

Larry Bogan

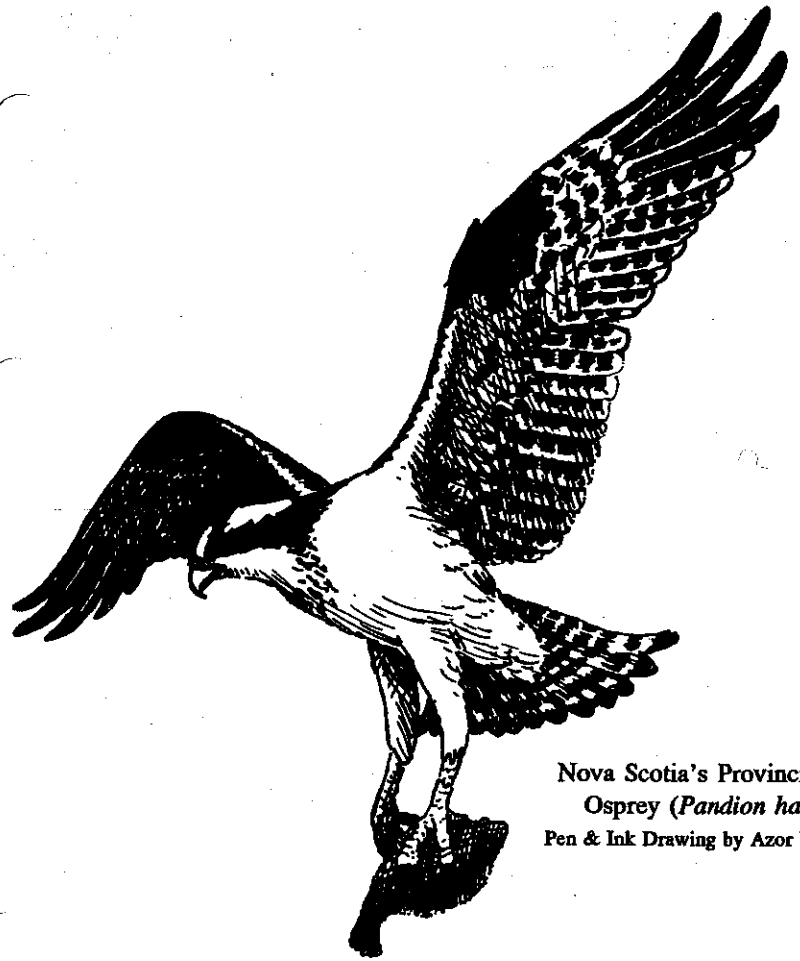
NEWS

Federation of
Nova Scotia
Naturalists

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Fall 1994

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Nova Scotia's Provincial Bird
Osprey (*Pandion haliaetus*)
Pen & Ink Drawing by Azor Vienneau

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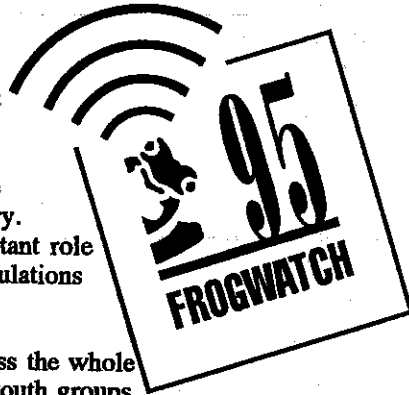
Nova Scotia
Sport and Recreation
Commission



RECYCLED PAPER

CAN YOU LEND AN EAR?

You may have heard of the pilot Frogwatch Programme that ran in Halifax County last spring. Thousands of students, Girl Guides, Beavers, families and individuals listened for, recorded and reported the calls of the northern spring peeper (our diminutive treefrog) as part of an environmental education project. The pilot project determined that kids make good amateur field biologists because, as well as having fun, the frogwatchers gathered useful scientific data that is now on file at the Nova Scotia Museum of Natural History. The Frogwatch data will play an important role in any future studies on amphibian populations and distributions in Nova Scotia.

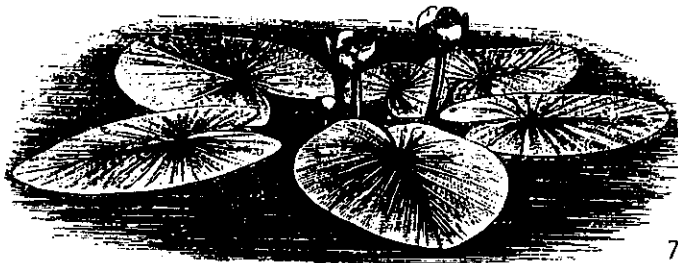


This spring, Frogwatch will occur across the whole province and once again, schools and youth groups will be observing the seasonal changes of which the spring peeper is such a familiar herald. We are setting up a network of naturalists and biologists to verify the times and locations of the peeper calls. This structure will provide an added level of legitimacy to the scientific data. There is also room to get involved as teacher support by providing field trips on amphibians in the spring or by giving slide shows in classrooms. If you or your group would like to know more about Frogwatch '95 write to:

Frogwatch '95
c/o Nova Scotia Museum of Natural History
1747 Summer Street
Halifax, NS B3H 3A6
FAX 902-424-0560.

Include your telephone number and whether you want to facilitate part of the programme and/or be a Frogwatcher. *Peep Well!*

Frogwatch '95 is sponsored by The Clean Nova Scotia Foundation, the Nova Scotia Museum of Natural History, Envirosphere Consultants Ltd., the Environmental Partners Fund, and Science Culture Canada.



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FNSN NEWS

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OPSREY (*Pandion haliaetus*) DESIGNATED PROVINCIAL BIRD

Cover Illustration

From Museum News, Published by the N.S. Museum of Natural History

Over the past few years, opinion polls were taken with wildlife, naturalist and youth groups to determine which bird best deserved the honour of being chosen as Nova Scotia's Provincial Bird. The osprey (*Pandion haliaetus*) was finally chosen for many reasons: Nova Scotia has one of the largest breeding populations in eastern North America with about 400 breeding pairs; ospreys are easy to see and identify because of their large size, their behaviour, and the black patches underneath their wings; and both the female and the male look alike, although females are slightly larger with a wing span of up to 2 metres (6 feet).

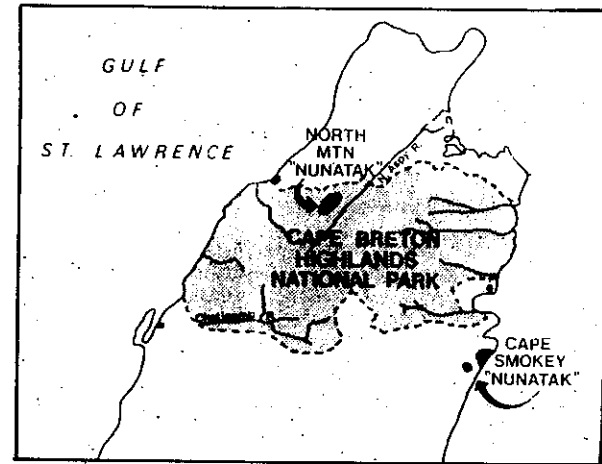
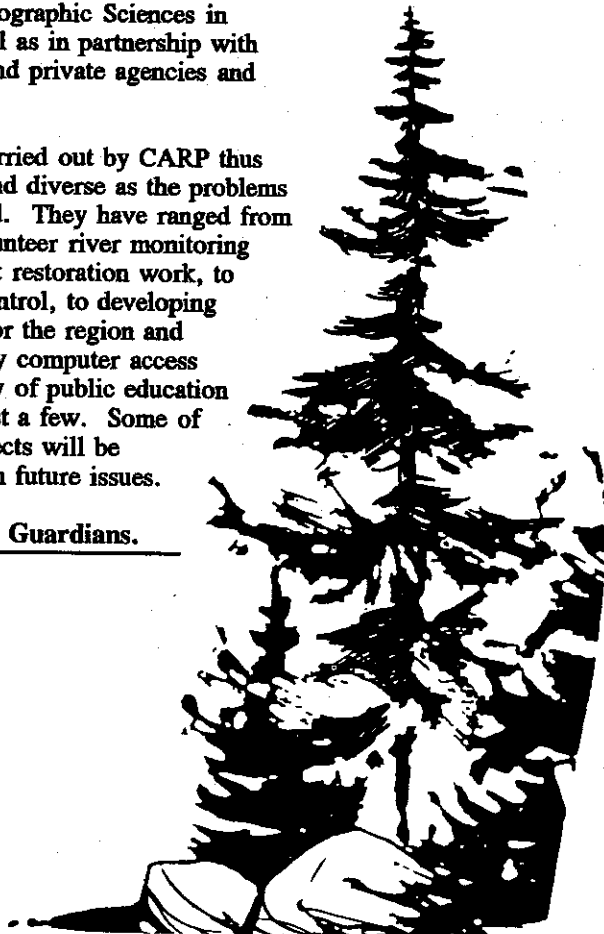
Ospreys' nests are large and open and built on top of trees or power poles, often near water. The same nest is used each year and added to continually. The birds mate for life and are good parents. They feed almost exclusively on fish and although they are often called "fish hawks" they are not hawks at all. From April to September, the osprey can be found in most parts of Nova Scotia, hunting along our coastline and rivers. They overwinter from Florida to South America.

The osprey joins the mayflower, named the official flower in 1901, and the red spruce, named the official tree in 1988. Stilbite is our official mineral and agate is Nova Scotia's gemstone. Don't miss the display at the Museum of Natural History. Did you know the osprey is on the back of the ten dollar bill? Do you know which other birds are featured on Canadian currency and which bird is featured twice?

CARP is a community-based organization whose direction and priorities are established by a Board of Directors elected at an annual general meeting open to all residents of the region. Day to day management is the responsibility of a Program Director and an Administrative Assistant. The many diverse projects undertaken are each supervised by a Project Leader. In addition, for each project a Project Team is established, comprised of representatives from various government agencies, educational institutions or private enterprises having particular expertise relevant to the project. This group meets periodically to review progress, provide guidance regarding the direction of the project, and give technical advice to the Project Leader as required. This partnership approach to project management has proven particularly effective as "in kind" contributions of time, services and other resources exceed manyfold the number of real dollars expended in carrying out the project. The Project Leader is also assisted by contract employees, youth corps workers, summer students and co-op students as required by the project workload. Many of the projects are carried out cooperatively with the Acadia University Centre for Estuarine Research and the College of Geographic Sciences in Lawrencetown, as well as in partnership with various other public and private agencies and groups.

The projects carried out by CARP thus far are as numerous and diverse as the problems plaguing the watershed. They have ranged from an award winning volunteer river monitoring program to fish habitat restoration work, to streambank erosion control, to developing ecological databases for the region and associated user-friendly computer access tools, to a wide variety of public education initiatives, to name just a few. Some of these challenging projects will be described more fully in future issues.

Next issue: The River Guardians.



Possible Nunataks on Northern Cape Breton Island

This theory was controversial when he proposed it in 1925. Most geologists of the time believed that all of eastern Canada had been completely buried by glaciers during the Wisconsin period.

In the 1930s alternate theories were proposed to explain this peculiar distribution. The most influential of these was put forward by V.C. Wynne-Edwards in 1937. He observed that many of these plants were in fact calcium-loving species normally restricted to alkaline soils. He held that the distributions of the rare plants reflected their ecological isolation and the discontinuity of preferred habitat.

While it appeared to explain the current distribution of these plants, Wynne-Edwards' theory of "Ecological Isolation" failed to answer the question of how the plants got to the region in the first place. Frère Marie-Victorin (a Quebec botanist) proposed the "Rainbow Theory" in which the Arctic-Alpine and Boreal Disjunct flora were regarded as remnants of a single plant population or flora. This flora, he argued, had evolved in the Arctic, north of the ice sheet during or since the Pleistocene era, and had expanded southward on both sides of Hudson Bay over barren calcium-rich soils as the ice sheet melted. With time, the "arch" or "rainbow-shaped" distributions of these plants were disrupted by gradual leaching and acidification of glacial soils as well as by competition from the flora expanding northward from continental North America.

There is a problem with the alternative explanations of Wynne-Edwards and Frère Victorin. Not all of the sites where these plants are found have alkaline soils. Hounsell and Smith, two Nova Scotia botanists, examined many of the Cape Breton sites of Arctic-Alpine plants and found that most of these sites have acidic soils. What appears to be the common element allowing these plants to persist in Cape Breton Highlands is a combination of deep shade in the upland gorges, cooling moisture from brooks, waterfalls

The round-leaved sundew's white to pink scentless blossoms, which reportedly have a slightly bitter taste, have traditionally been harvested throughout the month of August for use in herbal applications. The reported uses for round-leaved sundew listed in Our Healing Plants are not unique to the species, e.g. its use as a mild diuretic and as an anti-bacteriological agent.

These uses probably have more to do with the plant's high levels of vitamin C than with any unique characteristics. James Duke, an ethnobotanist with the US Department of Agriculture who has worked on Amazonian plants for 20 years, suggests that all plants have naturally occurring vitamin C, which acts as a diuretic and as an anti-bacteriological agent.

A second source for curative plants, Zelená Léčárna (Medicinal Plants), lists other uses for the round-leaved sundew. Made into a tea it is reported to act as an anti-tussif, and it was used until quite recently in the home-production of cough syrup. This source also reports the use of the sundew family in Russia as an anti-curdling agent.

The authors of Our Healing Plants identify some of the active enzymes in the sundew family, especially droserin and drosenon. The enzymatic secretions made by this insectivorous plant are used to paralyse its prey. It may well be these compounds which are the active muscle relaxants reported by Medicinal Plants.

Keeping in mind the dangers of over-harvesting from the wild, individuals who would like to experiment with this plant should follow these instructions: collect the flowers at their peak (usually in August), desiccate the flowers in the shade and dry them at a temperature not exceeding 40°C (the proportion of wet weight to dry weight is 6:1, e.g., for 6 gr of freshly picked blossoms you will have 1 gr after drying), use the dried petals to make an infusion or tea (1 gr dried petals : 250 mL boiled water), let steep five to seven minutes before drinking.

Sources

Barnoš, L. 1994. *in verbis*.

Korbelař, J. and Z. Endris. 1981. Naše Rostliny v Lékařství (Our Healing Plants), Prague: A Vicenum, Pp. 370-371.

Randuška, D. and M. Křižo. 1983. Chránené Rostliny, Prague: Příroda, Pp. 168-176.

Rubcov, V.G. and K. Benes. 1984. Zelena Lekarna (Medicinal Plants), Prague: Lidove nakladatelství, Pp. 238-241.

Rychnovska, M. 1994. *in verbis*.



The first group of plants, the arctic-alpine circumpolar, comprises plants found in arctic alpine conditions all around the world. Examples included:

- Asplenium veride* Green spleenwort, found in the limestone soils above the treeline. It is a fragile deciduous fern, only a couple of inches tall and found in only a few areas.
- Lycopodium selago* Fir club-moss, found in the upper reaches of canyons in cool moist cliff crevices, 4-5" tall, and distributed rarely.
- Rhododendron lapponicum* Lapland rosebay. There is only one known location in Nova Scotia harbouring about a dozen plants. The plant is tiny, about 6" tall, and grows on limestone, rather than acidic, soil - which makes it an exception to the rule of the rhododendron family.
- Pinguicula vulgaris* Butterwort is found in arctic areas, high, mountainous areas in moist limestone crevices. It is an insectivorous plant - an insect lands on its sticky leaf and becomes trapped. The process to obtain nitrogen then begins. The flowers are violet in colour and are violet-like in shape.
- Sedum rosea* Roseroot sedum is nearing its southern limit; it is found in canyons. It has blue green foliage and greenish-reddish flowers and is 4-12" high.
- Saxifraga leusoides* Golden saxifrage, has a symmetrical yellow flower and is found only at one location in the Park on a north-facing cliff hanging down.

Plants in the second group are known as arctic-alpine american plants which are high arctic mountain plants found only in America.

- Anemone parviflora* Small-flowered anemone, found at only one location in the park and has a white flower.
- Saxifraga paniculata* Livelong saxifrage, white flower with a rosette of lime-encrusted leaves at its base, found at the base of Grand Falaise.

The remaining groups are mostly self-explanatory in meaning:

Arctic-Alpine Eastern America (including Greenland)

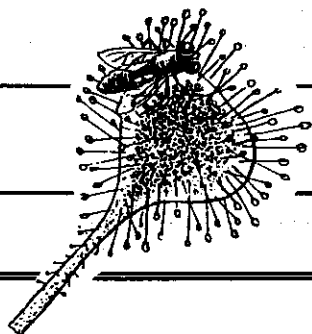
- Salix uva-ursi* Bearberry willow, a dioecious plant only a few inches tall, it hardly lifts its leaves from the ground.

Subarctic Boreal American

- Anemone multifida* Bird's-foot anemone, 6-8" tall, cream coloured flowers, (some red-flowered), usually found on cliffs, first collected in 1938.
- Primula mistisina* Bird's-eye primrose, white flower with yellow eyes, rosette of leaves, only a few inches tall, a calceophile, found at the upper Cheticamp River headwaters.

Table 1: The Czech Republic Legal Obligations to Protect Plants ¹

	Legal Act	Site Date	Valid From	Signed by The Czech Republic ²
I N T E R N A T I O N A L	Internation Treaty on Protection of Plants	Rome 1951	1952	1983
	Convention on Int'l trade in endangered species of wild animals and plants (CITES)	Washington 1991	1973	1992
	Convention on Biological Diversity	Rio de Janero 1992	not yet	1993
N A T I O N A L	Act on the Development of Plant Production	Prague 1964		
	Act on Nature and Landscape Protection	Prague 1992		
	Act on Forests	Prague 1977		



¹ Not Comprehensive

² Or by the Czech and Slovak Republic

For example, of the 180 species listed in *Chránené Rostliny*, a compendium of endangered species occurring in the Czech and Slovak Republics, only eight are found in *Naše Rostliny v Lékařství* (Our Healing Plants), an ethnobotanical guide to medicinal plants in Europe. Those species which are listed in both publications are: spring pheasant's eye (*Adonis vernalis*), lily-of-the-valley (*Convallaria majalis*), mezereon (*Daphne mezereum*), round-leaved sundew (*Drosera rotundifolia*), stag's horn clubmoss (*Lycopodium clavatum*), white water lily (*Nymphaea alba*), common butterwort (*Pinguicula vulgaris*), and lesser periwinkle (*Vinca minor*).

Three of these species occur in Nova Scotia, the lily-of-the-valley, the white water lily and the round-leaved sundew. The two former species were introduced to North America with the arrival of European settlers. The principle factor contributing to their endangerment in The Czech Republic

Cypripedium reginae

Showy ladies-slipper, 1 m tall with several flowers, hairy glandular leaves.

Drosera rotundifolia
var. *comosa*

Proliferating round-leaved sundew, a variety of the more common round-leaved sundew with basal leaves, never flowered but seems to be cloning.

Disjunct American (Western cordilloron and eastern coastal)

Galium kamtschaticum

Broad-leaved bedstraw, found in rich, open upland forests and along the edges of streams.

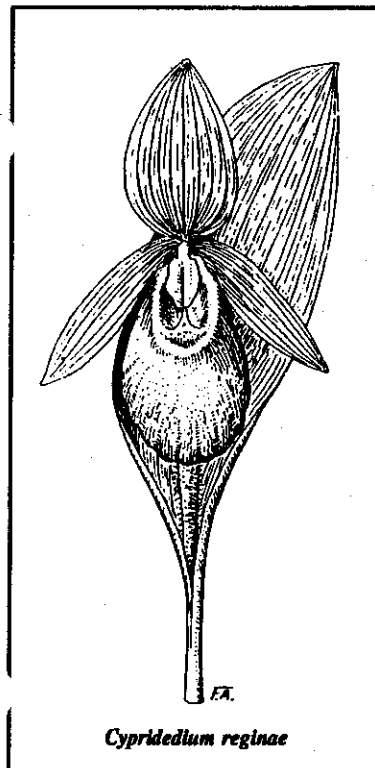
Goodyera oblongifolia

Giant rattlesnake-plantain, an orchid, 8-10" high, found in mixed woods with a high degree of conifers.

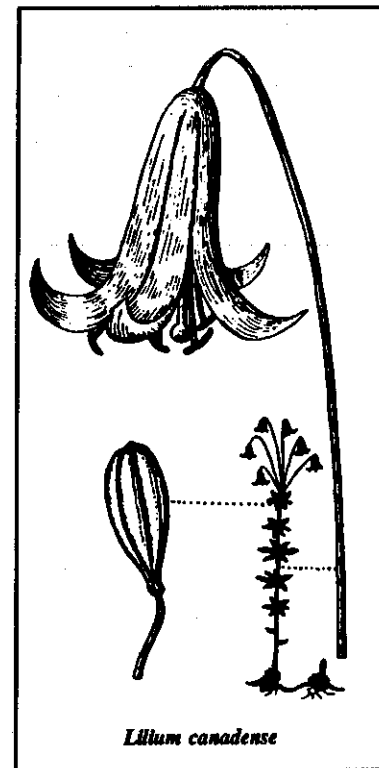
Temperate Eastern American

Lilium canadense

Canada lily. Flowers are variable in colour and shape; nodding &/or partly curled back. 2-5' high. Rare.



Cypridedium reginae



Lilium canadense

The illustrations used in this article are from *Flore Laurentienne* by Frère Marie-Victorin, published in 1947 by Les Frères des Écoles Chrétiennes.

A TRIBUTE TO OUTGOING PRESIDENT MICHAEL DOWNING

Jim Wolford, Blomidon Naturalists Society

Michael Downing was president of the FNSN from 1990 and 1994. He was instrumental in getting the Federation started in 1989-1990; however, his vision of the need for a provincial voice for naturalists goes back several years prior to that time.

Within the Halifax Field Naturalists, Michael, Colin Stewart, Sifford Pearné, Doug Linzey, and others had laboured on both regional and provincial issues. The HFN's response to the new Provincial Parks Act was the stimulus for a committee of HFN to contact naturalists' groups across the province for an initial meeting in Wolfville concerning the establishment of a provincial body that would unify the various natural history groups in the province.

About 20 people representing the various natural history groups, from Yarmouth to Cheticamp, comprising about 8 voting groups plus 3 or 4 observing groups, gathered in the Acadia Biology Museum on October 22, 1989. Michael welcomed everyone, delivered a well-constructed and very compelling speech, and offered to chair this day of exploratory discussions.

The day was very fruitful. The organization was formally conceived and named, and a constitutional committee was struck for groundwork on the FNSN's mission-statement, by-laws, etc.

Michael and that committee were very active that winter and spring, and the Blomidon Naturalists Society hosted the first annual general meeting June 8-10, 1990, in Wolfville. The drafted by-laws were accepted, and the first Executive was elected, with Michael as President.

Since that first a.g.m., the Board of Directors directed by Michael has met approximately every three months. Between meetings, Michael worked very hard on behalf of the Federation and the Board of Directors. This resulted in many of the Directors becoming dependent on the President for not only keeping us well-briefed, but also for chairing and/or participating in the drafting of position-statements and their public delivery. As an example of the latter, I hope many readers remember the FNSN's detailed paper toward a N.S. Wildlife Strategy, and I wish you all could have heard his oral comments at the Yarmouth workshop (February 1992) on the same subject.

All of these things and more were done unselfishly and always after a great deal of thought. Michael is a mentor/philosopher from whom we have learned a great deal. I look forward to his participation and guidance as our first Past-President.

Thanks, Michael, for your conceptual vision and our promising beginning. The onus is now upon all of us -- i.e. every individual member, every organizational member (society), and every director to provide input and support to Alice White and the new Executive.

Every naturalist in Nova Scotia has a responsibility to broaden her/his concerns beyond our own back yards.

ENDANGERED SPECIES: The Case of Rosnatka or the Round-leaved Sundew (*Drosera rotundifolia*) in The Czech Republic

Sandra Sweeney (Olomouc, CZ)

The round-leaved sundew (*Drosera rotundifolia*) occurs throughout Nova Scotia. In The Czech Republic, where it is called rosnatka, it is highly endangered. It is now illegal to harvest the round-leaved sundew in The Czech Republic and offenses are punishable by stiff fines. Herba Drosera, a medication available by prescription at herbal apothecaries, is imported. For a list of Czech legal obligations to protect endangered flora refer to the table.

This species once occurred in peat bogs and wet meadows in a wide band stretching across most of Europe. In The Czech Republic it was especially common near Treboňsku, in the areas surrounding Jindřichova Hradce, on Šumavě and around Krkonšich. However, the round-leaved sundew is now extremely scarce and its numbers continue to dwindle.

Along with the disappearance of habitat attributed to agricultural expansion and generally poor land use practices, Dr. Barnoš, the chair of the Botany Department at Palacky University, believes that one of the most serious conservation and management problems in The Czech Republic continues to be both the number of individuals who harvest from the wild and the quantities they harvest annually.

In Nova Scotia the distribution and abundance of some species have been severely reduced because they have been collected for aesthetic purposes, e.g. the yellow lady-slipper (*Cypripedium calceolus*). In The Czech Republic there is the additional problem of individuals harvesting plants both for food and for medicinal or curative purposes. While harvesting such species as raspberries, blackberries (*Rubus* sp.) and blueberries (*Vaccinium* sp.) is a time honoured tradition and has no direct negative impact on the plants, Dr. Barnoš points to the continued pressure on less weedy species.

In his opinion, small cottage industries that generate income through the sale of wild flora are a growing problem. Further, he maintains that in The Czech Republic many endangered species are harvested for medicinal purposes, presenting a problem that is too often overlooked in conservation and management efforts. This is particularly serious when either the entire plant is harvested, or that part of the plant which is collected is the root or rhizome. In both of these cases the individual plant is killed, ceasing to contribute to the seed bank. If population or species numbers are low enough the viability of the species may be affected. This position is likely a contentious one. I have been unable to learn of a single case of a plant species being extirpated from The Czech Republic solely because it has been harvested for its curative purposes, although such extirpations have been documented among showy plants, e.g. orchids, which have been collected for aesthetic purposes.

Subarctic/Alpine-Boreal Eastern American

Arenaria groenlandica

Mountain sandwort, 2-5" tall, extraordinary to find this species in general.

Vaccinium boreale

Alpine blueberry. Found in a couple of exposed areas, on slopes, it blooms and fruits earlier than *V. angustifolium*.

Sub-arctic/Alpine-Boreal Circumpolar

Selaginella selaginoides

Slender spike moss, found in a calcareous fen, a couple of inches tall, really rare, but very inconspicuous.



Selaginella selaginoides

Boreal Circumpolar

Asplenium trichomanes

Maidenhair spleenwort, rare in the C.B. Highlands National Park, found along the Fundy coast as well, found in rich woods and on calcareous slopes.

Epilobium hornemannii

Hornemann's willow-herb, found in cool springy areas, mossy areas, tiny.

Phloem communtatum
sp. *Americana*

Boreal timothy or alpine timothy, found in cool moist slopes, upper Cheticamp area.

Polystichum lonchitis

Northern Holly fern, found by South and Scofield in the 1940s way down north askie, deep canyon, calcareous cliffs, moist areas, spiny & scaly looking.

Boreal Eastern American

Oxytropis campestris
johannensis

Lake St. John Oxytrope is a member of the pea family, has a pink flower, and is found in gravelly, open areas overlooking the ocean.



Oxytropis campestris
johannensis

Sub-boreal Temperate Eastern American

Festuca prolifera

Bulbet-bearing fescue grass, found in the upper brook leading in to the Cheticamp River.

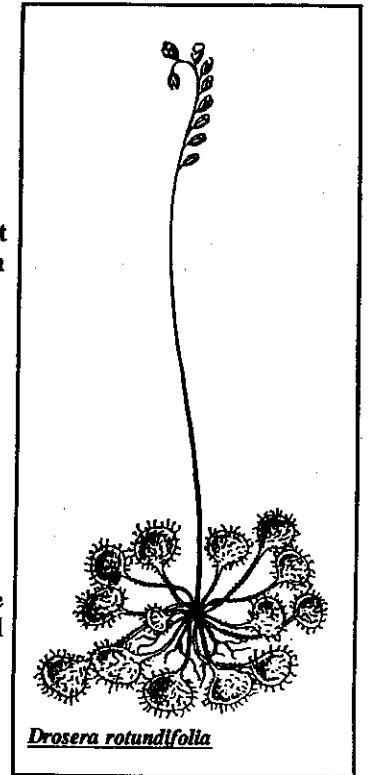
continues to be their collection for aesthetic purposes. The round-leaved sundew, which is native to both The Czech Republic and Nova Scotia, is harvested not for aesthetic purposes, but for its perceived curative properties.

Three principle economic factors have contributed to the decline of the round-leaved sundew, especially in the last 15 years. Because this species occurs in bogs and wet meadows, habitats which have historically been regarded wastelands, poor agricultural land use practices have had a severe impact on the amount of habitat available to the species, e.g. wet meadows have been drained and ploughed turning bogs into arable fields.

During the communist era in particular the use of fertilizers in mega-quantities impacted on many of the remaining wet meadows by changing the acid and nutrient levels of the soil. Excess nitrogen has tended to accumulate in the infertile soils on which the round-leaved sundew thrives. The problems associated with the over-fertilization of soil in land-based agriculture have been duplicated in the water environment where the over-fertilization of fish farms has resulted in an increase in nutrient levels in the water. In this case, excess levels of nitrogen in the water have been implicated in the extirpation of shoreline populations.

A third, more recent problem has been peat mining. Although this economic activity occurs on a smaller scale than land-based agriculture or fish-farming, peat mining completely destroys the sundew's habitat and removes the seed bank entirely, leaving no chance for the population to recover. This issue is reminiscent of the proposal to develop a peat mining industry at Swain's Road Bog, Shelburne County, which would have extirpated the threadleaf sundew (*Drosera filiformis*) from the northern-most limits of its range.

Certainly, the dwindling populations of round-leaved sundew in The Czech Republic cannot be attributed solely to individuals who harvest the plant for its curative properties. However, other environmental stresses under which the round-leaved sundew has been placed in recent years have meant that individuals have been removing plants from increasingly small populations. Thus, given the current combined circumstances, they probably are having a negative impact on the state's conservation and management efforts.



Drosera rotundifolia

and seepage, and very unstable substrates such as scree and talus slopes or river gravels. These conditions duplicate the Arctic environment - a short cold growing season, poorly developed soils disrupted by frost heaving, and a lack of humus accumulation.

However, the question remains. How did these plants get here? Did they survive the Ice Age on nunataks? Or did they arrive with the first expansions of plants across a barren tundra after the retreat of the glaciers? On this question the jury is still out. Recent geological studies by Doug Grant (Geological Survey of Canada) suggest the possible existence of Wisconsin nunataks on North Mountain east of Pleasant Bay and at Cape Smokey. Rene Belland of the University of British Columbia has recently discovered several moss species in Cape Breton which show the same disjunctions as the rare flowering plants. Did they spend the Ice Age here as well? We may never know for sure, but speculation is bound to continue.

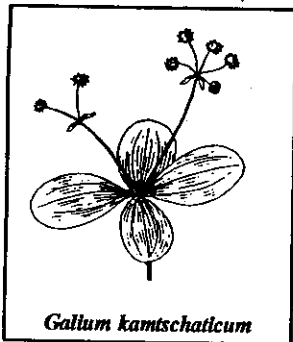
This article is reprinted from NS Conservation Vol 13, No 2.

At the FNSN annual general meeting in Cheticamp in 1993, H.R. (Hal) Hinds presented an exciting lecture, well complemented by slides, on the subject of Rare Alpine Plants of the Highlands. Mr. Hinds conducted research for Parks Canada in the 1980s on this subject. He began by explaining that 10% of any flora is rare; that floras are dynamic, reacting to climatic changes, especially temperature extremes. He explained that plants are rare or can be considered rare for several reasons:

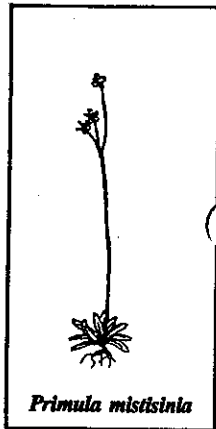
- 1) the plants are inconspicuous and therefore difficult to find
- 2) the plants are located in inaccessible areas
- 3) their habitat is rare or vulnerable, and/or
- 4) the area may be poorly explored.

He explained that rare flora in the Highlands is comprised of two groups: the obligate calceophiles - plants found only on limestone soils - which make up 50% of the rare plants, and the arctic or arctic-alpine plants which make up

37% of the rare plant populations found in the park. The arctic-alpine plants are disjunct populations, meaning, simply, that these are plants found some distance from their normal range of habitat. Mr. Hinds described the various groups of the rare plants and gave examples of each category, accompanied by slides. The following text is taken from my notes - I madly wrote while trying to catch a glimpse of the wonderful slides Mr. Hinds was presenting. The notes are a bit sketchy, but may provide some helpful information.



Galium kamschatcicum



Primula mistisina

THE CLEAN ANNAPOLIS RIVER PROJECT

Jon Percy, President, Annapolis Field Naturalists

In an age when environmental headlines appear to be, more often than not, depressingly negative about man's relationship to the natural world, it is always inspiring to come across the occasional example of an ecology-oriented initiative that is unquestionably positive in outlook. One such success story in recent years has been the Clean Annapolis River Project (CARP), a community based environmental organization devoted to the conservation and wise use of the watershed of the Annapolis River, the aquatic backbone of the scenic and productive Annapolis Valley in southwestern Nova Scotia.

Settlers have been using and abusing the natural wealth of the region ever since Samuel de Champlain first established his famous settlement at Port Royal in 1605. As is usually the case, it has been a slow, almost invisible process of environmental degradation that was only dimly, if at all, perceptible to the majority of residents; certainly nothing to be alarmed about. It thus came as something of a shock when a carefully prepared application to have the unquestionably historic Annapolis River officially declared a Canadian Heritage River was decisively rejected. It brought home to Valley residents in dramatic fashion that something was terribly wrong with their beautiful river and its many tributary streams.

CARP was born out of a community determination to do something about the situation, and to halt, if not altogether reverse, the river's slow dying. It evolved from a recognition that any substantive changes in environmental quality in the watershed would occur only if those who live near, and use, the river became more directly involved in decisions regarding its use, management and conservation. Remote government agencies had neither the resources, the incentive, the credibility, nor the initiative to resolve such pressing local problems. Residents realized that they were the ones best positioned to define a vision of their neighbourhood's future, identify the most pressing problems, establish priorities and develop creative ways of reaching these goals.



by Heather Roberts

RARE PLANTS IN THE HIGHLANDS: KEY TO GLACIAL HISTORY

by James Bridgland, Park Ecologist, Cape Breton Highlands National Park

The highlands of Cape Breton are well known for their magnificent scenery. With steep mountain valleys and river gorges, they never fail to inspire one's imagination. Even more inspiring and intriguing is the plant life found in these valleys and gorges. In places the flora is quite unlike that found anywhere else in Nova Scotia. Over a third of the 210 species designated as rare in Nova Scotia are found in the Cape Breton Highlands, and half of these are found mainly in deep rocky gorges which dissect the plateau. The occurrence of these plants raises questions about the geological history of the province and about why such a large number of rare plants should be found in one type of habitat and in such a small area.

Outside Nova Scotia these rare plants have remarkably similar ranges. Over half are Arctic-Alpine species normally found north of the continental tree line. In Nova Scotia and elsewhere south of the tree line they exist only in highlands or other mountainous areas, often as outlying populations widely separated from their main centres.

Another major group of plants, the Boreal Disjunct species, has ranges which centre in the cold coniferous forest zone stretching from Newfoundland to Alaska. The maritime populations of these plants are also widely separated from their main population centres.

A third, much smaller, group of Endemic species is found only in restricted localities around the edge of the Gulf of St. Lawrence, including the Long Range Mountains of western Newfoundland, the Shikshok Mountains on the Gaspé Peninsula, and the Cape Breton Highlands.

The large concentration of rare Arctic-Alpine, Boreal Disjunct and Endemic species found in the Cape Breton Highlands (and other regions around the Gulf) poses two questions. How did they get here and why do they persist?

While in human terms forest vegetation may appear very static and almost as fixed as the soil and rocks it grows on, in the context of geological time it is relatively ephemeral. During the Pleistocene Epoch (1,800,000 to 10,000 years B.P.) Canada was covered with ice four times. The last glacial episode, the Wisconsin glaciation, covered the Maritime provinces between 12,000 and 16,000 years ago. Well over 90% of our flora have expanded into Canada from the south since then. In the early 1900s the Harvard botanist M.L. Fernald suggested that the occurrence of endemic, disjunct arctic and boreal species in the mountains surrounding the Gulf of St. Lawrence was evidence that those mountains had stuck up above the continental ice sheet as ice-free islands or *nunataks*. The plants which now show such curious distributions had survived on these mountaintops, he said, while elsewhere they were wiped out by the overriding ice.

BOOK ANNOUNCEMENT: A NATURE AND HIKING GUIDE TO CAPE BRETON'S CABOT TRAIL

David Lawley, an interpretive naturalist with the Cape Breton Highlands National Park and a director with the Federation of Nova Scotia Naturalists, has recently written a book entitled, A Nature and Hiking Guide to Cape Breton's Cabot Trail. Published by Nimbus Publishing, this book is now available throughout Nova Scotia in the natural history sections of most book stores. David says this book sums up over 15 years of accumulated natural history knowledge of the Cabot Trail.



The excellent guide is divided into two parts. The first part of the book is devoted to descriptions of the various hiking trails located around the Cabot Trail. Each trail has a detailed description of what you can expect to see or encounter on the trail in terms of both flora and fauna.

The second part of the book contains descriptions of the geology, weather and climate, and the flora and fauna. A glossary and a selected bibliography complete the subject matter. The vegetation section even contains a list of the wildflower bloom sequence for the area for the most commonly known wildflowers.

The book is accompanied by numerous illustrations, including maps and assorted line drawings. The wood cut reproductions by Burland Murphy are worthy of special mention. An excellent source of information, the book will make a great addition to the collection of any naturalist. Don't forget - Christmas is just around the corner.

FEDERATION OF NOVA SCOTIA NATURALISTS

The purpose of the Federation of Nova Scotia Naturalists is to further communication and co-operation among naturalists and natural history societies in Nova Scotia. We also work towards a co-ordinated effort on the provincial level to protect the natural state of our environment. Our activities include:

- Promoting the enjoyment & understanding of nature by our members and the general public by:
 - educating through publications, lectures, symposia, field trips, and other activities;
 - fostering the creation of nature centers and nature education programs, and defending the integrity of existing facilities and programs.
- Encouraging the establishment of protected natural areas, as represented in parks, nature reserves, wilderness areas, heritage rivers, and other such protected areas.
- Defending the integrity of existing sanctuaries by exercising constant vigilance against pollution and habitat destruction.
- Promoting and engaging in funding and research needed for protecting the integrity of all natural ecosystems.
- Encouraging and engaging in the protection and restoration of threatened and endangered species, with special attention to the preservation of essential habitats, by:
 - working for the inclusion of all major habitats in a system of protected areas;
 - encouraging and facilitating the reintroduction of extirpated flora and fauna to their former ranges in the province;
 - encouraging and facilitating the restoration and enhancement of essential habitats.

FNSN is affiliated with the Canadian Nature Federation and is a member of both the Nature Conservancy of Canada and the Canadian Parks and Wilderness Society.

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THE FEDERATION OF NOVA SCOTIA NATURALISTS

The FNSN is an umbrella group comprised of naturalist organizations from across Nova Scotia. We present a unified voice concerning natural history issues.

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FNSN MEMBERSHIP is available in conjunction with memberships in the member organizations listed above, for \$5.00 - contact the membership secretary of your organization. Group, corporate and other category rates are available. Individual membership, available directly from the FNSN, entitles you to a quarterly newsletter and a vote at the AGM. Please fill in the following information, include a cheque or money order made payable to the Federation of Nova Scotia Naturalists, and mail to: The Treasurer, FNSN, c/o N.S. Museum of Natural History, 1747 Summer Street, Halifax, NS B3H 3A6 Please check one:

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