Iris

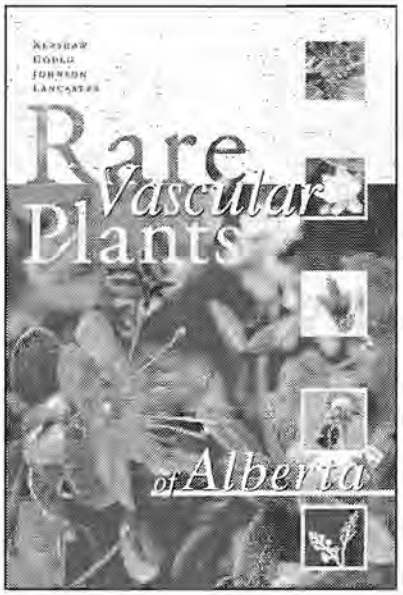
No. 40 • Fall 2001

The Alberta Native Plant Council Newsletter

No foolin'!

Rare Vascular Plants of Alberta published!

The *Rare Vascular Plants of Alberta* is finally published! Coming across this book in a bookstore, you might think it is simply a field guide similar to other guides you have on plants. But, this 484–page book will surprise you with its tightly packaged output of thousands of hours of fieldwork and data processing, accompanied by several years of work by many willing volunteers, aided by donations and grants from members and non-profit organizations. The project lends itself to superlatives and statistics: numerous appendices [7]; dozens of photographers [36]; hundreds of plant species [ca. 485], references [375] and glossary terms [339]; and thousands of images [415 photographs, 480 line drawings, and more than 800 distribution maps for Alberta and North America].



Species descriptions are divided into four main sections based on growth form (woody plants, broad-leaved herbs, grass-like plants, and ferns and fern allies). Common, scientific and family names are included for all primary entries. A general description of each plant is followed by descriptions of habitat and for most species, maps showing the distribution in both Alberta and North America. Each species description is concluded with notes on synonymy, descriptions of related or similar-looking plants, etymology of the scientific names and, for some species, medicinal or aboriginal uses of the plants. The appendices include keys to some of the more difficult-to-identify genera, a listing of the species by natural region, species new to Alberta, species previously considered rare for the province but not included in the book, and species classified as rare in Canada. An illustrated glossary, a reference list, and an index conclude the book.

Some of Alberta's rare plants are big and beautiful, but many more depend on our ability to travel slowly and observe closely. Many inhabit Alberta's wild, but some occur in not-so-wild places. All of the above-listed features of the *Rare Vascular Plants of Alberta* will help both casual readers and professionals to find and identify rare species. This beautiful plant guide allows readers quick reference in the field and leisurely browsing in the office or at home.

See ***Rare****, Page 16*

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Banner photo: East ridge of Cardinal Divide. Photo by Lorna Allen

2002 ANPC Workshop in Red Deer

Mark your calendars now! Planning is underway for the next workshop and Annual General Meeting on April 27–28, 2002 in Red Deer. The theme will be Alberta's native plants, their value and conservation. Look for more details in the winter issue of *Iris*.

President's Report

Dave Downing

There have been a couple of significant events over the last two months. One of the outstanding issues in September involved our working relationship with the U of A Press concerning the sale and promotion of our Rare Vascular Plants book. I am pleased to report that we have negotiated a satisfactory sale agreement with the University of Alberta Press. Lorna has taken delivery of nearly a thousand books that are slowly finding their way to school libraries courtesy of the Alberta Sports, Recreation, Parks and Wildlife Foundation grant we received a few years ago. Sales to members have also been steady. Our organisation is grateful to everyone who helped out and especially to our four editors for their invaluable gift of time and energy. We thought it would be fair to ask them whether they wanted a share of the royalties: all four refused our offer and directed us to return all royalties to the ANPC in support of ongoing rare plant, reclamation, conservation and education work.

We have settled on a tentative theme for our 2002 workshop, and we can now move ahead with the planning details. Thanks to Ed Karpuk for presenting the alternatives, soliciting votes, and clearly laying out the requirements for participation. Thanks to everyone who has offered to help—it really alleviates the stress a workshop co-ordinator feels.

There are a few other recent achievements of which we can be proud. We've helped to fund the publication of a document that one of our members, Heather Sinton, has been instrumental in developing (*Prairie Oil and Gas: a lighter footprint*). Patsy Cotterill was honoured by the Federation of Alberta Naturalists for her many years of front-line conservation work—on behalf of the ANPC, I'd like to extend our congratulations to Patsy. Birgit Friedenstab continues her efforts to ensure the ecological integrity of our stewardship area at Nisku Prairie. She and Heather Sinton recently prepared a well-written letter to a pipeline company stating exactly what conditions needed to be met for a pipeline; the ANPC is responsible for revegetation next spring, and we have of course asked the pipeline company for funding. Terry Clayton represents the ANPC on the western blue flag Recovery Team in southern Alberta. This initiative is a result of decisions made by the Endangered Species Conservation Committee, to which two other ANPC members (Chris Manderson and Dana Bush) belong, and the Scientific Subcommittee to which Cheryl Bradley, a long-time ANPC member, belongs.

I hope everyone has a good holiday and I look forward to seeing you at the ANPC workshop next April

The Alberta Native Plant Council

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Ladybird Centre looking for native plant success stories

The Lady Bird Johnson Wildflower Center is dedicated to educating people about the environmental necessity, economic value, and natural beauty of native plants. One of the most popular exhibits in our Visitors Gallery is a group of pictures and descriptions of native landscapes from across North America called "Native Plant Success Stories". The photographs depict native landscapes—from corporate headquarters framed by wildflower meadows, to vibrant patches of butterfly friendly black-eyed Susans in a family's backyard.

It is time for us to update the exhibit and take advantage of new technologies. Using the World Wide Web, we are creating an online gallery where people can come together to share their love, appreciation, and stories of native plants.

Because pictures are worth a thousand words, we invite you to send us your personal native landscape slides and photos. The photos can be of grand landscapes or of small sweet garden plots. While we are particularly interested in native plants, we are also looking for pictures that include entire habitats and communities. Birds, butterflies, bees, and babies are all part of the ecosystems we inhabit. We hope to promote our mission by displaying thriving examples from across the continent.

- How has using native plants added to the beauty of your landscape?
- Have there been any changes in the cost and/or maintenance of your landscape?

Please send your submissions (photos and text) to <ogren@wildflower.org> or by mail to 4801 La Crosse Avenue, Austin, TX USA 78722.

For more information visit the Lady Bird Johnson Website <www.wildflower.org>.

Iris is published three times a year by the Alberta Native Plant Council. The Council's aim is to increase knowledge of Alberta's wild flora and to preserve this diverse resource for the enjoyment of present and future generations.

Deadlines for upcoming issues:

Winter	**Jan 15, 2002**
Spring	May 15, 2002
Fall	Sept 15, 2002

If you have an announcement, article or other item, you are invited to submit it to the editor for publication. Items concerning native plants will be given the highest priority.

The editors reserve the right to edit submissions, but will review changes with the authors whenever possible. Disputes will be resolved in favour of the audience.

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Membership fees:

$15	Individual
$25	Family
$10	Student/Retired
$50	Corporate

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Square-stem monkeyflower–a new addition to the flora of Alberta

Ksenija Vujnovic

July 6, 2001. What an exciting day! The first day of our 2001 summer fieldwork in the Canadian Shield Natural Region of Alberta. This Natural Region is situated in the very northeast corner of our province. The La Butte Creek Wildland Provincial Park was our first destination on this trip (located in Township 120), followed by the work in Fidler-Greywillow WPP (on the north shore of Lake Athabasca). Both parks are only accessible by boat along the Slave River, or by float plane.

Square-stem monkeyflower (*Mimulus ringens*), a new species for Alberta

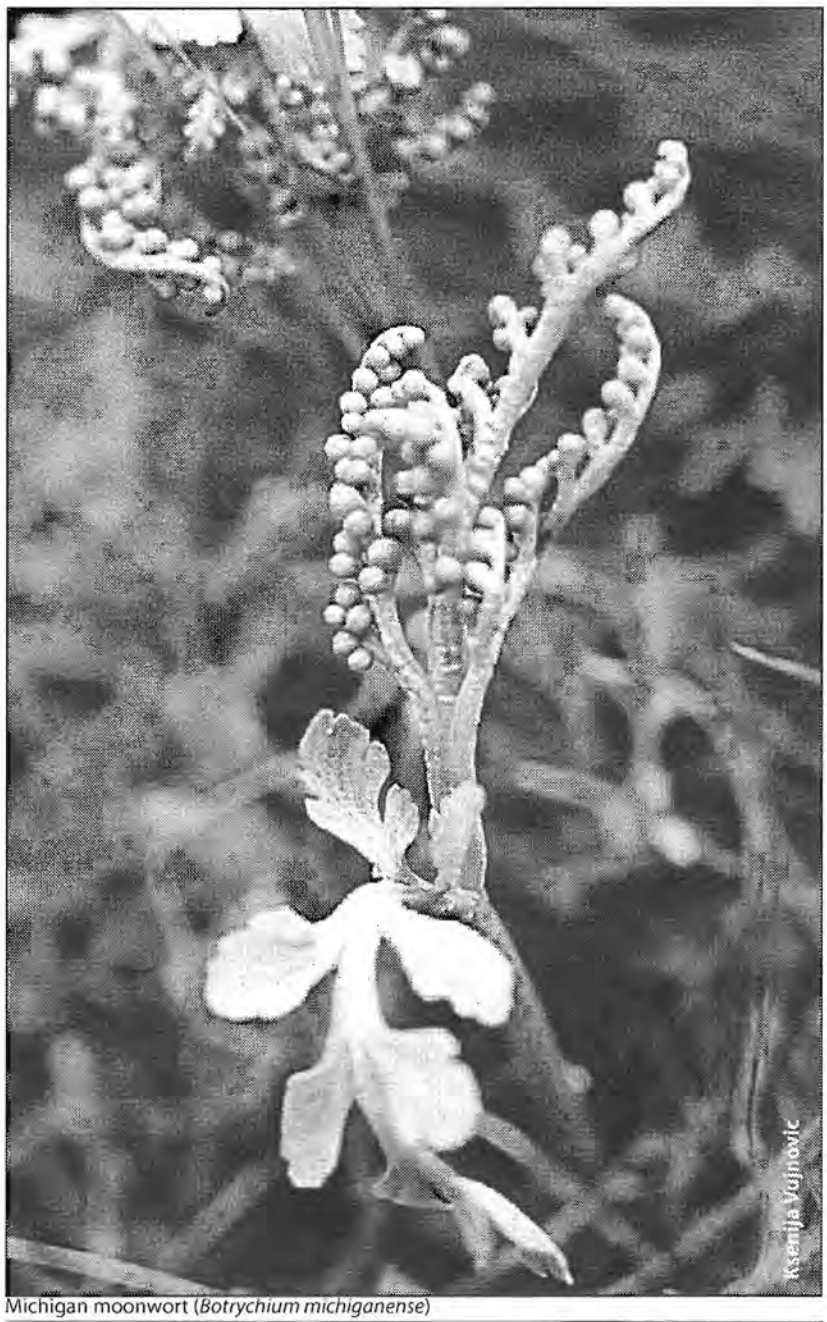
On that first field day, somewhat overcast weather influenced the decision of our small botany group to stick relatively close to the newly established campsite situated on the Slave River at the mouth of La Butte Creek. Lorna Allen, Derek Johnson, Bill Richards, Erin Flynn and I were enthusiastically making lists of plants, fungi and plant communities that we recognized as we walked through wetlands, shrubs and woodlands, and over the granite rock outcrops. Although Derek focussed his attention on non-vascular plants and lichens, his general experience with northern species was of great advantage to the whole group. We sampled a specimen or two of unknown species for later identification. The first big excitement came when we encountered a small group of grape ferns in a birch-willow stand, right by the signs of buffalo presence (clumps of hair on shrub branches). We found one plant of Virginia grape fern (*Botrychium virginianum*) and a

Mimulus ringens—habit

Some of the inventory crew at La Butte Creek WPP: L-R Derek Johnson, Bill Richards, Ksenija Vujnovic, and Erin Flynn.

***Monkeyflower**, from page 4*

Capitate sedge (*Carex capitata*)



Michigan moonwort (*Botrychium michiganense*)

half dozen individuals of the provincially rare species, crenulate moonwort (*B. crenulatum*). A nearby rock outcrop provided additional excitement when we found a small population of yet another provincially rare species, Michigan moonwort (*B. michiganense*), inhabiting a small mossy patch.

After many hours of botanizing we walked back toward the camp following the muddy shore of the Slave River. Somewhat tired, most headed directly back to camp, but Lorna, Bill and I dawdled, continuing to add new species to the list—those that thrive on the periodically disturbed shore of this powerful river. About 200m before we reached the camp, Bill pointed out a patch of quite tall plants with purple flowers, hiding within the stand of marsh horsetail (*Equisetum palustre*). None of us recognized this mysterious plant so we collected one flowering stem to check it out when we got back to the camp.

Back in the camp that evening, we enthusiastically examined our collected specimens as we shared our late-evening findings with Derek Johnson. Much to our surprise, Derek suggested that our mysterious plant with purple flowers looked to be some kind of a monkeyflower, but must be a new species for Alberta, since he has never seen a purple-flowered species in the province before. We frantically searched through all the books we brought with us to help us with identification, but we had no luck finding a monkeyflower with purple flowers. Being stuck in this wilderness for the next three weeks, we could do nothing else but wait patiently to come back home and find out the name of our new addition to Alberta's flora. In the meantime, we decided to focus on gathering more details about the species and its habitat.

To make a long story short, in the following days of our botanizing we found this species along La Butte Creek as well. We were surprised to discover that it occurred quite abundantly in the shallow water along the shores of

White water-lily (*Nymphaea tetragona*)

the creek. Plants were much shorter and behind in flowering compared to our first find, but by the end of our 10 day shift in the La Butte Creek WPP, many of their purple flowers started to open and added to the beauty of these shores, matching the color of yet another locally abundant, but provincially rare species, Ledingham's physostegia (*Physostegia ledinghamii*).

Not all collected specimens have been sorted out yet, but I'll just mention some of the other provincially rare vascular plant species that we found during this trip to La Butte Creek WPP: rock polypody (*Polypodium virginianum*), Hooker's cinquefoil (*Potentilla hookeriana*), cyperus-like sedge (*Carex pseudo-cyperus*), beaked sedge (*C. rostrata*), turned sedge (*C. retrorsa*), capitate sedge (*C. capitata*), white water-lily (*Nymphaea tetragona*), floating-leaf pondweed (*Potamogeton natans*) and sleepy catchfly (*Silene antirrhina*).

Lorna got back to Edmonton first and promptly dug into books to find out the name of our mystery plant: square-stem monkeyflower (*Mimulus ringens* L.). This is a common species of eastern Canada (Manitoba and Ontario), but rare in neighboring Saskatchewan, Montana and Idaho. It hasn't been reported from the Shield portion of Saskatchewan yet. The species is entered in ANHIC's database and is presently ranked S1, because this summer's finding is the only known location in Alberta so far.

The Alberta Natural Heritage Information Centre (ANHIC) is one of over 80 centres in an international Natural Heritage Network. It collects, evaluates and makes available information on elements of natural biodiversity in Alberta, including flora, natural plant communities and fauna. Alberta's plants (including vascular plants, mosses, liverworts and hornworts) of conservation concern are summarized in the *ANHIC Tracking and Watch Lists*. You can get a copy of the lists at the ANHIC website <www3.gov.ab.ca/env/parks/anhic/trackanh.html>, or by writing to:

Alberta Natural Heritage Information Centre
Parks and Protected Areas
2nd. Fl., 9820–106 St.
Edmonton, Alberta Canada T5K 2J6
tel. (780) 427-7702, fax 427-5980

Tracking lists for other elements (mammals, birds, amphibians, reptiles, fish, butterflies, odonates, bivalves, tiger-beetles, lichens and plant communities) are also available on ANHIC's website.

Ledingham's physostegia (*Physostegia ledinghamii*)

ANPC Stewardship Site

Fire in Clyde Fens Natural Area

Derek Johnson

I went out to the fens yesterday (August 28) with my technician to show Marion and Robin White from Calgary the pitcher plants. Driving to the site I noticed that most of the vegetation had been scraped out of the ditch. I was wondering if this was part of road improvements. Imagine my amazement when I got to the access point to the fens to see that a forest fire had ravaged much of the area. I don't remember hearing about a forest fire in that area at all. It must have happened while I was away in the field in June because the area was intact, with little evidence of recent disturbance, when I went there for the May Species Count on May 27. Do you know when this fire went through the area? The fire appears to have burned most of SW 15 and NE and SE 16 TWP 60 RGE 24 W4. The fire did not get as far north as SW 27 TWP 60 RGE 24 W4, as I saw no evidence of burned trees in that quarter.

The fire was quite severe, killing all the trees and burning off all the ground cover down to mineral soil in some of the upland areas. Because the area was so dry, even the sedges and forbs in the fen got scorched off down to ground level. It was amusing to see clumps of pitcher plants that literally looked like they had been clipped off at ground level by a lawnmower. The pitcher plants will recover. There was some new sprouting and we found about 15 plants that had managed to flower this year. The fens look like they will recover quickly as the birch, willow and sedges are sprouting vigorously from the surviving roots. The current abundance of buck-bean (*Menyanthes trifoliata*) in the area was striking. Whether or not this is because of new sprouting or because it's so visible now because everything else was burned off, I don't know. However, it might be quite a while before the tamarack comes back as most of the trees were killed and recovery will likely be strictly from seeding in. The rapid response of Bicknell's geranium (*Geranium bicknellii*), fireweed (*Epilobium angustifolium*) and poplar (*Populus tremuloides*) suckers in covering the ground in some of the drier areas is quite impressive. The Labrador-tea (*Ledum groenlandicum*) is doing its best to sprout back in the moister forests too. Much of the moss cover was removed along with the trees and I'm not sure if things like the round-leaved sundew (*Drosera rotundifolia*) and small bog cranberry (*Vaccinium vitis-idaea*) will reappear in the near future. Much of the upland area is likely to have a serious weed infestation over the next few years. Some of the bulldozed fireguards are already heavily covered by perennial sow thistle (*Sonchus arvensis*), annual hawk's-beard (*Crepis tectorum*) and even some Canada thistle (*Cirsium canadense*). Clovers (*Trifolium* spp.) and introduced grasses could also become prevalent in some areas. Since I have visited some areas of the fen regularly every year and know the vegetation quite well, it's going to be interesting to watch and record how they recover/change over the next several years. Needless to say, Clyde Fens has become a totally different natural area because of this fire.

Pitcher plant (*Sarracenia purpurea*)

If there was a highlight to this trip it was finding a single plant of bog adder's-mouth (*Malaxis paludosa*) in an unburned patch of moss...

If there was a highlight to this trip it was finding a single plant of bog adder's-mouth (*Malaxis paludosa*) in an unburned patch of moss in NE 16 near the edge of a cutline about 50 m south of the sand ridge. This is about 250-300 m north of the location in SE 16 where Matt Fairbarns found it in 1990. The area where the species

See ***Clyde****, Page 8*

Book review

The Botrychiaceae of Alberta

by Patrick Williston. 2001. Mnium Ecological Research, Smithers, BC & Alberta Natural Heritage Information Centre, Alberta Environment, Edmonton, AB. 57 pp.; 4 colour plates. ISBN 0-9688690-0-9

Reviewed by Silvie Forest

Smithers, BC, seems to be a Mecca for botany and botanists—perhaps its location and the folks attracted to it have a special calling. The author, Patrick Williston, of Smithers, dives into great depth in his account and key to the Botrychiaceae of Alberta. He includes the family's history, some folklore and famous quotes in reference to the grape ferns, life cycles, fossil records, conservation considerations, ecology, rarity (global and provincial), restoration opportunities, and future research directions.

The descriptions and distributions of species are well organized and include provincial maps with collection points and species drawings. While the drawings don't show great detail, the gross morphology can be easily ascertained. The 19 colour photographs were mostly taken *in situ*, but include a few herbarium specimens.

The author is very thorough and the publication is interesting to read—even for botanists/naturalists that do not specialize in pteridophytes.

Unfortunately, I did not have a chance to collect some moonwort specimens to try the key myself, but judging from the thoroughness of the publication, I trust that the key will work. Williston further includes "Notes on Troublesome Determinations" where he points out some of the "confusing taxa". Some notes on the individual species' descriptions may further help in arriving at a positive identification.

Overall, it's a job well done and I would not hesitate to recommend it!

Sylvie is with the Dept. of Natural Resource Industry Environmental Technology at Keyano College in Fort McMurray

Botrychium crenulatum, from La Butte Creek Wilderness Provincial Park (see page3)

***Clyde**, from page 6*

was originally found has been completely burned and I doubt if it could have survived in that area. This is the first time I'm aware of that the species has been seen since Matt's original discovery. I'm sure he will be relieved to know that he didn't eliminate the entire population when he "accidentally" collected the only plant seen in 1990.

Postscript

A couple of interesting tidbits to add to the Clyde Fen update report. If the fire did indeed start on May 31, that was only 4 days after we visited the site to do a May Species Count and site inspection on May 27. Normally it would be highly unusual for plants in the fen to burn, but the site this spring was the driest I've ever seen it in the 12 years that members of the ANPC have been visiting the area. Normally there would have been standing water everywhere, but it was restricted to only the most open areas of the fen this yeat. The 38 species we saw in flower was disappointing (I was expecting about 50 species), but probably much a result of the dryness of the site. We were unable to find any open flowers on the bog rosemary (*Andromeda polifolia*) and that has never happened before on the May Count. The plants themselves were browned and sickly, almost as though they had already been burned. Highly unusual conditions...just ripe for a fire?

The complex web of life underground

Peter Lesica

Achlorophyllous (non-green) plants usually attract notice. They seem so anomalous, so "unnatural". Green plants use chlorophyll to capture sunlight and produce food. These white, yellow or red plants are clearly different: how do they make a living? For many years it was thought that some achlorophyllous plants were saprophytes (obtaining nutrition from decaying plant material) or mycorrhizal (implying mutual benefit to both partners). We now know that neither is the case. All achlorophyllous vascular plants in Montana are parasites; they obtain nutrition from a host, damaging but not killing that host. The process of parasitism is varied and interesting.

In our area achlorophyllous plants occur in five plant families:

- Loranthaceae (mistletoes)
- Cuscutaceae (dodders)
- Orobanchaceae (broomrapes)
- Ericaceae (ericads), and
- Orchidaceae (orchids).

Mistletoes and dodders attach themselves to the branches of other vascular plants and live their entire lives completely in the vegetation canopy. Dwarf mistletoes (*Arceuthobium* spp.) parasitize coniferous trees causing deformed branches, and heavy infestations may eventually kill the host. Dodders (*Cuscuta* spp.) twine around the stems and leaves of herbaceous and shrubby host plants in many families. Both mistletoes and dodders are perennials and can cause damage of economic importance by infesting commercial timber or crops. Broomrapes (*Orobanche* spp.) also parasitize green vascular plants, but they do it underground, attaching their roots to the roots of a host. Many species specialize on hosts in the Aster Family, especially sagebrushes (*Artemisia* spp.); however, one-flowered broomrape (*O. uniflora*) has much more catholic tastes. Many species of broomrape are annuals. All three of these groups of plants have long been recognized as parasitic.

It is the achlorophyllous orchids and ericads that cause confusion about life history. These include the coral-root orchids (*Corallorhiza* spp.) and candy stripe (*Allotropa virgata*), Indian pipe (*Monotropa uniflora*), pinesap (*Hipopitys monotropa*) and pinedrops (*Pterospora andromeda*) in the Ericaceae. These plants usually occur in forest soils with deep humus layers. This led to the belief that they were obtaining nutrition directly from decaying plant material. Later it was observed that their roots or rhizomes are filled with fungal hyphae. Some scientists assumed that these achlorophyllous plants formed a below-ground symbiotic partnership with the fungal mycelium the way most vascular plants do. However, green plants supply their fungal partners with carbohydrates in exchange for soil nutrients—a true symbiosis, but achlorophyllous plants have no means to manufacture food so they have no way to benefit their associated fungi. Rather, the plants induce the fungal mycelium to enter their roots and then digest them—parasitism not symbiosis.

Striped coral-root (*Corallorhiza striata*)

The achlorophyllous ericads are usually associated with the same fungi that form mycorrhizal symbioses with coniferous forest trees. Pinesap parasitizes members of the genus *Suillus*, *Rhizopogon* and close relatives; Indian pipe was found with members of the genus *Russula*; and pinesap parasitizes a single species of *Rhizopogon* throughout its entire range. Like the achlorophyllous vascular plants, these fungi cannot manufacture complex carbon compounds such as sugars. But with their fine net of subterranean hyphae they sequester mineral nutrients from the soil and supply them to their tree partners in exchange for carbohydrates that the trees have in excess. Carbon compounds are made by the conifers, transferred to the mycorrhizal fungus, and then taken by the pinedrops or Indian pipe. In this way the trees supply both the fungus and non-green plants with food.

See ***Underground****, Page 10*

***Underground**, from page 9*

The wintergreens (*Pyrola* spp.) are closely related to pinesap and pinedrops, and in some instances, they too may become totally dependent on fungi for carbohydrates. For may years leafless wintergreens were considered a distinct species, *Pyrola aphylla*, until it was discovered that different species of wintergreen can become leafless, presumably when there is a more substantial relationship with the fungi compared to their leafy conspecifics. These leafless wintergreens are considered an evolutionary intermediate stage between mycorrhizal and achlorophyllous species of the Wintergreen Family.

Coral-root orchids may also parasitize mycorrhizal fungi, but they have more often been found associated with root-rotting fungi such as *Armillaria mellea*, the honey mushroom. These fungi parasitize coniferous trees for carbohydrates and are in turn parasitized by the orchids. This life history helps explain results of a recent study from northwest Montana where spotted coral-root was found to be more common in old-growth forests compared to 80–year-old second growth. The root rot that foresters so despise is food for the orchids that we admire. These simple-appearing plants give testimony to the complex web of life going on below ground.

Further reading

Furman, T. E. and J. M. Trappe. 1971. Phylogeny and ecology of achlorophyllous angiosperms. Quarterly Review of Biology 46: 219–225.

Cullings, K. W., T. M. Szaro and T. D. Bruns. 1996. Evolution of extreme specialization within a lineage of ectomycorrhizal epiparasites. Nature 379: 63–66.

This article was originally published in the Autumn 1999 issue of Kelseya, *the newsletter of the Montana Native Plant Society*

The Alberta Ecotrust

Allison Dinwoodie

I have been the ANPC representative to the Board of the Alberta Ecotrust Foundation for the last three years, so thought I'd give you a brief summary of the projects funded by Ecotrust in which I have been involved as a monitoring director. This should give you some idea of the scope of the Foundation. Projects are reviewed and funded twice a year, and a Board member is designated responsible for overseeing each project. Although I have often felt that I did not have expert knowledge to contribute, I have on occasion been able to provide

contacts, so it has been worthwhile. Now, there seems to be more emphasis on the use of native plant species in rehabilitation projects.

The first year I monitored the replacement of the boardwalk at the Clifford E. Lee Nature Sanctuary, near Edmonton. This is a popular wetlands nature reserve, which has many visitors including birdwatchers, educational field trips, and the general public. Without the boardwalk, which was becoming rotten and dangerous, access to the wetlands is impossible. This was a straightforward project, with a very tangible result.

The second project was very different. It supported FAN in the development of their computer program for entering bird field data. This has the potential for a lot of individual contributions from dedicated (and casual) birders in a common format, increasing the database on bird distributions, migration and breeding patterns. This sort of data is becoming increasingly valuable for tracking long term trends in habitat loss, climate change and pollution effects, and is not available elsewhere. It is also useful for professional field workers and could be adapted to other types of monitoring, so I felt this was a really useful project.

I have been involved with two projects at the Parkland Conservation Farm (PCF), although I only came in halfway on the first one. This is an experimental farm about 50 km east of Edmonton, where they test and demonstrate more environmentally friendly and sustainable agricultural practices. Ecotrust helped to fund two separate modules of the PCF's Education program, which is aimed mostly at older school groups but also used by the farming community. The first module was to develop a general Agro-Environmental Education Program, emphasising conservation practices such as reducing erosion and protecting waterbodies to reduce agricultural impacts on the parkland ecosystem. The second module focussed on Farming Technology and Safety for Agriculture in the 21st century, such as precision farming, biotechnology, and product safety handling. Both programs had a lot of hands-on and interactive features to engage the students' attention. The success of this type of program depends largely on the enthusiasm and organizational ability of the co-ordinator, and PCF was very fortunate to have a very skilled person as well as a number of dedicated and knowledgeable volunteers.

The same requirement for enthusiastic co-ordinators also applies to schoolyard naturalization projects, a number of which Ecotrust has funded. I came in halfway on two of these, the first one at Ellerslie Junior High. This was the more successful one, as it

***Ecotrust**, from page 10*

integrated the school's sewage lagoon, an adjacent fen, and agricultural land into their plan, and with a lot of student and parent volunteer involvement, it gave a more comprehensive idea of environmental challenges. The second project, at Coronation Primary School, appeared to only involve the planting of a few trees, without much further landscaping, so I am not too sure of the long-term impact on students' understanding of their environment.

The last two projects this year were different again. Two individuals working at the Beaverhill Bird Observatory produced and presented a program on dragonflies as a doorway to the exploration and health of wetlands. Everyone has seen dragonflies, but very few people know much about them, so this has been a very popular and well-received program, again with very enthusiastic presenters.

And finally, the last project focussed on one of the four R's: reducing greenhouse gas emissions, by promoting a car-sharing co-operative initiative. This is aimed at people who perhaps cannot afford the full cost of owning a car, or those who would like to increase the efficiency of their occasional car use, by pooling with others. Members pay only for their time and distance travelled, but have access to a vehicle on a first-come basis through a computer booking. It requires a certain amount of initial organization, which Ecotrust funded, but once set up, it should be relatively easy to maintain. It also requires some individual readjustment to organize one's schedule efficiently, but it appears to be working satisfactorily, although not spreading as fast as the Alberta Environmental Network (the recipients) would like.

As you can see, Alberta Ecotrust spreads its dollars in many directions, but with the emphasis on providing seed money for education and long term sustainability or specific actions, its value is way beyond the dollar figure. At least, the corporate sponsors who provide the dollars seem to think so, or they wouldn't be in it. And it is a chance for environmental non-governmental organisations (ENGO)to work and meet with the corporate world. As an ENGO representative, one does have to put in a fair number of hours, as the initial selection process for project approval does take time, when you can have 30- 40 projects to review twice a year. But it has been a very interesting and rewarding three years, and I hope Calvin Duane, who has taken over from me, enjoys it, as much as I did.

Frogwatch

Answer the Call!

The Canadian Nature Federation (CNF) and Environment Canada's Ecological Monitoring and Assessment Network (EMAN) would like to thank all the volunteers who helped get the Frogwatch program off to a hopping start. Although spring may seem to be a long time away, its not too early to get ready for a new season of frogwatching. For those of you who missed out on the fun last year, now is your chance to get involved!

About the program

The aim of Frogwatch is to encourage Canadians to take an interest in the health of our environment. Because frogs spend part of their life in water, and part on land, they have been chosen as an indicator species to monitor changes to our ecosystems.

They appear to be telling us something is amiss, as their numbers have been declining worldwide since the 1980s. Currently, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists three populations of frogs as endangered, while six others are categorized as threatened or of special concern. Additionally, there have been unexplained population declines in species not normally considered at risk.

In order to identify the causes of these declines, scientists must first determine the extent of frog population reductions. That's where Frogwatch participants can help. We are looking for volunteers of all ages who are willing to monitor frog calls at their local wetland on a number of evenings over the calling season. By gathering information on which frogs are calling at a particular site, when they call, and under what conditions, you can help scientists collect the data they need to identify threats to our natural environment.

Get involved now!

The earliest spring frogs begin calling in late March or early April. Regardless of where you live, the species you are likely to hear first is the wood frog, which is the only frog found in every province and territory in Canada. To listen to its ducklike quack, as well as the calls of other frogs and toads in your region, visit the National Frogwatch Web site <eqbdqe.cciw.ca/emanops/intro.html> or call 1-888-31FROGS.

Pictures and descriptions of Canada's frogs and toads can be found on the Frogwatch ID poster. A printed copy is available free of charge

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Botany Alberta No. 4

Exploring the Crown of the Continent:

The West Castle and the Big Sagebrush Natural Area

Patsy Cotteril

We were huddled in the cool spring wind against the wall of the A & W that stands prominently on the rise as you approach the town of Pincher Creek from the north. Following the pointing finger of our local guide we gazed southwest to a green eminence, Prairie Bluff Mountain, our destination for the day. It looked quite far away and rather high, and I felt a stab of my familiar pre-montane anxiety: had I brought enough warm clothes? After all, this area is the wind capital of Alberta, not far from the iconic skyline at Cowley with its wind turbines, and the mountains can still be very cold in the middle of June, even in the southwest. Such fears were forgotten, however, when after about a half-hour's drive we had arrived at the trail head of Prairie Bluff and the sun was caressing our backs as we began the climb.

Alpine townsendia (*Townsendia condensata*)

A sizeable crowd of us had assembled for the start of the ANPC's annual Botany AB field trip. This one was Number 4, masterminded and organized by Joanne Golden of Lethbridge and about to be executed by a number of local and semi-local naturalists who make it their business and pleasure to know the myriad lovely trails and by-ways of the Castle and West Castle areas, north of Waterton Park. We had converged from Edmonton and Red Deer (mostly via the Syncline Group campground on Highway 774 or accommodation in the Beaver Mines district) or simply from home in Lethbridge, Pincher and other comparatively local points. Moving upwards along a cutline through the lower wooded zone, past cool coniferous forest and aspen woods replete with the large yellow umbellifers so characteristic of this area, huge feathery mountain wild parsnip, *Lomatium dissectum*, and aniseed-smelling western sweet cicely (*Osmorhiza occidentalis*), we paused to examine woollen breeches, *Hydrophyllum capitatum*, a rarity that is confined to the southwest. (I had time to note down that it was much visited by bees.) At the first terrace on Prairie Bluff, where we stopped to admire the view eastwards and disparage the huge scar in the hillside created by the Shell gas installation, co-leader Reg Ernst decided to take the bull by the horns and sort out the bottom-feeding sheep from the upwardly mobile mountain goats. He pointed to me, bringing up the rear with *Flora of Alberta* open in my hand and commanded, "You: in the slow group." And so it was that we split and went our separate ways, a smaller group heading directly west under the guidance of Bill Sharp, and a larger, more ambitious group striking off north with Reg towards the summit of the mountain.

We were soon into montane grassland, where rough fescue (*Festuca campestris*) and fruit-setting Geyer's sedge (*Carex geyeri*) were punctuated by the brilliant blues of silky scorpionweed (*Phacelia sericea*), showy Jacob's-ladder (*Polemonium pulchellum*) and low larkspur (*Delphinium bicolor*); the whites and creams of several *Arabis* species, including Nuttall's rock cress (*A. nuttallii*), and silver-leaved scorpionweed, *Phacelia hastata*; and the pinks and purples and reds of rose and shooting-star and common red paintbrush. Rough-creviced rocky outcrops sheltered the fern, Oregon woodsia (*Woodsia oregana*), spotted saxifrage (*Saxifraga bronchialis*) and striking clumps of

sticky alumroot (*Heuchera cylindrica*). In a wooded ravine cradling a stream we found the tall understory herbs that seem to grow so vigorously in this part of the world: the Solomon's seals, false and star-flowered, baneberry, yellow Angelica (*A. dawsonii*), yellow columbine, western meadow-rue, the sedges *Carex raynoldsii* and *C. sprengelii*, and amongst a variety of shrubs the smooth gooseberry *Ribes inerme* and the prickly *R. lacustre*, both forming fruit. On a dry sandy slope of the ravine above some strange-looking wolf willow, we took our time distinguishing lance-leaved lungwort (*Mertensia lanceolata*, or was it *M. longiflora*?), a remarkably unhairy member of the borage family, from smooth blue beardtongue (*Penstemon nitidus*), in the Scrophulariaceae. These two species look superficially similar with their glaucous leaves and brilliant aquamarine-blue trumpet flowers. Beyond the ravine in the wider mountain gully we came upon a mixture of prairie, high-montane grassland species and alpines. On the moist, north-facing slope a large patch of Geyer's sedge was conspicuously still in flower; on the south-facing, blue and slender blue beardtongues (*Penstemon albertinus* and *P. procerus*), moss phlox and prairie groundsel rubbed shoulders with alpine bluegrass (*Poa alpina*), mountain wood-rush (*Luzula piperi*), kitten-tails (*Besseya wyomingensis*) and *Minuartia nuttallii*. I was surprised to see many plants of double bladderpod, *Physaria didymocarpa*, a species I am mostly familiar with from the aeolian sands of Kootenay Plains Ecological Reserve. Also worthy of admiration were the multicoloured rock layers and boulders in this gully, including some yellow sandstone-like rocks that had peculiar cigar-shaped depressions in them. All too soon it was time to retrace our steps downhill. Amazingly, sheep and goats converged with perfect timing on the road to the parking lot, the latter exultant after achieving their goal of finding alpine townsendia (*T. condensata*).

Saturday, another bright day, found us strolling along leisurely all together in the valley of the West Castle River at the Syncline Cross-Country Ski Area, under the direction of Bill Sharp and Terry Clayton. Here again was an interesting combination of habitats: cool white spruce forest, lodgepole pine and aspen, moist meadows and dry grassy or disturbed knolls. Plants that came under scrutiny included conimitella (*C. williamsii*) and its fellow saxifrage, the bishop's-cap *Mitella trifida*, whose intact but caducous petals one must see to understand its Latin name. Two annuals attracted our attention: the glandular-sticky slender phlox (which the locals have apparently dubbed "pink-twink"), *Phlox* (*Microsteris*) *gracilis*, and small baby-blue-eyes, *Nemophila breviflora*, not to be confused with the similarly-named ubiquitous blue-eyed Mary (*Collinsia parviflora*), a scroph. The phlox preferred open disturbed or sandy ground which it shared with another weedy species, prostrate speedwell (*Veronica agrestis*), while the latter sprawled weakly along the edge of the trail in forested areas. *N. breviflora*, a member like *Hydrophyllum* and the Phacelias of the water-leaf family (Hydrophyllaceae) which is well represented in this part of the world, has a couple of interesting features: its simple basal leaves are the original seed leaves (cotyledons) and contrast with the pinnately lobed true leaves, and its large, round, orangey seeds, which sit singly in the capsules. Seeds have a spongy area at their base attractive to ants that aid in dispersal (always an important consideration for annuals).

Silver-leaved scorpionweed (*Phacelia hastata*)

After lunch, alert birders Doug and Teresa Dolman presented us with a moral dilemma. They had found a junco's (*Junco hyemalis*) nest in a low shrub in which were four eggs: two belonging to the homemaking juncos, and two to an intruding cowbird (*Molothrus ater*). Should we jettison the cowbird's eggs, given the predictable fate of the junco's? We decided to leave nature alone, although the judgement would have been harder had the dark-eyed junco been a less common bird.

We rounded off the day with a short drive up the road towards Beaver Mines hamlet to a spot where Bill Sharp knew of a population of the rare *Montia linearis* (ah, the benefit of local knowledge!). Not quite as showy as its common family relative western spring-beauty (*Claytonia lanceolata*), it was quite abundant in the roadside ditch and in the wetter spots of the montane pasture upslope. This stop yielded much interest in a small area: here were the delicate small-flowered rockstar (*Lithophragma parviflorum*), few-flowered rush (*Juncus confusus*), rhomboid-leaved saxifrage (*Saxifraga occidentalis*) and a tiny *Polygonum*, to name only a few of the specialities. Sighting of a Lazuli

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Botany Alberta, *from page 13*

Bunting (*Passerina amoena*) provoked a heads-up all round, as did a surprise encounter with a herd of cows among the flowering balsamroot. creatures whose focus, like ours, had hitherto been pretty much at ground level.

On Sunday, our final day, we jolted in convoy down the hugely potholed road, southeast of the Syncline area, to Big Sagebrush Natural Area, a 540-hectare reserve that occupies the steep slopes of Windsor Ridge overlooking the Castle River. Although it has been reserved by the Province since 1980, this area, home to the largest population of big sagebrush (*Artemisia tridentata*) in Alberta as well as a high concentration of other rare species, still has not been legally established by the government. Such is politics and the widespread fear that protection will interfere with economic activity! The previous evening environmentalists Diane Pachal and James Tweedie had expounded on the difficulties of attempting to protect the Castle-Crown area, a key component of the Yellowstone-to-Yukon wilderness corridor, and that afternoon, as we ate lunch looking out over green forest as far as the eye could see, Dave Sheppard, local naturalist and long-time activist with the Castle-Crown Wilderness Coalition, expressed gloomy foreboding over what would happen when the forest was ripe for cutting.

At Big Sagebrush we were once again split into two parties, with "Tyrannosaurus" Reg once again leading the fast-track group that struck boldly upslope and Dave Sheppard guiding the "low-road" team who followed the contour across the ridge at a gentle pace. Notable plants on these slopes were mariposa lily (*Calochortus apiculatus*), more *Lithophragma* and saxifrages along the seeps and streamlets, mountain shooting-star (*Dodecatheon conjugens*), mostly past flowering, and tall, striking, entire-leaved groundsel (*Senecio integerrimus*) in full flower. When our group descended through lodgepole pine forest I was particularly struck by a community with an abundant ground cover of large wintergreen (*Pyrola bracteata*), prince's pine (*Chimaphila umbellata*) and dwarf bilberry, *Vaccinium caespitosum*. Red twinberry, *Lonicera utahensis*, was in flower beside the track leading back to the river and parking lot, and even better, in a muddy spot was a lone clump of one of the most attractive sedges in the province, *Carex mertensii*.

By late afternoon most people were headed homewards, but as I had a rendez-vous in Calgary the next evening (friend and fellow-tripper Alison Dinwoodie was a finalist at the Emerald Awards), I de-camped and set up again at Beaver Mines Lake Recreation Area. (I had time only to do a little in-depth botanizing at this delightful spot before a huge thunderstorm and continuing downpour confined me to barracks.) The next day, with time to spare, the return of sunlight and re-victualling once again at the Pincher A & W, I decided to take in the Oldman Dam exhibit site, not far away off the main highway. The experience was not without interest but stirred unpleasant memories. With the idea of getting access to the river shore I followed the road down and was horrified to see a row of cottages newly perched on a cut into the prairie escarpment: not your humble lakeshore cabins but affluent upstart pieces of architecture that looked as if they had just jumped out of a suburban subdivision. As if the scarring left by the dam wasn't enough! In the floodplain of the Oldman sat a newly refurbished campground, the home of countless Richardson's ground squirrels and definitely countable senior citizen cottonwood trees (*Populus angustifolia*, if I remember correctly). These last, bent with age and much de-limbed, were enmeshed against beaver but seemed curiously naked and orchard-like, perhaps because shrubby ground cover was completely lacking. There were no cottonwood offspring in sight, and the river shore itself had nothing to offer but agricultural weeds. I found myself trying to picture how these rivers must have looked centuries ago, pre-dams, pre-agriculture, pre-settlement. I drove sadly northwards through thundershowers, not looking forward to Calgary's prolonged sprawl. Reflecting on the sights and scenes and stories of the weekend, I concluded that there are many landscapes and ecosystems in Alberta that are still wild and beautiful, yet field trips can no longer be just field trips, they must also be clarion calls to wilderness protection.

My thanks to Joanne Golden and Eileen Ford who provided additional information for this report.

***Call**, from page 11*

from the Canadian Nature Federation, while an electronic version can be viewed on CNF's Web site. Although a survey form is included with the poster, volunteers are encouraged to submit their observations electronically via EMAN's Web site to save both paper and data processing time (see addresses below).

More information

We will be publishing a semiannual newsletter to keep Frogwatch participants up to date and provide further information. Keep an eye on the CNF Web site <www.cnf.ca> to find out when it will be available. Contact us For more information on how you can get involved, check out the EMAN Website at <eqb-dqe.cciw.ca/emanops/intro.html> or the CNF site at <www.cnf.ca/frog/index.html>. To obtain printed copies of the national Frogwatch identification poster (available in English or French), and the Frogwatch newsletter, or to be added to our electronic Frogwatch newsletter distribution list contact: Canadian Nature Federation, 1 Nicholas St., Ste. 606 Ottawa, ON K1N 7B7 phone: (613) 562-3447 fax: (613) 562-3371 email: <frogwatch@cnf.ca>

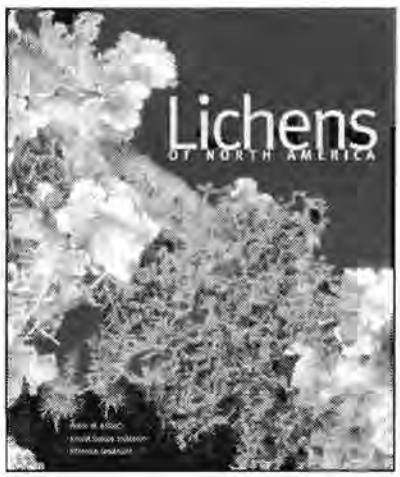
News and notes

New Books

Rare vascular plants of Alberta
Linda Kershaw, Joyce Gould, Derek Johnson & Jane Lancaster.
University of Alberta Press and the Canadian Forest Service
ISBN: 0-88864-319-5 (softcover)
Price: $34.95

Lichens of North America

Irwin M. Brodo, Sylvia and Stephen Sharnoff
Yale University Press
ISBN 0-300-08249-5, cloth
Price: US$69.95
For more information contact Yale



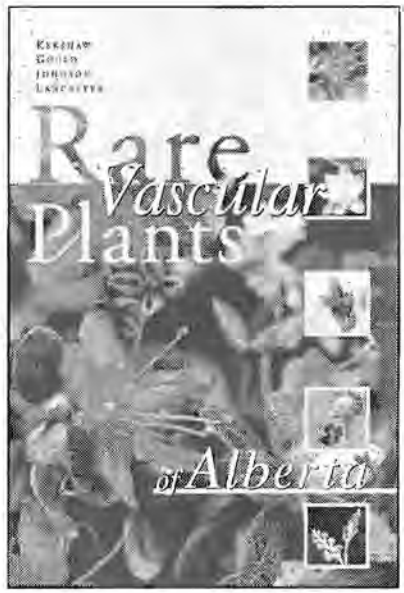
University Press <www.yale.edu/yup/>

Orchids and Their Conservation

Harold Koopowitz
Timber Press
ISBN: 0-88192-523-3, hardcover
Price: US$39.95
For more information, contact Timber Press
<www.timberpress.com>

An Illustrated Flora of Yosemite National Park

Stephen J. Botti
The Yosemite Association
Price: US$125



For more information, visit the Yosemite Association webpage <www.yosemite.org>

Northern Range Plants

Alberta Agriculture
$25
<www.agric.gov.ab.ca/homestudy>
tel. (780) 427-2171

Saskatchewan's Native Prairie: Taking stock of a vanishing ecosystem and dwindling resource.

Andy Hammermeister, D. Gauthier and K. McGovern.
Native Plant Society of Saskatchewan.
<info@npss.sk.ca> for more information.

America's Vanishing Flora: Stories of Endangered Plants from the Fifty States and Efforts to Save Them.

Center for Plant Conservation, Missouri Botanical Garden
ISBN: 0-9702488-0-6
Price: US$14.95
For more information, visit the CPC website <www.mobot.org/cpc>

Meetings

Native Plants: Our Culture, Heritage and Future
Native Plant Society of Saskatchewan, Annual Meeting and Workshop
February 22–24, 2002
Hawood Inn, Waskesiu Lake, Prince Albert National Park
for more information, contact the NPSS at (306) 668-3940 or by email at <info@npss.sk.ca>.

Canada's natural capital: investing in biodiversity for the information age

March 1–4, 2001
Ottawa, Ontario
<www.nrc.ca/confserv/biodiversity>

Sedges 2002: International Conference on Uses, Diversity and Systematics of Cyperaceae.

June 6–8, 2002
Delaware State University,
for more information, contact Robert Naczi <rnaczi@dsc.edu>

XXVI International Horticultural Congress

August 11–17, 2002
Toronto
for more information contact Norm Looney at <looneyn@em.agr.ca> or by telephone at (604) 494-6361.

The Power of Natural and the Empowerment of Natural Areas

29th Annual Natural Areas Association Conference
October 2–5, 2002
Asheville, North Carolina, USA
for more information, visit the NAA website at
<www.natareas.org>

***Rare**, from page 1*

The *Rare Vascular Plants of Alberta* book makes a wonderful gift for any Alberta nature lover. It is also perfect for teachers, students, professional botanists, land-use planners, foresters, environmental consultants, and natural-history enthusiasts. Order your copy today!

The *Rare Vascular Plants of Alberta* was edited by four of the ANPC's own:

- Linda Kershaw, MSc, botanist, writer and editor
- Joyce Gould, MSc, biologist/ botanist
- Derek Johnson, MSc, ecologist, herbarium curator
- Jane Lancaster, BSc, botanist

In addition to the editors who spent years bringing together the material, over 100 other individuals and organizations have been involved in the rare plants project since its beginning, with the Alberta Native Plant Council taking a lead role as author. Numerous reviewers took time to comment on the material.

Two project editors, Brenda Laishley and Leslie Vermeer, had the daunting task of channelling all of the material into book form. The designer, Carol Dragich, performed miracles getting everything in its proper position. When it came time to package all of this information into book form, it took the energy and resources of two publishers to produce it: the University of Alberta Press and the Canadian Forest Service.

How can you buy a book, save some money and support ANPC?

The Rare Vascular Plants of Alberta is available from the ANPC. We are selling books to members for only $25.00 each. This is a 16% discount, but with the added benefit of no GST, it is equivalent to a saving of 22% or $7.05 per book. What a bargain! And, the ANPC makes $4.17 for each guide sold.

If you live in or near Edmonton, Red Deer or Calgary, you can pick up books from the following people:

Calgary

Mryka Hall-Beyer,
Department of Geography,
University of Calgary,
(403) 220-6586 wk; 284-1621 hm
<mhallbey@ucalgary.ca>

Edmonton

Lorna Allen,
tel. 780-427-6621 wk;
(780) 436-8032 hm; fax 427-5980
<lorna.allen@gov.ab.ca>

Joyce Gould
Dept. of Renewable Resources,
University of Alberta,
(780) 492-4155 wk
<ajgould@ualberta.ca>

Red Deer

Eileen Ford
Box 12, Penhold AB
(403) 886-4905 hm
<hh3@telusplanet.net>

It might be a good idea to call or e-mail ahead of time to make sure that your contact person will be in when you arrive.

Members can place orders using the order form. You must be a member to qualify for this discount. However, shipping charges ($6.00 postage and handling for 1 book and $1.00 for each additional book in an order) will need to be added to orders. Even at $31.00 ($25.00+$6.00), you still save $1.55 per book and the ANPC profits from your sale.

*Note to the potential buyers: According to our agreement with the U. of A. Press, we can only sell books to ANPC members and to people attending lectures and workshops involving the editors of the book and/or ANPC members. It's important that we sell only to non-competing markets. Consequently, if friends or fellow researchers are visiting from out-of-town and want to buy a copy, we can sell them one, but we can't sell books to local people who aren't affiliated with the ANPC. The price for non-members is $30.00 each (with no GST). Maybe this is an incentive for new members to join!

Yes! I'd like my own copy of *Rare Vascular Plants of Alberta*

_____ copies @ $25 each	____
shipping (1st copy)	$6
shipping (additional copies) @ $1 ea.	____
Total	____

Note: You must be a member of the ANPC to qualify for this discount. Individual memberships can be purchased for $15. Please make cheques payable to the ANPC and send to:

Alberta Native Plant Council, Box 52099, Garneau Post Office, Edmonton AB T6G

Ship to:

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Address: _____

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Province _____ Postal Code _____