

# Kelseya

Newsletter of the Montana Native Plant Society

[www.umt.edu/mnps/](http://www.umt.edu/mnps/)

## Natural Prairie Holds Key to Sustainable Fuels

**A**s gas prices inch higher, the search is on for renewable, plant-based fuels that don't require fertilizer or pesticides, both of which require energy to produce. A solution may be at hand, from University of Minnesota ecologist David Tilman and two colleagues: Instead of growing a single fuel source crop, grow many species together because such plantations will yield more total vegetation—and do it more reliably—than any growing just one species.

The most cited ecologist in the world, Tilman has long been singing the praises of biodiversity, as the coexistence of many species is called. In May, he and two colleagues (University forest resources professor Peter Reich and Johannes Knops of the University of Nebraska) published a paper in the journal *Nature* in which they sum up 12 years of experiments at the University's Cedar Creek Natural History Area. The longest-running experiment of its kind, it shows unequivocally that plots of land with numerous species produce much more "biomass" and suffer less from fluctuations in productivity than plots with only one or a few species. This makes diverse plantings the likeliest candidates to drive the "bio" revolution.

The paper is a call to everyone who wants to extract energy from biomass to start thinking in terms of species diversity. Biomass can be either burned for energy or refined to

produce concentrated energy in the form of biofuels such as ethanol or synfuel gasoline and diesel. The greater the yield of biomass per acre the better, and data from Cedar Creek show that diverse plantings fill the bill.

"Diverse prairie grasslands are 240 percent more productive than grasslands with a single prairie species," says Tilman, a Regents Professor of Ecology in the College of Biological Sciences, which operates the Cedar Creek field station. "That means that if a plot with one or two plant species produces 100 pounds of vegetation a year, a plot with 16 species [the most diverse plots planted at

make and apply. Experiments now under way in Germany and the Netherlands are noting similar effects of diversity on yields, says Tilman, even though they use totally different species. Also, because prairie plants are perennial, they would not have to be replanted year after year. Farmers would need only mow their fields in the fall. If burned, biomass could replace some of the coal that now pumps carbon dioxide and mercury into the atmosphere.

"You can burn prairie grass using the fluidized bed technology of existing coal-fired power plants, and can mix it in with coal," says Tilman. "The energy density of biomass is 60

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***Ecologist David Tilman says a diversity of plant species will likely produce the most biomass for making sustainable fuels.***

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Cedar Creek] will produce 340 pounds. This huge advantage comes when you plant numerous grasses and legumes and various prairie flowers together."

Findings from Cedar Creek suggest that plantings of multiple species of prairie plants will produce fuels, such as ethanol, with greater net energy gains per acre than corn, soybeans, or even switchgrass, which has been touted as a promising source for biomass. But the higher energy gains aren't just from higher productivity; diverse plantings require little or no inputs of fertilizer or pesticides, both of which require lots of energy to

to 70 percent that of coal. If power plants wanted to buy biomass and farmers wanted to grow it, it could happen, but it will take much work to get there."

Now that the value of biodiversity has been shown, the next step should be an economic analysis, says Tilman. It remains to be seen whether biomass farmers, along with energy producers and the people who transport biomass from one to the other, can each make money if they put the vision that he and his colleagues have into practice. For optimal results,

*(Continued on page 8)*



# President's Platform

## Susan Winslow



Ah, another change in season. The brown-cured hues of late summer are making way for the promise of autumn color. The annual meeting held in the Madison Valley was dry and warm with record attendance. In addition to folks of all ages, the bugs also were present in large numbers. I think most of the field trips in the high country experienced fewer pesky insects, along with dazzling floral displays. The Clark Fork Chapter did a superb job with the entire meeting, especially considering that some crucial members weren't able to attend due to sudden illness. In addition to being short-staffed, sporadic power outages played havoc with the water source, and threatened to leave everyone hungry on Saturday night and Sunday morning! Talk about stress piled on stress; they all deserve an award for pulling it off so successfully.

### Membership Meeting

As expected, Pat Plantenberg's parody on the election results provided comic relief and insightful analysis. Congratulations to Dave Hanna and Pat Plantenberg, the re-elected Vice President and Secretary respectively, and to Wayne Phillips for assuming the duties of Eastern Montana Director At-large! Speaking of Pat Plantenberg, he deserved and

rightly received the Outstanding Service Award, which was eloquently presented by Wayne Phillips. Thanks to Pat for all his years of dedication, diligence, and support to the Society. The Board of Directors voted last March to increase dues, so a general announcement was made to the membership (see below). A Valley of Flowers Chapter member, Leslie Edgington, has tentatively volunteered to take over the task of being our new Webmaster. Read more about Leslie in January after she's had a chance to hone her html programming skills. The Society greatly appreciates all the time, effort, and dedication dispensed by the outgoing Webmaster, Marilyn Marler—thanks and good luck in your political endeavors. A representative of each chapter recapped activities, accomplishments, and future goals—what a busy bunch. Leslie Marty has reassumed the presidential role for the Artemisia Chapter. The Kelsey Chapter is hosting next year's meeting at Georgetown Lake. They already have a good handle on the situation, so make plans to attend. The Landscape Committee reported that efforts are underway to develop a web-based source guide. The Threatened Plants Steering Committee is scheduling a fall meeting to discuss assigning and

ranking threats to species of concern. Lastly, the music-inspired camaraderie around the bonfire was nicely supplemented with shooting stars.

### Board of Directors Meeting

The next meeting is scheduled for October 28, at 10:00 a.m. in Helena. The meeting is open to all members. For those not able to attend, be sure and pass along any appropriate topics to your representative for discussion at the meeting. Chapters with potential projects that require funding should have requests to me no later than October 14.

In closing, one year ago in my first platform as president, I commented on basic homeowner recommendations for dealing with the ongoing fire season in mostly grass-dominated rangelands. This is a much different year, with wildfires raging on privately held and national forest timberlands. The Montana woods, and some structures, are going up in smoke. More than 2,000 wildfires have burned greater than 630,000 acres, and we have a long way to go yet before the onset of normal fall moisture patterns. Luckily, there have been very few injuries, but if you're out and about at work or play, be safe. In spite of the fire conditions, have a good fall.

Susan can be reached at P.O. Box 502, Bridger, MT 59014 406-668-9112 e-mail: susan213@msn.com

## WELCOME new members!

The Montana Native Plant Society extends a warm welcome to the following new members:

Calypso Chapter: Char Davis; Clark Fork Chapter: Poody McLaughlin, Mamie Smith, Richard Wren; Flathead Chapter: Geri Cochrane, Michele Disney, Susie Heger, Robben Leingang, John & Laurel Swetnam; Valley of Flowers: Lynn Burton, Tom Forwood, Heather's Garden Service, Charles Repath; Eastern Montana: Susan Stout; Western Montana: Bob Wilson, Terry Hightower.

Your participation and support are important to us! Please contact your chapter representative with any ideas or suggestions you may have.

### MNPS Dues Increase

Effective January 2007 there will be a slight increase in MNPS dues. An individual with chapter affiliation will be \$20 and without affiliation will be \$15. Other categories were raised proportionately. The board was reluctant to raise the cost of membership, but noted that costs have increased and dues have been unchanged for a number of years.

## 2007 Annual Meeting Scheduled

Mark your calendars now! The 2007 MNPS annual meeting is June 29-July 1, 2007, at Georgetown Lake. The Kelsey Chapter is busy with plans to make this event one not to be missed. We have a camp rented right on the lake and the event promises to be loads of fun. There are lots of great hiking opportunities and several Forest Service Research Natural Areas are close by. Wildflowers should be abundant! Plan ahead and we'll see you then.

## Release of 2006 IUCN Red List reveals ongoing decline in status of plants and animals

Geneva, Switzerland, 2 May 2006 (IUCN)—The total number of species declared officially extinct is 784 and a further 65 are only found in captivity or cultivation. Of the 40,177 species assessed using the IUCN Red List criteria, 16,119 are now listed as threatened with extinction. This includes one in three amphibians and a quarter of the world's coniferous trees, on top of the one in eight birds and one in four mammals known to be in jeopardy.



The 2006 IUCN Red List of Threatened Species brings into sharp focus the ongoing decline of the earth's biodiversity and the impact mankind is having upon life on earth. Widely recognized as the most authoritative assessment of the global status of plants and animals, it provides an accurate measure of progress, or lack of it, in achieving the globally agreed target to significantly reduce the current rate of biodiversity loss by 2010. "The 2006 IUCN Red List shows a clear trend: biodiversity loss is increasing, not slowing down," said Achim Steiner, Director General of the World Conservation Union (IUCN). "The implications of this trend for the productivity and resilience of ecosystems and the lives and livelihoods of billions of people who depend on them are far-reaching. Reversing this trend is possible, as numerous conservation success stories have proven. To succeed on a global scale, we need new alliances across all sectors of society. Biodiversity cannot be saved by environmentalists

alone—it must become the responsibility of everyone with the power and resources to act," he added.

The 2006 Red List includes additional species from the Mediterranean region, one of the world's 34 biodiversity hotspots with nearly 25,000 species of plants—of which 60% are found nowhere else in the world. In the Mediterranean, the pressures from urbanization, mass tourism, and intensive agriculture have pushed more and more native species, like bugloss, *Anchusa crispera* and centaury, *Femeniasia balearica* (both Critically Endangered) towards extinction. The bugloss is only known from 20 small sites, and less than 2,200 mature centaury plants remain. Endemic to the Balearic Islands, *Femeniasia balearica* now occurs only in six sites in the north of the island of Minorca. It is a typical seashore species that grows in dry sunny places on sandy soils.

But what can be done to halt and reverse the decline of the Earth's biodiversity on which so much of our own well-being depends? The IUCN Red List of Threatened Species acts as a wake up call to the world by focusing attention on the state of our natural environment. It has become an increasingly powerful tool for conservation planning, management, monitoring, and decision-making. It is widely cited in the scientific literature as the most suitable system for assessing species extinction risk.

The IUCN Red List of Threatened Species classifies species according to their extinction risk. It is a searchable online database containing the global status and supporting information on about 40,000 species. Its primary goal is to identify and document the species most in need of conservation attention and provide an index of the state of biodiversity.

Major analyses of the Red List are produced every four years. These were produced in 1996, 2000 and 2004. The 2004 Global Species Assessment is available from: [www.iucn.org/themes/ssc/red\\_list\\_2004/2004home.htm](http://www.iucn.org/themes/ssc/red_list_2004/2004home.htm)

Key findings to date include:

- The number of threatened species is increasing across almost all the major taxonomic groups.

- Most threatened birds, mammals and amphibians are located on the tropical continents—the regions that contain the tropical broadleaf forests which are believed to harbor the majority of the Earth's terrestrial and freshwater species.

- Australia, Brazil, China, and Mexico hold particularly large numbers of threatened species.

- Estimates vary greatly, but current extinction rates are at least 100-1,000 times higher than natural background rates.

- The vast majority of extinctions since 1,500 AD have occurred on oceanic islands, but over the last 20 years, continental extinctions have become as common as island extinctions.

Created in 1948, the World Conservation Union (IUCN) brings together 81 States, 113 government agencies, 850 plus NGOs, and some 10,000 scientists and experts from 181 countries in a unique worldwide partnership. The Union's mission is to influence, encourage, and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. The World Conservation Union is the world's largest environmental knowledge network and has helped over 75 countries prepare and implement national conservation and biodiversity strategies. The Union is a multicultural, multilingual organization with 1,000 staff located in 62 countries. Its headquarters are in Gland, Switzerland.

Web: [www.iucn.org](http://www.iucn.org); [pressiucn.org](http://pressiucn.org)  
<[http://www.iucn.org/en/news/archive/2006/05/02\\_pr\\_red\\_list\\_en.htm](http://www.iucn.org/en/news/archive/2006/05/02_pr_red_list_en.htm)



Centuary, *Femeniasia balearica* (both photos), is a Critically Endangered species from the Mediterranean.

# Undaunted Botany: Lewis and Clark's Search for Plants



Hot dog! When this title appeared in green on the cover of the *Montana Outdoors* July-August issue, of course I went straight to it, skipping “Wolves in Montana,” another of my favorite subjects. To my amazement, the text of the article was printed on copies of original herbarium sheets from the Lewis and Clark Herbarium at the Academy of Natural Sciences in Philadelphia, complete with the 200-year-old plant material and all of the labels that appear on the original sheets. What a clever idea! But then the authors of the article are no less than our very own MNPS newsletter editors, Kathy Lloyd and Drake Barton.

I expected an article on Lewis and Clark plants in *Montana Outdoors* to be restricted to the Expedition’s plant collections from Montana. Indeed, a listing of the 32 extant collections from Montana, and six of the lost specimens, do line the margin of the three photo panels. However, the narrative is much broader in scope, embracing the botanical objectives of the entire expedition, but in a very readable, conversational way that never gets bogged down in detail. Everyone’s favorite edible

and medicinal plant discussions are central to the article, including information about camas, cous bisquit-root, wild apple, licorice root, yampah, bitterroot, serviceberries, chokecherries, onions, and wild ginger.

The plant photographs on the three beautiful photo panels are not restricted to the plants collected in Montana either, with several included that were collected from areas outside the state: yellow bell, prairie smoke, bunchberry, and thimbleberry. The photography is outstanding, especially the breathtaking view of a large field of bitterroot in full bloom. I’ve never seen bitterroot so abundant! I was somewhat disappointed though, to find that only three of the 17 photos illustrating the article were those of Drake Barton. In our Society and beyond, Drake is well known and respected as an outstanding plant photographer, and I was hoping to see this article showcase more of his work. However, the photos do include the fine photos of other MNPS experts, like D. Linnell Blank.

New and newsy information is included in the article. The recent discovery of one more Lewis and Clark plant specimen, Sandberg’s bluegrass, at the Royal Botanic Gardens in Kew, England makes one wonder how many more are filed away, unnoticed, in other herbaria. The timely news of original Lewis and Clark specimens from Philadelphia on display at the Crazy Mountain Museum in Big Timber is highlighted to encourage readers to attend.

The clever use of photos of 200-year-old dried plants on herbarium sheets alongside freshly blooming ones, the engaging dialogue, and new information combine in this article, “The Corps of Botanical Discovery,” in a way that is worth your while. I recommend reading it before you turn to “Working it out with Wolves.” Me? I’m off to Lost Trail Pass to search for Dawson’s angelica where Lewis collected it. I’ve only seen it once before. Want to go?

H. Wayne Phillips  
Editors’ note: Luke Duran, art director, and Tom Dickson, editor, are to be credited for the creative and attractive layout.

## Available from MNPS

Available free from MNPS Publications: MNPS membership brochures, *Plant Collection Guidelines for Teachers* brochures, and *Echinacea Cultivation Information*. Also available are additional copies of *Plants Collected in Montana During the Lewis & Clark Expedition*. Please send a SASE to 1270 Lower Sweet Grass Road, Big Timber, MT 59011 to receive any of these publications.

Available from the Flathead Chapter: a packet of information about gardening with Flathead Valley native plants. The packet can be mailed to you for \$3.50. Contact Tara Carolin at 334 North Many Lakes Drive, Kalispell, MT 59901.

Available from the Kelsey Chapter: a packet of information on landscaping with natives in the Helena area. The packet will be mailed to you for \$3.50. Contact Kathy at 449-6586 or e-mail: drakekath@hughes.net. to order.

Available from the Valley of Flowers Chapter: a booklet of information on landscaping with natives in the Bozeman, Livingston, and Big Timber areas. The booklet will be mailed to you for \$6.50. Contact Denise Montgomery at 586-0156 or e-mail: nmontgomery@montanadsl.net to order.

Visit the MNPS website at [www.umt.edu/mnps](http://www.umt.edu/mnps) to download in pdf format *Weeds Listed as Noxious by Montana Counties*, a list of weeds that are targeted by each county; *Guidelines for Selecting Horticultural Plant Material for Montana*, voluntary guidelines by MNPS and the Montana Nursery and Landscape Association; and *Lewis & Clark Plants Collected Elsewhere That Occur in Montana*, an inclusive list of Lewis & Clark plants found in



Drake

*Hymenoxys grandiflora* in the Gravellys.

## Montana Conservation Assessment for Spalding's Catchfly

Available from the Natural Heritage Program

Spalding's catchfly (*Silene spaldingii*) is one of only three Montana plant species listed as "threatened" under the U.S. Endangered Species Act (USFWS 2001). It is restricted to the inland Pacific Northwest, ranging from eastern Washington and northeast Oregon to north-central Idaho, northwest Montana, and just into adjacent British Columbia.

While Montana supports just 15% of this species' total range-wide populations, we do host the largest population at The Nature Conservancy's Dancing Prairie Preserve. Estimated at 10,000 plants minimum, this population alone comprises a significant percentage of the total plants known range-wide. Other sizeable populations in Montana occur on the Flathead Indian Reservation and the Lost

Trail National Wildlife Refuge.

Typical Montana habitat for this plant is rough fescue grasslands on rolling kettle/drumlin topography, swales, minor draws, and north slopes where moisture remains available a little longer into the growing season compared to adjacent drier slopes. These sites often occur near the lower treeline or with scattered ponderosa pine.

A range-wide status assessment of Spalding's catchfly, written in 2004, contained relatively outdated information for Montana. Thanks to survey work in 2004 and 2005 by MTNHP botanist Scott Mincemoyer (funded by the U.S. Fish & Wildlife Service), we now have an up-to-date Montana Conservation Assessment (available at [www.mtnhp.org](http://www.mtnhp.org)). Scott used predicted habitat modeling to help him locate two new populations, bringing the number of extant occurrences in Montana to eleven. Survey work is challenging because Spalding's catchfly can stay below ground, especially during dry years, resulting in populations being overlooked or undercounted.

Unfortunately, Montana populations continue to be vulnerable to invasive weeds; habitat loss, and fragmentation, particularly in the Tobacco Plains; and to impacts associated with grazing, fire exclusion, and small, isolated populations. Based on current information, successful conservation will depend on protecting existing populations, improving habitat conditions, rebuilding populations, mitigating impacts of invasive weeds and grazing, and renewed monitoring and survey efforts.

For now, the MTNHP rank for this species remains S1 due to its combined rarity and the level of threats to populations. However, opportunities for beneficial management in Montana should be high since the majority of populations are on lands administered by state or federal agencies, the Confederated Salish and Kootenai Tribes or The Nature Conservancy. Contact Scott at 406-444-2817 for more information.

Reprinted from Spring 2006  
*Optimolocus*

## Outstanding Service Award

Anyone who has been close to the hub of power in any organization knows that it takes many folks working behind the scenes to keep things humming along on both cylinders. Pat Plantenberg, the 2006 recipient of the MNPS Outstanding Service Award, is just such a person. Pat has been the state Secretary for many years, documenting the board meetings and keeping the bylaws up to date. He compiled a notebook that brings important Society information together in one place, and keeps it updated. Pat also collects and tallies the votes for the election of all state officers, and firmly denies that any lobbying monies went into his recent house remodel. Besides working behind the scenes, Pat also has entertained us for many years at the annual meeting, presenting the results of the election and encouraging, or shaming, us into getting out to vote. He was also honored for his work with the Kelsey Chapter putting together both a landscaping with natives se-



Patrick Plantenberg receives the 2006 Outstanding Service Award.

ries and a wild edible plant class. In addition to a certificate, Pat received a beautiful image of Indian breadroot (*Psoralea esculenta*, *Pedimelum esculentum*) as portrayed by Missoula artist Nancy Seiler.

## Edible Wild Plants Booklet Available

The Montana Federation of Garden Clubs has republished Patrick Plantenberg's *Edible Wild Plants Used in Montana Yesterday and Today*. The publication contains recipes gathered by Patrick from edible wild plant class participants over the last 30 years. The booklet also contains nutritional information on some edible wild plants. The Montana Cooperative Extension Service first published the publication in 1976. The 50-page booklet is available on CD or hard copy and costs \$5.00. Proceeds from the sale of the booklet are being donated to the Montana Federation of Garden Clubs. For information and to order your copy, please contact Patrick at 406-266-5265 or write to Patrick at 133 N. Maple, Townsend, MT 59644. With the holidays approaching at a scary pace, this booklet would make a nice gift for your edible plant enthusiast friends!

## Edible Wild Plant Class Concludes with Potluck

The Kelsey Chapter and the Montana Federation of Garden Clubs sponsored a five-part Edible Wild Plant Class in Helena from April through August 2006. The class concluded with an edible wild plant potluck on August 18<sup>th</sup>. Course instructors, Patrick Plantenberg and Kathy Lloyd, showed class participants various edible, useful, and medicinal plants over the duration of the class. The menu at the potluck included many delicious and interesting dishes: huckleberry and nut bread; wilted wild greens with a hot bacon dressing; buffaloberry sweet and sour chicken; golden currant sweet and sour pork on rice; pickled cattail leaves; milkweed pod, cabbage, and leek soup made with cattail broth; purslane pickles; wild greens salad made with green orach leaves, young purslane stems and leaves, pigweed leaves, lambsquarters leaves, chickweed stems and leaves, kochia leaves, wild onion leaves, sheep sorrel leaves, Loesel's mustard flowers, tumbling mustard seed pods, Rocky Mountain bee plant flowers and seed pods; chokecherry salad dressing; melon salad topped with a wild onion and fanweed seed dressing; wild salmon pot pie with purslane greens topped with cattail pollen biscuits; international stir fry made with Italian olive oil, young American showy milkweed pods, Mexican mild chili peppers, and topped with Chinese soy and Szechwan sauces; nettle and chanterelle mushroom lasagna; young Russian thistle greens in nutmeg cream sauce with sunflower seeds; cattails on the cob; chokecherry pudding; wild mint sun tea; gooseberry pie; huckleberry whole wheat muffins; golden currant, oatmeal, and yampa squares; and golden currant muffins. Hungry yet?

The class participants will be writing up their recipes and experiences over the summer and the Kelsey Chapter will publish a booklet with the information.

Patrick Plantenberg

## Celebrating Wildflowers on Mount Helena

On May 23, 2006, the Kelsey Chapter of the Montana Native Plant Society, along with the Helena National Forest and the Montana Discovery Foundation, invited approximately 200 Helena area students to take part in the 9<sup>th</sup> annual Celebrating Wildflowers event on Mount Helena. Each year these partners come together to promote the importance of conservation and management of native plants and plant habitats. Sixteen volunteers participated in the popular event this year.

Students spent the day on Mount Helena identifying many spring flowers, and also made their way through three learning stations focusing on flower anatomy, pollination, and noxious weeds.

In conjunction with the event, a wildflower poster contest was held in which the winner's drawing was placed on a billboard in Helena.

Celebrating Wildflowers is a popular event with students and teachers and increases public awareness of the importance of native species and habitats. It is hoped that by teaching children to appreciate native landscapes in Montana, they will carry that awareness into adulthood.

Kathy Martin

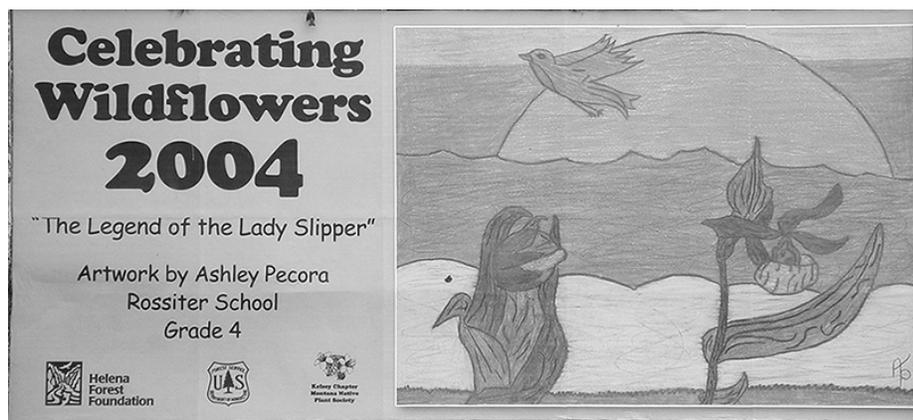
## Celebrating Wildflowers Web Site

The new Forest Service web site Botany: Celebrating Wildflowers is ready for the public. This new web site is the gateway to an enormous amount of botanical information provided by a variety of groups. The Forest Service web portal is available at: <http://www.fs.fed.us/wildflowers/>

Every Region, Forest, Grassland and Prairie contributed to the content of this new site. Detailers from across the nation assisted in the development of emphasis area content such as Pollinators, Beauty of it All, Native Gardening, Just for Kids, Teacher Resources, Wildflower Ethics, and Invasive Plants, to name a few. A number of other modules such as rare plants, native plant materials, ethnobotany, lichens, ferns, and other botany subject areas are currently under development and will be posted to the web site as they become finalized. The Forest Service is extremely proud of the work of the botanists, plant ecologists, and other resource specialists, and the many partners who contributed to the current content of this site.

Check the site to find out what wildflower activities are scheduled for Montana.

Emily B. Roberson, Ph.D.  
Native Plant Conservation Campaign



Celebrating Wildflowers is a popular event in Helena. Student artwork is featured on a prominent billboard in town, drawing attention to Montana native plants. This recent billboard features lady's slipper by fourth grade artist Ashley Pecora.

# Fabulous, Fantastic, *Frasera* Facts

The star plant of the Montana Native Plant Society annual meeting this year—the belle of the floral banquet—was Miss Gravelly herself, *Frasera speciosa*! If you get the chance, look very closely at this beautiful, detailed, interesting plant, and then look again.

*Frasera speciosa* belongs to the class Magnoliopsida, the order Gentianales, the family Gentianaceae, the genus *Frasera*, and the species *speciosa*. Its common names are green gentian, monument plant, elkweed, and deer tongue.

David Douglas first collected *Frasera speciosa* in the Spokane area in the early 1830s. The genus *Frasera* is named for John Fraser, an 18<sup>th</sup> century Scots nurseryman who botanized in the southern Appalachians from 1786-1807 and collected for Kew Gardens and the Linnaean Society. He also sold plants privately, including to the Empress of Russia, becoming Russia's main plant collector of that time. The species name, *speciosa*, means showy, describing the leaves and the massive flower display.

*Frasera speciosa* is found in mountain meadows throughout western North America. The reproductive plant is a rosette with a tall, cylindrical inflorescence. The flower is four-petaled and hermaphroditic, with both male and female organs. Purple spots on the petals, known as nectar guides, attract pollinators. The nectar is under two fringes of hairs that may serve to keep it cool and prevent it from crystallizing.

Until recently this plant was thought to be a biennial, a plant that normally requires two years for its life cycle. Biennials store food in the first season of their growth, flower, bear fruit, and die. Studies by Dr. David Inouye, who has researched the plant for decades, indicate that *Frasera speciosa* is actually a monocarpic plant, flowering only once in a lifetime of 20-80 years, then dying. Inouye's research also shows that large numbers of *Frasera speciosa* flower every 2-4 years, with sporadic yet synchronous flowering. The average age of a flowering plant seems to

be about 35-40 years, though at high altitudes the plants may wait until they are 75-80 years old to bloom.

Inouye's research shows that the "number of leaves in the swirl of basal leaves roughly corresponds to the age of the plant, but individual plants may produce fewer, the same number, or more leaves in one season than in the previous season."

He believes that when the plants get to a certain age, anywhere between 20 and 80 years, they are ready for an environmental cue that signals them to bloom. After intensively watering a plot of about 100 wild green gentians for two consecutive summers, he observed that the plants pre-form leaves and flowers two years in advance. The third year he left the plot alone and the gentians in the plot flowered significantly more than in other areas across the mountains. Inouye hypothesizes that the plants received an environmental cue two years prior to blooming, prompting their floral display. Inouye believes the cue is summer precipitation, rather than drought, though he's not sure if it's the amount of rain throughout the summer, or density of rain during a certain month, or another formula altogether.

A.J. Beattie, D.E. Breedlove, and P.R. Ehrlich state, "The local synchrony revealed by the occurrence of discrete colonies and the overall synchrony revealed in the almost total absence of floral colonies in some years and the abundance in others is viewed as a strategy for predator avoidance. The flowering regime of



*Frasera speciosa*, the belle of the banquet.  
Photo: Drake Barton

*Frasera* combines a predator avoidance system which yields widely dispersed colonies in space and in time with a pollination system which successfully exploits the maximum diversity of floral visitors (15%) and maintains excellent seed-set (not less than 52%) whenever and wherever the colonies appear. The systems are clearly complementary in preventing the build-up of predator populations while maintaining an attractive forage source for potential pollen vectors."

As for germination and survival in the wild, the seeds of *Frasera speciosa* fall to the ground beneath the mother plant, which soon keels over on top of them. In a year with typical rainfall, Wied and Galen's green gentian seeds germinated regardless of whether the researchers planted them on bare ground or on places scattered with parts of an adult plant. But, green gentian seedlings were almost twice as likely to survive if they grew among the fallen leaves and stems of an adult plant as they were if they grew in the open. The soil under the collapsed mother plant was moister than that in open spots, where the sun and wind drove faster evaporation. The dead mother plant was thus providing postmortem drought insurance, the researchers claimed. They called this one of the first demonstrations of a plant nursing its own seedlings.

To grow *Frasera speciosa*, the Permaculture Information Web says to sow seed in spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and grow them in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frost. Divide in late winter. There is little or no seed dormancy, and germination occurs the following spring. Sources from the Seed Germination Database say to sow seeds at 4° C (40° F) for 6 weeks, and move to 20° C (68° F) for germination. *Frasera speciosa* prefers moist, sandy or loamy soils and good drainage. It can grow in semi-shade to full sun, and prefers a neutral to acid soil.

Kelly Chadwick

# CALENDAR

Please remember to leave pets at home during MNPS field trips.

## ARTEMISIA CHAPTER

For a schedule of Artemisia Chapter events or to get your questions answered, please call Leslie at 445-9178.

## CALYPSO CHAPTER

Call Sheila Thompson at 846-1855 or Debbie Mueller at 782-6651 for details.

Thursday, October 5, 7:00 p.m.

Grant Mitman, Ph.D. will present a program on "Biological Illustration." Professor Mitman will share his artwork and information about the course in biological illustration taught through Cornell University on Appledore Island, Maine. There will be a short instructional session on pen and ink. Those wishing to participate should come prepared with a Micron .005 or .01 technical pen (available at Montana Tech bookstore or art supply stores for around \$2.50). The free program is at the Montana Tech Biology/Chemistry Building, Room 105.

## CLARK FORK CHAPTER

Thursday, October 12, 7:30 p.m.

Have you wondered about that mountainside of brown trees at Homestake Pass or all those old, dead whitebark pines in the Pintlars? Now you can find out. Come and listen to Diana Six, University of Montana professor of forest pathology, talk about her research on "Bark Beetle-Fungus-Conifer Interactions in Forests of North America." Rm L09 Gallagher Business Bldg., UM Campus.

Thursday, November 9, 7:30 p.m.

It's easy to contaminate a watershed, but making things right is another matter. Plant ecologist Rich Producers has been restoring and reclaiming mined lands in Montana for three decades. Hear him talk about his biggest challenge, "Bringing Back the Dead: Revegetation of Silver Bow Creek." Rm L09 Gallagher Business Bldg., UM Campus.

Thursday, December 14, 6:30 p.m.

Our annual Christmas potluck will be held at the Open Way Center, 702 Brooks just north of the Rose Garden on the southeast corner of Brooks and Franklin. Bring plates, utensils,

and a dish to share. Please, no alcoholic beverages! Don't forget to bring a few of your favorite slides or digital pictures from the summer.

## EASTERN MONTANA

For more information about Eastern Montana events call Wayne Phillips at 453-0648.

## FLATHEAD CHAPTER

New place and day! We'll be meeting downstairs at the Flathead County Library (247 1<sup>st</sup> Ave. East) on the first Wednesday of the month.

Wednesday, October 4, 5:30 p.m.

Come visit with other plant enthusiasts, share a potluck dinner, and help plan the upcoming chapter events.

Wednesday, November 1, 5:30

General meeting. 7:00 program TBA.

Wednesday, December 6, 5:30 p.m.

Christmas Party. Bring a potluck dish and a recycled or under \$10 gift. Always a great time. Location TBA.

## KELSEY CHAPTER

For more information about Kelsey Chapter programs and events, call Kathy at 449-6586.

Saturday, December 9, 6:00 p.m.

Join us for our annual "Holiday Potluck and Show-and-tell" hosted by Jo Lace and Brian Shovers at 210 S. California St. in Helena. Bring a dish to share, your own plate and utensils, and something native plant-related to show off!

## MAKA FLORA CHAPTER

For information about the Maka Flora Chapter or events call Rebecca Kallevig at 488-5455.

## VALLEY OF FLOWERS

During the fall and winter, the Valley of the Flowers Chapter meets on the second Tuesday of each month in Room 108 of the AgbioScience Building at MSU. The building is on South 11<sup>th</sup>, and parking is free in the evening in the lot north of the building. Meetings begin at 7:00 p.m. For more information contact Monica Pokorny at 763-4109.

Tuesday, October 10, 7:00 p.m.

Harold Armstrong, Manager of Montana State University Seed Laboratory, will present "Native Species

Seed Collection, Cleaning, Viability and Site Selection." Are you interested in collecting and growing native plants for your garden or restoration project? This presentation will discuss how to collect, clean, store, and treat native seed, and how to select a site for planting.

Tuesday, November 14, 7:00 p.m.

Tom Forwood, Naturalist at Lewis and Clark Caverns State Park, will present "Flowers Outside the Caverns." This presentation is a seasonal slideshow of flowers as the year progresses at Lewis and Clark Caverns State Park. Photographs and discussion will highlight the diversity of the flora at the Park.

## WESTERN MONTANA

For information about activities in western Montana, call Erich Pflazer at 406-827-4078.

...Prairie Fuels (Continued from page 1)

each region of the country and the world would have to be studied to determine what mix of plant species would work best in that particular soil and climate.

"In Minnesota there are over a million acres of abandoned farmland in the Conservation Reserve Program," says Tilman. "That land is mainly planted with just a few grass species" and so may hold potential as a future site of biomass plantations.

Planting more species should allow not only bigger yields of vegetation, but more predictable yields. As the Cedar Creek experiments show, yields of vegetation fluctuate less from season to season if the vegetation contains many species. This kind of reliability is important because no one wants to see boom and bust years in the energy supply.

"This paper suggests there might be an unsuspected benefit to restoring land to a more native condition," Tilman says. "Restoring land so it can produce biofuels is a new idea, but there are many reasons to do it. We need a stable and productive source of bioenergy. Biodiversity can give us this on abandoned agricultural land around the world, and it doesn't have to be just grasses. As we get away from fossil fuels, we're going to have to have a diversity of approaches."

# Annual Meeting Field Trip Reports

## ...In the Gravelly Mountains

### Black Butte

Our trek to the top of Black Butte, the highest point in the Gravellys, started with the long drive from the Wall Creek camp. It was a slow drive, since at least one car in the group was very distracted by the spectacular scenery and some in the group thought we would never make it to our starting point. And, once there, the profuse displays of wildflowers near the cars were so overwhelming that a number of our group claimed they didn't want to go to the top, but would rather just hang out in the meadows near the road. There were great displays of alpine wildflowers, including old man of the mountain (*Hymenoxys grandiflora*), fern-leaved lousewort (*Pedicularis cystopteridifolia*), and our meeting mascot, green gentian (*Frasera speciosa*). As we wandered up we found even more species, including *Lewisia pygmaea*, pygmy bitterroot. Ultimately, the prominent volcanic plug of Black Butte was so compelling that eventually everyone made it to the summit, where we were rewarded with panoramic views of the mountain ranges of southwest Montana.

Dave Hanna

### Bighorn Mountain

A dozen years ago when the Native Plant Society went to the top of the Gravellys it was raining with visibility of just a few hundred yards. This time it couldn't have been more different. We drove up Standard Creek, and nobody got lost, and by the time we got to hiking it was already a little bit hot without a cloud in the sky. We began at 9,200 feet with Bighorn Mountain our destination. We never made it; all the wildflowers kept getting in the way. At the start, many of the showy species, like sky pilot (*Polemonium viscosum*) and old man of the mountain (*Hymenoxys grandiflora*) were already done, but they started appearing as we climbed higher. And of course we saw some

green gentian (*Frasera speciosa*). There were lots of legumes, including thistle milkvetch (*Astragalus kentrophyta*), yellow sweetvetch (*Hedysarum sulphurescens*), locoweed (*Oxytropis sericea*), and lupine (*Lupinus argenteus*), as well as a couple of parasites: fern-leaf lousewort (*Pedicularis cystopteridifolia*) and a yellow paintbrush (*Castilleja pallenscens*). We ate lunch at about 10,000 feet on the ridge above Alpine Creek about two-thirds of the way to the peak. We examined cushion plants like *Smelowskia calycina* and *Arenaria obtusiloba* and a herd of 100 elk (someone actually counted them), with dozens of calves on a ridge at the head of the creek. After lunch the climb continued up the ridge and then down a drainage filled with thick-leaved butterweed (*Senecio crassulus*), hosting myriad butterflies who were having their lunch. We made it back to camp in time to go swimming or do the plant contest.

Peter Lesica



Field trips in the Gravelly Mountains featured spectacular views, abundant and gorgeous wildflowers, perfect weather, and good fellowship.

Thanks to all the hike leaders for helping make the meeting a success.

Photo: Drake Barton

## MNPS 2006 Election Results

### Maka Flora Dominates Voting...again

New officers were installed at the 2006 Montana Native Plant Society (MNPS) Annual Meeting sponsored by the Clark Fork Chapter at the Wall Creek Wildlife Management Area near Cameron on July 15 (see page 2 for officer information). The 126 total votes were less than the 2005 total of 131. Only 16% of 806 MNPS members voted. Only 18% of the ballots were electronic. Voters from east of the divide decisively beat the western voters again 20% to 12%. The

west of the divide voters have never won.

The Maka Flora Chapter continued its election prowess and won the \$100 prize for having the largest percentage of voters for the fourth year in a row. Only 31% of its members voted. The Kelsey Chapter could have beat Maka Flora if only six more members had voted. The Calypso Chapter could have won if only three more members had voted.

The MNPS Electoral College would like to thank MNPS members for their election support. Keep up the good work MNPS members.

Patrick Plantenberg

## Small Grant Proposals

Get your small grant proposals ready for the MNPS twelfth annual Small Grants Program. Grants up to \$1,000 will be awarded in 2007 to fund projects that stimulate research, conservation, or educational activities that foster an appreciation for Montana's native plants and plant communities. The deadline is January 31, 2007. Watch for the winter issue of *Kelsey* and check the MNPS website ([www.umn.edu/mnps](http://www.umn.edu/mnps)) for complete proposal and grant application process details. For more information contact committee chair Cathie Jean at 406-599-9614.

Cathie Jean

## Stylin' and Goodyer'n in the Little Belt Mountains

Approximately 30 people from three Montana Native Plant Society chapters joined Wayne Phillips in the successful quest for endemics and specialists of the Little Belt Mountains near White Sulphur Springs in a weekend of botanizing and fun.

Part of the group started the trip off Friday night with a soak in the pool at the Spa Motel. We were up early the next day and headed to Kings Hill in search of *Aquilegia jonesii*. We were not disappointed finding Jones's columbine, a few of which were still in bloom on the north side of the hill where the snow had stayed longer. In addition, we saw the endemic *Cirsium longistylum* and 37 other plants in bloom. We talked about fairy rings and discovered the mother tree in a colonial ring of a subalpine sanctuary.

After thoroughly investigating King's Hill, we headed to Ant Park for lunch among the green gentian and joined Wayne in a ceremony during which he burned the leaves of *Artemisia ludoviciana* in a musselshell honoring the land around us. He quoted Aristotle, from *Metaphysics* II.1 993b1, "The search for truth is in one way hard and in another way easy, for it is evident that no one can master it fully nor miss it wholly, but each adds a little to our knowledge of nature, and from all the facts assem-

bled there arises a certain grandeur."

After lunch we stopped and studied the plants in an old growth spruce forest, then moved on to the fen where we saw *Eriophorum polystachion* and *E. chamissonis*, and *Corallorrhiza maculata* and *C. wisteriana*.

On our way to search for the endemics *Aquilegia brevistyla* and *Goodyera repens* we passed the Trask Ranch and sod roof cabin where Charlie Russell lived and cow-boyed. Within the first ten minutes in a shady draw, we found the columbine and after crawling around among moss and twinflower (*Linnaea borealis*), we found the tiny orchid in bud. This discovery was very exciting for the whole group. We smugly left the site and headed to the historic Judith Guard Station. We had perfect weather, no insects, and a starry night around the campfire with Wayne reciting the poems of Gerard Manley Hopkins.

Sunday morning we were invited to join the Forest Service historian as she explained the history of the station, and later led us to caves with pictographs. On the way we found more *Aquilegia brevistyla* and *Goodyera repens*. In total, we saw over 80 plants in bloom. It was another full, fun, and satisfying trip with Wayne.

Kelly Chadwick, assisted by Betsy Griffing, Beth Judy, Tarn Ream, and Mary Poss

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## Artemisia Chapter on the Beartooth Plateau

The bunches of Arctic gentian with green and purple flowers and the hare bells on their long slender stems warned us, "You are much too late for the magnificent floral display you expected in mid-July on the Beartooth Plateau." The alpine meadows, baked by this summer's heat and drought, nevertheless shone with subtle color. The modest wind blew the fine purple inflorescences of the hairgrass, *Deschampsia cespitosa*, while the fescue kept its blue-green leaves close to the ground.

Jennifer Lyman led us to a stream tumbling down a rock-strewn slope where snow still lingered in the shadow of the boulders. She showed us a myriad of sedges—some tall, some diminutive. Some with inflorescences tawny-brown, some black and topped with creamy-white, and one smoky-purple. We promised ourselves that next summer we will learn those sedges.

Our buttercup-infatuated members spotted the minute pygmy buttercup tucked between gneiss cobbles. The plant could rest on a fifty-cent piece. Where the stream broke over a cliff edge, partially hidden among the red stems and gray-green leaves of willow, was the beautiful, white fringed Parnassus, *Parnassia fimbriata*. A pika chided us for interrupting his gathering of hay.

Off to a swampy spring at 10,000 feet where Basque sheepherders, until recently, camped each summer. A buttercup of the far north, *Ranunculus hyperboreus*, colored the pools a golden-flecked green. Stems, rooting at

the nodes, entangled like green spaghetti on a plate.

Nearby, growing in a mat of sappy wet moss, was an annual plant of the alpine tundra, the tiny buckwheat *Koenigia islandica*, the plant that does it all in one short, alpine summer, from seed to seed: a root, a short stem, two leaves, and a flower, in all no taller than two centimeters. Before us were thousands of these plants. They have survived in this ecological niche for untold hundreds of years. Does the plant have an insurance program? Will some of this year's seed germinate year after next? Is *koenigia* dependent upon the moss? Does the moss serve to anchor this weak-rooted plant and hold it upright? Is the moss critical to protect this tiny plant from winds and the inevitable drops in temperature of the alpine tundra? All questions that will draw us back to the Beartooth Plateau next summer to seek out other populations, observe, and ponder our questions.

Stopping in Red Lodge for huckleberry ice cream, we thanked Jennifer for a day full of wonder. One more delightful and informative field trip.

Post script: Checking various web sites on *Koenigia islandica* reveals that it can grow up to five centimeters and, in addition to the terminal flower, may have a few flowers branching from axils. It has been noted to have adventitious roots. In the Arctic it does grow in acidic gravel, with two other small plants but without moss, in shallow pools protected from the wind. Sørensen in 1941 reported that all the *koenigia* seeds he collected did germinate the next spring. Now that is incredible. Maybe in less than favorable conditions some seed carry over. A good research project for someone.

Clayton McCracken

**MNPS Chapters & the Areas They Serve:**

- ARTEMISIA CHAPTER - Yellowstone and Carbon Counties; southeastern/south-central Montana
- CALYPSO CHAPTER - Beaverhead, Madison, Deer Lodge, and Silver Bow Counties; southwestern Montana
- CLARK FORK CHAPTER - Lake, Mineral, Missoula, Powell, and Ravalli Counties
- FLATHEAD CHAPTER - Flathead and Lake Counties plus Glacier National Park
- KELSEY CHAPTER - Lewis & Clark, Jefferson, and Broadwater Counties
- MAKA FLORA CHAPTER - Richland, Roosevelt, McCone, Sheridan, and Daniels Counties
- VALLEY OF FLOWERS CHAPTER - Gallatin, Park, and 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. Watch for meeting announcements in your local newspaper. Ten paid members are required for a chapter to be eligible for acceptance in MNPS.

Your mailing label tells you the following:

CHAPTER AFFILIATION: ART= Artemisia; CAL=Calypso; CF=Clark Fork; F=Flathead; K=Kelsey; MF= Maka Flora; VOF=Valley of Flowers  
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Membership in 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 mailed to each member in January. Please renew your membership before the summer issue of *Kelseya* so your name is not dropped from our mailing list. Your continued support is crucial to the conservation of native plants in Montana. THANK YOU!

**MONTANA NATIVE PLANT SOCIETY MEMBERSHIP**

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If you wish to be affiliated with a chapter (see above), list it here \_\_\_\_\_

Membership Dues	Price with chapter affiliation	Price no chapter affiliation
Individual	\$18	\$12
Family	\$22	\$18
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Lifetime (one-time payment)	\$300	

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## Montana Native Plant Society

The Montana Native Plant Society (MNPS) is a 501(c)(3) not-for-profit corporation chartered for the purpose of preserving, conserving, and studying the native plants and plant communities of Montana, and educating the public about the value of our native flora. Contributions to MNPS are tax deductible, and may be designated for a specific project or chapter, for the Small Grants fund, or the general operating fund.

Your yearly membership fee includes a subscription to *Kelseya*, the quarterly newsletter of MNPS. We welcome your articles, field trip reports, book reviews, or anything that relates to native plants or the Society. Please include a line or two of "bio" information with each article. Drawings should be in black ink or a good quality photocopy. All items should be typed, saved in Microsoft Word or rich text format (rtf) for a PC, and sent electronically to: drakekath@hughes.net or mailed to *Kelseya* Editors, 314 Travis Creek Rd., Clancy, MT 59634.

Changes of address, inquires about membership, and general correspondence should be sent to MNPS Membership, P.O. Box 8783, Missoula, MT 59807-8783.

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The deadline for each issue is: Fall— September 10;  
Winter— December 10; Spring— March 10; Summer— June 10.  
Please send web items to our webmaster concurrent with these dates.

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