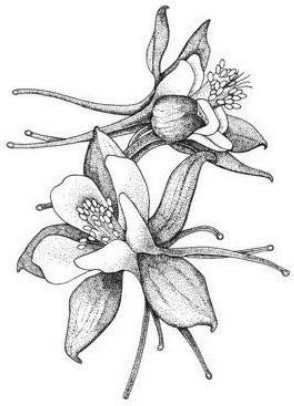
Aquilegia

Newsletter of the Colorado Native Plant Society



". . . dedicated to the appreciation and conservation of the Colorado native flora"

MARR AND STEINKAMP GRANT REPORT

A Monitoring Program to Determine the Effect of Climate Change on Alpine Plant Communities in the San Juan Mountains

By Dr. Koren Nydick

Even though direct human land use has affected alpine areas relatively little, today's climate warming may produce dramatic species shifts and could result in the reduction of alpine landscape extent. Increased temperatures can disturb the growth of cold-adapted species and may lead to competition on alpine plants from lower elevation species. Climate warming could force alpine plants to migrate upwards until they reach mountaintops with nowhere else to go. Mountain ranges with many endemic plants may suffer important species losses.

Upward migration of plants has already been observed in many mountain ranges where monitoring has occurred, but most mountain areas currently do not have the level of observation required to document subtle shifts that may warn of more drastic changes to come. Observations from the Alps show that alpine biodiversity may at first increase as lower elevation plants shift upwards, but model simulations suggest that as warming continues alpine species will be lost and overall diversity will decline.

A period of abrupt warming of about 2°F on average has occurred since 1990 in the San Juan Mountains and global circulation model forecasts project a 4-5°F increase by mid-century. Whether or not this will cause alpine plant communities to shift is unknown, but this program ensures that we will be watching.

In the summer of 2006 the Mountain Studies Institute (MSI) initiated a long-term monitoring program to detect climate-induced changes in alpine plant communities in the San Juan Mountains. The Institute's project is one "target area" in the Global Observation Research Initiative in Alpine Environments (GLORIA). This international program now has 35 active target areas, with six in the United States.

Methods, Location, and Project Team. GLORIA uses a multi-summit approach and standardized low-impact monitoring methodology that allows study of alpine plant communities and climate change impacts both within and among regions. Each target area requires four summits along an elevation gradient beginning just above treeline. The mountaintops have to be as

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conically shaped as possible so that plots can be located on all four sides. Furthermore, geology and climate have to be very similar and peaks have to be as accessible as possible, while avoiding areas impacted by recreation or mining. Each of the four summits is monitored using a specific observation protocol extending no farther than 10m below and 100m horizontal distance from a summit, with four main plots located at a specific distance below the summit in the primary cardinal directions. There are a total of 16 x 1 m^2 temporary gridded quadrats for detailed surveying and eight larger areas for more general observations per summit. To facilitate repeat studies, small monument stakes or paint markers are installed to mark the summit origin point and the plot corners. The protocol also includes installation of a tiny, self-contained soil temperature-monitoring sensor at a shallow depth inside each plot. The multi-summit array is observed at least once every five years, and temperature sensors are downloaded every two to three years.

Several candidate locations were considered before picking four summits on public land near Lake City. The peaks range from 12,195 to 13,800 feet elevation. Working at this elevation offered its share of obstacles, including difficult access, cold temperatures, rainy conditions, and lightning. A team of 13 people installed and monitored the plots in 15 very full days. Koren Nydick (Research Director, MSI) coordinated the project and led plot installation. Botanists Peggy Lyon (Colorado Natural Heritage Program) and Julie Crawford (University of Pavia, Italy) identified plants. Kyle Skaggs and Ellen Stein (MSI), intern Lindsey Lennek from Fort Lewis College, and Michael Kelrick and his students from Truman State University rounded out the team. The project evolved into a tremendous educational experience for the undergraduates and a PhD dissertation for Julie Crawford, who is analyzing the baseline data for species-environmental relationships and the effects collecting data at different spatial scales and taxonomic resolutions.

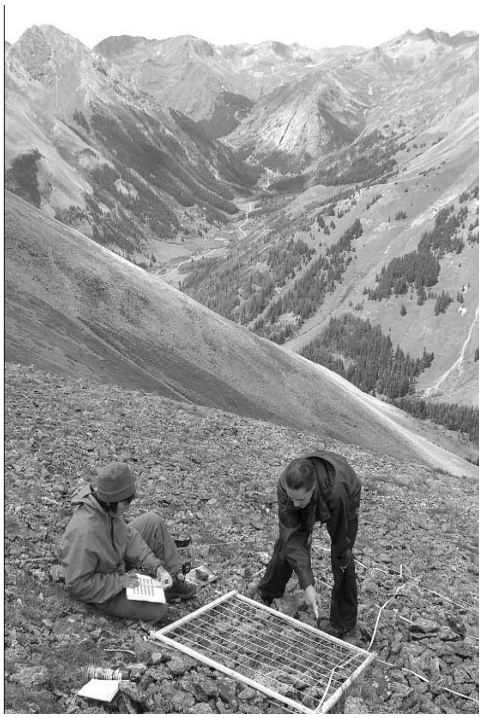
The 2006 baseline data were submitted to the international GLORIA database (www.gloria.ac.at/). The plots will be re-surveyed in 2011 and every five years thereafter, with the temperature data loggers being downloaded more frequently.

Summary of Findings. A total of 99 plant species were identified at the San Juan target region, with 22, 58, 56 and 43 species found on each summit from highest to lowest. The average number of species found across all target regions globally is 92 and the median is 79.

Some of the San Juan species were found on all four peaks, while others were found at only one location. These species appeared on at least one aspect of each summit: slender wheat grass (*Elymus trachycaulus*); spike trisetum (*Trisetum spicatum*); alpine fescue (*Festuca brachyphylla*); condensed phlox, a cushion plant (*Phlox condensata*); Rocky Mountain spikemoss, a fern ally (*Selaginella densa*); dwarf clover, a cushion plant (*Trifolium nanum*); Jacob's ladder (*Polemonium viscosum*); chickweed, a cushion plant specializing in rocky exposed ridges (*Lidia obtusiloba*); bluebells (*Mertensia lanceolata*); and featherleaf fleabane (*Erigeron pinnatisectus*).

The only rare plant found in the plots was Altai chickweed (*Stellaria irrigua*) in the talus under rocks. This species is ranked G4 S2, or rare in the state by the Colorado Natural Heritage Program. Townsend's Easter daisy (*Townsendia rothrockii*), ranked G2 S2, was found near the project, but not in the plots. Common dandelion (*Taraxacum officinale*) was the only invasive non-native species observed.

Funding Acknowledgement. Funding this type of project is very difficult and we are grateful to our sponsors. Cash support was provided by San Juan Public Lands (USFS/BLM), The Nature Conservancy, Colorado Native Plant Society, Mountain Studies Institute, American Alpine Club, and Colorado Mountain Club. In-kind services were contributed by the Mountain Studies Institute, Julie Crawford, Fort Lewis College, and Truman State University.



Peggy Lyon (left) and Julie Crawford (right) identify plant species in a plot. By Koren Nydick.

Dr. Koren Nydick is Executive Director of the Mountain Studies Institute (MSI), a non-profit mountain research and education institution based in Silverton.

Memories of a Colorado Botanist: Dr. H.D. Harrington

By Marilyn Ritter Colyer

In 1957, I had the great pleasure of attending college at Colorado State University. I was most happy to learn that I did not have to choose between the study of plants and the study of animals, as this would be the first year that a new major — Biological Science — would be offered. That meant that I could study both of these life forms, and one of my first classes was botany. Coming from the small town of Mancos, I was prepared to be a small fish in the big pond. However, after my first exam at college, Dr. Livingston announced my grade, "97%, good for you Ritter!" I was motivated to go for the best.

When I walked down the halls of the botany building, I often peeked into the office of Dr. Harrington, whose name was well known, as we were using his thick and heavy *Manual of the Plants of Colorado*. It was September and each week we were told to bring in five or ten plants to key out during our botany laboratory. Our reference was this very detailed book covering thousands of plants, with descriptions of their size and habit, stamen and stigma, fruit, even leaf hairs. When you finished keying the plant, you knew that you either had it right or not — the elaborate details for each species were there.

Harrington was a quiet man with a quiet smile. He seemed always to be working at the microscope. When I passed his office, I would shyly glance at him and say "Hello," if he looked up. He would smile and return the greeting. I thought to myself, "His hunched shoulders and slouched belly were his price for spending hundreds of hours pouring over the microscope, describing each species, and devising dichotomous keys comparing one plant with another." This, in addition to traveling the state and searching each nook and corner, added up to an enormous effort. Perhaps traveling and collecting were really the fun part. At least that is what I think now, as I go into little canyons and hidden niches where I might find something extra-ordinary.

In 1963 I had a job as a Museum Aid, GS 2, which paid about $3 an hour. However, we didn't care so much about the pay. The job was fantastically interesting as hundreds of artifacts poured in each day from the Wetherill Mesa Archeological Excavations at Mesa Verde National Park. The five aids all had a great time washing dirty shards, fitting them together to make pots, cataloguing and drawing stone tools, and listening to the five archeologists argue about this and that. However, I went back to school for one more year — that was to get my Teacher's Certificate. My mother was a teacher and there were always jobs available for teachers. Did I want to be a teacher? No, but I'd better get the credentials, just in case.

That winter when back at college, I read in the university newsletter that Dr. H.D. Harrington was looking for summer assistants to help gather information for his new book, *Useful Wild Plants of the Rocky Mountains*. This was what I wanted to do! I had always been interested in the uses of wild plants. Even though I intended to go back to the archeological lab the next summer, I thought that I would drop by to see Dr. Harrington and ask him if I could work part time on his project and full time at the lab. Harrington was delighted that I might get some information from the southwestern corner of Colorado. It was set up and I would earn about $2 per hour, the going rate for college students.

So, in the summer of 1964, I spent my weekends talking to elderly Utes at the Ute Mountain Reservation. We went on field trips to the forbidden Ute Mountain, our elderly companions jumping out of the car and charging through the brush to plants that they wanted to show me. These women told me the Ute names and what they meant, such as "dirty sock plant," or valerian, and "under arm plant," or yellow bee weed, both of which were eaten as potherbs. They showed me how to take a stick and dig up the starchy nodules of "bead potato" or *Stellaria jamesii*. They cautioned me about the little tubers of this spring beauty, "Do not peel this or the bear will chase you." They told me how they harvested large amounts of chokecherries, ground them (seeds and all) into a mush, and made patties that they put out to dry. These patties were sold for 50 cents apiece to the Navajos, who ate them as a tonic. They then said that the patties must dry thoroughly to allow the poisonous prussic acid to dissipate into the air. I collected information from the Utes on more than 50 plants and sent every detail to Dr. Harrington. He was delighted and told me that much of this information was new to him.

I talked with my 75-year old grandmother who had lived in Disappointment Valley when it was isolated from the conveniences of life. Grammy had laid a tarp under buffaloberry bushes, after frost, and knocked down the fruit. The fruits were mashed to release the juices, producing a beautiful pink vinegar used to pre-

"**Harrington**" continues on page 4

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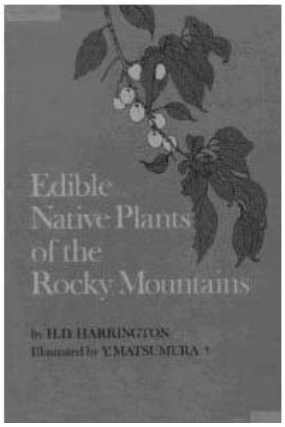
serve other food. I talked to another industrious early settler who collected shepherd's purse leaves for use as a potherb. She agreed that shepherd's purse, like dandelion, was probably brought here by early European settlers to provide early spring greens for food. Mr. Martinez told me that he often had bad headaches and kept bundles of snakeweed, *Gutierrezia sarothrae,* hanging from his porch ceiling. A tea from this would cure his headaches. In fact I talked to every "old timer" that I could. Sometimes they had nothing to add, but most of the time they provided insight into a plant or two that they used in one way or another.

All of this was good enough for Harrington. He wrote me, saying that his wife and his Japanese illustrator Professor Y. Matsumusa would accompany him to visit me and see some of these plants. The various researchers at the Wetherill Mesa lab thought that this was great. Could Dr. Harrington come to the lab so they could meet him? Of course he did and he was further delighted to be given a tour of this elaborate archeological excavation in process. The next two days, I accompanied the Harrington group to several locations on the Ute Mountain Reservations; searched for a few plants, such as our seven species of biscuit roots, *Cymopterus ssp and Lomatium ssp,* in Mesa Verde; and went to the La Plata Mountains. We went to a cattail patch to check out all of the useful parts of this plant. We did the same thing with the datil yucca, which grows at Mesa Verde. We found some fruits of the large-padded prickly pear and, at this time, I told Harrington that it appeared that the Ancestral Puebloans ate lots of cactus, because my screenings of human coprolite showed prevalent cactus glochids. Matsumura sketched the plants on site, using pen and ink. Harrington had a wonderful time getting a first time view of some plants and seeing the habitat. It was evident that he was thrilled to be here.

About a year later he sent me a copy of the finalized book and a note thanking me for my help.



Marilyn Colyer retired as Resource Biologist for Mesa Verde National Park and served as technical editor for Ancient Pinon-Juniper Woodlands: A Natural History of Mesa Verde Country.

WORKSHOP AVAILABILITY!

Spots are still available in the following, including a **new workshop** on botanical photography. Registration details can be found at www.conps.org or by contacting Linda Smith at 719-574-6250 or conpsoffice@aol.

BASIC WILDFLOWER IDENTIFICATION

Leader:	Mary Ann Bonnell
Location:	Morrison Nature Center at Star K Ranch 16002 E Smith Rd., Aurora, CO 80011
Time:	9:00AM to 3:00PM
Session 1:	Saturday, 2 May 2009
Session 2:	Sunday, 3 May 2009

Jump-start the wildflower season with a primer on plant parts, family characteristics, and using a botanical key. In addition to covering the basics, we'll help you overcome your fear of composites and the pea key. Class will be indoors. Bring a sack lunch and a hand lens. Attendance limited to 15 per session.

BOTANICAL PHOTOGRAPHY USING DIGITAL SINGLE LENS REFLEX CAMERAS

Leader:	Jacobe Rogers
Location:	Walker Ranch, Boulder County Open Space Picnic Shelter at Meyer's Gulch parking lot
Time:	8:00AM to 3:00PM
Date:	Saturday, 20 June 2009

Improve your wildflower photography skills with Jacobe Rogers. We will first consider the pros and cons of lenses, lighting methods, and other odds and ends. Then, spend up to four hours photographing plants using various techniques. We will end the day by looking at what techniques work best for varying situations. If you choose to bring a laptop computer, this time at the end of the day will be most beneficial. Attendees should be familiar with their camera equipment. The class is not limited to single lens reflex cameras; however, if you bring a point and shoot or a film camera, please keep in mind the class structure is primarily digital single lens reflex. Regardless, you will still learn some tricks for your camera type. Attendance limited to eight people.

BOOK REVIEW

High and Dry: Gardening with Cold-Hardy Dryland Plants. Robert Nold. 2008. Timber Press, Portland, OR. $34.95 (hardcover)

Reviewed by Jan Loechell Turner

If you have an interest in gardening with native plants, this is the book for you. Local gardening expert Robert Nold has produced a guide that focuses on plants that, once established, are likely to survive winter lows of -10°F., as little as 10 inches of annual precipitation, intense sunshine, and drying winds -- in other words, conditions that can occur in the Denver area. Through decades of experience, the author has learned what works and what doesn't when growing plants in Denver's challenging environment without supplemental irrigation. Although plants native to the drier, colder areas of the western United States might be expected to tolerate the conditions in this area, such plants do not always survive or flourish in the Denver garden. Nold provides the reader with information that can increase the odds of success. He reminds us that the amended soils and techniques that east coast plants may require are rarely the same as those that our native plants prefer. After all, our native dryland plants are adapted to alkaline, clay soils, lack of moisture, and the unique climate of our area.

In the foreword of *High and Dry*, Panayoti Kelaidis compares Nold's book to the "beautifully written accounts of plants and gardens written by real gardeners (e.g., Claude Barr and Elizabeth Lawrence) who can wield a mighty pen as well as a trowel." This is not an exaggeration, since Nold's writing style is entertaining and humorous, and his well-researched book serves the dual purpose of an encyclopedic reference and a pleasure book. Nold is not claiming to have all the answers, but he has shared insights from his own experiences and information gathered from authoritative resources. As well as sharing his experience, Nold also shares his humor, commenting on the ability of the beautiful *Astragalus ceramicus* pods to turn law-abiding citizens into pod thieves and, in the rock garden chapter, confessing that "botanical names here are dispensed with as much consideration as a drunken tank driver heading backward down a freeway at night." You will almost certainly find yourself laughing out loud.

Gorgeous, colorful photographs and artwork by artist Cindy Nelson-Nold, Bob's talented wife, fill the book and will fill the reader's heart with joy and anticipation of the spring. Each of Nelson-Nold's watercolors features an insect, as well as a plant.

Practical advice about establishing wild gardens (unplanned gardens) and rock gardens is contained in a chapter that covers watering, soil, pots and troughs, berms, propagation, and insects. Plants are grouped into perennials and annuals, grasses, bulbs, rock garden plants, cacti, yuccas (and other woody rosette-forming plants), shrubs, and trees. Within chapters, plants are arranged alphabetically by genus. A number of species may be included under each genus and color photographs illustrate many of the plants. Different species of the same genus (for example, *Sphaeralcea*) are included in more than one chapter because of height; the chapter on rock garden plants is limited to species that are usually 12" in height or less. Entries may include the native habitat or range, cultural information, and descriptions of the species appropriate for the dryland garden.

In a book used for reference purposes, an index is essential and *High and Dry* contains a thorough index, as well as a multipage bibliography of resources that Nold consulted. Well-researched and well-written, *High and Dry* will appeal to native plant gardening enthusiasts. Nold's previous books, *Penstemons* and *Columbines*, are also recommended. If you wish to purchase books online, link through the CONPS bookstore webpage, http://conps.org/bookstore.html, to Amazon. CONPS will receive a percentage of the profits from anything you order. You will have an opportunity to visit Nold's yard in late spring or early summer when the Denver Chapter has its Garden Tour. Contact Megan Bowes (BowesM@bouldercolorado.gov) for details.

Jan Loechell Turner is Associate Professor at the Regis University Library and a Director on the CONPS Board.

Other books on native plant gardening in our region include *Growing Native Plants of the Rocky Mountain Area* by Robert and Jane Dorn, *Native Plants for High-Elevation Gardens* by Janice Busco and Nancy R. Morin (The Arboretum at Flagstaff), and *Grow Native* by Sam Huddleston and Michael Hussey. Readers interested in gardening with xeric native and non-native plants will find Jim Knopf's *The Xeriscape Flower Gardener* and *Waterwise Landscaping with Trees, Shrubs, & Vines*, Ellefson and Winger's *Xeriscape Colorado*, and Denver Water's *Xeriscape Plant Guide* to be useful. For a historical perspective on gardening in our region, check out George Kelly's *Rocky Mountain Horticulture is Different* published in 1951.

CONSERVATION CORNER
Center for Plant Conservation

by Jenny Neale

The Center for Plant Conservation is a network of botanic gardens dedicated to the preservation of America's vanishing native flora. Established in 1984, the Center for Plant Conservation (CPC) aims to save the endangered plants of the United States through the use of *ex situ* (off-site) horticultural techniques, such as seed collection, germination, and propagation. Originally consisting of 16 botanical institutions, the CPC is now a network of over 35 institutions nationwide. The species protected by the CPC are part of the National Collection of Endangered Plants, a list compiled by the institutions. Each species that is included in the National Collection was nominated by a participating institution as one in need of *ex situ* protection to complement *in situ* (on-site) conservation efforts. To date, more than 600 species are included in the National Collection. For each species, seeds, cuttings, or both, are collected and maintained at a participating institution. Germination protocols and growing conditions are determined for species, when possible, and additional seed is stored at the USDA National Center for Genetic Resources Preservation in Fort Collins, Colorado.

It is important to note that seed collection and *ex situ* conservation measures, in general, are not seen as alternative approaches to on-the-ground protection for the nation's rare species, but rather are meant to be complementary measures. Strict collecting guidelines have been developed and are followed by all institutions (for details, see the 1991 CPC publication entitled *Conservation and Genetics of Rare Plants* edited by Donald A.I. Falk and Kent E. Holsinger). These guidelines ensure that collections will not harm populations in the wild. They designate how many individuals of a species must be reproductive, and the percentage of individuals and amount of seed that may be collected in a given year. Due to the rare nature of many species in the National Collection, multi-site and multi-year seed collections are often required in order to collect enough seed to sufficiently maintain genetic diversity within a species, should that species go extinct in the wild.

Surveying for *Penstemon penlandii*. From Scott Dressel-Martin.

Penstemon penlandii. From Scott Dressel-Martin.

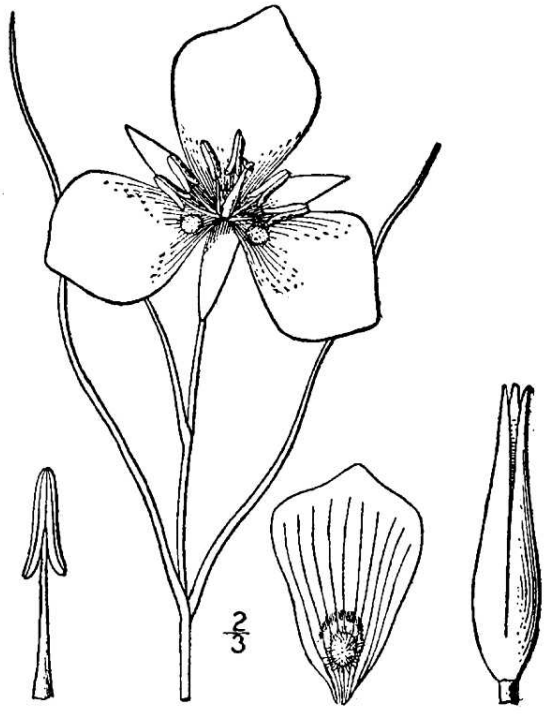
Beyond facilitating seed collection, the CPC works to educate people about the importance of plant conservation on a national level. In addition, they work to coordinate large-scale conservation efforts with national agencies, such as the National Park Service. Recently, the National Park Service partnered with the CPC to collect and store seed of all species found in national parks that are listed under the federal Endangered Species Act. The CPC also serves as a network for sharing information on reintroduction and monitoring methodologies and practices among botanic institutions.

As stewards of over 50 National Collection species, research staff members at Denver Botanic Gardens are busy identifying appropriate populations for collection and working to grow out and maintain species under our stewardship. As one of the early participating institutions, we have collected seed for the majority

of our stewarded species; however, these collections are aging. Most of our collections are over 10 years old and small in number. We intend to collect, or re-collect each of our species in the near future. If you are interested in helping to identify populations for seed collection or assist with collecting, please contact Jennifer Neale at nealejr@botanicgardens.org.

To learn more about the Center for Plant Conservation, to sponsor a National Collection species, or to see the list of National Collection species under the stewardship of Denver Botanic Gardens, visit the CPC website: www.centerforplant-conservation.org.

Jennifer Ramp Neale, Ph.D., is Associate Director of Research at the Denver Botanic Gardens and a Director on the Board for the Colorado Native Plant Society.



Calochortus nuttallii
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. Vol. 1: 508.

Donations for 2008

The Society is extremely grateful to all who contributed in support of our activities and programs, including:

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MICROSCOPE FUND

Members continue to pay off the purchase of the dissecting microscopes with $8 of the $20 workshop registration fee going directly to this Fund. We have collected approximately 50% of the purchase price in two seasons. You can also contribute directly to the Fund. Mail contributions payable to CONPS at P.O. Box 200, Ft. Collins, CO 80522.

WHO'S IN THAT NAME?

John Charles Fremont (Part 1)

by Al Schneider

John Charles Fremont (1813-1890) was a teacher and surveyor; a student of sciences including mathematics, astronomy, botany, geology, and cartography; a military expedition leader; an American icon; a gold rush millionaire; and a governor, senator, and twice candidate for President of the United States. He was a strong-headed, successful, court-martialed, impoverished, belligerent, American success and failure story.

Fremont is not a central botanical figure of the 19th century (although his collections were numerous and many plants are named for him), but his life does show so well the relationship of the explorer/scientist/politician to the public, the government, and the botanical world.

Fremont's early life had its significant successes and failures and presaged the same roller coaster experiences that would always be his. In his few years in college he did well, especially in mathematics, but he was expelled for poor attendance. Fremont was fortunate throughout his early life in coming under the guidance of influential people; soon after Fremont's expulsion, Joel Poinsett (of poinsettia [*Euphorbia pulcherrima*] fame, as well as South Carolina Congressman, first Minister to Mexico, and Secretary of War), obtained a position for Fremont as a mathematics teacher aboard a navy sloop bound for two years to South America. Poinsett later helped Fremont obtain a commission as Second Lieutenant of Topographical Engineers, which led to an assignment as chief assistant to the respected French scientist Joseph N. Nicollet for a survey between the Missouri and Mississippi Rivers. Nicollet tutored Fremont in all aspects of expedition logistics and in the gathering of scientific information.

Fremont became a national icon between 1842 and 1854, leading five Western expeditions, traveling over 20,000 miles, mapping large areas of the West, collecting thousands of plant specimens, and inspiring a huge wave of pioneers with his expeditionary reports (mostly, if not wholly, written by his wife, Jessie Benton). He came to be revered as "The Pathfinder" (although this title should more appropriately have been given to Kit Carson, his guide on three of these trips).

Through Nicollet, Fremont met one of the most influential United States Senators, Thomas Hart Benton, who quickly saw Fremont's promise in helping Benton promote westward expansion and Manifest Destiny. Fremont was often in Benton's home

John Fremont. From Library of Congress.

and, in 1841, secretly married 17-year-old Jessie Benton. Thomas Hart Benton was infuriated at this action but quickly reconciled with Fremont, became Fremont's powerful ally, and utilized Fremont's expeditions to expand America's boundaries.

In 1842, Fremont conducted his first expedition — to map the Oregon Trail to the Rockies. (Prior to the trip, Fremont received a quick course in plant collecting and preserving from the eminent George Engelmann and the expedition collected plants and other scientific data.) Congress published 20,000 copies of Fremont's report in 1843, the report appeared in major newspapers, and commercial American and foreign editions sold several hundred thousand copies. Fremont's maps of the Great Salt Lake area influenced the Mormons to settle there, and his maps of routes across the West were studied and followed by westward moving pioneers.

Fremont was thus catapulted into being the most famous American explorer of the time and, in fact, he was one of the most famous Americans of his time. But through all of his exploits, he was rash, brash, headstrong, political, knowledgeable, persuasive, brave, and foolhardy, which led him to having strong supporters and powerful enemies.

In the mid-1840's, for instance, during his third expedition, Fremont played a significant role in taking California from Mexico. He was so popular in California that he was appointed Governor of the new Territory in 1846, but he was court-martialed

in 1847 for failing to obey military orders to step down from the governorship. He was convicted and ordered dismissed from the military. President Polk upheld the conviction, but pardoned Fremont from the penalty. Fremont was so furious at the conviction that he resigned from the Army in 1848.

Running as a Democrat, Fremont was elected in 1850 as one of the first two Senators from California; however, after serving the six-month short term he failed in his bid for re-election.

Fremont went on to make a fortune in the Gold Rush, but only after protracted battles in courts and Congress over land claims, payments, partners, and promises. Fremont's popularity from his Western exploits and his anti-slavery position got him the newly formed Republican Party's first presidential nomination in 1856. Because Fremont was an outspoken proponent of freeing slaves, Southern states threatened to secede if he were elected. Fremont lost to James Buchanan.

When Lincoln became President, he promoted Fremont to Major General. From Fremont's Missouri command post, he confiscated nearby southerners' lands, freed their slaves, declared martial law, and then refused to obey Lincoln's order to rescind these unauthorized actions. Lincoln removed him from command after six months of service, but Republican pressure on Lincoln forced him to reinstate Fremont, which some came to regret as Fremont proceeded to lose a number of Civil War battles. Fremont was demoted again and angrily resigned.

Fremont lost his gold rush fortune, ran for President as a Democrat in 1864, was convicted by the French in an 1873 swindle case involving the Transcontinental Railroad, and was Territorial Governor of Arizona from 1878-1881 until removed from office for failing to perform his duties.

Senecio fremontii. From Al Schneider.

Fremont's botanical ventures followed the same path as his life — a roller coaster of success and failure. We will look at his botanical accomplishments in the next issue of *Aquilegia*.

NOTE: Much of the above information is common knowledge that can be found in the many books and on-line materials about Fremont. A key source for information about Fremont is *The Expeditions of John Charles Fremont* by Mary Lee Spence. The primary text for the botanical accomplishments of Fremont is *John Charles Fremont, Botanical Explorer* by Stanley Welsh, who also wrote *A Utah Flora.*

Al Schneider is the Vice Presdient of CONPS and contributes regularly to Aquilegia.

Award Nominations Requested

The CONPS Board of Directors desires to honor contributions to Colorado botany and the Colorado Native Plant Society. Service to the Society takes many forms, from an occasional event to significant contributions over a span of five years or more. Do you know someone who deserves recognition for their time and effort given to CONPS? Perhaps you know an individual who has contributed over a lifetime to enhance Colorado botany?

Recognition Gifts: non-members who provide a one-time service to the society.

Certificate of Appreciation: members and non-members who provide occasional services to the society.

Certificate of Merit: members who have made a significant contribution to the Society in a short period of time (less than five years).

Special Merit Award: non-members for short-term contributions to Colorado botany and/or significant contributions to the Society's goals.

Honorary Lifetime Membership: CONPS member for long-term, high quality service to the Society (over ten years).

Lifetime Achievement Award: members and non-members for long-term (30+ years) contributions to Colorado botany.

Nominations are accepted at any time of the year and may be submitted to President Boyce Drummond at bdrummond3@msn.com or 970-690-7455. The Directors will review the nomination and supporting materials and vote upon your nomination at their next meeting. For details of award criteria, contact any Director or visit our website: www.conps.org.

NATIVESCAPES
Native Landscaping for our Future

By Susan Smith

Does what we plant in our flowerbeds or how we landscape our yards make any difference to the future of native plant and wildlife conservation?

Consider this: "Between 1982 and 2001, about 34 million acres — an area the size of Illinois — were converted to developed uses... the rate of development between 1997 and 2001 averaged 2.2 million acres per year" (USDA National Resources Inventory, www.nrcs.usda.gov/technical/NRI/). In our own state, Environment Colorado (www.environmentcolorado.org) estimates that 10 acres of open space and/or agricultural land are developed each hour. If we rely on parks and other public lands to preserve plants and ignore what happens in our own yards, will that be enough?

Last year, an entomologist caught the attention of botanists, wildlife biologists, and gardeners by proclaiming that our own yards significantly impact local biodiversity. In *Bringing Nature Home: How Native Plants Sustain Wildlife in Our Gardens*, Dr. Douglas Tallamy built the argument that native plants fulfill a role in the ecosystem that non-natives simply cannot. It is based on the concept of a simple food chain: plants use the sun to produce energy and herbivores consume the energy, which in turn feed higher-level consumers (carnivores and omnivores). Without the herbivores, the ecosystem collapses. Plants that have not evolved in a given geographical region are not palatable to the majority of herbivores (primarily invertebrates) living there, because of differences in leaf chemistry.

Dr. Tallamy's research was astonishing! Take for example *Melaleuca quinquenervia*, which was introduced to North America over two centuries ago. Where it is native, it supports 409 species of herbivores; in North America it supports only eight. Or look at *Clematis vitalba*, introduced about 100 years ago; it supports only one herbivore on this continent, but provides habitat for at least 40 species where it naturally occurs. Bird watchers, who make up one quarter of the US population, should take note, too. Birds may love those sugar-packed berries in the fall, but 96% of our terrestrial birds feed their nestlings invertebrates, which have more protein per ounce than beef. If our birds do not have a healthy population of insects, spiders, and other creepy crawlies to feed their young, the success of future generations is in jeopardy.

Western Tiger Swallowtail on *Penstemon strictus*. From Susan Smith.

Native plants are also getting attention by those concerned with water and energy conservation. Many people are already aware of the Leadership in Energy and Environmental Design, or LEEDS program, administered by the US Green Building Council. But did you know that they are now expanding their focus to include the outside environment, as well as the built environment? The US Building Council is a leader in the Sustainable Sites Initiative (www.sustainablesites.org) that looks at how the landscape around a building "can address increasingly urgent global concerns, such as climate change, loss of biodiversity, and resource depletion." Not surprisingly, native plants are taking center stage. In one case study of two residential yards in Santa Monica – a traditional garden vs. a native garden — they found that the native garden

Two-Tailed Swallowtail caterpillar. From Susan Smith.

used 77% less water, produced 66% less green waste, and required 68% less money for maintenance labor. The native garden cost a bit more to install ($16,700 vs. $12,400 for the traditional garden), but it is anticipated that the lower costs of maintenance would offset the initial investment. Not included in these numbers are other valuable benefits, such as, cleaner water and creation of wildlife habitat. I would also offer that homeowners receive another priceless bonus -- the enjoyment of a yard that expresses a sense of place and is one step closer to restoring the local ecology.

The EPA (www.epa.gov/greenacres/) is also promoting the use of native plants for landscaping, because they find that natives:

- do not require fertilizers,
- require fewer pesticides than lawns,
- require less water than lawns,
- help reduce air pollution,
- provide shelter and food for wildlife,
- promote biodiversity and stewardship of our natural heritage,
- save money.

We've all seen the disheartening statistics about how current gardening practices can affect the environment: 70 million pounds of pesticides applied to lawns annually in the US; emissions for one gas-powered lawnmower 11 times that of a new car for each hour of operation… and the list goes on. Anytime we can take action to reduce our carbon footprint and have a positive effect on the environment is a reason for optimism.

Native plants are also a draw for those yearning for a yard that creates a sense of place and connection to nature. Fortunately, there is a growing trend towards gardens that reflect the local environs and culture of our region that rejects the notion of mass-produced yards that look exactly like yards in Ohio or Delaware.

For gardeners that enjoy producing their own food or grow "prized" ornamentals, integrating regional natives to the landscape can be beneficial. Native plants can support predatory insects that provide an invaluable service by keeping pest species in check. As every gardener knows, striking that delicate balance between "beneficial insects" and "bad bugs" is challenging and has its "ups and downs." But when we can achieve a certain level of dynamic harmony in the garden, the results are amazing. We use fewer chemicals, or none at all, and usually have more time to relax and enjoy the garden.

I heard from a friend recently who had met Dr. Tallamy at a lecture and asked him to sign his copy of *Bringing Nature Home*. Dr. Tallamy's inscription read, "Garden like your life depends on it." If you are concerned about the future of our environment, then I would echo Dr. Tallamy's words… garden like your life depends on it.

Susan Smith is owner of The Habitat Gardener, offering Colorado native plants throughout the growing season. Susan also volunteers as a Native Plant Master, a Habitat Steward for National Wildlife Federation, and manages the native gardens at the Audubon Center at Chatfield.

Plant Conservation Day

Saturday, 30 May (10:00a.m.-4:00p.m.), the Butterfly Pavilion will be celebrating Plant Conservation Day.

Dr. Douglas Tallamy will present a keynote address at 10:00a.m. There will be a number of other speakers and family activities throughout the day, all focused on home landscaping with natives.

In addition, "The Habitat Gardener" will be conducting a native plant sale raising funds for the Butterfly Pavilion that day.

Chapter News and Announcements

Boulder Chapter

Boulder Chapter meetings are typically held on the second Thursday of each month (October through May) at 7:00 PM. All meetings will occur in the Community Room at the Boulder REI Store at 1789 28th Street, between Canyon and Pearl. For more information, visit www.conps.org or contact Cathern Smith at smith_cathern@yahoo.com or 202-841-4016. Help make 2008 zero waste — bring your own cup and plate.

9 April 2009 **Thursday at 7:00 PM**

Boulder REI Community Room

The Chatterbox Orchid Reveals it's Secrets

Denise Wilson (M.S. Candidate, University of Colorado Denver) will discuss her pollination biology research conducted on the chatterbox orchid, *Epipactis gigantea,* at three sites near Grand Junction, Carbondale, and Salida. These are beautiful and unique ecosystems of cold seeps and hot springs, which are home to blue-eyed grass, fireflies, long-eared bats, and Brazilian free-tailed bats.

26 June 2009 **Friday 9:00AM – 3:00PM**

Liken' Lichens in the Forest Field Trip

Meet Trip Leader Ann Henson at 9:00AM in the parking lot at Heil Ranch Open Space. From there, we will carpool to the St. Ceran trailhead off Overland Rd east of Hwy 72, where parking is limited. We will begin from here at 9:30AM. Bring your magnifier or hand lens, lunch, and the usual layers for all kinds of weather. Larry St. Clair's book Color Guidebook to Common Rocky Mountain Lichens will be available. We will explore the various growth forms of lichens and review the structures that make them unique. Walking will be fairly easy over relatively short distances at 9500' elevation. This trip is limited to eight participants.

Metro-Denver Chapter

Monthly meetings of the Metro-Denver Chapter are typically held on the fourth Tuesday of the month (September through May, except November). Beginning January 2009, Chapter meetings are being hosted by the Department of Biological Sciences at the University of Denver (DU), where we will meet in Olin Hall located at 2190 E. Iliff Ave. For details regarding this location, see: http://www.du.edu/maps/index.html?mpType=0&mrkID=8. For more information, visit www.conps.org, or contact Vickey Trammell at jrtrambo@q.com or 303-795-5843.

24 March 2009 **Tuesday at 7:00 PM**

Olin Hall at DU, Room TBA

Sensitivity of Grasslands throughout the Great Plains to Future Variability in Rainfall

Dr. Jana Heisler White (Post-Doctoral Research Scientist, Department of Renewable Resources, University of Wyoming) received her PhD in ecology from CSU. She is currently studying the effects of elevated carbon dioxide and warming on rangeland ecosystems.

28 April 2009 **Tuesday at 7:00 PM**

Olin Hall at DU, Room TBA

The Chatterbox Orchid Reveals its Secrets

Denise Wilson (M.S. Candidate, University of Colorado Denver) will discuss her CONPS supported research addressing the pollination biology of the chatterbox orchid, *Epipactis gigantea*, which was conducted at three sites near Grand Junction, Carbondale, and Salida. These are beautiful and unique cold seeps and hot springs, which are home to blue-eyed grass, fireflies, long-eared bats, and Brazilian free-tailed bats.

26 May 2009

Second Annual Denver Chapter Spring Hike

Chapter members, who will have an opportunity to suggest and select the destination for the spring hike, will choose the time and place of the hike. At the end of May, the open spaces around Denver are bright with wild flowers. It's time to get out on the trail with your fellow wild flower experts and find as many as we can.

Northern Colorado Chapter

Chapter meetings are held on the first Wednesday of the month (October through April) at 7:00 PM. Meet at the Gardens on Spring Creek, 2145 Centre Ave., Fort Collins. Prior to meetings, members meet at 5:30 PM for dinner with the speaker at Café Vino, 1200 S. College Ave. If you would like to join us for dinner, please contact Chapter President Pam Smith at 970-223-3453 or pamelas4824@earthlink.net. For more information, visit www.conps.org.

Southeast Chapter

The Southeast Chapter is newly revitalized. Activities will be scheduled throughout the year with most meetings in Pueblo and field trips to a variety of sites throughout the area. Southeast Chapter meetings are held on the third Thursday of each month (February through May) from 6:30PM to 8:00PM. All meetings, except the 16 May meeting, will be held at the CSU Extension Office Meeting Room, 212 W. 12th. Street in Pueblo. The 16 May meeting will be at the Southeastern Colorado Water Conservancy District Demonstration Garden, 31717 United Avenue, Airport Industrial Park, in Pueblo. For more information, visit www.conps.org or contact Warren Nolan at 719-543-6196.

Plateau Chapter

Chapter activities are scheduled throughout the year. For more information, visit www.conps.org or contact Chapter President Gay Austin at 970-641-6264 or austinaceae@frontier.net.

San Luis Valley Chapter

Chapter activities are scheduled throughout the year. For more information, visit www.conps.org or contact Chapter President Hobey Dixon at 719-589-3813 or pixies@amigo.net

Southwest Chapter

The Southwest Chapter explores, preserves, and enjoys the flora of the Four Corners area through activities that are scheduled throughout the year. We welcome new ideas for field trips, activities, and programs, and we especially welcome new members from Colorado, New Mexico, Arizona, and Utah. All meetings and field trips are free and open to everyone. Bring a friend. For more information, visit www.conps.org or contact Chapter President Al Schneider at 970-882-4647 or webmaster@conps.org. The Chapter has concluded its season of field trips, but members are looking forward to potluck-socials. We always have homemade refreshments. See www.conps.org/southwest.html for details.

30 March 2009 **Monday at 6:30 PM**

Durango Recreation Center

Oaks of Mexico and the Four Corners

Our March 30 meeting will feature a photo show by Fort Lewis College Professor Ross McCauley on the Oaks of Mexico and the Four Corners.

Society News and Announcements

Website News

The Botanical News page is updated daily with information about botanical jobs, conferences, research results, new botanical publications, etc. Each chapter has a web page at www.conps.org with its field trips and programs announced. "Botanical Slide Shows" is a popular section of the website with photo shows on Orchids, *Botrychium*, *Physaria*, and various plant communities around the state. You will also find plant lists from many field trips held over the years. Please contact web master Al Schneider at 970-882-4647 or webmaster@conps.org with comments and suggestions.

Annual Meeting Notes

Keep watching the CONPS web site for the dates of next year's Annual Meeting in Fort Collins. The Northern Chapter has already started planning the event and if you would like to assist, please contact Pam Smith at (970) 223-3453 or pamelas4824@earthlink.net. Folks are needed to keep continuous tally of the electronic and mail-in registration, coordinate a silent auction and native plant sales, visit area motels to check out accommodations, compile a list of campgrounds and RV parks, get information about catering services, get volunteers to bake treats, work on obtaining speakers and field trip leaders, etc.

Volunteers Needed

The Education and Outreach Committee seeks a volunteer to take on the organization of our outreach events, most of which take place along the Front Range. Typically, the committee has requests for roughly five events each year, and some of these require only setting up our booth and don't need any formal staffing.

Please contact Committee Chair Megan Bowes at bowesm@bouldercolorado.gov or 303-561-4883 for details.

Field Trip Lists

Trip Leaders and Participants: Plant lists are of great value. Please consider keeping a list for each field trip and submitting it to Loraine Yeats, 1395 Nile Street, Golden, Colorado 80401. The lists will be posted at: http://www.conps.org/plant_lists_keys.html

Aquilegia

Newsletter of the Colorado Native Plant Society

Aquilegia is published four or more times per year by the Colorado Native Plant Society. This newsletter is available to members of the Society and to others with an interest in native plants.

Articles from 750 to 1500 words in length are welcome. Previously published articles submitted for reprinting require permission. Digital photographs or line drawings are also solicited. Please include author's name, address, and affiliation. Articles must be submitted electronically as email attachments. Articles and other contributions may be edited.

Articles for *Aquilegia* may be used by other native plant societies or non-profit groups, if fully cited to author and attributed to *Aquilegia*.

Please direct all contributions to the newsletter to:

Leo P. Bruederle, Editor
leo.bruederle@ucdenver.edu
University of Colorado Denver

Pease direct all questions or comments regarding layout, printing, and distribution to:

Kim Regier
kimberly.regier@ucdenver.edu
University of Colorado Denver

Aquilegia Deadline Approaches

Submit Contributions by 15 April

Announcements, news, articles, book reviews, poems, and other contributions are requested for publication in Aquilegia. Articles not exceeding 750-1500 words in length are especially welcome. Consider contributing to a column or submitting a book review. Include author's name, address, and affiliation, as well as credit for images. Please follow closely the format from previous issues. Previously published articles submitted for reprinting require permission. All contributions are subject to editing for brevity and consistency.

Welcome New Members

Isabel Ashton
Jim Barkley
Brenda Bell
Leanne Benton
Kerry Byrne
Marilynn Chambers
Diane Blaser & Ellen Heath
Vicki Henderson
Carol Jacobs-Carre
Jill Jagemann
Duane Jones
Kristina Koff
Randolph Moses
Cecily Mui
Warren Nolan
Lisa Olsen
Jeff Ottersberg
Susan Pearson
Edward Roland
Russell Ruof
Wendy Schwarting
Dr. Susan Sherrod
Mike Steinbeiss
Suzy Velez
John White
Penny Whitten
Elinor & Bob Williams
Paige Wolken.

Amazing Amazon

Whenever you buy anything through Amazon, be sure to enter Amazon from our CONPS bookstore: http://www.conps.org/bookstore.html. CONPS will then receive 5-7% of your purchase price. You do not pay anything extra, nor do you fill out forms — you simply enter Amazon by clicking on any book on our Bookstore page. If every member did this, the Society would receive several thousand dollars from Amazon each year.

American *Penstemon* Society

Call for ENTRIES
March 1-June 1, 2009

SUBJECT Funding for projects of modest dimension that will enhance, expand, or otherwise contribute to the APS objective of promoting the enjoyment of penstemons.

GRANT AMOUNT $100-$350

ELIGIBILITY All members of the American *Penstemon* Society. It is permissible to join. APS ($15/year) in order to enter.

FOR MORE INFORMATION Visit www.apsdev.org or contact Barbara Lewis at lewisorders@iriscolorado.com

Colorado Native Plant Society

The Colorado Native Plant Society is a non-profit organization dedicated to the appreciation and conservation of the Colorado native flora. Membership is open to all with an interest in our native plants, and is composed of plant enthusiasts both professional and non-professional.

Please join us in helping to encourage interest in enjoying and protecting Colorado's native plants. The Society sponsors field trips, workshops, and other activities through local chapters and statewide. Contact the Society, a chapter representative, or committee chair for more information.

OFFICERS

President
Boyce Drummond
bdrummond3@msn.com
970-690-7455

Vice President
Al Schneider
webmaster@conps.org
970-882-4647

Treasurer
Mo Ewing
moewing@q.com
(303) 584-8925

Secretary
Ann Henson
2henson@kwabena.us
303-772-8962

Administrative Assistant
Linda Smith
conpsoffice@aol.com
719-574-6250

CHAPTER PRESIDENTS

Boulder
Elizabeth Drozda-Freeman
elizabeth.wildflower@gmail.com
303-443-9460

Northern Colorado
Pam Smith
pamelas4824@earthlink.net
970-223-3453

Metro-Denver
Vickey Trammell
vjrtrambo@q.com
303-795-5843

Plateau
Gay Austin
austinaceae@frontier.net
970-641-6264

Southeast
Ed Roland
erroland@daeo.net
719-676-2179

Southwest
Al Schneider
webmaster@conps.org
970-882-4647

San Luis Valley
Hobie Dixon
pixies@amigo.net
719-589-3813

BOARD OF DIRECTORS

John Giordanengo (09)
john@wlrv.org
303-996-260

Catherine Kleier (10)
ckleier@regis.edu
303-817-6814

Sarada Krishnan (09)
krishnas@botanicgardens.org
303-465-4274

Brian Kurzel (10)
Brian.Kurzel@state.co.us
303-866-3203 ex 301

Jenny Neale (10)
NealeJR@gmail.com
720-865-3562

Laurel Potts (09)
kalmia127@earthlink.net
970-524-3377

Robert Powell (11)
robertpowell@durango.net
970-385-8949

Jan Turner (09)
jlturner@regis.edu
303-45-4262

Charlie Turner (11)
turner@rabbitbrushpublishing.com
720-497-1093

Steve Yarborough (11)
steveandkenna@msn.com
303-233-6345

STANDING COMMITTEES

Conservation
Vacant

Education & Outreach
Megan Bowes
bowesm@bouldercolorado.gov
303-561-4883

Endowment
Leo Bruederle
leo.bruederle@cudenver.edu
303-556-3419

Field Studies
Steve Popovich
stevepopovich@hotmail.com
970-295-6641

Field Trips
Brian Kurzel
Brian.Kurzel@state.co.us
303-866-3203 ex 301

Horticulture & Restoration
Laural Potts
kalmia127@earthlink.net
970-524-3377

Media
Boyce Drummond
bdrummond3@msn.com
970-690-7455

Membership
Eric Lane
eric.lane@ag.state.co.us
303-239-4182

Research Grants
Jan Turner
jlturner@regis.edu
303-458-4262

Sales
Linda Smith
conpsoffice@aol.com
719-574-6250

Workshops
Ann Hensen
2henson@kwabena.us
303-772-8962

MEMBERSHIP APPLICATION AND RENEWAL FORM

Name(s) _____

Address _____

City _____ State _____ Zip _____

Phone _____ E-mail _____

Chapter: _____ Boulder _____ Metro-Denver _____ Northern _____ Plateau
_____ San Luis Valley _____ Southeast _____ Southwest

DONATION

$_____ General Fund

Endowments in support of small grants-in-aid of research:

$_____ John Marr Fund: research on the biology and natural history of Colorado native plants.

$_____ Myrna P. Steinkamp Memorial Fund: research and other activities that will benefit the rare plants of Colorado.

MEMBERSHIP CLASS

Dues cover a 12-month period

___ Individual, $20.00
___ Family/dual, $30.00
___ Senior, $12.00
___ Student, $12.00
___ Organization, $30.00
___ Supporting, $50.00
___ Lifetime, $300.00

Mail to: Eric Lane, PO Box 200, Ft. Collins, CO 80522 DUES AND CONTRIBUTIONS ARE TAX-DEDUCTIBLE

CALENDAR 2008

CHAPTER PROGRAMS

Boulder Chapter

April 9	Chatterbox Orchid
June 26	Lichen Field Trip

Metro-Denver Chapter

March 24	Grasslands
April 28	Chatterbox Orchid
May 26	Spring Hike

Northern Colorado Chapter

Southwest Colorado Chapter

March 30	Oaks of Mexico and Four Corners

SOCIETY WORKSHOPS

March 14 & 15	Mosses, Ferns, Horsetails
April 25 & 26	Interesting Grass Genera
May 2 &3	Basic Wildflower ID

BOARD MEETINGS

Apr. 11	9:00 AM	Regis University
Sep. 11	6:00 PM	Larimer Cty Fairgrounds
Nov. 14	9:00 AM	Regis University

See http://www.conps.org/conps.html for details.

TIME SENSITIVE MATERIAL

Colorado Native Plant Society
P.O. Box 200
Fort Collins, Colorado 80522
http://www.conps.org