	rock	slope toward water facing mainland
<i>Mycoblastus sanguinarius</i>	tree branch	edge of wet rea midway across island
<i>Ochrolechia androgyna</i>	upturned root	wet seep in white spruce woods
<i>Parmelia saxatilis</i>	tree	Not collected
<i>Parmelia sulcata</i>	tree,rock	Not collected
<i>Parmelia squarrosa</i>	white spruce	on headland west end
<i>Parmelinopsis minarum</i>	rock, tree	edge of northerly wet area

<i>Parmotrema crinitum</i>	tree	swampy fir stand. FERTILE; also on spruce
<i>Parmotrema perlatum</i>	tree	edge of northerly wet area
	east side of falling	
<i>Parmotrema</i> sp.	fir	headland, west end
<i>Peltigera aphthosa</i>	soil	in fir woods toward east end
<i>Peltigera canina</i>	soil	next to rock in field high hill west end
<i>Peltigera didactyla</i> var <i>extenuata</i>	soil	near rock in field, west end
<i>Peltigera elisabethae</i>	soil	cliff edge near house, shaded sandstone
<i>Peltigera neopolydactyla</i>	soil	fir woods toward east end
<i>Peltigera rufescens</i>	soil	next to rock in open field
<i>Physcia caesia</i>	rock	granite in open field in open field west end of island above house
<i>Physcia dubia</i>	rock	house
<i>Physcia millegrana</i>	rock	in grass west end
<i>Physcia millegrana</i>	dead fir	white spruce forest
<i>Physcia tenella</i>	falling fir	west headland
<i>Placynthiella icmalea</i>	log	in grass, west end headland
<i>Platismatia glauca</i>	tree	Not collected
<i>Platismatia tuckermanii</i>	tree	Not collected
<i>Protopannaria pezizoides</i>	soil	dangling moss on cliff edge
<i>Punctelia rudecta</i> ?	lignum	exposed fallen log in NW facing clearing
<i>Ramalina farinacea</i>	tree	Not collected
<i>Ramalina roesleri</i>	tree	Not collected. Very common in open field west end of island above house
<i>Rhizocarpon eupetraeum</i>	rock	house
<i>Sphaerophorous globosus</i>	tree	old fir near swampy area
<i>Stereocaulon pileatum</i>	rock	sandstone at field edge
<i>Tuckermannopsis orbata</i>	tree branch	white spruce woods
<i>Usnea cornuta</i>	white spruce	SE
<i>Usnea</i> cf. <i>flammea</i>	white spruce	west end
<i>Usnea longissima</i>	tree	open area in spruce forest
<i>Usnea merrillii</i>	tree	open area in spruce forest
<i>Usnea</i> cf. <i>silesiaca</i>		spruce/fir woods
<i>Usnea</i> cf. <i>subscabrosa</i> type c	white spruce	edge of field
<i>Usnea</i> cf. <i>trichodea</i>		
<i>Xanthoparmelia cumberlandia</i>	granite boulder	east end, on shale cliffs
<i>Xanthoparmelia conspersa</i>	rock	in open field
<i>Xanthoria elegans</i>	rock	exposed shale cliffs, west side
<i>Xanthoria parietina</i>	rock	Not collected in open field west end of island above house
<i>Xanthoria polycarpa</i>	rock	house
<i>Xylographa opegraphella</i>	lignum	log in grass, west headland

- denotes found in more than one habitat

Author's Experience:

Previously Branch/Extension/Systems Librarian for South Shore Regional Library

Past 5 years - Research Associate at the Nova Scotia Museum in the lichen section of the Botany Collection.

Conducted extensive formal and informal lichen surveys for NGOs and corporations.

Currently working on a checklist of macrolichens for Nova Scotia, and also writing a field guide to lichens of the Maritimes for the non-lichenologist. The latter is a joint effort, including photos by Catherine Pross.

Recently co-authored a draft report on the status of the lichen *Degelia plumbea* for COSEWIC (Committee On the Status of Wildlife In Canada).

Co-taught a lichen identification course at MTRI in 2009 with David Richardson.

Courses Completed at Eagle Hill:

Richardson's Ecology of lichens of Coastal maine,

Brodo's crustose lichens (twice),

Philippe Clerc's the genus *Usnea*,

Stephen Clayden's Soil lichens: *Cladonias* and *Stereocaulons*,

David Hawksworth's Lichenicolous fungi,

Steve Selva's Calicioid lichens of New England,

Alan Fryday's Saxicolous Lecideine crustose lichens,

Dick Harris tutorial on interpreting TLC plates.