

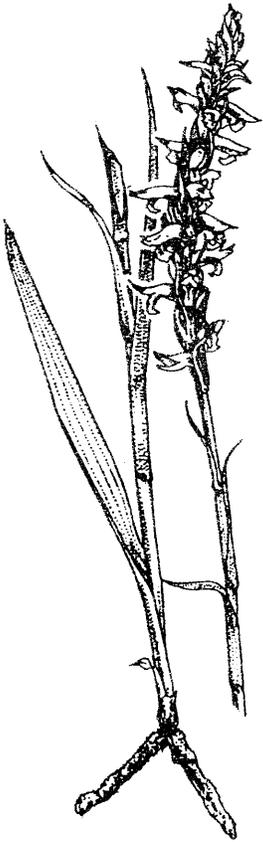
Kelseya

NEWSLETTER of the MONTANA NATIVE PLANT SOCIETY

Ute ladies' tresses shows up again in Gallatin County

And puts an airport expansion project on hold

By Judy McCarthy



Spiranthes diluvialis.
Illustration by
Carolyn Crawford.

Montana has two plants protected as threatened on the Endangered Species list: Ute ladies' tresses and Water Howellia.

THREE FORKS – Now there are eleven Montana locations of the threatened orchid, Ute ladies' tresses (*Spiranthes diluvialis* Sheviak). All eleven are in Gallatin, Madison, Jefferson and Beaverhead Counties. The intermontane valleys about the Jefferson, Gallatin, Madison, Beaverhead and Ruby rivers form 80 miles of connected valleys at the headwaters of the Missouri River, braiding specialized habitat for this rare orchid. Restricted to low elevation valley bottoms, *Spiranthes diluvialis* occupies wet meadows, stream banks and abandoned stream channels in a micro-habitat that falls within four soil series: within them to shallow, meandered wetlands; and within these, to small pockets of highly calcareous meadows. For more about Ute ladies' tresses, see Bonnie Heidel's full report in the Spring 1996 edition of *Kelseya*.

Donna Lovell, wetlands environmental consultant, anticipated the possible occurrence of this threatened orchid species in a planned airport expansion area at Three Forks, in Gallatin County. Well equipped with Montana Natural Heritage Program reports, illustrations and photographs of *S. diluvialis*, Ms. Lovell surveyed the wetlands at the anticipated mid-August flowering time and, lo!, an ivory-colored orchid appeared.

I was happily drawn into the excitement when asked to identify the orchid. Thus my delightful adventure began with the literature search, followed by careful and, incidentally, indescribably beautiful views of this creamy, delicate flower under the microscope at MONT. The terms *pandurate* (fiddle-shaped, referring to the lip), *ringent* (gaping, referring to the corolla) and *pollinia* (waxy pollen grains transported as a unit) became commonplace as I waded through the technical description, measuring the millimeters of each characteristic of leaf, bract, sepal, petal, lip, basal calli and root.

An on-site visit and comparison among three specimens satisfied me of the positive identification of *Spiranthes diluvialis*. Finally, I confirmed my findings with both Bonnie Heidel (MNHP) and Ernie Nelson of the University of Wyoming Herbarium, collector of *S. diluvialis* in Wyoming. *Continued on page 3*

Protected flower stymies airport plans

For airport officials at Pogreba Field in Three Forks, there is a problem blooming in the nearby wetlands. They are flowers called Ute ladies' tresses. Standing less than a foot tall, they bloom in August and are rather inconspicuous. But *Spiranthes diluvialis* has been protected under the Endangered Species Act since 1992. It is a discovery that could thwart officials' plans to expand the growing airport. Airport officials want to fill in the 10-acre wetlands and expand the airport. For years (they) have been trying to buy the wetlands that abut the airport. The marshes are man-made, created nearly 70 years ago when workers dug pits to build an overpass on Highway 2 to go over railroad tracks.

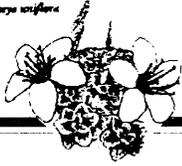
From an article in the *Bozeman Daily Chronicle*, Sept. 19, 1998, by Tim Neville. Used by permission.

CALL FOR PAPERS

PRESENTATIONS ARE
INVITED TO THE 1999
MONTANA NATIVE PLANT
CONFERENCE

Co-sponsored by the
Montana Native Plant Society
and Salish Kootenai College.
This year's conference will be
March 25 and 26 at
Salish Kootenai College
Pablo, Montana

See page 3 for more details.



FROM THE PRESIDENT

WAYNE PHILLIPS

Annual Meeting at Seeley Lake

Congratulations to the Clark Fork Chapter for the great annual meeting at Camp Paxson on the shore of Seeley Lake. The location, facilities, and field trips (and guides) were outstanding! I was thrilled to see and photograph several new (for me) native plant species including: large round-leaved rein orchid (*Habenaria orbiculata*, Orchidaceae), narrow-leaved cow-wheat (*Melampyrum lineare*, Scrophulariaceae), broad-tipped twayblade (*Listera convallarioides*, Orchidaceae), and round-leaved sundew (*Drosera rotundifolia*, Droseraceae). Isn't it fun to botanize a new area with nice folks who are enthusiastic about plants?! Membership in Montana Native Plant Society is truly a rewarding experience!

Thanks to Clark Fork Chapter representatives: Will Butler and Peter Lesica, Anne Garde, Madeline Mazurski, John Pierce, Steve Shelly, Jack Greenlee, Steve Arno, Robyn Klein, Maria Mantas, Dorothy Faucett and those in the Clark Fork Chapter for all the work in organizing and making our trip to Camp Paxson both educational and fun.

A special thanks to guest speaker Rosiland Yanishevsky for her outstanding presentation on old growth forests.

Congratulations to Madeline Mazurski, who received the outstanding service award at the Annual Meeting. The time and energy that Madeline has poured into the Society as Treasurer and Membership chairperson is truly remarkable and deserving of our thanks and praise. If that wasn't enough, there was Madeline at the Annual Meeting organizing and running the plant identification demonstration and contest. Thank you, Madeline, for all of your many contributions to the Montana Native Plant Society.

Also announced at the Annual Meeting were the installment of your new officers: Vice-President Betty Kuropat from Whitefish, Secretary Pat Piatenberg from Townsend, and Eastern

Montana Director at Large Hal Vosen from Miles City. Congratulations and thanks to Betty, Pat and Hal for taking on these important jobs for the Society.

Recognition

Pryor Mountains bladderpod (*Lesquerella lesicii* Rollins)

An article in the Great Falls Tribune recently announced that a new Montana native plant species has been named for its discoverer, our own Peter Lesica. Pete found the new bladder-pod species in the Pryor Mountains in 1992. He sent the specimen to Reed Rollins at Harvard University, who described the species in the botanical literature in 1995, naming it in honor of Pete. The plant is one of only about a dozen species that are endemic to the state of Montana. Congratulations Pete!

Montana Native Wildflowers in the News

In July I led an alpine wildflower walk for the newly formed Beartooth Chapter of MNPS. The front page of the "Outside" section of the Carbon County News for July 22, 1998 announced the wildflower walk and had a highlighted section entitled "Nature Notes" by Jean Redonski, representative of the Beartooth Chapter, MNPS. In Nature Notes Jean described the Alpine buttercup (*Ranunculus adoneus*) and spring beauty (*Claytonia lanceolata*) in the well written article, which included good pictures of the plants. Evidently Jean's Nature Notes are a regular feature of the Carbon County News. Jean also had a letter in the Opinion Section of this same newspaper describing the MNPS Annual Meeting, and inviting new members to the Society. Of course, it helps that the vice-president of the Beartooth Chapter is Carbon County News Staff Reporter, David Owen. Congratulations and thanks to Jean and David for their work on behalf of the MNPS in the Red Lodge

area.

A regular weekly feature of the Great Falls Tribune this summer has been "The Wildflower Trail" by MNPS member Fay Valois, of Vaughn. Fay has featured a Montana native wildflower in each of these articles, complete with her outstanding photos of the flowers. In addition, Fay has had special feature stories in the Tribune about growing wildflower gardens (Go Wild for Flowers) and Lewis and Clark plants, also with photos from her camera. Congratulations, and thanks to Fay.

Perhaps other members of the Society have also been active in writing native plant articles and submitting wildflower pictures for the newspapers in their community. I would be interested in examples and information about this activity, which benefits the Society. Please drop me a note.

- Wayne P.

Next Board Meeting

**Saturday,
November 7th
10:00 a.m.
Lewis & Clark
Library
Helena**

The Board of Directors of the Montana Native Plant Society meet twice a year in Helena. Chapter and At-Large Representatives and other officers get together to discuss the business of the Society. Let your representative know if there is anything you would like to be considered at the Fall Board Meeting. Any member is welcome to attend the day-long session.

Wayne can be reached at 2601 Third Ave. North, Great Falls, MT 59401

e-mail: mtwayne@juno.com

Ute ladies' tresses

From page one

Charles J. Sheviak wrote in *Spiranthes diluvialis*, *A New Species from the Western United States* (Brittonia 36 (1), 1984, pp. 8-14) an explanation of the origin of this species in Colorado, Utah and Nevada. The hybridization of *S. magnicamporum* (2n=30) and *S. romanzoffiana* (2n=44) yielded *S. diluvialis* (2n=74), with characteristics of both parents, which enable its survival. When the climate became drier, the parental species and the hybrid species responded differently due to different habitat requirements. The boreal *S. romanzoffiana* retreated to higher, cooler

and wetter areas; *S. magnicamporum*, requiring warm, mesic sites, was extirpated from the region; and *S. diluvialis* combining adaptive features of both parents, colonized extensive

Spiranthes diluvialis raises concerns for airport expansion.

• Three Forks

areas of wet, warm territory. As aridity increased, *Spiranthes diluvialis* became progressively more limited to scattered areas of permanent water. (*Spiranthes* was named *diluvialis*, "of the flood," in allusion to both its wetland

habitat and to its hypothetical origin in a Pleistocene pluvial period).

Today we find this orchid adapted to lower elevations in mesic or wet meadows along permanent streams. Hence the Three Forks arid region is suitable habitat for a southern plant of Great Basin origin, as long as it finds shallow wetlands and calcareous meadows.

As a result of *Spiranthes diluvialis* occurrence near the proposed expansion to the Three Forks airport, the project has been put on hold indefinitely.

Judy McCarthy is president of the Valley of the Flowers Chapter of MNPS.

A Special THANK YOU goes to these fine businesses and individuals for contributing to this year's annual meeting:

- ⇒ Bagels on Broadway
- ⇒ Big Sky Brewing
- ⇒ Biodesign Farm (Helen Atthowe)
- ⇒ Bitterroot Restoration (Pat Burke)
- ⇒ Botanica (Brenda Oviatt)
- ⇒ Great Harvest Bakery
- ⇒ Hunter Bay Coffee Co.
- ⇒ Mountain Press
- ⇒ Rocky Mountain Elk Foundation
- ⇒ Jerry DeSanto
- ⇒ Don Fawcett
- ⇒ Gertrude Lackschewitz
- ⇒ Sheila Morrison
- ⇒ Mary Beth Percival

THANK YOU

Research Natural Areas Program has change in leadership

MISSOULA – In pursuit of new adventures, Dr. Angie Evenden, Natural Areas Program Manager, departed the Forest Service in early April. Since arriving in Missoula in 1987, Angie has guided natural areas and botanical resource programs in the Northern Region. A scientist with the Rocky Mountain Research Station for the past seven years, Angie served as the manager for the Natural Areas Program in Montana, Idaho, North Dakota, Utah and western Wyoming. The program primarily emphasizes work on Research Natural Areas, and to a lesser degree, Special Interest Botanical Areas. During her tenure, Angie helped secure establishment of over 125 new research natural areas on National Forests throughout the northern Rockies and intermountain west. Upon her departure, Regional

Botanist Steve Shelly assumed leadership for the natural areas program.

Pursuing a desire to get back to her botanical (field) roots, Angie is conducting freelance botanical conservation work throughout the west. Although she will remain based out of her home in Missoula, she may often be found exploring some southwestern desert landscape. Her initial projects include working for The Nature Conservancy of Utah, the Western Regional Office of The Nature Conservancy and the new Grand Staircase-Escalante National Monument in southern Utah.

Angie has served MNPS as president and chair of the small grants committee. Her efforts on behalf of MNPS and her contributions have been greatly appreciated, and we wish her all the best.

1999 Montana Native Plant Conference

By Virgil Dupuis

PABLO – Presentations are invited to the 1999 Montana Native Plant Conference, co-sponsored by The Montana Native Plant Society and Salish Kootenai College. This year's conference will be March 25 and 26 at the Salish Kootenai College campus in Pablo, MT.

A major new theme for this year's conference will be Native American cultural plant issues and traditional ecologic knowledge; in addition to rare plant, plant community and natural areas conservation, and the promotion and use of native plant materials for ecological restoration.

There will also be a Tribal perspectives forum when interested Tribal representatives will be offered the time to present information on the status of their cultural plant programs and concerns.

The second day of the conference will be dedicated to special workshops, demonstrations and meetings. Display space will also be available both days.

Interested presenters should send a 200 word abstract (hardcopy and disk) to Steve Shelly, USFS, P. O. Box 7669 Missoula, MT by January 15, 1999. Copies can also be emailed to him at: Shelly_Steve/r1@fs.fed.us.

Program committee contacts are:

Agenda:

Jack Greenlee 406-542-3887
Steve Shelly 406-329-3041
Joanne Bigcrane 406-675-2700

Facilities:

Virgil Dupuis 406-675-4800
Pat Hurley 406-675-4800

Guest Speakers:

Bonnie Heidel 406-444-0581
Joanne Bigcrane 406-675-2700

The Complex Web of LIFE UNDER GROUND

By 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)
- 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.

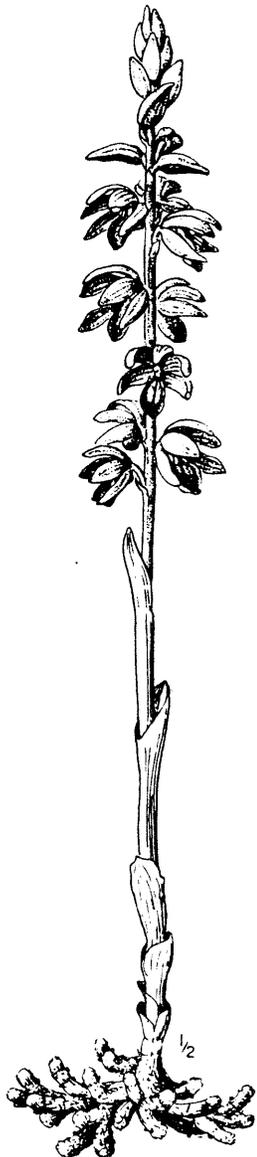
The achlorophyllous ericads are usually associated with the same fungi that form mycorrhizal symbioses with coniferous forest trees. Pinesap parasitizes members of the genus *Suillus*, *Rhizopogon* and close relatives; Indian pipe was found with members of the genus *Russula*; and pinesap parasitizes 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.

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 many 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.

Continued on next page



Corallorhiza striata

Life Under 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.



Can you identify the plant depicted in the drawing above? Send your answer to MNPS, P.O. Box 1632, Noxon, MT 59853. All correct entries will go into a drawing for a packet of native plants greeting cards. Please include your name, address and phone number.

Both illustrations are by Jeanne Janish, *Vascular Plants of the Pacific Northwest*.

LANDSCAPING WITH NATIVE PLANTS

Why should you?

Traditional Landscaping

The expansive grass lawns which predominate in our country today comprise primarily non-native grasses, and require considerable maintenance and cost to keep them alive. Natural landscaping improves air and water quality through reduced use of landscape chemicals and fossil-fueled maintenance equipment. Natural landscaping costs less to maintain, and also provides habitat for wildlife, helps manage stormwater and enhances regional biodiversity.

As an example of the impacts of domestic development on biodiversity, consider what has happened in the mid-west. Prior to the arrival of the first European settlers, approximately 65% of Illinois, 33% of Minnesota and 15% of Indiana consisted of prairie (native grasslands). Today, less than one percent of native prairie remains in these three states. Much of the loss was to agricultural uses, but urban development also consumed vast amounts of native prairie.

Nationally, there is more than 20 million acres of lawn, or 32,000 square miles, in the United States. More American land is covered by well manicured grass than by any other "crop." In urban areas, lawn irrigation uses large amounts of water -- up to 30% of water consumption on the east coast, and up to 60% on the west coast.

Most people tend to over-fertilize their lawns. Phosphorus and nitrogen from fertilizers wash into the nation's lakes and rivers, causing rapid plant and algae growth, depleting oxygen, harming aquatic life and interfering with recreational activities.

Gas-powered garden tools emit 5% of the nation's air pollution, and a gas-powered mower emits 11 times the air pollution of a new car for each hour of operation. The average homeowner spends 40 hours a year mowing lawn.

How will planting natives conserve water?

Native species are plants that originate in a given area and as a result are adapted to the local climate and environmental conditions. Adaptations allow them to use less moisture in their environment. Native plants have deeper, more

extensive root systems than lawn grasses. This root network enables them to obtain moisture when needed, while lawn grasses are always needy, and so, vulnerable to drought.

Many native plants, especially from the prairie, are covered with small hairs which help them reduce evaporation and utilize atmospheric water vapor and dew as a source of water. Native plants do not require as much water to grow as non-natives. Planting at least a portion of your yard with natives will reduce your dependence on irrigation.

How will planting natives reduce dependence on fertilizers?

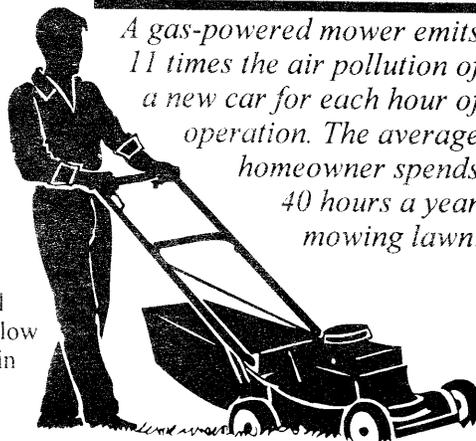
Limit your lawn to areas of active use. Consider converting areas of your lawn that are infrequently used to native plants or ground cover requiring less maintenance. Then take good care of the lawn that remains. To avoid over-fertilizing, test your soil every three or four years in either fall or spring to accurately determine what is needed. When applying fertilizer, be sure to follow the package instructions and apply only the amount recommended. Remember, more is not necessarily better.

How does landscaping with natives benefit the environment?

Every plant species provides different benefits for the environment. All plants take up nutrients in the soil, some return nutrients as well, and most offer different types of habitats and food sources. Birds, insects and other wildlife depend on many different native plants. The modern lawn provides very little of these benefits. The primary Eurasian grass species that make up our lawns are of little use

to most insects and animals. Landscaping with natives contributes to regional habitat diversity in your own backyard.

This information came from EPA Fact Sheets on *Natural Landscaping*. John Pierce is the MNPS Landscaping Committee contact. For more info call him at (406)542-2640.



A gas-powered mower emits 11 times the air pollution of a new car for each hour of operation. The average homeowner spends 40 hours a year mowing lawn.

CHAPTER LIFE

Get involved with an MNPS Chapter in your area, or join with other members for field trips and programs.

WE'D LIKE TO HEAR FROM YOU!

The Montana Native Plant Society has eight chapters across our great state. From Westby to Whitefish, Billings to Butte, we'd like to hear about your activities in each issue of *Kelsey* right here in: Chapter Life. Send your reports to:

Montana Native Plant Society,
Dennis Nicholls, *Kelsey* Editor,
P.O. Box 1632,
Noxon, MT 59853.

It's a big state. Let's share our adventures.

Storm Lake

ANACONDA – On August 8th eight MNPS members from the Calypso and Clark Fork chapters met at Storm Lake at the edge of the Anaconda-Pintlar Wilderness and climbed to Storm Lake Pass and Goat Flats on the Continental Divide. With the help of trip leader Peter Lesica, we identified 103 species in flower. It was a great day for gentians; we saw explorer's gentian (*Gentiana calycosa*), swertia (*Swertia perennis*), the little annual northern gentian (*Gentianella amarella*) and our spectacular white gentian (*Gentiana algida*). We also relocated one of only two known Montana populations of Kruckeberg's swordfern (*Polystichum kruckebergii*), and our only population of Weber's sawwort (*Sausurea weberi*). We had a surprise encounter with summer resident of nearby Southern Cross and MNPS member Mark Behan and his llama who were out for a stroll. They joined us on our return trip. It was beautiful weather, and some of us jumped in the lake when we got back. Clark Fork members hope that the Calypso Chapter organizes more hikes in that area. The Calypso Chapter covers southwestern Montana.

- Pete Lesica

Bottle Point

TROUT CREEK – The Saturday after the annual meeting in July, Pete Lesica joined a merry band of hikers for an excursion onto the high open ridges of the Clark Fork-Coeur d'Alene Divide along the Montana-Idaho state line. It was a gorgeous day with virtually no wind, marred only by the explosion of a truck battery that sprayed Pete and several others with battery acid! Fortunately, no one was hurt, but it is rumored that the western Montana Rep owes several people new sets of clothing. We refused to allow the incident to dampen our enthusiasm to look for subalpine plants nestled in the grassy meadows of Bottle Point. About 70 plants were catalogued along the way. Among the most interesting finds of the day were the namesake plant for the Figwort Family (*Scrophulariaceae*), *Scrophularia lanceolata*; a native St. Johnswort, *Hypericum formosum*; and what appeared to be a coastal variety of *Saxifraga ferruginea* (this plant had no bulblets as it was supposed to have in this area). Though clear cuts crowded our ridge on either side in these heavily logged mountains, we were treated to pristine meadows on the ridge tops.

- Dennis Nicholls

Ninepipe Refuge

RONAN – August 8, at 1:00 p.m., with 30 garbage bags of purple loosestrife, *Lythrum salicaria*, in the back of Bill West's pickup, we applauded ourselves for another year of pulling at Ninepipe National Wildlife Refuge south of Ronan in the Mission Valley. There were six of us: veteran pullers Neal and Pattie Brown, Bill West from the Bison Range, Ed Prach and Brett Thuma with his friend from California, Adam. Pattie modeled her new purple loosestrife leisure suit, a vision in pink!

And so we slogged off into the wetland, and after a wet June and a high water table, we found loosestrife on then dry sites. *Lythrum* invasions degrade and can eliminate wetlands. It has no value to wildlife and quickly replaces native vegetation. If allowed to flourish, it will radically change the character and value of Montana's pristine wetland resources. *Lythrum* is a stout, erect perennial herb that sends up multiple stems from a dense, matted root system. Plants can be ten feet tall. Stems are four to eight sided; leaves are opposite or whorled; flowers are pink (see Pattie's leisure suit) to purple with six petals. Old stems with seed capsules can persist through the winter. A single stem can produce 120,000 seeds a year, and seeds are viable for 50 years.

We know we will be pulling loosestrife from this area until we are in nursing homes. We enjoyed a gourmet picnic and discussion with Bill West on wetlands issues. Why not join us next year? Look for loosestrife in other waterways and wetlands. We found it in Swan River north of Ferndale Bridge this year.

- Neal Brown

Indian Meadows

LINCOLN – Members of the Kelsey chapter enjoyed an interesting hike to the Indian Meadows Research Natural Area outside of Lincoln led by John Pierce of Missoula and John Beaver of Helena on July 25. The intent of the hike was to explore the diverse wetlands in the area and search for three sensitive species, pale sedge (*Carex livida*), the carnivorous linear-leaved sundew (*Drosera linearis*) and water bulrush (*Scirpus subterminalis*). Several pristine wetland communities exist at Indian Meadows, including old beaver ponds currently dominated by Geyer willow/beaked sedge (*Salix geyeriana/Carex utriculata*); forested – Englemann spruce (*Picea englemannii*) and quaking aspen (*Populus tremuloides*); wetlands – bluejoint reedgrass (*Calamagrostis canadensis*); moist meadows, and floating organic mats and fens. Indian Meadows occupies a basin in a perched glaciated bench surrounded by low hills of lodgepole pine (*Pinus contorta*).

The ecological history of the area is particularly interesting. Walking between the different wetland communities provides snapshots of wetland succession from open water beaver ponds to sedge dominated meadows, and eventually less saturated areas supporting shrubby cinquefoil/tufted hairgrass (*Potentilla fruticosa/Deschampsia cespitosa*) communities. Viewing these different sites in a day allows one to imagine each wetland's successional history from open water to eventual terrestrial habitat.

The floating organic mats,
Continued on next page

CALENDAR: Spend an evening with your plant-loving friends!

Indian Meadows

however, are perhaps the most unique features in the area. These mats are formed of several inches of accumulated, incompletely decomposed organic or "peat" soil that is deposited under water-soaked conditions. The mats near the center of a basin float over water and "quake" when walked upon. While the mats are generally over a foot thick, several of us discovered the thin spots by unexpectedly sinking hip deep in the cold, brackish water. Though the carnivorous sundews at the site would likely have appreciated the service had we sunk out of site, this particular process of nutrient enrichment is not commonly recommended.

In addition to the interesting environment, all three sensitive plant species were observed on the fens as well as an additional state-listed species, English sundew (*Drosera angelica*). Several additional species were also added to the original species list for the area.

The combination of the strange, semi-terrestrial environment and the presence of unusual species made the fens an extremely interesting area to explore.

More information on peatlands, quaking bogs and fens is available in the recently published Forest Service report *Peatlands on National Forests of the Northern Rocky Mountains: Ecology and Conservation* (Chadde et al., 1998).

- John Beaver

VALLEY OF THE FLOWERS CHAPTER *Bozeman*

Wednesday, November 4, 7:30 p.m. Rm 306 Lewis Hall, MSU Campus. Stuart Jennings, "Reclamation Efforts in Butte and Anaconda Using Native Plants."

Wednesday, December 2, 7:30 p.m. Rm 306 Lewis Hall, MSU Campus. Dr. Cathy Cripps, "The Wild Mushrooms of Montana's Aspen Forests."

Wednesday, February 3, 7:30 p.m. Rm 306 Lewis Hall, MSU Campus. (stay tuned for details).

Wednesday, March 3, 7:30 p.m. Rm 306 Lewis Hall, MSU Campus. Charlotte Trollinger, "Phylogenetically Inclined."

Wednesday, April 7, 7:30 p.m. Rm 306 Lewis Hall, MSU Campus. Bonnie Heidel, "Newly Discovered Species Since Dorn."

CLARK FORK CHAPTER *Missoula*

Thursday, November 12, 7:30 p.m. Dr. Mark Behan will present a Story of Teas based on his experiences in Nepal and the Himalayas. Room 119, Gallagher Building on U of M campus.

December Pot Luck will be held at Joe Elliot's home at 3918 Lincoln Road, Missoula at 6:30 p.m. Call Will Butler, (406)543-6744, for the date.

Be prepared to bring a plate and utensils to eat with, a favorite dish to share, and a few slides of past adventures to show the group.

ARTEMISIA CHAPTER *Billings*

Clayton McCracken of the Artemisia Chapter said they are looking for people in south-central Montana to take on leadership roles in that chapter. He is hoping for "coffee discussions" this winter with those willing to assume responsibility for organizing meetings and field trips. Clayton said, "We want to get out next spring and look at wildflowers," but he indicated that they are in need of helpers. If you can help pull the Artemisia Chapter together then give a Clayton a call at (406)252-2807. South-central and southeastern Montana is big country full of native plants to look at. We hope YOU can help us get out there and find them.

MAKA FLORA CHAPTER *Westby*

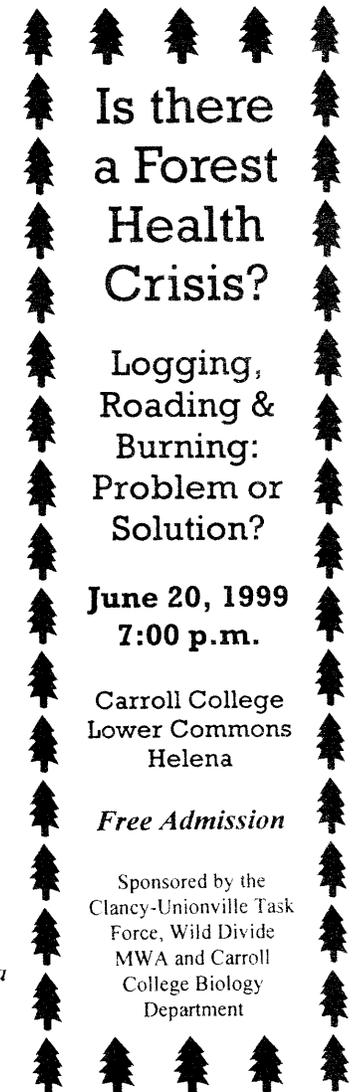
Al Joyes of the Maka Flora Chapter said that they intend to have fall meetings and events in the far northeast corner of the state, but have not yet set a schedule. Those people are big time farmers out there on the plains, and it is difficult to find time to get organized. But Al said that they will, and anyone interested in programs in the Plentywood, Scobey, Wolf Point and Westby areas should call him for dates and times. Al's phone number is (406) 385-2579.

KELSEY CHAPTER *Helena*

November 5th, 7:00 p.m. at Lewis and Clark Library in Helena. Sue Crispin, Director

of the Montana Natural Heritage program, will present a program on the flora of the Great Lakes region and its surprising commonality with vegetation found in the Rocky Mountains. We will learn how relic communities in the Great Lakes area came to be there and why they are so similar to some of the plant communities closer to home.

PLEASE REMEMBER:
to send in meeting announcements by December 10 for the next issue of the newsletter.
Thank You.



Is there a Forest Health Crisis?

Logging, Rooding & Burning: Problem or Solution?

**June 20, 1999
7:00 p.m.**

Carroll College
Lower Commons
Helena

Free Admission

Sponsored by the
Clancy-Unionville Task
Force, Wild Divide
MWA and Carroll
College Biology
Department



MONTANA NATIVE PLANT SOCIETY 1999 SMALL GRANTS PROGRAM

The Montana Native Plant Society announces the fourth annual small grants program for research, study and appreciation of Montana's native plants. One or two grants of up to \$500 each will be awarded in 1999 to fund projects or studies supporting conservation of native plants in Montana.

The grant competition is open to residents of Montana or members of MNPS. The deadline for proposals is **JANUARY 30, 1999.**

The purpose of the MNPS Small Grants Program is to stimulate research, conservation and

education activities which help foster an appreciation for Montana's native plants and plant communities. These grants are intended to promote native plant conservation through better understanding of our native flora and the factors effecting their survival.

In 1997 two grants were awarded for the 1998 field season. In the last issue of *Kelsey* Wendy Belliveau reported on the cryptobiotic soil crusts in the sagebrush steppe grasslands of western Montana. A small grant from MNPS helped Wendy conduct the field studies and greenhouse experiments she needed to determine the interactions between organisms in soil crusts with vascular plants. She concluded that understanding cryptobiotic soil crusts may aid in arid land conservation efforts.

If you have a project that you think might qualify for the MNPS small grants, consider submitting a proposal with the following information:

PROJECT EXPENSES ELIGIBLE FOR COVERAGE:

- Direct costs of travel, meals and lodging for research, conservation or education projects.

- Supply and service expenses used for the sole purpose of the native plant project.
- Printing costs for public outreach projects or research publications.

Please, do not include expenses such as wages and equipment, nor expenses that are non-essential to the project.

APPLICATION PROCEDURE & REQUIREMENTS:

- Submit two copies of your proposal. It should be no longer than three pages, double spaced type.
- Include a project title.
- Identify a contact person, organization affiliation if any, and give address and phone number, and email

if applicable.

- Describe the project (objectives, methods, description of final product).
- Please explain how the project will benefit native plant conservation in Montana.
- Outline an overall project budget, including the amount you are requesting from MNPS (up to \$500), and show other funding sources.
- Give a time frame for completing the project.
- Give a brief statement of the applicant's

qualifications.

Successful applicants will be required to submit a final report documenting the study or project accomplishments to the Montana Native Plant Society. We will also require a brief summary of the work to be published in *Kelsey*, newsletter of MNPS.

Submit your project proposal to:
Montana Native Plant Society
P.O. Box 8783
Missoula, MT 59807-8783

Remember the deadline is January 30, 1999.



RHIZOMES

(news briefs from around the state)

HELENA – Bonnie Heidel from the Montana Natural Heritage Program notes that MTNHP has a new email address and website domain name. If you need help from Bonnie or the Heritage Program, contact them at 1515 E. 6th Avenue, Helena, MT 59620-1800; phone (406)444-0536; fax (406)444-0581; email: bheidel@nris.state.mt.us. Homepage <http://nris.state.mt.us/mtnhp>.

CLINTON – Kelly Chadwick writes that MNPS t-shirts from the 1998 annual meeting at Seeley Lake are still available. Long sleeves are \$16.50, short sleeves \$13.50. The t-shirt artwork was designed by Susan VanRooy, and represents the large trees of the Western Larch forest of western Montana. Order your t-shirt from your chapter representative, or give Kelly a call at (406)258-5439. They would make great Christmas gifts.

HELENA – Montana Audubon will be offering wildlife grants totaling more than \$1000 in 1999. This money, generated by an endowment fund called the Audubon Wildlife Fund of Montana, will be awarded to individuals or nonprofit organizations whose project will directly benefit wildlife in Montana. Preference will be given to projects involving non-game wildlife, from birds to invertebrates, and their habitats. The deadline for submittals is December 7, 1998. Submit your proposal to the Audubon Wildlife Fund, Montana Audubon, P.O. Box 595, Helena MT 59624. For more information call (406)443-3949.

Anything happening in your part of Montana that should be reported here in Kelsey? Send a note or report to Kelsey Editor, P.O. Box 1632, Noxon, MT 59853.

Big Sky

KETCHES

With Bonnie Heidel

Primula alcalina

Alkali primrose (*Primula alcalina*) will be recognized for Montana in the "Flora of North America." Verification of the 1936 specimen from Monida, collected by Frank H. Rose (MONTU), was recently made by Primula expert and FNA author, Sylvia (Tass) Kelso of Colorado College. Alkali primrose is a regional endemic species otherwise known from five occurrences in Idaho, and ranked G1 (globally imperiled).

This taxonomic review resolves whether alkali primrose has really been found in Montana, a point of previous debate, but begs the question of whether it survives here. The FNA text will include a "?" beside Montana because the only known population may be extirpated.

The population at the Monida collection site has not been relocated despite surveys of over 20 alkaline meadows around the area conducted by Peter Lesica. The Monida landscape has changed since 1936 with the construction of Highway 15. This information provides the basis for assigning it a state rank of "SX" - believed to be extirpated in Montana.

Surveys around Monida and other areas in Beaverhead County have produced new records for mealy primrose (*Primula incana*), a circumboreal relative that is also tracked as a Montana plant species of special

concern. These are the only two species of the primrose genus (*Primula*) in foothills, valleys and plains of Montana beside the high elevation species, Parry's primrose (*Primula parryi*).

The two low elevation species are both scapose perennials, 7-30 cm tall, with

corolla 5.8-8.2 mm long, lilac; leaves strongly farinose on abaxial surface, denticulate; Rocky Mountains from northern Canada to Utah and Colorado ... *P. incana*.

Note: Albino flowers can be found in any species of *Primula*. That corolla color

The suite of habitat characteristics and variables among Idaho populations has been characterized in the Idaho status report (Moseley 1989) and as part of management research evaluating demographic response (Muir and Moseley 1994).

For now, add *Primula alcalina* to your copy of Dorn (1984). Next year, please collect information on and look carefully at any low-elevation primrose!

Illustration by Anita Cholewa, from *Brittonia* 36(1):59-62.

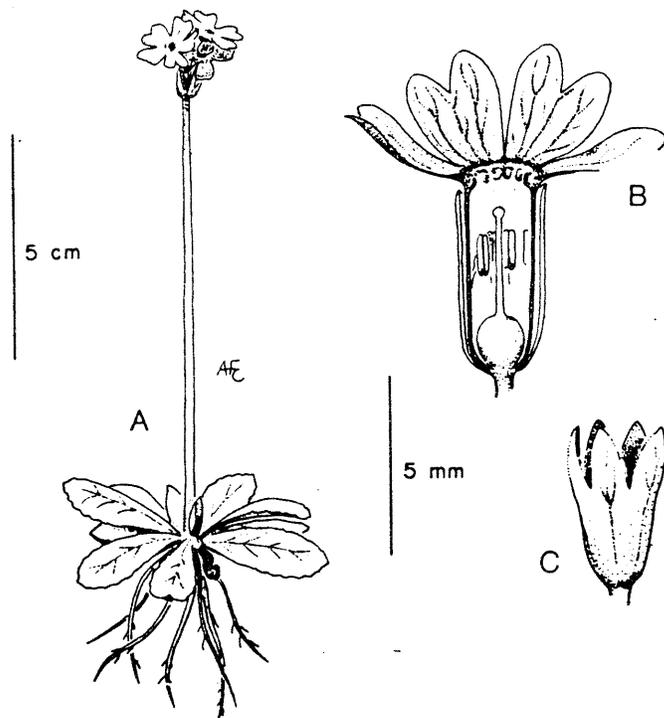
Literature cited:
Cholewa, A. F. and D. M. Henderson. 1984. *Primula alcalina* (Primulaceae): a new species from Idaho. *Brittonia*, 36(1):59-62.

Dorn, R. D. 1984. Vascular plants of Montana. Mountain West Publishing. Cheyenne, WY. 276 pp.

Kelso, S. 1991. Taxonomy of *Primula* sects. *Aleuritia* and *alcalina* in North America. *Rhodora* 93:67-99.

Moseley, R. K. 1989. Report on the conservation status of *Primula alcalina*, a proposed candidate species. Unpublished report to U.S. Fish & Wildlife Service. Idaho Conservation Data Center, Boise. 32 pp. + app.

Muir, P. S. and R. K. Moseley. 1984. Responses of *Primula alcalina*, a threatened species of alkaline seeps, to site and grazing. *Nat. Areas J.* 14:269-279.



a "farinose" surface (mealy, whitish covering) on the calyx, at least when young.

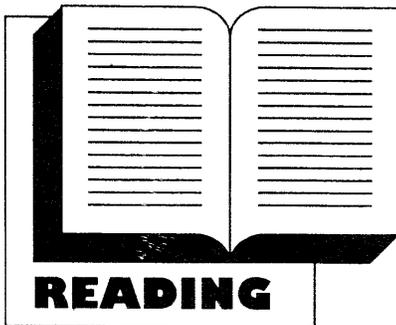
Distinguishing characteristics are highlighted below, as presented in the monograph on *Primula alcalina* (Cholewa & Henderson 1984).

♣ Calyx 4-5.7 mm long; corolla 4.3-6.2 mm long, white; leaves efarinose or farinose only on the abaxial surface when young, entire or denticulate; east central Idaho... *P. alcalina*.

♣ Calyx 5-8 mm long;

fades with age, and is particularly a problem in older flowers on herbarium specimens (Kelso 1991).

Alkali primrose also differs from mealy primrose in that it has a relatively rare breeding system represented by the distylous condition (in which flowers of the species have one of two different sets of styles length; either much longer or shorter than the stigma) - rather than the homostylous condition. It is also a diploid (rather than polyploid) (Kelso 1991).



Plants of Southern Interior British Columbia

Reviewed by Jill Davies, Noxon

Kelsey Readers Write Poetry

Key

For a moment
The loment was in foment.
How could it know
Into what it was to grow?
A lily with villi
Or a fructose rose?
A callow mallow
Or a grass (most crass)?
Then with thoughts mendelian
(and slightly darwinian)
It felt a sudden bliss
And began to dehisce.
Silly me
What a wee wee;
I was meant to be
A magnificent pea.

- Dr. Lexa W. Lee, Great Falls
Dedicated to Robyn, who loves to
key, unlike me!

Woman in Pink

There once was a woman in pink
Who gave her back a kink
She pulled all that loosestrife
She's still my wife
But now she's driven to drink!
- Neal Brown, Bigfork

We're Pullin'

Get a grip on loosestrife,
The prettiest plant you love to hate.
Pulling isn't an adventure,
It's a career.
Join the ARM forces and
Be the best you can be.
Aunt Pattie needs you...
Hup 2,3,4, what are we pullin' for?
We're pullin' for the marsh wren.
We're pullin' for the ducks.
We're pullin' cause we love to.
Cause purple loosestrife sucks.
- Pattie Brown, Bigfork

A great field guide for northwest Montana regions, *Plants of Southern Interior British Columbia* has it all. Packed into 450 pages, in color coded sections, it includes comprehensive descriptions of the region's trees, shrubs, wildflowers, grasses, sedges, rushes, ferns, bryophytes and lichens.

The plant descriptions, occupying half a page each, are presented with good quality photos and line drawings all together, with the key features worth remembering highlighted in bold print. The descriptions include specific information about the leaves, flowers, fruits and ecology of the plant. Along with this, the

authors present useful notes about similar species, interesting special features about the plant and suggestions about the origins of the plants' names. They have also drawn extensively from the excellent research that has been done on the southern B.C. aboriginal peoples' plant use and knowledge, and given indications of these medicinal uses in the Notes' section.

For people who have trouble with big keys, this book gives relief. First, to introduce each family, there are descriptions of features which distinguish that family, with key features that should be remembered in bold type. Then, for many

difficult plant groups (usually at the family level), there is a specific, concise and imaginative picture key that is designed to be user friendly. It may use a combination of words, line drawings, color codings and charting to help the reader learn the distinguishing characteristics. All of this is in a hand-sized book with good quality paper and strong bindings, making this guide one to get, well worth the \$20 price.

PLANTS OF SOUTHERN
INTERIOR BRITISH
COLUMBIA
By Parish, Coupe, Lloyd
1996, Lone Pine Publishing
ISBN 1-55105-057-9

Other publications that might be of interest

The University of North Carolina Press is offering *Guide to Flowering Plant Families*, by Wendy B. Zomlefer. Understanding the flowering plants of any region begins with the recognition of families. This 430-page volume contains 165 figures, 23 tables comparing related families, and has three introductory chapters on examining, dissecting and sketching live plant material. Softbound edition is \$27.50, and can be

ordered by calling toll free
1-800-848-6224.

* * * * *

Seven years ago Janet Marinelli joined the search for the endangered seabeach amaranth, and finally found it on a glamorous Long Island beach. But the plant, one of the rarest on the planet, had just been flattened by a 4x4 vehicle. *Stalking the Wild Amaranth*, is Janet Marinelli's personal quest for a new kind of landscaping that makes

room for a greater richness and variety of earthly life. As wilderness shrinks and backyards grow, the gardeners' role in the current extinction crisis becomes greater each passing day. For Marinelli, the amaranth became the symbol of everything that's wrong with our attitude toward nature.

Check your local bookstore, or call Henry Holt & Co., 212-886-9324 for information. \$25.00

REMINDER TO RENEW

Don't let your membership in the Montana Native Plant Society lapse. Send in your renewal today! See the membership form on page 11. Every one of you are important to the conservation of native plants in Montana.

MONTANA NATIVE PLANT SOCIETY * Membership Application/Renewal**

DATE _____

NAME (please print) _____

ADDRESS _____ CITY/STATE/ZIP _____

PHONE (____) _____ NEW _____ RENEWAL _____

STATEWIDE MEMBERSHIP WITH CHAPTER AFFILIATION*

MEMBER-AT-LARGE
(No chapter affiliation)

PLEASE NOTE: Canadian subscribers must add \$4.00 to each category to cover additional mailing costs.

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\$ _____ Additional Donation (may be specified toward a particular project or the general operating fund)

MAKE CHECKS PAYABLE TO: **MONTANA NATIVE PLANT SOCIETY**
MAIL TO: **MNPS Membership P.O. Box 8783 Missoula MT 59807-8783**

***AREAS COVERED BY CHAPTERS:**

- ARTEMISIA CHAPTER** - Yellowstone and Carbon Counties; southeastern/south-central Montana
 - BEARTOOTH MOUNTAIN CHAPTER** - South-central Montana, the Beartooth Plateau country
 - CALYPSO CHAPTER** - Beaverhead, Madison, Deer Lodge, Silver Bow Counties; southwestern Montana
 - CLARK FORK CHAPTER** - Lake, Mineral, Missoula, Powell, Ravalli Counties
 - FLATHEAD CHAPTER** - Flathead and Lake Counties plus Glacier National Park
 - KELSEY CHAPTER** - Lewis & Clark and Jefferson Counties
 - MAKA FLORA CHAPTER** - Richland, Roosevelt, McCone, Sheridan and Daniels Counties
 - VALLEY OF THE FLOWERS CHAPTER** - Gallatin, Park, Sweet Grass Counties plus Yellowstone National Park
- All MNPS chapters welcome members from areas other than those indicated. We've listed counties just to give you some idea of what part of the state is served by each chapter. Additional chapters are in the planning stages for other areas. Watch for announcements of meetings in your local newspaper. Ten paid members are required for a chapter to be eligible for acceptance in MNPS.

YOUR MAILING LABEL TELLS YOUR

CLASS OF MEMBERSHIP (See I, II, III, IV above)
CHAPTER AFFILIATION: (ART=Artemisia; CAL=Calypso; CF=Clark Fork; F=Flathead; K=Kelsey; MF=Maka Flora; VOF=Valley of the Flowers)
DATE YOUR MEMBERSHIP EXPIRES. If your label reads "2/97" your membership expired February 28, 1997. Use this form to renew your membership **immediately**. Please drop us a note if any information on your label is incorrect. Please notify us promptly of any address changes.

Membership in the Montana Native Plant Society is on a calendar-year basis, March 1 through the end of February of the following year. New-member applications processed before the end of October each year will expire the following February; those processed after November 1 will expire in February of the year after. Membership renewal notices are included in the Winter issue of *KELSEYA*. Anyone who has not renewed by the time the Summer *KELSEYA* is ready to mail will be dropped from the mailing list/MNPS membership roster.

<p><i>Welcome These New Members</i></p> <p><u>MONTANA</u></p> <p>Gayle Hayley, Roberts Susan Desmit, Red Lodge Kathleen Sweet, Philipsburg Fred & Carol Griffin, Missoula Jane & Jim Weaver, Helena</p>	<p>Phillep B. McVey, Helena Belva Lotzer, Helena Jane & Douglas Hunsaker, Helena Patricia Corry, Helena Elaine Cook, Great Falls Sheila Brunkhorst, Dillon Sue Crispin, Clancy Gary Vodehnal, Bozeman</p>	<p><u>MINNESOTA</u></p> <p>Dan Jergens, St. Paul</p>
		<p><u>CALIFORNIA</u></p> <p>R.T. Hawke, Wrightwood Hugh Safford, Davis</p>

MONTANA NATIVE PLANT SOCIETY

The Montana Native Plant Society (MNPS) is a 501-C-3 (not-for-profit) corporation chartered for the purpose of learning more about plants native to our state and their habitats, and of sharing that knowledge. Contributions to MNPS are tax deductible, and may be designated for a specific project or chapter, for the Small Grants fund, or may be made to the general operating fund.

Your yearly membership fee includes a subscription to *KELSEYA*, the newsletter of MNPS, published quarterly. We welcome your articles, clippings, field trip reports, meeting notices, book reviews — almost anything, in fact, that relates to our native plants or the society. Please include a line or two of "bio" information with each article. Drawings should be in black ink or good-quality photocopy. If you send clippings, please note the source, volume/issue, and date. All meeting and field trip notices, field trip reports or announcements should be mailed to *KELSEYA* EDITOR, P.O. BOX 1632, NOXON, MT 59853. All items should be typed and, if possible, put on a 3.5" disk and saved as an ASCII file, whatever that means. Please include a hard copy with your disk.

CHANGES OF ADDRESS AND INQUIRIES ABOUT MEMBERSHIP IN MNPS SHOULD BE SENT TO: MNPS MEMBERSHIP, P.O. BOX 8783, MISSOULA MT 59807-8783. GENERAL CORRESPONDENCE SHOULD ALSO BE DIRECTED TO THE MISSOULA ADDRESS. Do NOT send to the *KELSEYA* editor.

Advertising space is available in each issue at \$5/column inch. Ads must be camera-ready and must meet the guidelines set by the Board of Directors for suitable subject matter; that is, be related in some way to plants or the interests of MNPS members.

Deadline for the WINTER issue is DECEMBER 10. Please include meeting/field trip notices through March. The WINTER issue of *KELSEYA* will be mailed by January 10, 1999.

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Small Grants - vacant		

IF YOU MOVE, PLEASE NOTIFY US AT MNPS MEMBERSHIP, P.O. BOX 8783, MISSOULA MT 59807-8783

MONTANA NATIVE PLANT SOCIETY

KELSEYA Editor

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