

# KELSEYA

NEWSLETTER of the MONTANA NATIVE PLANT SOCIETY

## BITTERROOT DISPERSAL IN MONTANA AND ALBERTA

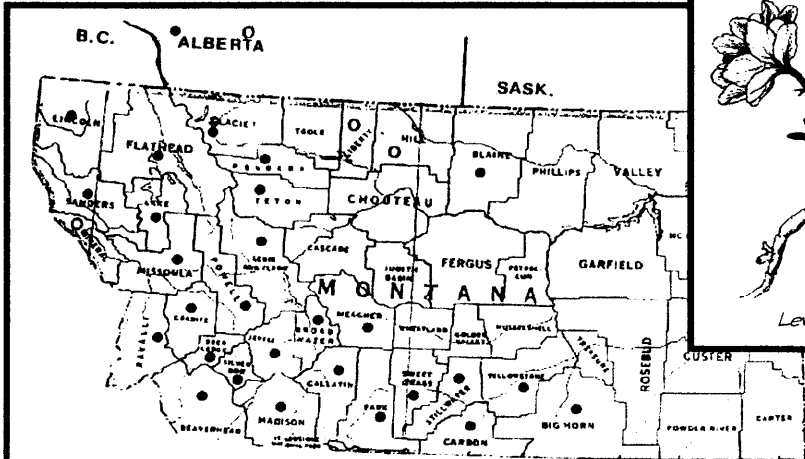
— Jerry DeSanto

The disjunct and puzzling distribution of Bitterroot (*Lewisia rediviva* Pursh) across its range, and especially the first published report of the species in Alberta, has revived some near-dead arguments over dispersal. This brief summary outlines and discusses four hypotheses attempting to explain dispersal patterns we see today.

whether winds of southeast B.C. would have been strong enough "to entrain the clusters and carry them to significant altitudes" for transport over the continental divide. Two alternative hypotheses

were proposed to explain the existence of the Alberta populations: cultural dispersal and natural dispersal during past xeric (dry) times.

Trade of Bitterroot from native peoples to white hunters and traders was noted by David Thompson in the early 19th century. Alberta Blackfoot groups who were present in Crowsnest Pass and moved south into Montana would have been familiar with areas in



Distribution of Bitterroot in Montana and Alberta

- Verified (county and province)
- Unverified (county and province)

Bitterroot -- the state flower of Montana -- was first reported from southwestern Alberta in 1985. The two new populations were located close to each other in exposed areas on southwest-facing slopes at 1700-1800m elevations. The report's authors suggested the populations were of recent origin and may have resulted from wind dispersal of seed clusters from populations in southeastern British Columbia. Before this discovery, Bitterroot was not known to occur in Canada east of the continental divide, although many occurrences east of the divide are found in Montana and Wyoming.

which Bitterroot plants were found. Other native groups in southwestern Alberta, such as the Kutenai and Flathead, regularly moved back and forth across the continental divide into Montana, Idaho, and British Columbia. The Alberta Bitterroot populations are situated in an area where movement of native groups was relatively common. Also found in this region are localized occurrences of several species known to be of economic importance to native groups. Since Bitterroot is known to resprout from even long-dried rootstock (as its name *rediviva* suggests), propagation from plant parts carried into new habitats would not have required deliberate planting and tending of seedlings.

Three years later in 1988, a new study questioned

In addition to the cultural dispersal hypothesis, "relict survival of a formerly widespread species" has been suggested to explain Bitterroot's disjunct appearance in Alberta. During the intervals of the

—Continued on page 10

—Linda Iverson

Talk about a room with a view! Those of us who made the trip were dazzled by the incredible panorama visible from the deck adjoining the A-frame meeting center at Makoshika State Park. I will never forget the dramatic badland views and the sunset skies. For those of you who missed the meeting, I highly recommend stopping to see Makoshika anytime you're near Glendive; it's literally right out of town. And what a great welcome on the sign above the Chamber of Commerce. We ranked right up there, along with the softball game and car show!

The Maka Flora Chapter outdid themselves organizing a great meeting. It wasn't an easy task, but the weather cooperated and we made it out before the deluge on Monday! Thanks to all members and contributors! Over 90 people attended, many from the western part of the state. Dry hot conditions were a sharp contrast to the wetter regions of the state this year, but we all saw new plants and learned about the precious hardwood draws.

Field excursions varied from trips within the park to prairie high ground on working ranches and hardwood forests outside the park. We visited a ranch in the area and learned about grazing practices that affect vegetation. Although it was a dry year, we still found many forbs in bloom, such as Indian Breadroot, (*Psoralea esculenta*), Bessey's crazyweed (*Oxytropis besseyi*), and Sego lily (*Calochortus nuttallii*) in abundance. Grasses? The woody draws were rich havens for many forest type species as well.. See Robyn Klein's report on the woody draws trip on page 5.

Evening talks ended the days, both on Friday and Saturday. We saw slides of the Comertown Prairie Pothole area and heard Nature Conservancy ecologist Brian Martin describe its significance. Peter Lesica gave an informative look at the unique woody draw flora and fauna, as well as his thoughts about conservation and management of these places (See Peter's article on page 3). Saturday night closed with a suite of breathtaking

photographs by Dr. Jim Romo from the University of Saskatchewan, Canada. Dr. Romo preceded the slides with a thought-provoking talk about grassland conservation. We also hope to have a brief recap of this talk in a future newsletter.

Other highlights of the meeting included the third annual Wayne Phillips Plant ID Contest! This year's winner combined the talents of Madeline Mazurski and Anne Garde as a team, which won them the Claude Barr book, *Jewels of the Plains*. Everyone had lots of chances to spend their cash on a wide variety of books and a raffle full of handmade items. Thanks to everyone who participated in our much-needed annual fund-raiser.

The meeting came to a close on Sunday with committee meetings and half-day and whole-day trips. A small group continued to drive on to the Medicine Lake Wildlife Refuge. The half-day trip avoided the buggy river bottoms for a tour of the park's drier desert and badland plants from Artist's Point. We enjoyed the varying textures and colors of rock, earth, and leaves reminiscent of the Pryor Mountain landscape. We saw an assortment of salt-tolerant plants like Shadscale (*Atriplex confertifolia*), Inland saltgrass (*Distichlis stricta*), Few-flowered buckwheat (*Eriogonum pauciflorum*), and admired the interesting foliage of *Sueda depressa* and *Artemisia longifolia*. The park is rich in geologic formations and fossils, and the visitor center has great displays describing these.

What a wonderful place to finish my term as plant society president. I was very honored to receive a beautiful drawing of Pasqueflower (*Anemone patens*) by Debbie McNeil. Thanks so much!! MNPS is like family to me, and it's inspiring to see the great dedication we have to our native plants and landscapes. Once again, thanks to everyone for organizing and participating!



## MNPS SEEKS PROPOSALS FOR 1998 SMALL GRANTS COMPETITION

The Montana Native Plant Society announces the third 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 1998 to fund projects supporting conservation of native plants in Montana. The grant competition is open to residents of Montana and MNPS members.

Please see the enclosed insert describing requirements for the 1998 Small Grants Program, and instructions on how to submit a proposal. The deadline for proposals is **JANUARY 15, 1998**. For further information, please contact Angela Evenden, Chair, MNPS Small Grants Committee at (406) 542-4173 or c/o MNPS, P.O. Box 8783, Missoula, MT 59807-8783.

# MONTANA'S HARDWOOD DRAWS

— Peter Lesica

Forest vegetation is relatively uncommon amidst the semi-arid grasslands of eastern Montana and the Northern Great Plains. Upland hardwood forests dominated by green ash (*Fraxinus pensylvanica*), elm (*Ulmus americana*), box elder (*Acer negundo*) and cherry (*Prunus* spp.) occur on cool slopes and along drainageways of smaller order streams. These upland forests are often referred to as hardwood draws or woody draws. They are the western-most outliers of the Eastern Deciduous Forest Province.

Although they comprise less than one percent of the landscape in the Northern Great Plains, the aesthetic, economic and biological values of upland hardwood forests are disproportionately large compared to their aerial extent. Many species of plants, such as frog orchis (*Habenaria viridis*) and striped coral-root (*Corallorhiza striata*), that are rare in eastern Montana occur here. Hardwood draws provide important habitat for many mammals and birds. Upland hardwood forests also undoubtedly provide habitat for numerous species of invertebrates and microorganisms that otherwise would not occur in the prairie ecosystems. Unfortunately studies on these less conspicuous creatures of hardwood draws have not been done, but it stands to reason that many insect herbivores and soil organisms not found in the grasslands and shrublands would occur in these habitat islands.

Unfortunately, evidence from throughout the Northern Great Plains suggests that most upland hardwood forests are degenerating. Forest communities, once having dense stratified canopies and undergrowth dominated by shrubs and native

graminoids and forbs are being replaced by open canopy forests with few shrubs in the understory and a ground layer dominated by introduced sod-forming grasses. Tree recruitment fails and the relatively open canopy of degenerating stands allows more light to reach the forest floor, favoring the spread and dominance of introduced grasses. The dense sod formed by these grasses exacerbates the problem by preventing establishment of tree seedlings. In this way upland forest communities are converted to shrublands and meadows, and the benefits attributed to the forest are lost. Once upland hardwood forests have degenerated, they may be difficult to reestablish due to competition from the grass species and lack of appropriate mycorrhizal symbionts.

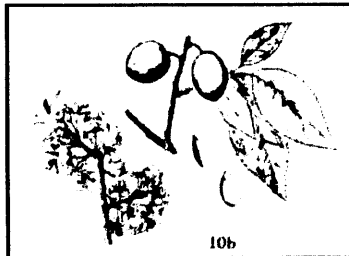
There are many potential causes to explain the decline of upland hardwood forests in Montana. None are mutually exclusive, and more than one may be acting together synergistically:

1. Livestock grazing is the most often cited cause for failure of tree regeneration in upland hardwood forests. Poor tree regeneration in upland hardwood forests may also result from grazing by native ungulates.
2. Climate and disease are other factors mentioned as possible causes of upland hardwood draw degeneration. Exclusion of naturally-occurring fire may also play a role.

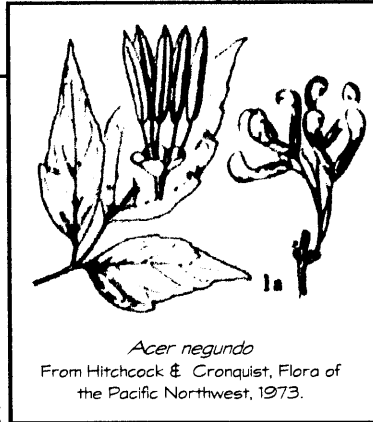
Whatever the causes for the decline of hardwood draws, these declines must be reversed to preserve the biological diversity of the Northern Great Plains. The majority of these forests in Montana are on private land. An understanding of forest dynamics and good stewardship are essential if we are to save these unique forests.

### Additional reading

Lesica, P. 1989. The vegetation and condition of upland hardwood forests in eastern Montana. *Proceedings of the Montana Academy of Sciences* 49: 45-62.



*Prunus americana*



*Acer negundo*  
From Hitchcock & Cronquist, *Flora of the Pacific Northwest*, 1973.



The Center for Plant Conservation has available the Native Plant Conservation Directory, a compilation of federal and non-federal natural resources staff listings as well as native plant laws, regulations, and lists. Cost is \$18

per copy (includes shipping and handling).

For more information and to order, write to CPC, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.



## FOREST SERVICE DESIGNATES 20 NEW NATURAL AREAS IN MONTANA

On July 29th, Regional Forester, Hal Salwasser designated 18 Research Natural Areas (RNAs) and 2 Botanical Special Interest Areas (SIAs), encompassing 27,061 acres on six National Forests in Montana. MNPS participated in the public environmental analysis supporting this action. The following areas are now protected as natural areas and botanical areas:

RNA/BSIA	Acres	General Natural Features
<u>FLATHEAD NATIONAL FOREST</u>		
LeBeau RNA	5709	Forest of red cedar, hemlock, grand fir, and larch on glacier-scoured rockland, lake, ponds and wetlands
Swan River RNA	682	Significant wetland and peatland communities and western red cedar and grand fir forest
<u>GALLATIN NATIONAL FOREST</u>		
Black Butte RNA	510	Dry subalpine forest w/whitebark pine
East Fork Mill Creek RNA	882	Engelmann spruce and Douglas-fir w/whitebark pine, and mountain stream
Black Sand Springs BSIA	407	Spring creek riparian system
Obsidian Sands RNA	390	Lodgepole pine with bitterbrush understory
Palace Butte RNA	1280	Subalpine wetlands, waterfalls, geologic features, subalpine forest and meadows
Passage Creek RNA	1112	Engelmann spruce, Douglas-fir, subalpine fir, upland and riparian forests
Sliding Mountain RNA	1459	Whitebark pine and subalpine fir forests
Wheeler Ridge RNA	640	Old growth whitebark pine
<u>HELENA NATIONAL FOREST</u>		
Indian Meadows RNA	949	Wetlands and peatlands, Douglas-fir and subalpine forest with aspen
Cabin Gulch RNA	2408	Douglas-fir with bunchgrass understory
Red Mountain RNA	1901	Subalpine fir/whitebark pine forest, alpine and timberline, scree and mountain stream
<u>KOOTENAI NATIONAL FOREST</u>		
Lower Ross Creek RNA	1777	Western red cedar and hemlock forest
Norman-Parmenter RNA	1300	Douglas-fir, western red cedar and black cottonwood forest
Hidden Lake BSIA	605	Wetlands, unusual plants, Engelmann spruce, Douglas-fir and western red cedar forest
<u>LEWIS &amp; CLARK NATIONAL FOREST</u>		
Big Snowy RNA	3145	Alpine plant communities, forested scree, timberline forests and rockland
<u>LOLO NATIONAL FOREST</u>		
Shoofly Meadows RNA	934	Peatlands, lodgepole pine, subalpine fir and Engelmann spruce forest
Ferry Landing RNA	630	Ponderosa pine and Douglas-fir forest with bunchgrass understory
Barktable Ridge RNA	341	Old growth mountain hemlock

Many of these areas were first identified for possible designation during the development of Forest Plans in the 1980s. Several others were proposed since that time. RNAs and SIAs are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands. RNAs are available for non-manipulative research, observation, and study. SIAs are dedicated to protect outstanding natural features for public enjoyment and study. For further information on the Forest Service Natural Areas Program please contact Dr. Angela Evenden, Rocky Mountain Research Station, PO Box 8089, Missoula, MT 59807; (406) 542-4173.

### INTERNET - PLANT LINKS

MNPS Member Steve Shelly suggests checking out the new home page for the International Organization for Plant Information (<http://iopi.csu.edu.au/iopi/>). Steve says that there are a lot of very useful links for botanical bibliophiles, such as the link to the "Internet Directory for Botany." This takes you

to a home page that has many excellent resources, including a listing and links to dozens of herbaria world wide (including Montana State University Herbarium in Bozeman). There are also links from the IOPI home page for ethnobotany, botanic gardens/arbores, TES species conservation, non-vascular plants and much, much more.

## AND NOW... COMPUTERIZED PLANT KEYS!!

A new type of plant key has been created for the computer and is now available in our area. Bruce Barnes provided a demonstration of the key at the April Rare Plant Conference in Missoula. Over the past three years, he has used XID Systems software, developed by Richard Old, PhD, of Pullman, Washington, to create plant keys for all of the vascular plants of Oregon, Washington, Idaho, southern British Columbia, Montana, and Wyoming.

The following is a description of how the program works. To identify a plant, the user first selects from a menu of types of plant characteristics (such as leaves, stem, inflorescence, flower or fruit). The user then selects those characteristics which best describe the plant to be identified. The computer eliminates from consideration all plants which do not match those characteristics, and also eliminates all menu choices which would not help to distinguish between the remaining species. The user then goes to another menu and makes another selection, and so on. At any point, the user may ask the computer to analyze the remaining species and provide a list of the characteristics which are easiest to identify and will most effectively separate between the remaining species. The user may select from that list or go to a different menu. In addition, one may call up an alphabetized list of the remaining species (in either common or scientific names), including the page numbers of references (such as Hitchcock or Jepson) that describe the plants. When all species are eliminated but one, the plant has been identified. The user may check it against the references listed on the screen and may check for errors by calling up a list of the characteristics that were entered by the user.

With a little practice, identifying a plant takes one or two minutes. It usually takes only four or five entries to identify a species. This speed and simplicity is due to the computer identifying the species that has a particular combination of characteristics.

The traditional dichotomous keys we have all struggled with are a very ingenious system, given the limitations of pen and paper with large volumes of data. They also demand great skill to create, and much practice and patience to use. A frequently frustrating experience with dichotomous keys is being expected to make a choice in the key when the necessary part of the plant (ex., fruit or flower) is not present. In an expert system key, the user is simply asked to describe the features that are most obvious about the plant. If a plant characteristic cannot clearly be defined, such as whether a leaf is best described as lanceolate or linear, the user may tell the computer to include all species that have either description.

The keys include comprehensive data on each species in order to provide the user with the widest possible range of characteristics from which to choose, and they contain all vascular plants known to be in the regions listed, including all trees, flowering plants, grasses and grass-like plants, and spore-bearing plants. Plant names are based primarily on the NRCS Plants Database.

Technical botanical terms are kept to a minimum, and help screens with definitions are provided for all menu items. Graphics with line drawings to accompany the definitions of terms (such as leaf shapes and inflorescence types) are available and are a great help in clarifying definitions. Help screens also provide a description of the habitat and geographic range for each plant.

The keys are sold by geographic areas (such as SW Montana). The software they run in is available for either DOS or Windows format, and a MAC version should be available soon. For prices and ordering information, contact Bruce Barnes at Flora ID Northwest, 541-278-2222 (Office), 541-276-5547 (Home), 541-276-8405 (FAX), e-mail [flora@ucinet.com](mailto:flora@ucinet.com), or on the internet at <http://www.pullman.com/Business/xid/fidnw.html>.

### EXTINCT ENDEMICS IN MONTANA?!

—Bonnie Heidel

Endemics have been clearly identified in the updated 1997 Montana Plant Species of Special Concern list. Among them are two endemic mosses, *Entosthodon rubiginosus* and *Grimmia brittoniae*. There are no documented extirpations among the native vascular plant species of the state, but these two bryophyte species restricted to Montana are known only from single historic records and are considered potentially extinct based on

unsuccessful surveys and associated habitat observations

*Entosthodon rubiginosus* was collected exactly 110 years ago by R.S. Williams from the "Missouri River banks just below Great Falls, Montana," while *Grimmia brittoniae* was collected about the same time from Columbia Falls, also by R.S. Williams.

While acknowledging the searches that have already been conducted by Joe Elliott and Toby Spribille, this note is issued as a challenge to all bryologists!

# CALENDAR

## MEETINGS

**Wednesday, October 1, Valley of the Flowers Chapter.** 7:30 pm, Rm 306, Lewis Hall, MSU, Bozeman. Herbalist Robyn Klein and Herb Grower Mark Mackin will jointly discuss "Overharvesting and Cultivation of Native Plants for the Herb Market." Robyn will talk about the goals of the United Plant Savers organization (see p. 8), and present a slide show of native plants "at risk" from overharvesting. Mark will discuss cultivating both for income and to relieve pressure on native plant populations. (Please note new meeting place!)

**Monday, October 6, Kelsey Chapter.** 7 pm, Lewis & Clark Library in Helena. Robyn Klein, herbalist, and Mark Mackin, an herb production consultant, will present a program on the over-harvesting of commercially valuable native plants and the opportunities available for people interested in growing herbs for the market.

**Thursday, October 9, Clark Fork Chapter.** 7:30 pm, Room 131 Science Complex, UM Campus. Herbalist Greg Tilford will speak and show slides of "Medicinal Plants of the West." Greg's new book, Edible and Medicinal Plants of the West, will be available for purchase at the meeting, and there will be a book signing afterwards. (Please note our new meeting place, which is wheelchair accessible.)

**Wednesday, October 15, Flathead Chapter.** 5:30 pm, general meeting (everyone's welcome). 7 pm, program, Flathead Valley Community College (room to be announced). Shannon Kimball will discuss the Research and Natural Areas program. Call 857-2024 for directions.

**Monday, November 3, Kelsey Chapter.** 7 pm, Lewis & Clark Library in Helena. Carla Wambach, recipient of a small grant from MNPS, will present the teaching/learning trunk she developed with grant funds. The trunk, entitled "Montana Native Plants Interwoven through the Journey of Lewis & Clark" contains slides, music, videos, teaching packets, curriculum and support materials, and is available to teachers, community groups, elderhostel groups and others interested in learning about Montana's native flora through the journey of Lewis & Clark.

**Wednesday, November 5, Valley of the Flowers Chapter.** 7:30 pm, Rm 306, Lewis Hall, MSU. Dr. Rich Stout of Montana State University will present "Some Like it Hot: Plants of Yellowstone's Thermal Areas." Dr. Stout's study is only one of a handful worldwide which focuses on the vascular plants that surround hot pools and thermal springs.

**Thursday, November 13, Clark Fork Chapter.** 7:30 pm, Room 131 Science Complex, UM Campus. Dan Rogers, Missoula's City Forester, will give a presentation entitled "Native Plants and the City Forest."

**Wednesday, November 19, Flathead Chapter.** 5:30 pm, general meeting (everyone's welcome). 7 pm, program, Flathead Valley Community College (room to be announced). Steve Arno will present a program on the ecology and disturbance history of fire dependent Ponderosa pine and Western larch old-growth forests. Call 857-2024 for directions.

**Wednesday, December 3, Valley of the Flowers Chapter.** 7:30 pm, Rm 306, Lewis Hall, MSU, Bozeman. Dr. Bob Gough of Montana State University will present his findings on the growth and development of our delicious Montana huckleberries. Dr. Gough's huckleberry study was one of the projects to receive an MNPS small grant award.

**Saturday, December 6, Kelsey Chapter.** 6 pm, Steve Cooper's home at 217 E. 8th in Helena. The Kelsey Chapter's annual Holiday Happening!! Bring a potluck dish to share, your own table service, and some of your favorite plant slides. We'll kick off our shoes and remember green and colorful times.

**Thursday, December 11, Clark Fork Chapter.** The annual Christmas Potluck will be held at John Pierce's house, 737 Locust, at 6:30 pm. Bring a dish to share and a few of your favorite slides from the summer.

**Artemisia Chapter.** Plans are in the works for at least four events! Postcards will be mailed to each member announcing chapter meetings. For further information, please contact Dr. Clayton McCracken at 3227 Country Club Circle, Billings 59102-0609, phone 252-2807, or



### FREE BROCHURE FROM THE NATIVE PLANT CONSERVATION INITIATIVE

The Native Plant Conservation Initiative recently developed, printed, and distributed 85,000 copies of a new educational brochure, *Wild Wealth: The Riches of Native Plants*. This beautiful-four-color brochure featuring the work of graphic artist Nancy Gibson Nash highlights the importance of native plants in our everyday lives. For a copy, write to the Native Plant Conservation Initiative at P.O. Box 37127 MS MIB 3223, Washington, DC 20013, or e-mail at [native\\_plant@nps.gov](mailto:native_plant@nps.gov).

# CHAPTER ACTIVITIES

## FIELD TRIPS

### WOODY DRAWS

—Robyn Klein

Here in the middle of miles and miles of wheat fields in Eastern Montana there exist pieces of badlands from which sprout woody draws. In and around these special ecosystems are found hundreds of wildflowers. Of course the Aster family won the most popular prize (16 species) with the pea family in hot pursuit (12 species). Of special importance was a species only found in these woody draw environments – the ivory sedge, *Carex eburnea*. We also found yellow loosestrife (*Lysimachia ciliata*), black snakeroot (*Sanicula marilandica*) and other shade-loving plants. We even found a strange vine which can be none other than bittersweet (*Celastrus scandens*) through process of elimination! The tree species found in such special ecosystems are usually green ash (*Fraxinus pennsylvanica*), chokecherry (*Prunus virginiana*) and box elder (*Acer negundo*).

Surrounding the woody draws were many dry-prairie plants. We were treated to a beautiful downy painted cup (*Castilleja sessiliflora*), a delicate *Stephanomeria runcinata*, and even a *Stanleya pinnata*. The *Echinacea angustifolia* was in bloom, a popular herb which many of us have tasted yet never seen growing wild. We sure will never look at woody draws the same way again!



### PEET'S HILL STROLL

—Tulli Kerstetter

A drop-dead gorgeous June 21st turned out to be a perfect day for a stroll up Peet's Hill in the Burke Park area of Bozeman. After a rather dismal rainy three weeks in June, it was gratifying to walk in sunshine and view our spectacular ring of local mountain ranges! Led by local botanical expert Dr. Matt Lavin of Montana State University, the two-hour walk, sponsored by the Valley of the Flowers chapter, took in a surprising variety of life forms and microhabitats. Matt had considerably made up a handout listing some 126 species he had identified as flowering in June in this area. These included Arnica (*Arnica sororia*), Desert Alyssum (*Alyssum*

*desertorum*), *Microsteris* (*Microsteris gracilis*), Penstemon (*Penstemon procerus*), Silver sage (*Artemisia cana*), as well as a few more likely to be flowering in April/May or July than June. Several species of grasses were also located: Thickspike wheatgrass (*Agropyron dasytachyum*), Bluebunch wheatgrass (*A. spicatum*), Green needlegrass (*Stipa viridula*), Japanese brome (*Bromus japonicus*), and Mannagrass (*Glyceria grandis*). Thanks to Matt for taking his time to guide us along the flowered paths!



### EVARO HILL

— Peter Lesica

On the evening of June 5th, members of the Clark Fork Chapter met at the Bob Hayse Ranch to inspect the Evaro wet meadows known for their spectacular camas displays. We weren't disappointed. Also blooming in the same meadows were Yellow rattle (*Rhinanthus crista-gali*), Geyer's onion (*Allium geyeri*) and American bistort. A subsequent hike in the adjacent forest turned up an additional 40 species, including four pussytoes (*Antennaria microphylla*, *A. neglecta*, *A. racemosa*, *A. parvifolia*), along with Fairy-slipper and White lady's-slipper orchids.



Camas  
(*Camassia quamash*)



White Lady's Slipper  
(*Cypripedium montanum*)

**Editor's Note:** As many of you may have noticed, there was no summer issue of the Kelsey. Instead, we are sending out the Fall issue a bit earlier than usual and with a somewhat larger edition. Hope you all had a great summer!!

## UNITED PLANT SAVERS

Many medicinal plants, once abundant, are becoming increasingly rare. Overharvesting is occurring because of the increased popularity of botanical medicine. A group of concerned herbalists recently formed United Plant Savers (UPS). UPS is a nonprofit educational corporation dedicated to preserving native medicinal plants.

UPS is currently putting together a list of medicinal plants that are at risk of extinction, and a guide to nurseries and farms that supply medicinal plant stock. Long-term goals include providing land consultation services to help farms/growers cultivate these plants, and establishing medicinal-plant sanctuaries. UPS had its first conference in April 1997 in Santa Cruz, California.

Sources that carry endangered or threatened plants include:

Horizon Herbs, P.O. Box 69, Williams, OR 97544

Land ReFormers, 35703 Loop Rd, Rutland,  
OH 45775

Elixir Farms, Brixey, MS 65618

Seeds of Change, 1364 Rufina Circle #5, Santa Fe,  
NM 87501

Abundant Life Seed, Box 772, Port Townsend,  
WA 98368

Garden in the Woods, 180 Hemenway Rd,  
Framingham, MA 01701

For information on ethical wildcrafting guidelines, consult:

*A Plant Lover's Guide to Wildcrafting*, by Krista Thie, Longevity Herb Press, 1549 West Jewett Blvd, White Salmon, WA 98672

*Direct Marketing Registry: Ethical Wildcrafters and Organic Growers of Medicinal Herbs*, compiled by Rocky Mountain Herbalist Coalition, 412 Boulder St, Gold Hill, Boulder, CO 80302

*The EcoHerbalist Field Book*, by Gregory Tilford, Mountain Weed Publishing, Conner, MT 59827

*Principle & Practice of Plant Conservation*, by David Given, Timber Press, Portland, OR

For more information concerning UPS, try the Web at <http://members.aol.com/upsavers>. You can also contact them at P.O. Box 420, East Barre, VT 05649, or call 802-479-9825. Their e-mail address is [ups@ilhawaii.net](mailto:ups@ilhawaii.net).

—Reprinted from the quarterly newsletter of the Great Northern Botanicals Association

“Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has.”  
—Margaret Mead

## DO NOT PICK!!

According to Robyn Klein of the Sweetgrass School of Herbalism, here are some plants you should not pick within the 50-mile radius surrounding Bozeman (and most of Montana):

**Broomrape** (*Orobanche*) - parasitic herb with no chlorophyll

**Cascara sagrada** (*Rhamnus* spp) - just not very common here

**Coral root** (*Corallorhiza*) - sensitive plant. Do not pick any orchids, period!

**Dogwood** (*Cornus canadensis*) - far too rare in this area specifically

**Echinacea** (*Echinacea pallida*) - overcollected in other states; plenty being cultivated.

**Eyebright** (*Euphrasia* spp) — sensitive parasitic plant in high demand

**Fairy slipper** (*Calypso bulbosa*) - does not survive in gardens because of necessary soil fungus

**Goldthread** (*Coptis occidentalis*) - far too rare to collect

**Lady's slipper** (*Cypripedium*) — rare and endangered, other plants make excellent substitutes

**Ladies tresses** (*Spiranthes*) - hard-to-find orchid

**Lobelia** (*Lobelia* spp) - too sensitive and hard to find

**Maidenhair fern** (*Adiantum pedatum*) - far too rare to collect

**Monkshood** (*Aconitum columbianum*) - not common in this area

**Osha** (*Ligusticum*) - far too rare in Montana

**Rattlesnake plantain** (*Goodyera*) - orchid

**Stream orchid** (*Epipactis*) - very rare in Montana

**Sweet flag** (*Acorus calamus*) - found in other parts of Montana. Recommend extreme caution when collecting this at all.

**Sundew** (*Drosera* spp) - far too rare in most areas

**Trillium** (*Trillium*) - sensitive plant

**Twayblade** (*Listera*) - hard-to-find orchid.

**Wild ginger** (*Asarum caudatum*) - far too rare in most areas of Montana



# WETLANDS: THE BOOK YOU'VE BEEN LOOKING FOR

—Rich Prodgers

Time was, books on plant ecology were few, the authors eminent authorities, and their works frequently classics. Desktop publishing changed all that. Too often now, titles are intriguing but the authors are relative unknowns who are lucky to have a good chapter or two in them.

Take heart: Wetlands: Characteristics and Boundaries (National Academy Press, ISBN 0-309-05134-7) is a wonderful reference. You'll want your own copy so that you can highlight sections. Already I have quoted from it extensively while reviewing wetland delineations and functional assessments. If you are looking for a reference on wetlands, this is the one.

Did you know that the most plant roots in wetlands are concentrated in the upper one to two feet, and one foot (30 cm) below the ground surface is considered the critical depth for saturation? That hydrophytes must not only be adapted to lack of oxygen (anaerobic soil conditions), but also must be able to absorb nutrients and water without absorbing toxins that accumulate in anaerobic soils? That in the semiarid West, phreatophytes can occur in riparian zones that lack wetland hydrology?

The National Research Council, an arm of the National Academy of Sciences, undertook this project with funding from the EPA and NRCS; their sponsorship gives this book's pronouncements special weight. Also due to their sponsorship, this book is a sound value at \$37.95. Wetlands: Characteristics and Boundaries is a collaborative effort. The committee of authors consists of an impressive list of professors and a wide range of knowledgeable federal bureaucrats and private consultants. The NRC staff did a masterful job of organizing and editing many contributions into a seamless whole.

Among government agencies, the importance of wetlands to our nation was first recognized by the U.S. Fish and Wildlife Service in 1956, by which time most U.S. wetlands outside Alaska (not yet a state) had been

converted to other functions. The 1977 Clean Water Act (CWA) provided protection for some wetlands. Regulated wetlands are termed "jurisdictional wetlands," meaning that provisions of the CWA apply. Executive Order 11990 ("no net loss" of wetlands) became the cornerstone of federal wetland policy.

Delineating jurisdictional wetlands is an important issue wherever wetlands may be lost or their function impaired. The objective is to identify and map jurisdictional wetlands. "Much of the controversy over wetland delineation can be reduced to a single question: which characteristics can be used to identify wetland ecosystems and distinguish them from other ecosystems?" Two federal delineation manuals and some proposed revisions have tackled this issue using hydrologic, edaphic, and vegetational indicators.

For many delineators, the urge to meddle with ("improve on") federal delineation procedures has been irresistible, resulting in a variety of mostly half-baked unofficial modifications. NRC correctly points out that "the wetland delineation system should provide consistent, reliable results." However, they note that the current manual requires independent evidence from hydrology, soils, and vegetation, downplaying the strong causal relationship that links the hydrologic regime to other evidence of wetlands.

The discussion of wetland vegetation is unlikely to be over the head of any MNPS member, but even those knowledgeable about the factors responsible for the prevalence of hydrophytic vegetation are likely to learn from NRC's discussion. If you want to brush up on the 50% dominance rule or how to use a prevalence index or the more esoteric FAC-neutral test, they're covered here.

My guess is that plant people who lack an understanding of soil genesis, nomenclature, and classification will have some trouble following the discussion of hydric soils. If so, Appendix A, Soil Taxonomy, packs a lot into five pages.



## WELCOME TO OUR NEW CHAPTER!

The Calypso Chapter in southwest Montana is our newest chapter of MNPS. According to Sheila Thompson, Calypso's first president, a meeting was held in early April in Butte in order to gauge public interest for a local chapter. Although a snowstorm was raging, 40 people attended.

As of early summer, 14 people have signed up as MNPS members, and two field trips had already taken place. The chapter encompasses the areas near Butte, Ennis, Anaconda, and Dillon.

## PHOTOS WANTED

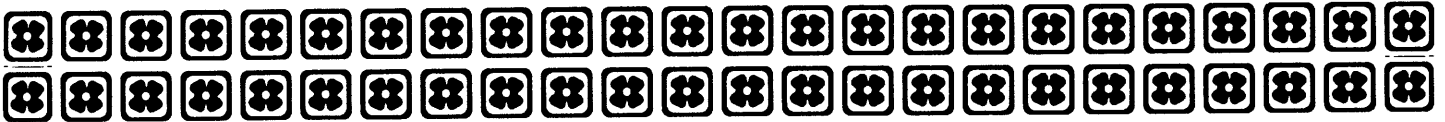
The Native Plant Conservation Initiative is seeking slides or photographs for its publications, exhibit and website depicting native plants, especially flowering plants; the public and/or scientific/field staff interacting with plants (inventorying and monitoring activities, revegetation, hiking, birdwatching, flower gazing, photographing, etc.); behaviors destructive to native plants and plant communities. If you can supply some of these photos, please contact Margaret Sotham, NPCI Outreach Coordinator 202-208-5895. Photo credit will be given. Do not send originals unless you do not need them returned.

# REQUEST FOR HELP!

—Jennifer Birdsall

We are a Forest Service research unit located in Bozeman that works on biological control of weeds. Before we can release a biological control agent against a weed, we must do extensive testing to determine what plant species may be at risk of attack. We like to include as closely related native species in our host specificity tests as we can. We are currently trying to collect species for host specificity tests of biological agents for *Chondrilla juncea* (rush skeletonweed), a common weed in Idaho that has begun to invade northwest Montana. We solicit your help in collecting plants/seeds of the following: *Crepis acuminata* (long-leaved hawksbeard), *Crepis occidentalis* (western hawksbeard) *Crepis pulchra*, *Crepis runcinata* (dandelion hawksbeard), *Crepis setosa* (rough

hawksbeard), *Taraxacum ceratophorum* (horned dandelion), *Taraxacum eriophorum* (Rocky Mountain dandelion), *Taraxacum lyratum* (dwarf alpine dandelion), *Lactuca pulchella* (blue lettuce), *Malacothrix torreyi* (Torrey malacothrix), *Microseris troximoides* (false-agoseris), *Prenanthes sagittata* (arrow-leaf rattlesnake-root), *Stephanomeria tenuifolia* (narrow-leaved stephanomeria), and *Sonchus oleraceus* (common sowthistle). If you could collect any of these species, know of any populations where we could collect, or would like more information on our ongoing program, please contact me at the USDA Forestry Sciences Lab, 1648 S. 7th Ave., Bozeman, MT 59717, 406-994-1784. Thank you!



## BITTERROOT DISPERSAL (Continued from page 1)

Hypsithermal (Altiathermal) interval (9000-5000 years before the present) and a warming event 4000 to 3000 years ago, grasslands extended into Alberta foothills and mountains formerly occupied by forests. This warmer, drier climate in mountain passes allowed dryland species to migrate northward. Including *Lewisia rediviva*, there may be at least 30 species that could have arrived during warm, dry intervals by migration from the south and west. Relict survival then (presumably) followed as the Bitterroot persisted on "islands" surrounded by vegetative cover unfavorable to the species when cooler conditions later set in.

A fourth hypothesis -- natural dispersal by birds -- has long been a favorite explanation for widely-disjunct populations. Charles Darwin, for example, asked his readers to "reflect for a moment on the millions of quail which annually cross the Mediterranean: and can we doubt that the earth adhering to their feet would sometimes include a few minute seeds?" Birds -- and mammals -- can transport seeds either by ingestion and passage or by the adherence of disseminules to fur or feet. Chipmunks and squirrels are great seed harvesters, and many other mammals are capable, whether actively or passively, of spreading plants or plant parts. However, the action of animals cannot fully explain widely-disjunct populations of Bitterroot. Distant outposts of Bitterroot are not zoochores (plants distributed by animals), although animals can be responsible for short-range dispersal.



The best explanation for the scattered Bitterroot populations, then, seems to be a combination of hypotheses. In the area of northern Montana and adjacent Alberta, the long-range effects of glacial advance and recession and of the following periods of alternate warming and cooling are of primary importance. Dryland species such as Bitterroot occupied wider ranges during xeric intervals than at present. A return to cooler conditions diminished the suitable habitat, with isolated populations persisting in restricted, discontinuous locations. Short-range dispersal via winds, birds, and mammals then increased the complexity of the distribution picture. Although the role of cultural dispersal is more difficult to document, plants of economic, religious and/or ceremonial significance have been found at many ancient cultural sites. Whether the plants were deliberately carried to the sites or whether the sites were chosen because of the natural presence of the plants, however, remains a mystery.

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- Wilson, M.C., L.V. Hills, B.O.K. Reeves, and S.A. Aaberg. 1988. Bitterroot, *Lewisia rediviva*, in southwestern Alberta: cultural versus natural dispersal. Canadian Field-Naturalist 102(3): 515-522.

Jerry DeSanto has lived in Alberta since his retirement from the National Park Service in 1986.

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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.

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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.

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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* CALENDAR, P.O. BOX 6444, BOZEMAN MT 59771. All items should be typed and on 3.5" diskette in Microsoft Word for Windows or in a generic ASCII file.

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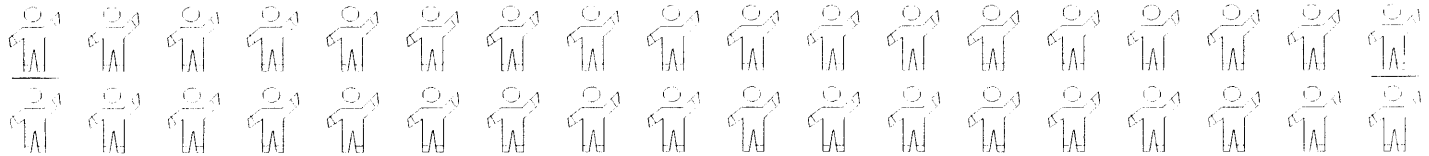
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