

SARRACENIA

Newsletter of the
Canadian Wildflower Society

Newfoundland Chapter

Volume 4, Number 1

Fall 1993

Winter Schedule

December 2, 1993, Plants of Alberta, by Todd Boland

A slide talk about the plants Todd saw on his recent trips to Waterton Lakes, Alberta.

Note: We would also like members to bring along their best slides from this field season to share with the rest of the society. We will have an empty carousel available for your use. Please label your slides clearly to avoid mix-ups with other people's slides.

Contents

General Announcements	2
Report of the Executive Meeting	3
Beaches, Barrens and Blanket Bogs <i>by Ken Knowles</i>	4
The Pyrolaceae (Wintergreen Family) <i>by Sue Meades</i>	6
Newfoundland Alpines....at Sea-Level! <i>by Todd Boland</i>	11
Book Review <i>by Sue Meades</i>	
The Rare Vascular Plants of the Island of Newfoundland	13

Dues

Annual dues of \$10.00 are now due for the 1993-1994 season, please pay at the next meeting, or send your check to:

Canadian Wildflower Society, Newfoundland Chapter
c/o Memorial University Botanical Garden
Memorial University of Newfoundland
St. John's, Newfoundland, A1C 5S7

Meeting Place for February and March Meetings!!!

This year, our meetings have been held at the **Memorial University Botanical Garden**. Our regular meetings are held at 8 P.M. on the first wednesday of each month (Oct. - Dec., Feb. - June). As the Garden is closed during the winter months and there is no snow plowing of the parking lot, we will have to find other accommodations for our February, March, and possibly April meetings. Members will be contacted as to the location of future meetings. If you have not heard from anyone, please call your representative on the executive (phone numbers below). Our May and June meetings will be held at the Garden as usual.

General Announcements

1993-93 Executive & numbers to call for information about meetings or trips:

Ann Marie Madden, president	737-8590	Botanical Garden	737-8590
Todd Boland, Garden rep.	737-8590	Alice Close, treasurer	579-1474
Caroline Harley	895-2606	Ken Knowles	437-6265
Sue Meades, <i>Sarracenia</i> editor	335-2669	Tom Smith, secretary	754-0949

Any member who would like to write an article for the newsletter or submit a black and white graphic (preferably pen and ink), please contact Sue at 335-2669 or Ann Marie at the Garden (737-8590). Articles should be submitted on computer disk (if possible) in Word Perfect, IBM compatible; illustrations should be no larger than 4 X 6 inches.

Upcoming topics, which will be described in more detail in the Winter/Spring 1994 newsletter, include discussions on the role of fire in forest ecosystems (Dr. Mike Weber, Forestry Canada), the types of wetlands characteristic of the Northern Peninsula (Dr. Doyle Wells, Forestry Canada), and a slide preview of the plants we will see on our trip to the Northern Peninsula this summer.

Yes, I am planning to participate in the field trip to the Northern Peninsula this summer.
I prefer the following time frame:

August 14-20 _____

August 21-27 _____

(Please include your phone number _____)

Report of the Executive Meeting

Before our first public meeting of the year in October, the executive met to discuss the future direction of our organization. We have made a few guideline changes that hopefully will make it easier for both professional and amateur botanists to enjoy our meetings and field trips.

- Whenever possible, we will be use common and scientific names to identify plants (in articles, discussions, and field trips). During field trips, one member will be responsible for recording the names of plants that we see during that trip. These lists will be made available to members or included in future newsletters. For consistency, scientific names from *Gray's Manual of Botany*, Fernald (1950,1970), will be used.

- In trying to accommodate everyone, we have regularly rescheduled field trips to avoid inclement weather; this has become confusing to many members and makes it difficult to plan other activities. Thus, field trips and meetings will proceed rain or shine (barring hurricanes or blizzards). If there is any doubt about departure times or meeting places, contact the Garden or the leader of the field trip for information.

- Many members would like to hear more about how to identify plants, thus, we will be getting back to basics, starting with a series of talks on using leaf, flower, and stem structures in plant identification. The first talk, on leaf morphology, was conducted by Sue in October. To keep this information fresh in your minds, we will put out a special issue of *Sarracenia* later in the year to summarize this talk.

- We will be starting a library, strictly for the use of members. Members present at our October meeting authorized the purchase of our first book - The Atlas of Newfoundland Plants. Although not illustrated, this large volume contains distribution maps, compiled by Rouleau, for most of the species reported from the island. Since the herbarium at MUN is not very accessible, we are also planning to compile a working herbarium to help new members learn the flora. During our field trips, one member will be responsible for collecting samples, which will be pressed and mounted. These specimens will be used for teaching purposes at our meetings.

- We are planning a trip to the Great Northern Peninsula of Newfoundland in August of 1994. We will visit the Serpentine Tablelands in Gros Morne, the limestone barrens in Daniel's Harbour and Cape Norman (the northern tip of the peninsula), and spend a day hiking between the Point Riche lighthouse and Port-au-Choix. All transportation, accommodations, and meals will be the responsibility of the participating members. We will be discussing this trip in more detail at the December meeting. We would like to know who is interested in this trip, and what time frame is preferred by most members. On the form provided on page 2, please fill in your name next to the preferred week, along with any conflicts we should be aware of, and return the form to the garden or bring it to our next meeting. We will be finalizing our plans for this trip during January, so we must know the approximate size of the group. If you cannot make it to the meeting in December, but wish to go on the summer trip and would like more information, call one of the executive members listed on page 2.

Beaches, Barrens and Blanket Bogs

by Ken Knowles

On July 18, 1993 several cars full of flower-huggers met at Placentia for the official start of the Wildflower Society's field trip to Cape St. Mary's. Although wildflowers were the official excuse for the outing, it was difficult to ignore the birds. How can you ignore a gannet with a six-foot wingspread? The trip encompassed three basic habitats, as far as this inexperienced observer could figure out:

The Beach

The first stop was the beach at Point Verde. Here we looked at the usual salt-loving candidates for hypertension. **Sea rocket** (*Cakile edentula*) has tiny, pale purple blooms, but you can't really appreciate this plant until you take a bite of the leaves - horseradish! Another common beach dweller is the beautifully shaded **oysterleaf** (*Mertensia maritima*). The tiny bluebell-like flowers come in a variety of pastel pinks and blues that Cezanne would have loved. It seems you can't get sway from *Potentilla* species, and the one that loves beaches is the **silverweed** (*P. anserina*). The buttercup-like yellow flowers failed to distract us in our quest for the "best" plant of the stop. We located it at the far end of the rocky beach, sheltered low among the stones. It was the delicate pink blooms of the **herb robert** (*Geranium robertianum*) with its equally pretty, palmately divided leaves. Of course we all remember what palmately divided means, after Sue's recent obfuscation (I mean clarification) of the issue. Mixed in with the herb robert were numerous square-stemmed plants with opposite leaves and just a hint of flower bud in the leaf axils - definitely a mint, but which one?. (Those who returned to Point Verde a few weeks later discovered that the now lavender blooms belonged to the **marsh skullcap** (*Scutellaria epilobiifolia*). With a "good" plant on the list we could now afford to relax and look at the inconspicuous ones like the **seabeach orach** (*Atriplex glabriuscula*), young **spotted jewelweed** (*Impatiens capensis*), **harebells** (*Campanula rotundifolia*) and the weeds, such as the various clovers and chickweeds, probably introduced through sheep and cow droppings of which there was much evidence. Fortunately, wildflower watchers always look down, unlike birders who tend to be more imperiled by manure.

Speaking of birds, since shores tend to attract shorebirds, we were able to identify several tiny **least sandpipers**, looking as much as possible like semipalmated sandpipers, but with the diagnostic yellow legs. Also with yellow legs, as you might expect, were the **greater yellowlegs**, at the opposite end of the size spectrum. We also enjoyed the grace of the **common terns** as they dove for minnows in the barachois.

The Barrens

We now headed straight for the Cape, with only a brief stop to enjoy a co-operative **short-eared owl** quartering the fields north of St. Brides in search of mice and voles, a "lifer" for Sue. Once we turned on the dirt road towards the Cape itself, we encountered our first **horned larks**, with their banjo-like song, and several **American pipits**, which tend to say their name as they fly ("pipit", not "American"!).

The exposed coastal barrens around the lighthouse are subject to arctic-like weather and are therefore home to some arctic plants that thrive in extreme conditions. Among the ones we encountered that could normally be expected in the far north were **moss campion** (*Silene acaulis*),

whose leaves form the protective dome-shaped mounds discussed by Peter Scott on our Hawk Hills trip last year. Unfortunately we missed the masses of pink blossoms produced when the plant is in bloom. We did see the pink blooms of another arctic plant, the **alpine bistort** (*Polygonum viviparum*), relative of the common garden weed, **lady's thumb** (*P. pennsylvanicum*). Most of the plants along this stretch seem reduced in size and hugged the ground for protection from the winds, including the **three-toothed cinquefoil**, yet another *Potentilla* - *P. tridentata* (see *The Beach*, above). Tiny **cinnamon ferns** (*Osmunda cinnamomea*) filled the rock crevices where some protection is provided and both dwarf birches (**Newfoundland dwarf birch**, *Betula michauxii* and the **swamp birch** *B. pumila*) and dwarf **willows** (*Salix spp.*) furtively emerged from among the **pink** and **black crowberries** (*Empetrum eamesii* and *E. nigrum*).

These headlands also attract some butterflies of note. We enjoyed the **pink-edged sulphur** (*Colias interior*) and the **mustard white** (*Pieris rapae*), the first with bright pink edges to the yellow wings, and the latter with prominent dark veins making it much more attractive than the introduced **cabbage white** (*P. rapae*).

Once at Gannet Rock, we had the usual great looks at the wheeling **gannets** and enjoyed their spectacular arrow-like dives. The screams of the kittiwakes and the smell of the regurgitated food etc. always makes this spot a multi-sensory experience. Fortunately we had an ear, nose, and throat specialist among our trip members. Every available nook of the cliffs was covered with nesting **common murre**s, **kittiwakes**, and for the intrepid viewer, a few **razorbills**, only to be seen by leaning dangerously over the cliff edge to get a view of "Tinker's Ledge". Gannets, razorbills, and kittiwakes had chicks to car for by this time of year, but the murre were just beginning to hatch.

The Blanket Bog

The final stage of the trip was a stop at a blanket bog. Unlike the regular variety bog, normally found in a depression, the blanket bog can extend up and down hillsides, literally draping the land, thanks to our lovely high Newfoundland precipitation that raises the water table to a level that only a sphagnum could love. The sphagnum soaks up the water like a sponge, although on the day of our visit, the sun had dried the surface to the point that the woolly, grey **heath moss** (*Rhacomitrium lanuginosum*) seemed perfect for a late afternoon nap. Sue wouldn't allow this however, and we continued our exploration of the bog, discovering a late **bog laurel** (*Kalmia polifolia*) in bloom as well as a few bells of **bog rosemary** (*Andromeda glaucophylla*). The bog was dominated by **deergrass**, its tips looking like they had been chewed by deer, plus some fluffy **white cottongrasses** (*E. angustifolium* and *E. spissum*), **tawny cottongrass** (*Eriophorum virginicum*) and the usual acid-loving "killer" plants, the **sundew** (*Drosera rotundifolia*) and **pitcher plant** (*Sarracenia purpurea*). **Leatherleaf** (*Chamaedaphne calyculata*) displayed its resin-dotted bronze underleaf, but no blooms, and **chokeberries** (*Aronia sp.*) defied species identification as is their goal in life. Not a **bakeapple** berry was to be found, of course at this time of year, but many leaves and a few flowers were observed. We headed home starved but happy.

For anyone planning a trip to Cape St. Mary's this year, the road through Colinet, by way of Salmonier Line is now fully paved, as is the former dirt road right up to the lighthouse. This saves at least 45 minutes driving time from St. John's, but it also means missing the beautiful scenery south of Placentia, including the fabulous beach at Gooseberry Cove. A circular trip would be ideal.

The Pyrolaceae (The Wintergreen Family)

by Sue Meades

Some authors include the **Wintergreen Family** (Pyrolaceae) in the **Blueberry or Heath Family** (Ericaceae), but most books treat them as two families. Although closely related, the Pyrolaceae is separated from the Ericaceae mainly by the former's herbaceous habit, and distinct (separate) petals. The Pyrolaceae also can be divided into two groups, which are sometimes treated as two families. The first category contains plants with simple, evergreen leaves (most in loose, basal rosettes). The second category includes the saprophytic Indian pipe and pinesap - plants that contain no chlorophyll.

Key to the Species of the Wintergreen Family

- 1a. Plants with green leaves. 2
 1b. Plants without green leaves. 10
- 2a. Plants with leafy stems. **Pipsissewa**
 2b. Plants with basal leaves; leaves forming loose rosettes at the base of the plant. 3
- 3a. Flowers solitary. **One-flowered Wintergreen**
 3b. Flowers few to many, in racemes. 4 (*Pyrola*)
- 4a. Flowers bent to one side, forming a 1-sided raceme. **One-sided Pyrola**
 4b. Flowers arranged around the scape, not 1-sided. 5
- 5a. Styles short, not exceeding the petals. **Lesser Pyrola**
 5b. Styles long, protruding past the petals (exserted). 6
- 6a. Plants less than 1.5 dm tall, flowers white to tinged with pink; plants of moist alpine barrens and slopes. **Arctic Pyrola**
 6b. Plants to 3 dm tall, flowers white, green or pink; plants of forests, bogs, thickets, or barrens. 7
- 7a. Flowers white, creamy, or greenish. 8
 7b. Flowers pink to red. **Pink Pyrola**
- 8a. Leaf blades elliptic (oval) or oblong, longer than wide. **Shinleaf**
 8b. Leaf blades rounded or broadly ovate. 9
- 9a. Leaf blades 2-5 cm long, shiny, flowers creamy white, fragrant. **Round-leaved Pyrola**
 9b. Leaf blades 1-3 cm long, not shiny, flowers green or greenish-white, not fragrant. **Greenish-flowered Pyrola**
- 10a. Plants white, with 1 flower. **Indian Pipe**
 10b. Plants yellowish, with many flowers. **Pinesap**

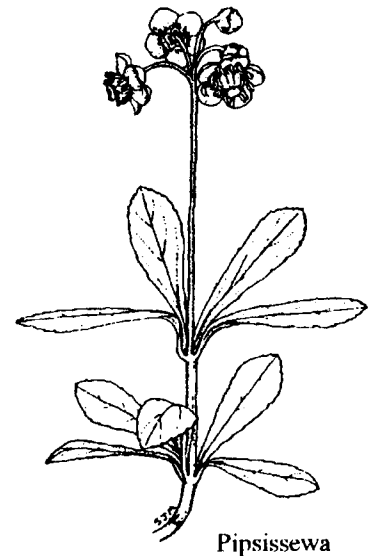
There are 11 species of the Wintergreen family in our province. According to Rouleau's checklist, all occur on the island, but three are absent from Labrador - the shinleaf, pipsissewa, and pinesap. Recent accounts from Bouchard *et al* indicate that the **arctic pyrola** is probably not in Newfoundland. Although mentioned in several publications, no known herbarium specimens exist to verify its presence.

The flowers of the Pyrolaceae are either **nodding** and **bell-shaped** (campanulate) or more open, with spreading and arching petals, as in *Moneses* and *Chimaphila*. Petals are usually 5 and separate, sepals are united into a calyx with 5, short lobes. The flowers may be greenish, white, pink, or pale purple, except in the pinesap, which is yellowish or tawny. The number of stamens is usually 10 - twice the number of petals. The characteristic anthers are reflexed and open by terminal pores, located near the attachment of the anther to the filament. The rounded ovary in all species is superior and quite prominent, maturing into an erect, dry capsule. The style is either short (nearly nonexistent in some species) or long and protruding well past the petals, as in most of the Pyrolas.

With the exception of the Indian pipe and pinesap, which have no chlorophyll, all other species are perennials with **simple, evergreen leaves**, most often arranged in loose **basal rosettes**. The main identifying features of our 11 species of the Wintergreen family are summarized in the following descriptions:

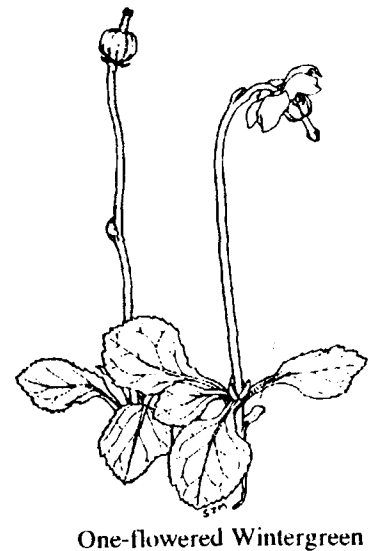
Pipsissewa *Chimaphila umbellata*

Plants of dry woodland habitats; to 3 dm tall; known from only two locations in northeastern Newfoundland - between Hall's Bay and the Bay of Exploits. **Leaves** dark green, thick and shiny, spreading, in 2 or 3 whorls along the stem. Leaf blades 3-7 cm long, oblanceolate, margins serrate (toothed), tips blunt to nearly rounded, with a small mucronate tip, base tapering to the short petiole. **Flowers** 2-8, in a loose cluster at the top of the erect stem. Petals 5, white to pinkish, round, spreading or slightly reflexed. Ovary large and globose, style very short, the broad stigma appearing sessile on the ovary.



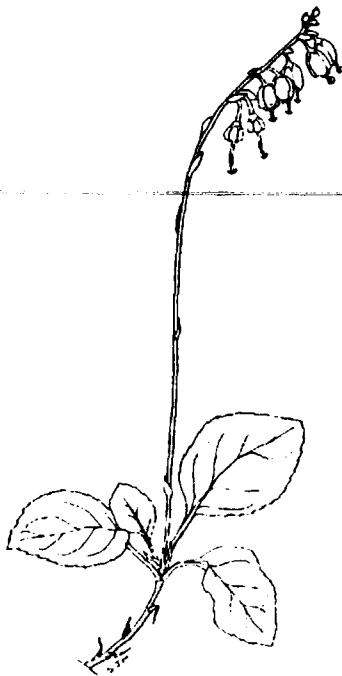
One-flowered Wintergreen *Moneses uniflora*

Perennial evergreen herb to 1.3 dm tall, spreading from slender rootstocks to form small colonies. First year plants consist of a tight rosette of leaves surrounding a large flower bud that is quite visible by late summer. **Leaves** simple, usually 3-4, basal, thin-textured, 1-3 cm long. Blades rounded to ovate, narrowing to a petiole; margins toothed, tip blunt-pointed. A fragrant, **solitary flower**, 1-2 cm wide, tops the 3-13 cm scape (flower stalk). Petals 5, white to pinkish, waxy, rounded, concave, and spreading or arching. The conspicuous stigma has 5 narrow lobes.



Pyrolas or Wintergreens *Pyrola spp.*

Pyrolas are perennial, evergreen herbs that spread from slender rootstocks. Their simple, petiolate leaves form loose rosettes at the base of the plant. **Leaf blades** are either thick, leathery and usually shiny, or thin and usually dull; the blade shape may be ovate, elliptic, round, or reniform (kidney-shaped); margins have low, rounded teeth (crenate). **Flowers** are few to many, nodding, and arranged on tall, erect racemes. Most flowers are somewhat bell-shaped and open (campanulate), but a few appear almost globose, with the petals nearly enclosing the pistil and stamens (lesser pyrola). The styles are long and prominent, protruding (exserted) beyond the petals, except in the lesser pyrola. Descriptions and a comparative chart of the 7 native species follow:



One-sided Pyrola

One-sided Pyrola *Pyrola secunda*

The simple evergreen leaves of the one-sided pyrola are thick and shiny. Leaf blades are elliptic to broadly-ovate, 1.5 - 6 cm long, and longer than the petioles. The 1-2 dm high flowering stem appears **1-sided**, as the flowers are bent to 1 side of the raceme, and displays 6-20, small **greenish-yellow flowers**. The slender style (5-9mm) is straight and protrudes past the 3.5-5mm long petals; the stigma is broad and 5-lobed. This perennial herb is found in dry-moist woods and in clearings, where it may form extensive colonies.

Lesser Pyrola *Pyrola minor*

The lesser pyrola has thin, dull leaves whose blades are elliptic, oblong, or rounded. The petiole is equal in length or longer than the 1-4 cm long leaf blade. The cylindrical raceme can reach as tall as 2.5 dm, but may be as short as 0.5 dm, making this **our most diminutive pyrola**. There are 6-17, white to pink flowers with short petals (3-5mm long) and **short styles** (0.5-1.3mm) that usually do not protrude past the petals. The lesser pyrola is found in moist woods and thickets; most commonly in mature coniferous stands.

Shinleaf *Pyrola elliptica*

The shinleaf has **large**, but **thin and dull** leaves. The leaf blades are **elliptic** or oblong, 2-8 cm long (always longer than wide), and the blades are considerably longer than the petioles. The cylindrical raceme is 1-3dm tall with 3-21, fragrant flowers. The **creamy white** petals are obovate, 7-10mm long, and veined with green. The protruding, curved style is 7-10mm long. Shinleaves are found in dry upland forests. According to the *Audubon Field Guide*, the pyrolas contain a drug closely related to aspirin. The name shinleaf is derived from the fact that the leaves of this plant were once used as a leaf plaster on bruises and injuries to the leg (a shin plaster) to reduce pain.

Greenish-flowered Pyrola *Pyrola virens*

This pyrola has **many** (4-11), **thick and opaque** (not shiny) leaves, which are smaller and more numerous than the leaves of other pyrola species. Leaf blades are **variable in shape**: ovate,

The following chart may be useful in comparing the 7 species of *Pyrola* found in Newfoundland.

Pyrola Species	Leaf blade shape / texture / length	Flower color Type of raceme	Style position Style length	Height
One-sided P. <i>P. secunda</i>	elliptic or broadly-ovate; thick & shiny; 1.5-6 cm	greenish-yellow; 1-sided	protruding; 5-9 mm	1-2 dm
Lesser P. <i>P. minor</i>	elliptic or rounded; thin & dull; 1-4 cm	white to pink; cylindrical	not protruding; 0.5-1.3 mm	0.5-2.5 dm
Shinleaf <i>P. elliptica</i>	elliptic or oblong; thin & dull; 2-8 cm	creamy white; cylindrical	protruding; 7-10 mm	1-3 dm
Greenish-flowered P. <i>P. virens</i>	reniform, nearly round, ovate, or obovate; thick, not shiny; 1-3 cm	greenish-white or green; cylindrical	protruding; 4-6 mm	1-3 dm
Round-leaved P. <i>P. rotundifolia</i>	nearly round or broadly ovate; margins revolute thick & shiny; 2-5 cm	creamy white; fragrant; cylindrical	protruding 5-10mm	1-3dm
Pink P. or Bog W-g. <i>P. asarifolia</i>	reniform or nearly round; leaf bases cordate; thick & shiny; 2-6.5 cm	pale pink to deep red, thin & veiny cylindrical	protruding; 5-10 mm	1-3dm
<i>P. asarifolia</i> v. <i>purpureum</i>	obovate, round, or elliptic bases round, not cordate; thick, but dull; 2-6.5 cm	pale purple; cylindrical	protruding; 5-10 mm	1-3 dm
Arctic P. <i>P. grandiflora</i>	rounded; often whitened along veins; thick & shiny; 1-4 cm	creamy white or tinged with red; cylindrical	protruding; 3-6 mm	1-1.5 dm

broadly elliptic, nearly round, obovate, or slightly reniform; 1-3cm long; and usually shorter than their petioles. The cylindrical raceme is 1-3dm tall, with 2-13, **green or greenish-white** flowers. Petals are oval and 4-7mm long. The protruding, curved style is 4-6mm long. The greenish-flowered pyrola is found in dry woods and thickets.

Arctic Pyrola *Pyrola grandiflora*

The arctic pyrola has leathery, **lustrous leaves** that are often **whitened along the veins**. Leaf blades are round, 1-4cm long, and about equal in length to the petiole. The cylindrical raceme is 1-1.5dm tall, with 2-9 flowers. The rounded petals are **creamy white or tinged with red**, 5-8mm long and rounded. The protruding, curved style is 3-6mm long. This pyrola is characteristic of **alpine habitats**, usually on moist slopes.

Round-leaved Pyrola *Pyrola rotundifolia*

Round-leaved pyrolas have firm, leathery, and **shiny leaves** whose blades are nearly round or broadly-ovate and 2-5cm long. Leaf margins are somewhat **revolute** and the blade is always somewhat decurrent (extending down along the petioles). Leaf blades are equal to or longer than the petioles. The cylindrical racemes are 1-3dm tall, with 3-13, fragrant flowers. The petals are thick, and **creamy white**, rounded, and 5-7mm long. The protruding, curved style is 5-10mm long. Round-leaved pyrolas may be found in barrens, bogs, or forest habitats. Our specimens (var. *rotundifolia*) are structurally identical, but smaller in all dimensions than the variety (var. *americana*) found in other parts of Canada.

Pink Pyrola or Bog Wintergreen *Pyrola asarifolia*

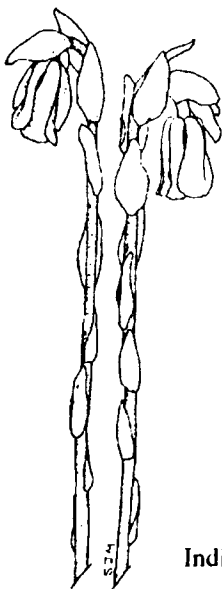
This attractive pyrola has shiny, leathery leaves that are darker on the underside. The leaf blades are round to slightly **reniform** (kidney-shaped) and their bases are **cordate** (heart-shaped). The blades are 2-6cm long and typically shorter than the petioles. The cylindrical raceme is 1-3dm tall, with 4-22 flowers. The **pale pink to deep red**, oval petals are 5-8mm long, thin, and veiny. ~~The protruding curved style is 5-10mm long.~~ Pink pyrolas are found in rich calcareous woods, wet thickets, or bogs.

Pyrola asarifolia var. *purpureum*

This purple-flowered variety of the pink pyrola differs from the typical plant in the shape and texture of its leaves and the color of the flowers. The leaves are dull, rather than shiny; leaf blades are broad-elliptic or round, but not reniform and usually slightly longer than wide; leaf bases are rounded or cuneate, but never cordate. Flowers are often pale purple. This variety may be found in mossy woods and wet thickets.

Monotropas

The following two species lack chlorophyll and are saprophytic on leaf mould or parasitic on soil fungi that are in mycorrhizal relationships with tree roots. Monotropas are found in moist, mature woods. Both species have superior ovaries and 8-10 stamens.



Indian Pipe *Monotropa uniflora*

Plants white to pinkish, waxy, blackening when mature or when dried; leaves scaly. Flower one, nodding at the end of the 0.5-3dm stem, which becomes erect as the fruit (capsule) matures. Flowers have 5 white petals, but only 2-4 indistinct, scale-like sepals.

Pinesap *Monotropa hypopithys*

Plant somewhat hairy or downy, yellowish to tawny, becoming reddish in autumn. Leaves are many, small, and scale-like. There are several flowers in a crowded raceme at the top of a scaly stem, 1-3dm tall. The upper flower of the raceme has 5 petals, but lower flowers have only 3 or 4 petals.

Indian Pipe

Newfoundland Alpines.....at Sea-Level!

by Todd Boland

(revised from an article submitted to the *Bulletin of the Alpine Gardening Club of British Columbia*)

When most people think of alpine plants, visions of the majestic Rockies, Alps or Himalayas come to mind; after all, most of our cultivated alpines are natives to these mountains. But what about alpines which naturally grow at sea-level? Such an image does not fit the normal definition of "alpine". In fact, it seems to be a contradiction in terms.

Several of Newfoundland's native alpines grow in typical alpine situations, notably on our Long Range Mountains. Perhaps the most well known alpine area of the Island is Gros Morne National Park. Here grow **purple heath** (*Phyllodoce caerulea*), **white mountain heath** (*Cassiope hypnoides*), **alpine azalea** (*Loiseleuria procumbens*) and the beautiful, yet rare, **diapensia** (*Diapensia lapponica*). However, our widest diversity of alpines do not grow on mountain-tops, rather, they grow at sea-level!

Sea-level alpines in Newfoundland are mostly distributed along the western shore and northern tip of our Great Northern Peninsula. One of the best places to see these sea-level beauties is along the Pointe Riche Peninsula, a small 25 km² extension of land located about 2 hours north of Gros Morne Park. This area is characterized by relatively flat, limestone barrens. The landscape is virtually devoid of trees and at first glance appears as an expanse of jumbled, broken rock. Combine these physical features with a climate typified by cool summers, very cold winters and frequent winds, then you can understand how alpines can grow at sea-level.

Several of the alpines growing at Point Riche are endemic to Newfoundland; others may also be found on mountain-tops of Cape Breton Island and the Gaspé Peninsula. A surprising number are also distributed throughout the Canadian Rockies.

The most conspicuous alpines embedded among the cracks in the limestone bedrock are the very showy **river beauty** (*Epilobium latifolium*), as well as **roseroot** (*Sedum roseum*), several **whitlow-grass** (*Draba*) species, **mouse-ear chickweed** (*Cerastium beeringianum*), **alpine chickweed** (*Cerastium alpinum*), **reddish sandwort** (*Arenaria rubella*) and **harebell** (*Campanula rotundifolia*). The *Campanula* are particularly striking, being a deeper shade of blue than any I have previously seen elsewhere in Canada.

Between the exposed bedrock are larger areas of mostly pebble-sized limestone gravel. In essence, this is a natural scree. Shrubs do grow in these gravels, albeit, very dwarf forms. Common shrubs include arctic **willow** (*Salix*) species, **shrubby cinquefoil** (*Potentilla fruticosa* - a prostrate form) and both the yellow-flowered **yellow dryas** (*Dryas drummondii*) and the white-flowered **mountain avens** (*Dryas integrifolia*). The flowers of this latter species are very similar to the Rocky Mountain *Dryas octopetala*. The arctic **net-veined willow**, (*Salix reticulata*) is most attractive, having small rounded leaves with a metallic purple-green sheen. The glossy leaves of this willow and the mountain avens is contrasted by the silvery foliage of several **pussy-toes** (*Antennaria* spp.), most of which are endemic to Newfoundland.

Scattered in these scree areas are several attractive hummock-forming alpiners including **moss campion** (*Silene acaulis*), **purple mountain saxifrage** (*Saxifraga oppositifolia*), **yellow mountain saxifrage** (*Saxifraga aizoides*) and **sea thrift** (*Armeria maritima* var. *labradorica*). This *Armeria* variety is far less showy than the typical form. Other pretty alpiners are the **Labrador violet** (*Viola labradorica*), **northern goldenrod** (*Solidago multiradiata*) and **few-flowered groundsel** (*Senecio pauciflorus*).

Along the coastline of the Pointe Riche Peninsula, the limestone barrens end abruptly as low cliffs, generally 3 to 10 meters in height. At the base of these cliffs there accumulates a band of peaty, gritty soil. Such areas are a shangra-la for many alpiners.

The most attractive species along the cliff bases are the **Newfoundland yellow lady's-slipper** (*Cypripedium calceolus* var. *planipetalum*). This variety is endemic to northern Newfoundland and the north shore of Quebec. The plants are very dwarf, often under 20 cm. and have pale yellow, untwisted petals. This is quite distinctive from the typical **small yellow lady's slipper** (*Cypripedium calceolus* var. *parviflorum*) whose petals are very twisted and mahogany tinted.

Overall, this area is a kaleidoscope of colours. Pink, purple or blue flowers originate from the **pink pyrola** (*Pyrola asarifolia*), **stemless raspberry** (*Rubus acaulis*), **alpine marsh violet** (*Viola palustris*), **beach-head iris** (*Iris hookeri*), **alpine milk vetch** (*Astragalus alpinus*), **bird's-eye primrose** (*Primula mistassinica*) and **island gentian** (*Gentiana nescophila*). White flowered alpiners include **northern anemone** (*Anemone parviflora*), **alpine bistort** (*Polygonum viviparum*), **northern bunchberry** (*Cornus suecica*), **long-stalked chickweed** (*Stellaria longipes*), **greenland primrose** (*Primula egaliksensis*) and **hyssop-leaved fleabane** (*Erigeron hyssopifolius*). Yellow-flowered **Crantz's cinquefoil** (*Potentilla crantzi*), **subarctic cinquefoil** (*Potentilla hyparctica*) and **small lady's-mantle** (*Alchemilla minor*) complete the picture.

Even the limestone cliffs themselves contain some treasures, such as the **holly fern** (*Polystichum lonchitis*) and **green spleenwort** (*Asplenium viride*) as well as **whitlow-grass** (*Draba*) species, **purple rock-cress** (*Braya*) species and **roseroot** (*Sedum roseum*).

Being an avid grower of alpiners, I have tried my hand at several of our choice native alpiners. Some have been a great success, others total failures. Whenever I collect native alpiners I always ensure there is a high local population of the particular species I desire. Too many of Newfoundland's wildflowers, alpiners in particular, are in serious danger due to over-exploitation. Therefore, I prefer to collect plants from soon-to-be construction sites, collect seed or take cuttings.

I highly recommend a trip to the Northern Peninsula to see these sea-level alpiners for yourself. Unlike many mountain alpiners, you do not need to hike long distances over steep terrain; just step out of your car and stroll along the beach!

Book Review:

by Sue Meades

The Rare Vascular Plants of the Island of Newfoundland.

by André Bouchard, Stuart Hay, Luc Brouillet, Martin Jean and Isabelle Saucier.
1991. Syllogeus No. 65. Canadian Museum of Nature. ISBN 0-660-50311-5.

Bouchard *et al.* have determined that there are 271 rare taxa* (species or subspecies) of plants in insular Newfoundland. Of these, 26 also are listed as rare in Canada. When discussing rare plants, two questions quickly come to mind - "What constitutes a rare plant?" and "How are particular species determined to be rare in Newfoundland?" These questions and many more are fully answered in this publication.

What is a rare plant? According to the authors, whether or not a plant is rare depends first on the geographic level that is being evaluated; i.e.: a plant may be rare in Newfoundland, but common in eastern North America, such as the **false Solomon's seal** (*Smilacina racemosa*), or it may be considered rare at the provincial or national scale, but be fairly widespread in certain habitats in western Newfoundland, such as the **dry-leaved sandwort** (*Arenaria marcescens*), which occurs only on serpentine barrens. For Newfoundland species, rare status is based on the number and distribution of populations known to occur throughout the island. The following are simplified versions of the definitions given in Bouchard *et al.* that reflect various degrees of danger, or risk of extirpation, that are used to describe a species' abundance.

rare: a taxon that occurs in low numbers or in a very restricted range.

endangered: a taxon that is threatened with immediate elimination, through all or much of its range, due to the actions of man.

threatened: a taxon that is likely to become endangered if the factors that make it vulnerable are not reversed.

extirpated: a taxon that no longer exists in the wild in a given area, but that does exist in other regions.

extinct: a taxon that was formerly indigenous (native) to a region, but that no longer exists anywhere.

The answer to the second question is more involved. Following a study of the floristic literature, distribution maps, and relevant herbarium collections, Bouchard *et al.* eliminated taxa that proved to be too widespread from their revised species list (based on Rouleau's *Checklist* plus recent additions and changes). Also, species that were introduced and plants that were taxonomic forms, hybrids, or invalid species were excluded.

***Note:** Since most of our members are not professional botanists, the term *taxon* (plural - *taxa*) may be new to many. *Taxon* is a general term that refers to a taxonomic units of any rank, including species, subspecies (ssp.), or varieties (var.).

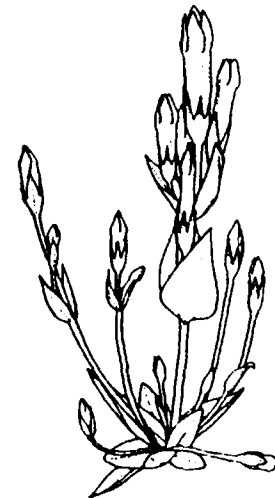
Only species with fewer than 20 locations were deemed candidates for rare status. Field studies were then conducted during 5 consecutive field seasons (1986-1990) to verify the presence and abundance of the candidate species. Bouchard *et al.* found that there were two main categories of rare plants in Newfoundland:

- taxa whose populations are limited to a single region (species with a limited distribution), and
- taxa with a small number of populations scattered over a wide area.

Species with a limited distribution were located primarily on the west coast for two reasons: there is a pronounced north-south climatic gradient, and there are many unique habitats on the west coast. For example: the Codroy Valley contains several species with a more southerly range, such as the **false Solomon's seal**, while the northern tip of the Great Northern Peninsula contains species with a more northerly range, such as the **alpine milk vetch** (*Astragalus alpinus*). Also, many rare species, such as the serpentine barrens' **dry-leaved sandwort**, are restricted to specialized habitats, like alpine plateaus and serpentine or limestone areas, which are only found on the west coast.

Plants with limited geographic distributions are often locally abundant in the few locations they occur, like the **four-parted gentian** (*Gentianella propinqua*), but their total populations are small, so they still qualify for rare status. Rare plants with scattered but wide distributions, such as the **seaside goldenrod** (*Solidago sempervirens*), are rare in each of their locations.

Due to differences in the level of botanical exploration, and thus knowledge of the flora, the authors used different criteria for rare status for plants that have limited (west coast) distributions and plants with widespread, but scattered, distributions. Species from western Newfoundland, with its long history of botanical exploration, were considered rare if they occurred in no more than 15 locations. Plants with small populations scattered across much of the island were classified as rare if they could be found in no more than 10 locations.



four-parted gentian
found at Plum Point,
August 13, 1993

Bouchard *et al.* note that the rare status of some plants may change as further exploration occurs in areas that are not very accessible, such as the Long Range Mountains and the south coast. Also, many aquatic species appear to be rare and sparsely distributed, but aquatics are easily overlooked and less often collected. Thus, with more collections in aquatic habitats, some of these species may be recognized as more common and removed from the rare list.

It is shown that most of the island's rare plants occur on the west coast - along the Strait of Belle Isle (114 species) and in the Corner Brook region (101 species). Both of these regions are characterized by exposed, unstable, calcareous or serpentic substrates, which are the habitats of most our endemic species (species unique to Newfoundland). A comprehensive discussion is included on the distribution pattern of rare plants according to Damman's ecoregions and the phytogeographic origins of these plants.

For each rare plant, the following information is provided in the form of an annotated list: scientific name, total range, Newfoundland distribution, habitat, ecoregions where it occurs, Canadian and Newfoundland status, information and map sources, and notes. For easy reference, all plants are listed alphabetically, rather than according to family. Dot maps, based on current herbarium records, illustrate the Newfoundland distribution of each taxon; these are located at the back of the publication. The following example shows how information is presented for each plant.

Gentianella propinqua* (Richards.) Gillett ssp. *propinqua
(= *Gentiana propinqua* Richards.)

SOURCES	CAN,DAO,GH,MT,NFLD; Rouleau (unpublished maps).
RANGE	Alas-Y-Mack, north to Banks Is. and Victoria Is., south through mts of BC and Alta to Mont; disjunct eastwards to Hudson Bay (Man, Ont, Que), Gaspé, nwNfld; extreme ne Asia (Gillett 1963).
NFLD MAP	White Bay North; St. Barbe North; St. Barbe South. Blondeau 1986; Gillett 1957, 1963; Hultén 1968; Porsild 1964; Porsild & Cody 1980; Raup 1947.
HABITAT	Coastal turfy limestone barrens.
ECOREGION	IVA,IX
STATUS	Rare in Manitoba, Quebec.
NFLD RARITY	S2
NOTES	May become adventive in disturbed roadsides along gravel roads on limestone barrens.



Gentianella propinqua
ssp. *propinqua*

The scarcity of each plant is ranked according to 4 categories:

- S1** - Taxa that are critically endangered because of extreme rarity (5 or fewer occurrences, or very few surviving plants or hectares of habitat).
- S2** - Taxa that are threatened because of rarity (6 to 20 occurrences, or few surviving plants or hectares of habitat).
- S3** - Taxa that are rare or uncommon (with 21 to 100 occurrences).
- SII** - Taxa that are known historically to have occurred on the Island of Newfoundland, but have not been found for at least 20 years, despite efforts to relocate populations of these taxa. If an SH taxon is relocated, it would receive an S1 rank.

In addition to the alphabetical list of rare plants and distribution maps, there is an extensive bibliography and two appendices: 1) a list of excluded species, and 2) a list of the rare vascular plants in taxonomic (family) sequence. There are several reasons why candidates for rare status have been excluded, including: mistaken identification on herbarium sheets; plants listed in the literature, but for which no herbarium record exists; plants that are forms, hybrids, or minor variations of other taxa; and plants that proved to be too widespread or to be introduced. This list (Appendix 1) is of particular importance to professional botanists because it identifies species that require further taxonomic study and plants that should be removed from Rouleau's list.

For the professional and some amateur botanists, this is an indispensable publication, but most amateurs will find its usefulness hampered by the lack of common names and descriptions. Maps are included, but no plant illustrations. You need to know your plants to appreciate this book. However, several issues are raised by this publication that are important to professional botanists, amateur naturalists, and **especially politicians interested in tourism and our environment.**

As mentioned before, most of the island's rare plants occur on the west coast - along the Strait of Belle Isle and in the Corner Brook region, emphasizing the uniqueness and biological importance of this area. The Strait of Belle Isle Ecoregion contains the most rare species - 114, 29 of which are endemic, or unique, to the straits. The Corner Brook area of the Western Newfoundland Ecoregion ranks a close second with 101 rare species, including 10 endemics. While most of the island's total flora is composed of boreal species (approx. 70%), the authors report that only 33% of the island's rare species are boreal. Conversely, endemic species comprise only 1% of the total flora, but 12.6% of the rare flora. Endemics are obviously a more endangered group than boreals. Boreal species that are rare in Newfoundland are common throughout other regions of Canada. Most of our endemics, however, are only found in Newfoundland (some are also found in a limited area along the Gaspé, on Anticosti, and the Mingan Islands). While we need to protect all of our rare flora, our first priorities should be to protect those species that are unique to the island. Newfoundland's endemic flora is what attracts botanists and eco-tourists to the island.

Plants that occur in inaccessible habitats, such as alpine plateaus, have some natural degree of protection from man's interference, however many kilometers of our unique limestone barrens have been converted to gravel pits for road fill over the past 20 years, largely because they are so accessible and their value is not understood. How many rare plants in the SH category have already been extirpated by this habitat destruction? How many have been reduced from widespread distributions to S1 rare status? When you look at the distribution of our rare calciphiles (plants of limestone habitats), it is easy to see that the protected 7 Km stretch of Watt's Point Ecological Reserve is not adequate to fully protect this unique flora. Now that we know what and where our rare plants are, more questions need to be answered.

- What can we do to protect our rare plants?
- What can we do to pass legislation to ensure protection of our rare plants and habitats?
- What species and habitats in Newfoundland are threatened or endangered as a direct result of the actions of man?
- What can be done to reverse population declines?
- How can communication channels between government departments (such as Transportation and Environment) be improved so that the destruction of unique habitats, whether due to ignorance or negligence, is successfully prevented?

The last word goes to Bouchard *et al.*: "...the Government of Newfoundland and Labrador already has access to a number of legal tools for rare plant protection. However, it must ensure the existence of a government agency to coordinate a program for the protection of rare and endangered species. If such a program is not developed and implemented, the project to list the rare plants of Newfoundland will never achieve one of its primary goals: the preservation of part of its natural heritage."