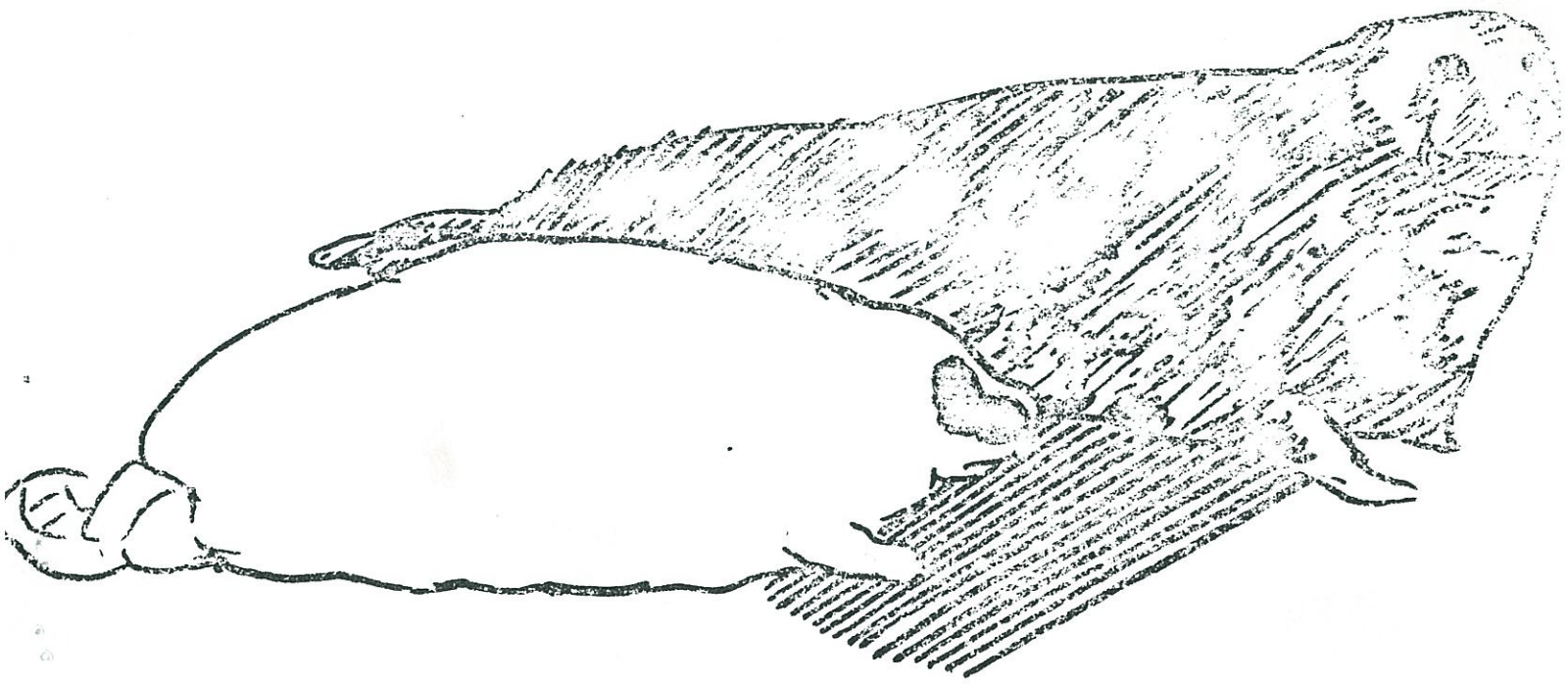
HALIFAX FIELD NATURALISTS NEWSLETTER

#15

c/o Nova Scotia Museum
1747 Summer Street
Halifax, N. S.

JANUARY-FEBRUARY 1978



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Meetings are held on the first Thursday of every month, at 8:00 p.m. in the Auditorium on the ground level of the Nova Scotia Museum, 1747 Summer Street, Halifax.

Field Excursions are held at least once a month.

Membership is open to anyone interested in the natural history of Nova Scotia. Membership is available at any meeting or by writing to Membership, Halifax Field Naturalists, c/o the Nova Scotia Museum. Individual membership is five dollars yearly; family membership is seven dollars. Members receive the newsletter and notice of all excursions and special programs.

Directors for 1978-1979

President.....	Joe Harvey	(422-3773)
Vice President.....	Anne Linton	(422-2977)
Membership-Secretary.....	Will Robertson	(463-9556)
Treasurer.....	Rose Barbour	(868-2947)
Past President.....	Kathy Aldous	(479-3032)
Directors.....	Jane Spavold	
	Huguette Mallet	
	Tony Bull	
	Ann Bull	
	Mike Burke	

Newsletter: Andrew McLaren, Ray Pierotti

Mailing Address

Halifax Field Naturalists,
c/o Nova Scotia Museum,
1747 Summer Street,
Halifax, N.S.
B3H 3A6

HFN is a member organization of the Canadian Nature Federation.

HFN is incorporated under the Nova Scotia Societies Act.

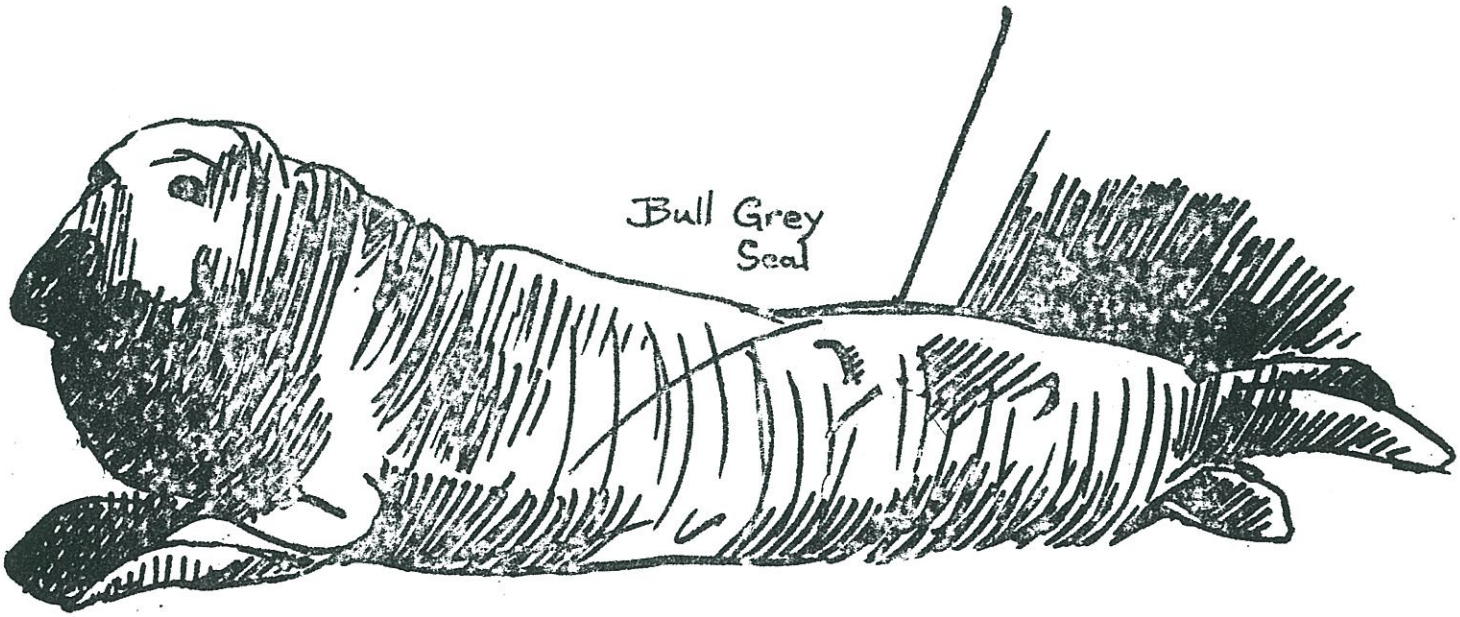
PRESIDENT'S REPORT:

HFN is now at a critical point in its development. Since its beginnings in October of 1975, HFN has grown at a rapid rate and has gained recognition as a responsible conservation organization as well as being an active natural history society. This remarkable success has been due in large part to the dedication and hard work of the founding executive, led by the enthusiastic and apparently tireless Paul Keddy. As is usually the case with a young organization, it was this executive, plus a handfull of volunteers who performed the majority of the work, from writing and publishing the newsletter, to keeping account books, to writing briefs. Many of the original executive members have remained active over the past two years, and the time is at hand when they should get a well-deserved rest. But for HFN to remain active and to contribute to the community, in fact for its very survival as an organization, new volunteers are greatly needed to supply ideas, leadership, and most importantly, enthusiasm and effort.

It is now time that the many small but important jobs within HFN be shared among the 300-odd members, rather than continue to be piled upon the shoulders of a few. Every member has something important that they can contribute, whether it be writing an article for the newsletter, leading a nature walk, or washing the cups after the monthly meeting. Any contributions, no matter how small, help ensure the continued success of HFN.

Yours,

Kathy Aldous



GUEST EDITORIAL

The Southwest — Nova Scotia's Forgotten Corner

Naturalists can be found to sing the praises of Cape Breton, The Cobequid Hills, the Annapolis Valley, and many other areas of the province. But who mentions the Tusket Valley? The Clyde River? The Shelburne Barrens? The Tusket Islands?

Our southwest is sadly neglected.

Its unique botanical status was documented by Gray Herbarium Expeditions from Harvard University during the 1920's. The southwest - and especially the Tusket River Valley - contains some plant species unique in Canada, and many others rare elsewhere in Canada. Yet the area has not a single nature reserve. And I doubt whether more than a handful of naturalists (and certainly not a single parks planner) are aware of the botanical richness of the area. A richness, sad to say, which is fading.

Species such as Coreopsis (Coreopsis rosea) and Plymouth Gentian (Sabatia kennedyana) are known in Canada only from the Tusket River Valley. Or should it be "were known"? Dams and cottages have taken their toll, and I know of no botanist who has seen either in recent years.

Many other little known species such as Redroot (Lachnanthes tinctoria) and Golden Crest (Lophiola americana) - both members of a tropical family - as well as the rare rush Scirpus Olneyi, Chain Fern (Woodwardia areolata) and Habenaria flava are precariously perched in our southwest.

The habitat for many of these species is the "cobble shoreline" characteristic of freshwater shores. Those of you familiar with this part of the province will recognize that habitat description immediately - medium sized rocks set in a gravel or peat mixture, surrounding the shoreline of lakes. As water levels fall during the summer, plants are progressively exposed and flower. The conditions on these cobble shorelines provide for a strange mixture of common bog and lakeshore species, as well as many of the aforementioned rare plants.

Alas, cottage development, dam construction, and other changes are rapidly eliminating or degrading this crucial shoreline habitat.

Ellenwood Lake Provincial Park is in the Tusket Valley. We were astonished to find a wide range of these rare plants along the shoreline only a few feet from our tent last summer. Yet this park exists only for human recreation, and shoreline vegetation was already suffering from trampling. Here would be a fine opportunity to add an adjacent section to this park as a nature reserve to preserve this unique Canadian shoreline flora.

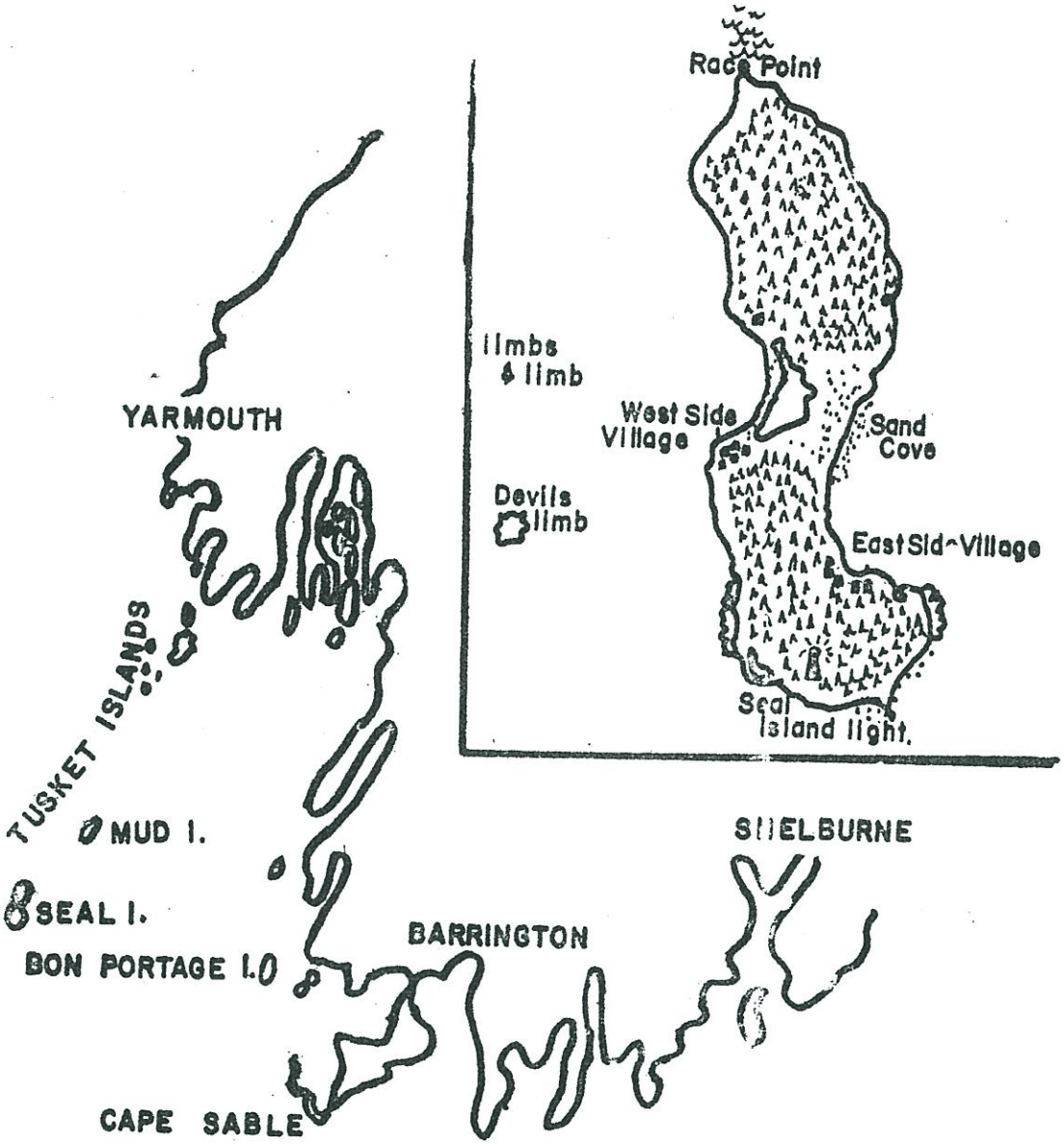
Nature Reserves? Ecological Reserves? Natural Environment or Wilderness Parks? These concepts appear so alien to present planners that I doubt whether we dare wait for them to make up their minds.

Perhaps the only answer in the short term is in land owners themselves. The local landowner who keeps a rich Red Maple swamp thick with Skunk Cabbage, or who doesn't subdivide his shoreline property. The naturalist who buys a chunk of lakeshore solely to protect the flora. The generous individual who bequests his land to the Nova Scotia Museum or local natural history societies.

If we don't soon take steps to protect portions of our southwest, it may be lost before any of us really get a chance to know it.

P.A. Keddy

SEAL ISLAND



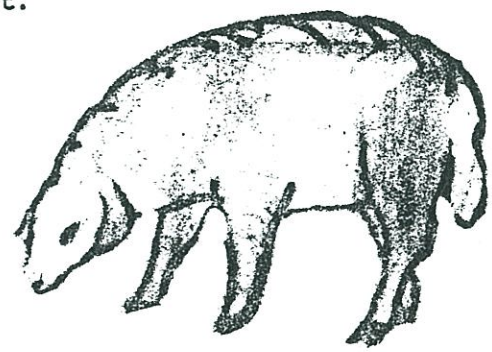
This issue is devoted largely to Seal Island - the extreme south west tip of Nova Scotia-to familiarize you with one small portion of our southwest.

Seal Island is largely owned by Mrs. Mary Nickerson, who like her mother before her, Mrs. Winnifred Hamilton, graciously allows small groups of naturalists to visit the island. Many of the articles in this newsletter grew out of a visit to Seal Island by a small group of HFN members last fall. The editors of HFN Newsletter would like to dedicate this issue to the Hamiltons for maintaining this beautiful island, and for allowing interested naturalists to visit.

The Island and its Inhabitants

Co-ordinates 43° 25' N. Latitude, 66°01' W. Longitude; better known to the local people and some bird watchers as Seal Island (there are three islands with this name in the maritime provinces), is located approximately 20 miles off Clark's Harbour, southwestern N.S. It is just one in a chain of islands which dot the coastline. Its position, further south than any of the other islands off southwestern N.S., places it in a position closer to the shipping lanes, which have in the past and still do today, service the trade routes of the northeast Atlantic. This, together with the rather stormy nature of the North Atlantic have ensured that Seal Island should get its fair share of shipwrecks.

Mrs. Winnie B. Hamilton, in whose family the island has been for many generations, has through the years compiled a list of some of the ships to have met their deaths on the shores of her island. In excess of 150 have gone to their graves on and around Seal Island, N.S., and several hundreds of lives have been lost.



In talking to Mrs. Hamilton and her daughter Mrs. Mary Nickerson, one is not long in realising that Seal Island is more than just a light station or a ship graveyard. They speak of it with obvious pride.

I would like to recite, if I may, a verse from Mrs. Hamilton's anecdotes of Seal Island which expresses - I hope - some of their thoughts about this island which is their home:

"There is a pleasure in the pathless woods,
There is a rapture on the lonely shore,
There is society where none intrudes,
By the deep sea, and music in its roar.
I love not man the less, but nature more,
From these our interviews in which I steal
From all I may be, or have been before.
To mingle with the universe and feel
What I can ne'er express, yet cannot
All conceal."

Today, with the recent retirement of the keeper of the light, Mr. Swim, there are only three permanent residents on the island. At one time, however, there were several hundred residents, a post office, a fish factory, a school with approximately 50 students and a church. The church has been maintained and may be seen on the southeast corner of the island, Festivals were held in the summer, and people came by boat from as far away as Yarmouth to attend.

Every year now, bird watchers visit the island in the spring and fall to await the arrival of thousands of birds on their migratory journeys. The birds stop over on Seal Island for brief periods to rest and feed before continuing on their long journeys. Several species of birds breed on the island in fairly large numbers. These include the Great Black Backed Gull, the Herring Gull, Eider Ducks and Black Guillemots. The Grey Seal also breeds along its shores.

My interest in Seal Island is with its population of squirrels. Approximately seven years ago, a local fisherman (Jackie Kenny, from Clark's Harbour) introduced on the island one pair (one female and one male) of american red squirrels caught from mainland N.S. I propose to carry out a comparative study of this population and the parental population on mainland, N.S., looking at ecological, behavioral and genetic characters of the population.

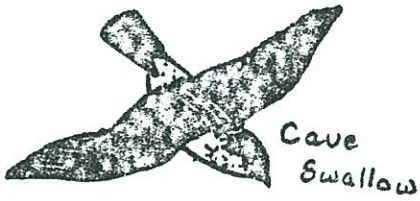
Craig J.d'Entremont

Birding on Seal Island

Seal Island is one of the jewels in the crown of Nova Scotian birding, especially during the fall migration when birds and birdwatchers congregate there for mutual scrutiny. Seal Island shares many characteristics with other off-shore islands along the Atlantic coast but a combination of some unique features makes it a great place for observing birds.

The location of Seal Island with respect to mainland Nova Scotia results in the passage of large numbers of birds including Nova Scotia residents, many species that breed to the west of us, and southern and far western rarities. During the fall migration many species tend to wander far to the east during their move southward so that species which nest in Quebec, Ontario or the Prairie Provinces are regularly found in Nova Scotia at this time. When these species as well as the Nova Scotian birds pass south through the province their movements are highly influenced by the sea coast so that these migrants tend to congregate in the southwestern part of the province, especially at Brier Island and Seal Island. These two spots act as traps or funnels for the moving birds. An interesting phenomenon known as reverse-migration also adds to the liveliness of the bird watching at Seal island. Occasionally some members of a species will, for a short period, move in the wrong direction along the line of their migration route, going north instead of south in the fall. For species making this mistake in New England the first land they may see is Seal Island. Consequently Seal Island becomes a stepping-stone for birds moving in either direction during migration.

The numbers of birds on Seal Island in the fall can be quite astounding. Despite the large areas of dense spruce forest, migrant birds are highly visible since they congregate in the bushy/weedy fringes of the forest, around the buildings and lobster traps in both East Village and West Village, and in the grassy neck joining the northern and southern halves of the island. Flocks of Chipping Sparrows or White-throats are frequently encountered as they quarter back and forth like armies of ants, the edge of the bush may seem in perpetual motion from the incessant flitting of warblers, while the observer is often startled by a Sharp-shinned Hawk or Merlin zipping around a corner hot on the tail of a panicked sparrow. An idea of the magnitude of the numbers involved is given by example peak estimates of species abundances on a single day during the fall (from the Nova Scotia Bird Society Newsletter, vol.12(3), p.116): Sharp-shinned Hawk, 30; American Kestrel, 70; Red-breasted Nuthatch, 200; Golden-crowned Kinglet 500; Northern Oriole, 150; Palm Warbler, 1000+; Dark-eyed Junco, 1000+. It is certainly not uncommon for a birder to see over 70 species during a two-day visit in October while favourable circumstances could push the list to 100.



One must not forget that Seal Island is surrounded by water! It is in or over this medium that a variety of inshore and offshore seabirds such as gannets, phalaropes, fulmars, guillemots and seaducks are frequently seen. In fact the trip to the island can be more memorable than the stay there, especially when the seas are high.

For the migratory reasons given earlier Seal Island acts as a funnel or trap for birds. Because of the high visibility of birds there, the bird watcher can scrutinize many hundreds and even thousands of birds for the rarities which make birding the exciting game it can be. As an example of the possible rarities (again from the NSBS newsletter) Little Blue Heron, Yellow-crowned Night Heron, Ruff, Say's Phoebe, Prothonotary Warbler, Yellow-headed Blackbird and Grasshopper Sparrow, all from lands distant from Nova Scotia, can be cited. Stranger still, three species, the Cave

continued on page 14...

The Vegetation of Seal Island

The vegetation of Seal Island is the net result of geological history, the forces of climate and the impacts of human occupation. These have combined to produce the array of vegetation types present today.

Vegetational History -

The forests are typical of those of the east shore of Nova Scotia, composed as they are of White Spruce (Picea glauca) and scattered Balsam Fir (Abies balsaminea) However, superimposed upon this is the unique geological position of the island on the extreme southwest tip of Nova Scotia. This area of the province harbours many rare and interesting plants (known collectively as the "coastal plain flora") with close affinities to the Cape Cod area of the United States. It is thought that when sea levels were much lower during the last ice age, and large areas of continental shelf were exposed, these species may have been able to migrate north from Cape Cod into south western Nova Scotia. Seal Island is right along this possible migration route, although at this time it was probably not an island, but the top of a hill on the exposed continental shelf. As the sea level rose, Seal Island would have been cut off from the mainland. At the same time the climate of the island would have become more and more dominated by the sea, and many rare species may have disappeared. Some have persisted, however. At least one rare south western species, skunk cabbage (Symplocarpus foetidus), still grows on the island, and it is possible that further botanical exploration could turn up others.

Today climate still has major effects upon the island as demonstrated by the stunted and twisted trees along the shore.

There are several distinct vegetation types which the casual visitor can distinguish:

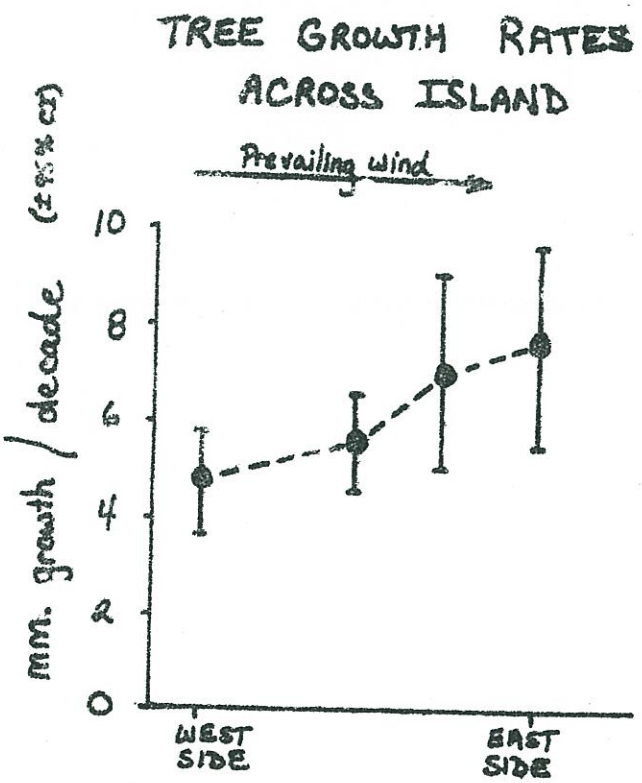
Spruce Woods

This is the largest and most obvious vegetation type on the island. White Spruce (Picea glauca) is the dominant species, but Balsam Fir (Abies balsamea), Dogberry (Sorbus decora) and Witherod (Viburnum cassinoides) also occur.

In many places the overstory of dense needles is so thick that only mosses can grow underneath. In more open areas, species may include:

Oxalis montana - Wood Sorrel
Linnaea borealis - Twin flower
Coptis trifolia - Gold thread
Cornus canadensis - Bunchberry
Dryopteris spinulosa - Spinulose Wood Fern
Gaultheria hispidula - Creeping Snowberry

We noted that many of these species, as well as mosses (Sphagnum spp., Dicranum spp., Polytrichum spp.) were much more common under Dogberry than under Spruce. Could it be that the deciduous leaves of the Dogberry admit more light, permitting a greater diversity of species to thrive beneath them?



Spruce tree growth rates (mm. radial growth in last decade) were measured with a bark hammer on a transect across the north island. As the accompanying figure shows, growth rate of the trees is lowest on the windwood side, and increases toward the leeward.

Wet Barrens -

Between the Spruce wood and the coast, especially in wet areas, bog species tend to thrive. The wet areas of the extreme south west shore are the best example of this vegetation type.

Prominent species include:

Empetrum nigrum - Black Crowberry
Myrica pensylvanica - Bayberry
Vaccinium macrocarpon - Large Cranberry
V. oxycoccus - Small Cranberry
Kalmia angustifolia - Sheep Laurel
Rubus hispidus - Trailing Blackberry

Herbaceous plant species include:

Osmunda cinnamomea - Cinnamon Fern
Iris versicolor - Iris
Epilobium sp. - Willow Herb
Juncus effusus - Rush
Hypericum virginicum - Bog St.John's Wort.
Drosera sp. - Sundew

We searched diligently for Curly Grass Fern (Schizea pusilla) but found none. Still, future visitors should keep their eyes open for this diminutive Fern.

Rush Wetlands -

The central lagoon is brackish and so has a limited number of plant species. However, extensive rush communities develop where fresh water enters this lagoon. Similar dense stands of rush surround the freshwater ponds on the lee side, and grow in wet areas all along the coast.

Juncus effusus is the commonest rush, and forms thick stands throughout the island. Other species often found in these rush wetlands include:

Iris versicolor - Iris
Hypericum virginicum - Bog. St. John's Wort
Alnus crispa - Downy Alder
Scirpus maritimus
S. lacustus - Bull Rush
Juncus bufonius - Toad Rush

The tall Scirpus lacustus, or Bull Rush, grows in only one small pocket near the "north home".

Sand Dunes -

The sand dunes on the east coast have several species typical of the eastern shore beaches of Nova Scotia:

Ammophila brevilegulate - Marram Grass
Juncus balticus - Rush
Salsola kali - Saltwort

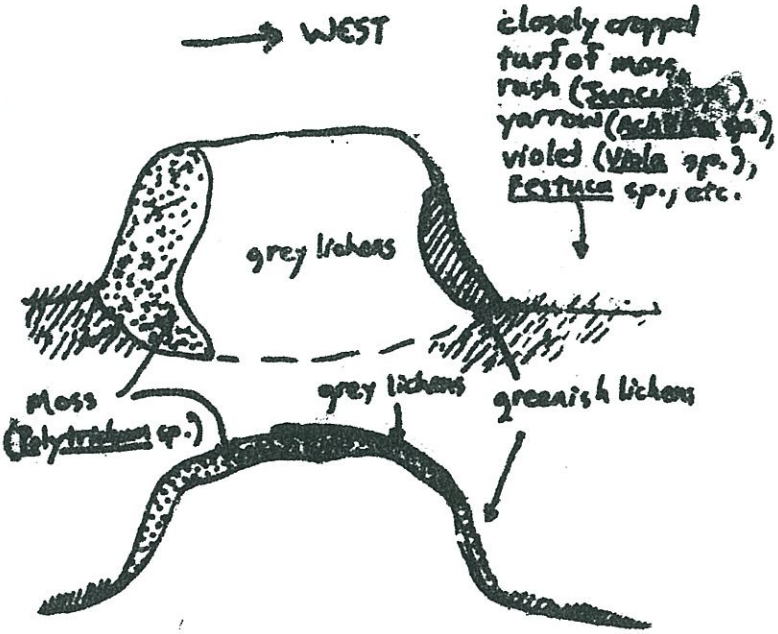
Sheep Turf (and Hummocks)

The entire perimeter of the island is kept trimmed closely by the herds of sheep. Only a few species of plants are not eaten by the sheep, and there is little doubt that they are a major force shaping the vegetation of the island.

One of the most striking aspects of the turf areas, and one which seems to interest all visitors, is the "hummock fields" which form. These hummocks range from 10 cm. to 30 cm. or more in diameter, and 10 cm. to 20 cm. in height. In some cases they even appear in parallel rows, like great rows of goose bumps in the turf.

What causes these hummocks? The first suggestion was that they were merely moss covered boulders, as indeed the occasional boulder protruded from one. We tested this theory by probing with a sharp stick - it went right through most of the hummocks. Scratch that theory!

SHEEP PASTURE HUMMOCKS
(GENERAL ASPECT AND A CROSS SECTION)



The most probable one is that these are the result of sheep trampling down narrow interlocking trails. Not only would their hooves cut deep furrows, but the adjacent untrampled mosses could then grow higher still. This would further encourage the sheep to keep walking in the narrow furrows between the hummocks. This is still only a suggestion - perhaps a future visiting ecologist will come up with the answer.

Another interesting feature of these hummocks is that the east side of the hummock often has different vegetation from the west side! and this observation seems to hold for both sides of the island. One side of hummocks, (the east) is usually covered in thick mats of moss (Polytrichum sp.), whereas the top and west side is covered in greyish lichens (see figure). Check this yourself with a compass if you visit - the best examples we saw were on the south western coast. Here's another problem for some curious ecologist to tackle.

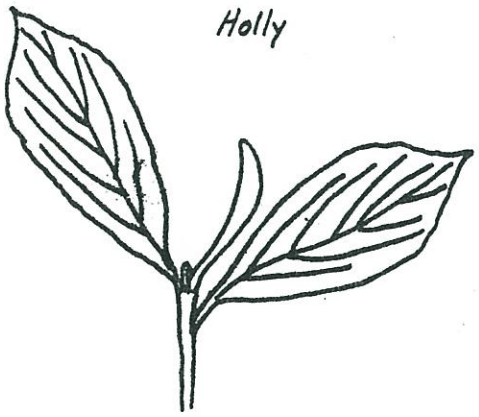
The plant species in the turf were difficult to identify because they were so closely cropped by the sheep. They included:

Festuca rubra	- Red Fescue
Achillea sp.	- Yarrow
Juncus sp.	- Rush
Viola sp.	- Violet
Trifolium sp.	- Clover
Rumex acetosella	- Sheep Sorrel

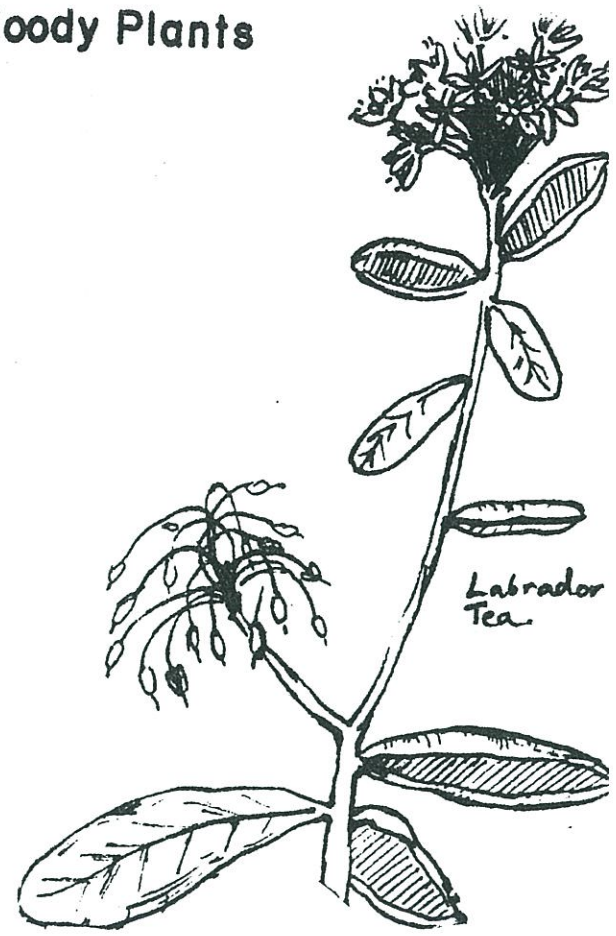
Those species selectively left included:

Juncus effusus	- Rush
Cirsium vulgare	- Bull Thistle
Iris Versicolor	- Iris
Ribes strigosus	- Raspberry

Paul Keddy.



Annotated Checklist of the Woody Plants of Seal Island



The woody plants on this list were identified during a three day visit from October 28-30. Most of the perimeter of the island, and some of the interior was visited. Future visitors may yet add several species . For example Wintergreen (Gaultheria procumbens) may be found. Flowering or fruiting material was sometimes not available, and therefore the identifications in several difficult groups must remain tentative. These cases are noted.

The richest habitats for woody plants appeared to be the boggy areas of the extreme southwest shore, and the margins of freshwater ponds on the west (lee) side of the island.

Abies balsamea - Balsam Fir.
- scattered through Spruce woods on both halves of the island.

Alnus crispa - Downy Alder.
- scattered locally in wet pockets on the lee side of the island; also a few seen in open woods on the north half.

Calluna vulgaris - Heather
- a few clumps; south half of island and shores of the central lagoon near the "north home". Apparently introduced from Europe.

Empetrum nigrum - Black Crowberry.
- common in wet barrens, especially along the south west shore.

Gaultheria hispidula - Creeping Snowberry.
- common in Spruce woods, especially in small clearings.

Ilex verticillata - Holly.
- uncommon; a few bushes in open spruce woods on both ends of the island.

Juniperus communis -Common Juniper
- scattered in clearings and coastal barrens; more common on east (lee) side of island.

Kalmia angustifolia - Sheep Laurel, Lambkill.
- common in open spruce woods and barrens.

Ledum groenlandicum - Labrador Tea.

- one patch seen in a fresh water marsh area adjacent to the lagoon near the "north home".

Linnaea borealis - Twinflower.

- common in Spruce woods

Myrica gale - Sweet Gale.

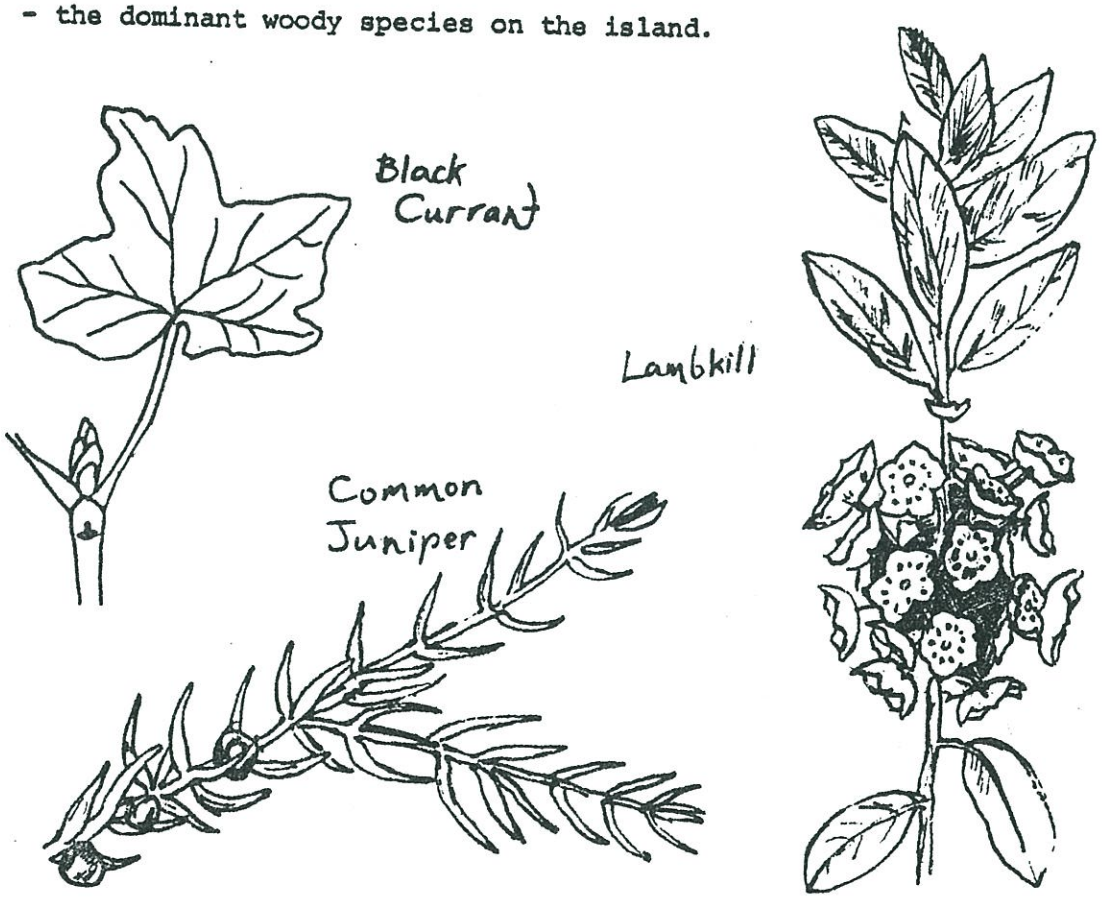
- uncommon; only a few clumps on wet areas along the leeside and along the shores of the central lagoon.

Myrica pensylvanica - Bayberry.

- common throughout; abundant in places along the coast between Spruce woods and the open turf.

Picea glauca - White Spruce.

- the dominant woody species on the island.



Ribes nigrum - Black Currant.

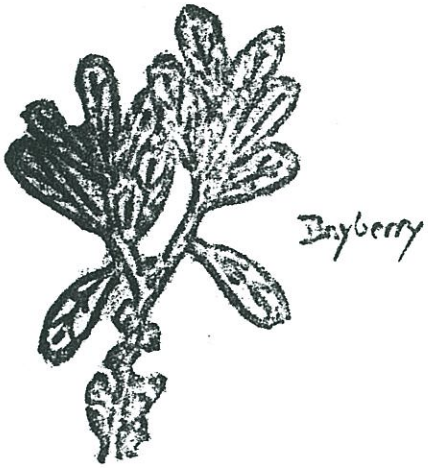
- scattered throughout. Identification was based on the key in "Identification of Nova Scotia Woody Plants in Winter" by J. Donly. However, according to Roland and Smith (The Flora of Nova Scotia) R.nigrum is a garden species. Assuming correct identification, this species would appear to have escaped from cultivation.

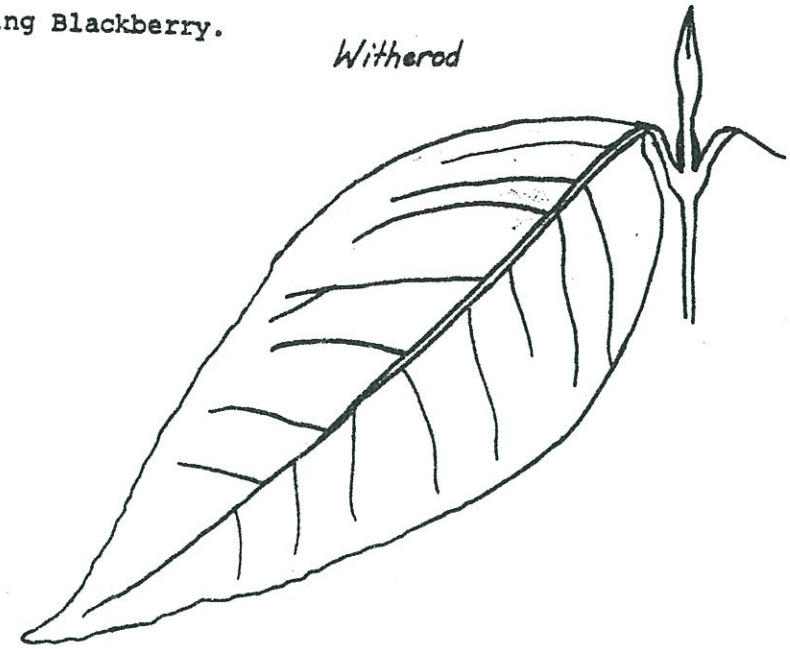
Rubus allegheniensis - Allegheny Blackberry.

- collected in a small clearing near the centre of the south half of the island.

Rubus hispidus - Trailing Blackberry.

- common throughout.





Rubus strigosus/idaeus - Raspberry

- according to Roland and Smith, R. strigosus, a native species, and R. idaeus, the introduced garden variety, can be distinguished by the presence of stalked glands on R. strigosus. The specimens examined exhibited many stalked glands, suggesting they were the native species. However, some plants appeared to be cultivated. A future visitor will have to collect some flowering plants to resolve the situation.

Salix humilis - Willow.

- one bush along the road from East Village to the lighthouse. Lack of fruits makes this identification tentative.

Sorbus decora - Dogberry.

- scattered through Spruce woods; the only deciduous tree on the island.

Vaccinium angustifolium - Blueberry.

- scattered in barrens along the shore, especially on the southwest coast.

Vaccinium macrocarpon - Large Cranberry.

- common in wet barrens.

Vaccinium oxycoccus - Small Cranberry.

- less common than the former, but scattered through similar habitat.

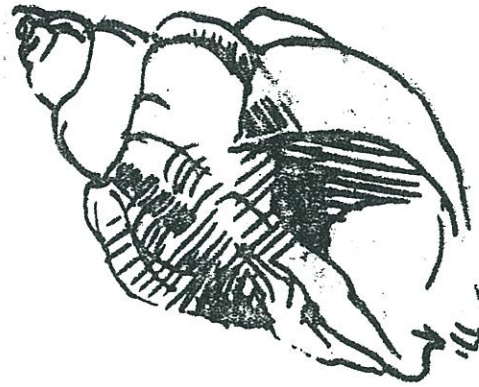
Viburnum cassimoides - Witherod.

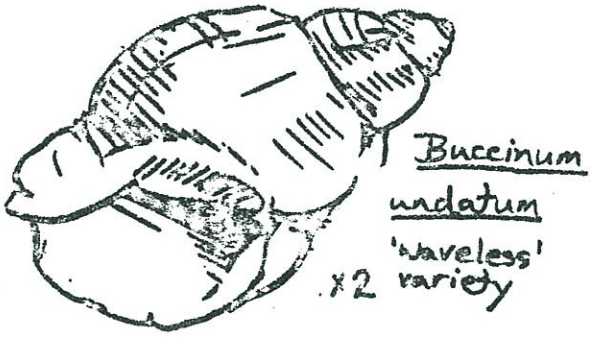
- scattered in Spruce woods and wet places.

Cathy Keddy
Paul Keddy

Shelling on Seal Island

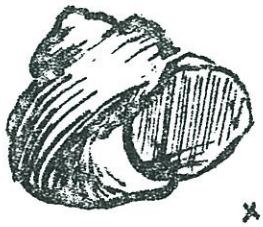
When I was a kid (and that wasn't too long ago), I passionately collected shells. Groping between the tide on the Seal Island rocks, I quickly discovered how rich they were. With patience, a good tide and waterproof boots, you could find Sea Cucumber, Brittlestars, Sea Anemones, Crabs and all sorts of spongy and slimy growths. I also found many shells below the rocks at the edge of the tide, that normally occur a couple of fathoms further down.





The common waved whelk Buccinum undatum is a good example of this. These carnivorous snails, growing to 8 cm., are usually found out with the kelp beds and lobster traps. When found between the tides, they're smaller and, due to the turbulent intertidal currents, often lack the 'waves' that give them their name.

Among the most colorful shells in these cold, rich waters are the Margarites top shells. These are herbivorous snails, never more than a centimeter in height, and have a pearly, irridescent shell. . The Greenland Margarite, Margarites groenlandicus is a stubby white or red shell with ridges on the whorls, which the other common species lack. The only other species I saw on Seal Island was the very common Helicina Margarite Margarites helicina, which has a tiny smooth pink shell. Vast numbers of dead individuals can be seen on the east side sand beaches after a storm. Live specimens of Margarites are, however, only occasionally found intertidally.

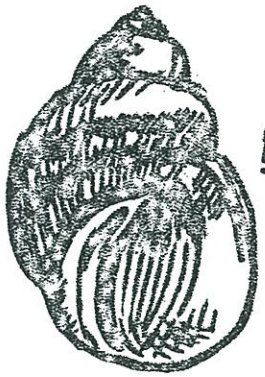


Another mainly offshore, cold-water family is the Boreotrophons. There are many very similar species living off Nova Scotia, but I have only found one between the tides. Boreotrophon truncatus which grows to about 3 cm., has a pink to chestnut-brown shell, and a tall ribbed spire. I found only three of them, in kelp holdfasts and in the exposed irish moss seaweed.

The chink shells, or lacuna periwinkles, are typical boreal, intertidal snails. Small (usually under 5 mm.), with thin, translucent shells, they have a chinklike slit by the aperture, hence the name. The Common Northern Chink, Lacuna vincta, has a fairly steep spire, varies from amber to brown, and is common at the mid-tide level. The other species is rather uncommon, more globose, greenish, and has an unusually wide aperture. I always found them on the sea lettuce by the edge of the low tide.

Lacuna pallidula neritoidea

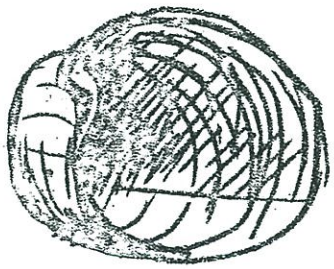
x20



Lacuna vincta

x8

Velutina velutina



One of the more primitive boreal snails is the Common Velutina, which I found both under rocks and in sheltered tidepools down at the edge of the tide. The shell is thin, brown and wrinkled in appearance and has a notably wide aperture.

Also found under rocks, Linne's Puncturell (Puncturella noachina), another primitive gastropod. Classified as a 'keyhole limpet', it is shaped like a dunce cap with a notch on top. The shell is white and usually about 5 mm. long.

Puncturella noachina

x8

Tonicella marmorea

x2

Lophrochiton albus

x4

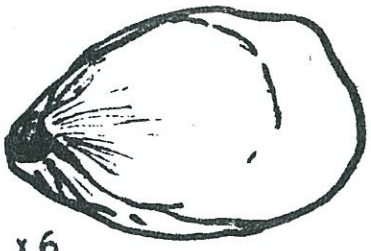
Chitons, a kind of mollusc with eight shells, are moderately common on the island. They look like miniature armadillos, or sowbugs - their shells are a flexible, eight-plated 'armour' surrounded by a leathery girdle. I've seen two species on Seal Island - the Northern White Chiton, Lophrochiton albus, the commoner of the two, which grows to one centimeter, and the Mottled Red Chiton, (Tonicella marmorea) which grows to about two.

The Arctic Saxicave, H atella arctica, is a ubiquitous burrowing clam. Found between tides, and at abyssal depths from Greenland to Panama, the shell is chalky white, and grows to about 3 cm. I always found them in the muck at the bottom of tidepools, and in kelp holdfasts.

Hiatella arctica

x4

When I first found lamp-shells (Terebratulina septentrinalis) I thought they were some kind of clam - they aren't even molluscs. They belong to the Brachiopoda, a phylum that flourished 350 million years ago. I occasionally found them in kelp holdfasts. The shells are small, clamlike, and white, attaching themselves to things with a stalk by the 'hinge'.



x 6

Terebratulina septentrionalis

These are most of the intertidal species I've found on the island. There are many, many more to be found in the province, including several hundred in deep water that I haven't seen. If you're really keen, I recommend the following:

E.L. BOUSFIELD, Canadian Atlantic Seashells, National Museums (Queen's Printer), 1960.

ELIZABETH MacPHERSON, The Marine Molluscs of Arctic Canada, National Museums, 1977.

ABBOT, ZIM, SANDSTROM, Seashells of North America, Golden Press, 1968.

EMERSON & JACOBSON, The American Museum of Natural History Guide to Shells: Land, Freshwater and Marine, From Nova Scotia to Florida, American Museum of Natural History, 1976.

Andrew McLaren.

Prothonotary Warbler

BIRDING ON SEAL ISLAND

continued from page 5

Swallow from the West Indies, Swainson's Warbler from the wooded swamps of the American South and Cassin's Sparrow from the arid regions of Texas and Mexico were all recorded for the first time in north-eastern North America on Seal Island. Why should Seal island (or Nova Scotia) be a terminus for so many strays? In relation to the high frequency of strays on Sable Island, Dr. Ian McLaren has suggested that the wind patterns of North America which converge on Nova Scotia, bringing us the atmospheric pollution of the industrial Great Lakes region, also bring us these birds. The larger problem of why birds stray is still unanswered.

Seal Island holds an attraction for birders who wish to be familiar with a wide range of birds. The numbers of species and individuals as well as their easy approachability during the fall migration make the birds of Seal Island a treat to behold. The emotional atmosphere of the island at that time of year is one of involvement in the biological process rather than detachment, in a way that is reminiscent of Sable Island.

Howard Ross.

Yellow-headed Blackbird.

The Breeding Habits of Grey Seals

The Grey Seal (Halichoerus grypus Fab.), a marine mammal common to areas off the Eastern Canadian coast, is most easily observed during periods of its annual cycle when it is found on land. There are two such periods, the breeding season (which should be taken to mean bearing young and mating) and the moulting period. During the latter period, the seals often use beaches which are either inaccessible to man or offer no suitable site from which the easily frightened animals may be observed. During the breeding period, however, the seals tend to be less easily disturbed and some of the locations used for breeding have suitable places from which observations may be made. For this reason, our greatest knowledge about the behavior of grey seals is of their breeding behavior. In this article, I shall describe the breeding society of a colony off the coast of Nova Scotia, but before I begin let me briefly tell you a bit more about this species of pinniped (the collective term used for all seals, sea lions, and walruses - meaning feather foot).

The world population of grey seals consists of three geographically separate groups. It is estimated at 90,000 animals; 55,000 around Great Britain, 24,000 off the East coast of Canada, and 10,000 in the Baltic regions of Scandinavia and Russia. In Great Britain, moulting females are found in large aggregations on land during the months of January, February and March. Similar patches of moulting males occur during the months of March through May. Little is known about the timing of the moult in Canada, although on Sable Island, large aggregations of mixed sexes occur in May and June, and some animals which have been captured then have loose hair. Virtually no detailed information about the habits of the Grey Seal between the end of the moult and the beginning of the next breeding season is available. They apparently spend a large proportion of their time at sea feeding.

The type of habitat that this species will use for breeding is quite diverse. For example - they breed: 1) on the pack ice; 2) on narrow shingle beaches; 3) in caves; 4) on rocky reefs and 5) on large sand-covered and/or vegetated islands. Even though the majority of present-day Grey Seals breed on land, they exhibit two characteristics which are common only to ice-breeding species: pups which have a white natal coat and a short period of lactation. This has led to speculation that the Grey Seal evolved originally as an ice-breeder, and has only recently (in evolutionary time) begun breeding on land.

In Canada there are both island breeding colonies and ice breeding colonies. Those islands which are known to be used include Sable Island, the Basque Islands, Camp Island, and Grand Manan Island. Deadman Island and Amet Island may or may not be used in a given season, depending on the condition of the ice around them. The principal ice breeding colonies are found in the Northumberland Strait and George's Bay, although a small colony is known in the St. Lawrence Estuary. The largest single breeding aggregation in Canada appears to be that on Sable Island, where there are slightly over 2000 pups born annually.

Each year within a few days after Christmas the Grey Seal begins its breeding season on Sable Island. Colonization of the breeding beaches begins with the birth of the first pup (each female gives birth to a single pup). The consistency in the timing of this event is almost unbelievable; in 1973 the first pup was born on 27 December and in 1974 and 1975 it was the morning of 28 December that the first pup was born. By the end of January, most of the cows which will bear pups have done so.

The mobility on land of these chiefly aquatic animals is rather cumbersome and probably restricts their movements, even though they may be able to keep up for a short distance with a human bundled in winter clothing. What may appear to be a rather short distance for humans is likely to be a relatively long distance for seals on land. Keep this in mind as I describe the spacing of Grey Seals. Females tend to take

up positions relatively close to one another, although they are also intolerant of another female coming too close to them and their pup. The minimum distance tolerated seems to be about 3 m. The males, on the other hand tend to be much more intolerant of one another and maintain distances of about 8 m. between themselves and their nearest male neighbour. Each male attempts to establish a position near one or more females, but because of the spacing of the cows and the intolerance of the males, not all males will be able to do so. Those which are not successful tend to roam about the breeding grounds, trying to acquire a position near a cow whenever possible.

The successful males maintain their positions and keep other males at a distance from the nearby females by the use of visual and auditory threats (they do not defend a geographically fixed area). Occasionally when another male persists and does not move away after being threatened, a fight may ensue. Fights do not produce fatal injuries as they do in some species. Like the outcome of threats, it is usually the established male whose female over which the fight occurred that remains with her after the fight. The male which is defending "his" female thus seems to have a psychological advantage.

Cows fast during lactation, staying with their pups continuously. During this time they frequently change their position for one reason or another. This behavior makes it difficult for a male to know where a female which he has been defending will be when she becomes sexually receptive (usually about 15 days after parturition), unless he changes position when she does. This is in fact, more or less what males do. However, a male generally moves with a female only if there is no other nearby cow which is close to being or already is sexually receptive. Once a female has mated, she will usually suckle her pup for another day or two, possibly mating several more times, and after about 17 days from parturition, she leaves the breeding grounds (weaning her pup).

Some pups on Sable Island, are known to stay around the breeding grounds, losing weight, for at least a week after they have been weaned. However, more detailed information is needed before we will know the average length of time that these weanlings spend at the breeding site. On the Farne Islands (in the U.K.) pups spend an average of 32 days on the breeding grounds, 15 of these after being weaned.

A male tending a female which departs either leaves the beach as well or shifts his position so that he is near another female which will soon become receptive. Since males also fast during their period of tenure on the breeding grounds, one factor which likely plays a part in determining which behavior occurs in these situations is the length of time that the male has been fasting. Some males are known to fast for as long as 30 days, although the average period of time that males stay on the breeding grounds is 18 days.

The form of society implied by the behaviour which has been described here could be adaptive on unstable pack ice as well as on land. Presumably such behavior is maintained through sexual selection because those males which succeed in becoming established and maintaining a position near particular females generally get to mate with those cows. In fact, the longer a male remains on the breeding grounds, shifting his position to new females as the ones which he has mated with depart, the greater number of females which he will likely fertilize.

The Grey Seal breeding society may thus be characterized as polygynous.

HFN PROGRAM

Feb. 11 — Chris Majka will lead a walk in Point Pleasant Park. Meet at the main gate at the end of Tower Road at 9:30 a.m.

March 2 — Monthly Meeting: Universal Illusions
Man is a perennial observer. Naturalists pride themselves on being able to observe the world in what they believe to be an objective and accurate manner. However, in many fundamental ways objective and accurate observation is an illusion because, to a degree, the most important optical system, the eye-brain system, imposes limitations and influences that are poorly appreciated.
Speaker: Roy L. Bishop NS Museum, 8:00 p.m.

Coming Event: Fundy Tidal Power
Discussion of environmental guidelines.
The date for this discussion cannot be set until certain technical reports are released. At that time a period of 14-21 days will be allowed for digestion of the report. Watch the other media for announcement of the time and place. A probable date is late February.

Membership in the Halifax Field Naturalists is open to anyone interested in the natural history of Nova Scotia. Membership fee is five dollars annually, family membership seven dollars. Come to a meeting of write care of the Nova Scotia Museum, 1747 Summer Street, Halifax.

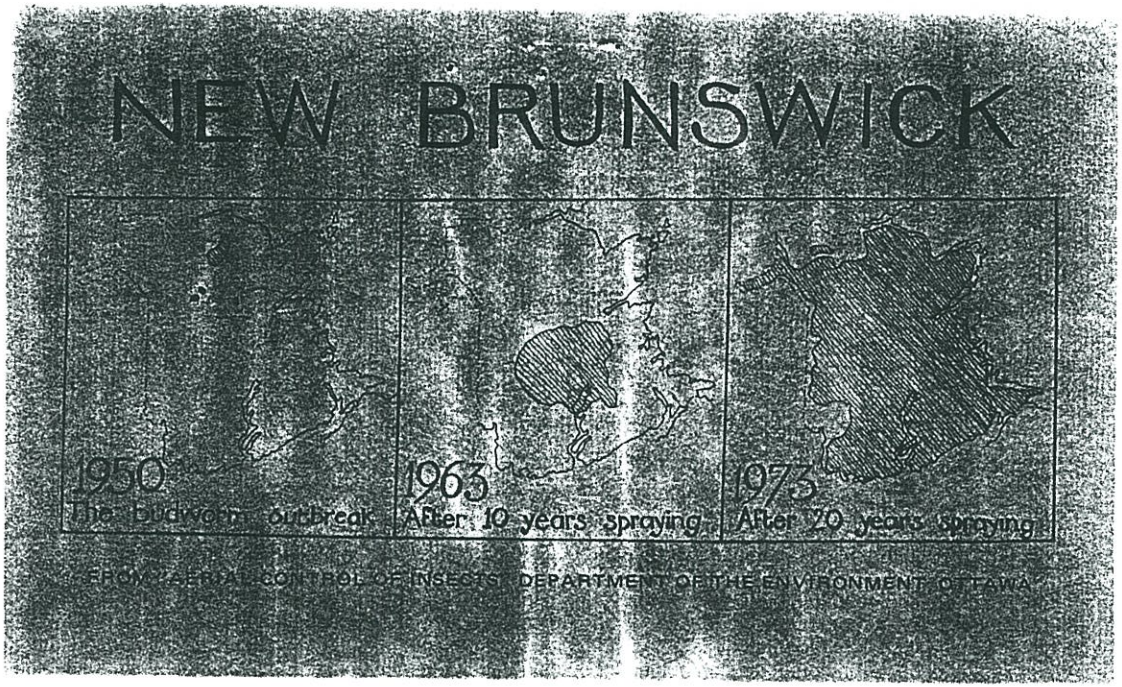
Halifax Field Naturalists new____ or renewal____

name_____

address_____

occupation or interests_____

suggestions for programs?_____


NEW BRUNSWICK
1950
The budworm outbreak
1963
After 10 years spraying
1973
After 20 years spraying
FROM AERIAL CONTROL OF INSECTS, DEPARTMENT OF THE ENVIRONMENT, OTTAWA