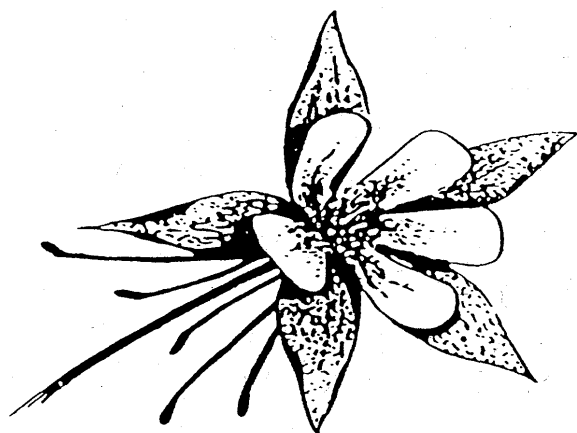


Aquilegia



Newsletter of the Colorado Native Plant Society

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

Volume 26 Number 4

July - August 2002

FLORISSANT FOSSIL FLORA

Mary Damm, University of Colorado Museum

The Florissant fossil flora is approximately 34 million years old, having been deposited at the Eocene-Oligocene boundary. Plant leaves, fruits, flowers, and pollen accumulated in the sediments of ancient Lake Florissant. Volcanic debris from active volcanoes in the Thirtynine Mile Volcanic field covered the lake and preserved the plants as fossil impressions in paper shales (MacGinitie 1953).

The fossil beds became known in 1874 from the work of A.C. Peale, an assistant on the Hayden Survey (MacGinitie 1953). In the early 1900's, T.D.A. Cockerell from the University of Colorado Museum collected both plant and insect fossils and described a number of species from the collections. Harry D. MacGinitie made additional collections in the 1950's and wrote a comprehensive flora of the fossil plants. MacGinitie based his nomenclature on extant taxa, using specimens of modern plants from a number of herbaria. MacGinitie primarily considered overall leaf shape and leaf venation as definitive characteristics for species' descriptions (Manchester 2001).

The fossil flora of ancient Lake Florissant had approximately 120 species representing 100 genera (Manchester 2001). This compares to the modern flora of Florissant Fossil Beds National Monument, which has approximately 430 species (Edwards and Weber 1990). The fossil flora consists mainly of trees and shrubs; however, several graminoid and herbaceous wetland species also occur in the flora.

The Florissant fossil flora represents a unique combination of plants — a combination that occurs nowhere else today. Fossils of plants that grow today in tropical and temperate environments were present together in this fossil flora. A possible explanation for this floristic mix is that the species occurred along a steep ecological gradient. The tropical species may have grown in a humid environment around the ancient lake and in riparian areas in the basin. Temperate species may have grown on dry upland slopes above the lake and streams. The floristic composition of the Florissant flora is most similar to that of the modern montane forests on the eastern slope of the

Sierra Madre Oriental in northeastern Mexico (MacGinitie 1953, Leopold and Clay-Poole 2001).

The Florissant fossil flora is dominated by species that currently occur in three different regions: Rocky Mountains, Edwards Plateau of central Texas, and central and southern China. Plants with modern distributions in the Ozark Plateau and Appalachian Mountains, California and the Great Basin, southern Arizona and western Mexico, southern Mexico, and South America are also found in the fossil flora (MacGinitie 1953, Leopold and Clay-Poole 2001).

Many of the genera in the Florissant fossil flora are still present in the Colorado flora today. Fossil genera with modern southern Rocky Mountain distributions include: *Abies* (fir), *Picea* (spruce), *Pinus* (pine), *Mahonia* (Oregon grape), *Quercus* (oak), *Populus* (cottonwood), *Salix* (willow), *Philadelphus* (mockorange), *Ribes* (currant), *Amelanchier* (serviceberry), *Cercocarpus* (mountain mahogany), *Crataegus* (hawthorne), *Rosa* (rose), *Rubus* (raspberry), *Acer* (maple), *Rhus* (sumac), and *Stipa* (needle-grass) (MacGinitie 1953, Manchester 2001). Some species of the above genera have very similar morphologies to modern Colorado species. For example, leaves of *Populus crassa* of the Florissant

"Florissant Fossil Flora" continues on page 2

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"Florissant Fossil Flora" continued from page 1

flora look similar to the leaves of *Populus angustifolia* (narrowleaf cottonwood). Some of the fossil specimens even have small depressions on the tips of the marginal teeth. The depressions may have been glands that are present on the teeth of *P. angustifolia*. Leaves and fruits (nutlets with elongated styles) of Florissant *Cercocarpus myricaefolius* appear analogous to the foothills shrub *Cercocarpus montanus* (mountain mahogany). *Pinus flexilis* (limber pine), *Quercus gambelii* (scrub oak), *Ribes inerme* (gooseberry), *Rosa woodsii* (wild rose), and *Rhus glabra* (smooth sumac) also have similar-looking species in the Florissant flora.

Other fossil genera are no longer present in the Rocky Mountains, but occur in moister temperate environments today. Species of *Ulmus* (elm), *Carya* (hickory), *Juglans* (walnut), and *Fagus* (beech) once grew in Colorado and have fossil remains in the Florissant flora. Today, the trees are components of the eastern deciduous forest, which has greater summer moisture than the Rocky Mountain region. *Sequoia* (redwood) trees also grew in Colorado, but are now distributed along moist coastal regions of northern California and central Asia.

Several of the fossil specimens and pollen samples in the Florissant flora record the earliest known occurrences of a taxon. Fruits of *Stipa* represent one of the earliest known macrofossils of the grass family. Grasses are not common in the fossil record until more recently in the Miocene, 5-24 million years ago (Leopold and Clay-Poole 2001). Fossils and pollen of taxa in the highly evolved subclass Asteridae also occur in the Florissant flora. Fruits and pollen of Apocynaceae (dogbane); fruits, leaves, and pollen of Caprifoliaceae (honeysuckle); and pollen of Solanaceae (nightshade) and Malvaceae (mallow) have been recently identified in the Florissant flora (Leopold and Clay-Poole 2001, Manchester 2001).

Specimens of Florissant fossil plants and insects are on display in the visitor's center at Florissant Fossil Beds National Monument and in the Centennial exhibit at the University of Colorado Museum of Natural History.

Literature Cited

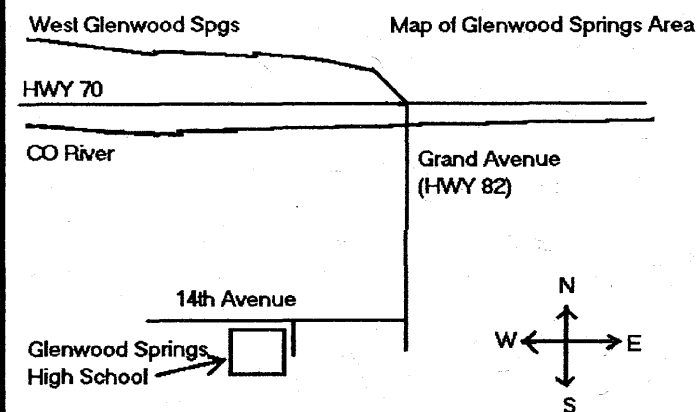
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CoNPS 2002 ANNUAL MEETING

Bring your swimsuit and come to the Colorado Native Plant Society's Annual Meeting to be held in Glenwood Springs over the weekend of **September 20 - 22, 2002!** The focus of this meeting will be "Rare Plants, Plant Communities, and Lichens," featuring a variety of speakers from Colorado and out of state.

We'll begin Friday evening with a reception at the Glenwood Hot Springs Pool. This will be followed on Saturday by an all day conference at which a large selection of books will be available for purchase. Topics for Saturday's conference will include rare plant and rare plant community protection and threats; pollination and reproductive biology; Colorado fens; uncommon lichens of gypsiferous soils; nursery propagation of rare plants; and plants of concern in the Roaring Fork Valley. Field trips on Sunday include a visit to the Rocky Mountain Native Plant Nursery, a lichen survey on gypsiferous soils, and a wildflower walk visiting unusual seep communities.

Look elsewhere in this issue of *Aquilegia* for more details and registration materials. See you there!



AQUILEGIA DEADLINE APPROACHES

Submit Contributions by August 15, 2002

Submit contributions for Vol. 26 No. 5 of *Aquilegia* on or before August 15, 2002. Articles not exceeding 1000 words are especially welcome. Previously published articles submitted for reprinting require permission. Include author's name, address, and affiliation; anonymity may be requested. Follow the format from previous issues closely. Spell check. Submit via e-mail or on disks — MAC, preferably — as an MS Word or rtf (rich text format) document.

WELCOME NEW MEMBERS

Eric Lane, Membership

The Colorado Native Plant Society is very pleased to welcome the following new members who joined the Society between April 16 and June 15, 2002:

Virgil Best III, Rachael Collins, Mildred Gilbert, Carrie Jackson, Vicki Mellott, Sheila Murphy, Rosalind Reed, John and Diane Toolen, Linda Watkins, Steve Weinstein, Mindy Wheeler, and Chad Yost.

COLORADO NATIVE PLANT SOCIETY
2002 Annual Meeting
Conservation of Rare Plants, Plant Communities, and Lichens of Colorado
September 20 – 22, 2002

Glenwood Springs High School
1340 Pitkin Avenue
Glenwood Springs, CO 81601

Friday, September 20, 2002

6:30 – 9:00 PM **Reception at the Hot Springs Pool.** Come join us for a swim, with refreshments provided by the Colorado Native Plant Society. Displays and handouts.

Saturday, September 21, 2002

8:30 – 9:00 AM **Registration:** refreshments, book and merchandise sales, and voting for Board of Directors

9:00 – 9:15 AM **Welcome and Introductions**

9:15 – 10:15 AM **Ecological Effects of the Conversion of the Old West to a New West**
 Dr. Richard Knight, Professor of Wildlife Conservation at Colorado State University

10:15 – 10:45 AM **Break:** refreshments, book and merchandise sales, and socializing

10:45 – 11:35 AM **How Do We Protect Rare Plants, Plant Communities, and Lichens on Public, State, and Private Lands?**
 Dr. Alice Guthrie, Geneticist, CoNPS Board Member; Jill Handwerk, Botanist, Colorado Natural Heritage Program; and Sheila Thompson, Botanist, The Nature Conservancy

11:35 – 12:05 AM **Rare Plants of Pitkin and Garfield Counties and the Roaring Fork Valley**
 Peggy Lyon, Botanist, Colorado Natural Heritage Program

12:05 – 1:30 PM **Lunch Break:** book and merchandise sales

1:30 – 2:00 PM **State of the Society Address.** Announcements, results from the election for Board of Directors, and awards.

2:00 – 2:35 PM **Conservation of Rare Plant Communities in Colorado**
 Denise Culver, Wetland Ecologist, Colorado Natural Heritage Program

2:35 – 3:10 PM **Considerations with the Propagation of Rare and Sensitive Plants**
 Randy Mandel, Ecologist, Rocky Mountain Native Plants

3:10 – 3:50 PM **Break:** refreshments, and book and merchandise sales

3:50 – 4:20 PM **Pollination Biology of Rare Plants of Colorado**
 Dr. Vince Tepedino, Entomologist, Utah State University

4:20 – 5:00 PM **Uncommon Lichens of Gypsiferous Soils**
 Dr. Larry St. Clair, Lichenologist, Brigham Young University

Sunday, September 22, 2002

9:00 AM – 2:30 PM Meet in the Glenwood Springs High School parking lot at 9:00 AM for field trips, which include travel to: Rocky Mountain Native Plants Nursery, unusual seep communities, or lichen survey of gypsiferous soils.

DIRECTIONS: Glenwood Springs High School is located on 14th St., one block west of Grand Ave., also called HWY 82. From the west, exit I-70 at Glenwood Springs, turn right onto HWY 82, and cross over the Colorado River. Turn right at 14th (stoplight), go one block — the high school is on your left. From the east, take the HWY 82 exit and cross over the Colorado River then follow the directions coming from the west. Coming from the south, travel into Glenwood Springs on Grand Avenue (HWY 82) and turn left onto 14th Street. Go one block; the high school is on your left.

MOTEL: A block of rooms is available until September 6 at the Caravan Inn, (800) 945-5495 or (970) 945-7451 (\$69/night/queen and \$79/night/2 doubles) and at the Affordable Inn, (800) 292-5050 (\$59.50/night/queen). The Caravan Inn is 4-5 blocks from the high school while the Affordable Inn is located in West Glenwood Springs 1 - 2 miles from the high school.

CAMPING: Ami's Acres in West Glenwood Springs (970-945-5340) or the KOA in New Castle (970-984-2240 or 800-KOA-3240).

ADDITIONAL INFORMATION: Contact Gay Austin at (970) 641-6264 (or austinaceae@frontier.net) or Laurel Potts at (970) 876-9977 (or laurel@rifle.net). The Glenwood Springs website is <http://www.glenwoodsprings.net/lodging.htm>.

MARR FUND: Report from Recipients

COLUMBINING COLORADO

Justen Whittall, University of California, Santa Barbara

The generosity of the Colorado Native Plant Society made it possible to study the columbines of Colorado last summer. This project was a portion of my doctoral work on the North American columbines, their flowers, and habitats. By visiting localities garnered from herbarium specimens and the suggestions of many CoNPS members, we traversed the state from the hanging gardens of *Aquilegia micrantha* in the sweltering southwestern Colorado desert to the thin sub-alpine air in search of *A. saximontana* atop Pikes Peak. In all, I was able to study six species of *Aquilegia* during a weeklong trip through Colorado.

We wasted no time in introducing ourselves with the Rocky Mountains by heading straight through some steep country from Durango to Ouray, where we found a delicate red flowered columbine growing in loose rocks at the base of Ouray Falls. This species, *A. elegantula*, is the only Colorado columbine with the hummingbird pollination syndrome (pendant red flowers with short spurs). We made floral measurements, habitat notes, took digital images, and collected seed from this population.

Our second stop in southwestern Colorado was Escalante Canyon, south of Grand Junction. We followed a poorly maintained dirt road down into the canyon, where we found *A. micrantha* growing amidst a hanging garden at the base of an arch rock. Fissures in the sediments provide a perennial source of water for this unique plant community, including orchids and monkeyflowers (*Mimulus cardinalis*). This columbine is unique among the North American species in that it looks just like a species with the hummingbird syndrome, but has white flowers. Although I did not observe any pollinators in this population, previous studies have documented visitation, primarily by queen bumblebees. In addition, I was excited to see the shiny, glandular leaf surfaces that we had observed in UCSB greenhouses. This is possibly a physiological adaptation to the dry air surrounding these hanging gardens, a hypothesis we plan to test this spring.

Next we were onto Rifle Falls, where we found a very rare columbine, *A. barnebyi*, growing in the mists at the base of the falls. This species has been confused with *A. micrantha*, but the yellow flowers were distinctly different from the pure white to whitish pink flowers of *A. micrantha*. Here, we made floral measurements and habitat notes, but did not observe any pollinators.

We headed east on the interstate through Vail and onto Loveland Pass. Just a half-mile up the trail, at 11,992 ft, I saw our first wild Colorado state flower, *A. coerulea* var. *coerulea*. This alpine population was thriving in the protection of a rock outcropping next to prostrate willows and other alpine mat plants. I began measuring the flowers when it began to rain, and thunder and lightning broke out. Remembering the warnings of electrocution at the trailhead, I quickly retreated to our vehicle.

We began the southern leg of our loop with a stop just west of Denver in hopes of relocating a spurless columbine, *A. coerulea* var. *daileyae*. Although we found the state flower in abundance,

no spurless mutants were located. Therefore, we headed south to Colorado Springs, where we were excited to ascend Pikes Peak in anticipation of finding a unique Colorado columbine, *A. saximontana*. With an early morning start, we stopped at the Elk Meadows trail and, after hiking just less than a mile, found these small blue flowered columbines growing in the shade of large boulders amidst a sub-alpine talus slope. We searched and searched for a couple of hours to measure only a handful of flowers. We were able to collect seed, take digital images, and make extensive habitat notes for this population.

Our last stop was to study an oddly disjunct form of the southwestern golden columbine, *A. chrysantha* var. *rhydbergii*. We headed west of Colorado Springs to Helen Hunt Falls nestled amidst a very dry pine forest. This habitat was reminiscent of one of our previous stops in central Arizona, Oak Creek Canyon near Sedona, where we collected the typical *A. chrysantha*. The Helen Hunt Falls population had slightly paler yellow flowers, with shorter spurs than typical *A. chrysantha*, but still characteristic of the hawkmoth pollination syndrome. Soon thunderstorms erupted and we were chased out of Colorado Springs for the interstate drive back up to the Wyoming border to continue our hunt.

This trip was a critical step in my doctoral studies on the evolution of the North American columbines. It became clear from seeing such diversity in Colorado that these plants have perfected the art of adaptation and speciation. By distributing distinct pollination syndromes over a range of habitats, they have exploited many niches in a very short period of time. The relative importance of pollinator shifts and habitat shifts in the speciation of the columbines is the subject of my doctoral thesis. The remainder of my doctoral work will focus on reconstructing the evolutionary relationships between the North American columbines. By comparing DNA profiles we should gain insights into the genealogy of the columbines, but this requires fresh leaf material. Therefore, I have begun germinating the seeds collected during this past summer to establish a greenhouse population here at UCSB. If anyone is interested in images of the Colorado columbines or other North American species, please visit my website at www.lifesci.ucsb.edu/~whittall or contact me at whittall@lifesci.ucsb.edu or (805) 893-0308. Thank you very much CoNPS!

UNC POSTS HERBARIUM WEBSITE

Neil Snow, University of Northern Colorado

The herbarium at the University of Northern Colorado in Greeley (GREE) recently posted its website (<http://www.unco.edu/biology/herbarium/index.htm>), which includes an overview of its mission and activities. It will occupy newly renovated space in late August that includes a compactor system and a new capacity of 50,000 specimens. Starting sometime in mid autumn of 2002, herbarium tours for schools and civic groups will be available one afternoon a week. Donations of high quality specimens from the High Plains, Colorado, and the southern Rockies, will be gratefully accepted.

Insert

Aquilegia

Insert

COLORADO NATIVE PLANT SOCIETY 2002 Annual Meeting

**Conservation of Rare Plants, Plant Communities, and Lichens of Colorado
September 20 – 22, 2002**

**Glenwood Springs High School
1340 Pitkin Avenue
Glenwood Springs, CO 81601**

REGISTRATION FORM

PARTICIPANT _____ PHONE _____
STREET _____ E-MAIL _____
CITY, STATE _____ ZIP _____
ADDITIONAL PARTICIPANT (S) _____

Please return this form and your check by September 9, 2002 if you wish to sign up for the reception on Friday evening, the luncheon buffet on Saturday, and/or the box lunch on Sunday. Sunday field trip carpools will be arranged on Saturday at the meeting. If you plan to stay overnight in Glenwood Springs, you must make your own reservations. See agenda (p. 3) for lodging and camping details.

FRIDAY, SEPTEMBER 20, 2002

I (We) plan to attend the reception (indicate number below):

_____ 6:30 - 9:30 PM: Glenwood Hot Springs Reception (free). Swimming is \$8.50 per adult and \$5.75 per child (3-12 years old) to be **paid at pool**. Signup requested. Directions and parking information will be sent to those who sign up.

SATURDAY, SEPTEMBER 21, 2002

Mexican buffet lunch will be catered @ \$15 per person

Number _____ Amount _____
_____ @ \$15 per person _____

SUNDAY, SEPTEMBER 22, 2002

_____ I (We) would be interested in attending field trips (indicate number).

Box lunch choices (optional)

Ham

Turkey

Veggie

_____ @ \$8 per person _____
_____ @ \$8 per person _____
_____ @ \$8 per person _____

Extra donation to help defray meeting costs _____

If non-member, please add membership fee (see schedule below):

Individual (\$15), Family/dual (\$20), Senior (\$8), Student (\$8), Corporate (\$30), Supporting (\$50.00), or Lifetime (\$250).

NOTE: Membership includes subscription to *Aquilegia*, the newsletter of the Colorado Native Plant Society; discounted rates for books; and registration for many Society field trips and workshops.

TOTAL AMOUNT ENCLOSED: _____

Make checks payable to Colorado Native Plant Society and return form by September 9, 2002 to:

Colorado Native Plant Society
ATTN: Annual Meeting Registration
P.O. Box 200
Fort Collins, CO 80522

NOMINEES FOR THE 2002-2004 TERM ON THE CoNPS BOARD OF DIRECTORS**David Anderson, Vice President CoNPS**

INSTRUCTIONS: Vote for five candidates (listed in alphabetical order), refold, seal, and return your ballot to the Colorado Native Plant Society at P.O. Box 200, Fort Collins, CO 80522. **It must be received by Wednesday, September 12, 2002.** Alternatively, you may bring it with you to the Annual Meeting at which time all of the ballots will be tabulated.

- **David G. Anderson:** David studied biology at the University of Colorado, and received an MS in Botany from the University of Washington, while studying the ecology of plants on Devon Island in the Canadian Arctic Archipelago. While in Seattle, he served as the Conservation Chair of the Washington Native Plant Society. He spent two years (1997 and 1998) in the Peace Corps as a science teacher in the Solomon Islands. David is now a botanist with the Colorado Natural Heritage Program. His work includes updating historical occurrences and finding new occurrences of rare plants throughout the state. He has served as Vice President of CoNPS for two years.
- **John Giordanengo:** John received an M.S. degree in 2000 from Colorado State University in the Department of Rangeland Ecosystem Science and currently serves on the Horticulture and Restoration Committee of CoNPS. John is employed by the City of Boulder, Open Space and Mountain Parks Department, where he works on wetland restoration projects and other wetland related issues. His primary interest is in the restoration of native plant communities and he has been enjoying the botanical wonders of Colorado for five field seasons. Prior to attending CSU, John worked as a public education program manager in the area of recycling, composting, and household hazardous waste for the City of Auburn, WA.
- **Gwen Kittel:** Gwen has been a member of CoNPS since 1985. Her botanical specialties are willows and other riparian plants. She works for NatureServe (the national umbrella organization to Heritage Programs) and The Nature Conservancy. Gwen works on western U.S. vegetation ecology, mapping, association descriptions, and conservation planning. This work includes traveling throughout the West. She really enjoys her work on the CoNPS board to date and being involved with organizing field trips keeps her "hands in" Colorado botanizing. Plus, it gives her a great excuse to get out in the field!
- **Laurel Potts:** Laurel completed a Master's degree at Colorado State University. She developed and taught an experimental course "Native Plants in the Landscape" for the Department of Horticulture and Landscape Architecture. Her work also involved surveying the native plant sector of Colorado's Green Industry. This work will be published in the Fall 2002 issue of the Native Plants Journal. In 2001, she took a position as restoration specialist with Rocky Mountain Native Plants Co., a nursery and ecological restoration company on the West Slope. Laurel has served on the CoNPS board for the previous two years.
- **Kim Fayette Regier:** Kim first learned of the Colorado Native Plant Society when she was hired to organize the 1995 Annual Meeting. Her exposure to the organization was great and she has been a member ever since. Kim is currently finishing up a Master's degree in Biology from the University of Colorado at Denver, studying *Eutrema edwardsii* ssp. *penlandii*, a rare Colorado endemic found in the Mosquito Range. She worked as a Botanist for the Colorado Natural Heritage Program for several years. Currently, she is the lab coordinator for the Basic Biology labs at the University of Colorado at Denver. She is dedicated to the study and protection of our native plants, and thinks CoNPS plays an important role.
- **Mark Simmons:** Mark is Assistant Professor and Curator of the Colorado State University Herbarium (CS). He completed his Ph.D. at Cornell University and spent a year as a postdoctoral associate at the Ohio State University Herbarium. His research specialties are the systematics of the Celastraceae and conceptual aspects of phylogenetic inference. He has conducted fieldwork in Virginia, Venezuela, and New Caledonia. He is working with Rob Guralnick, Ron Hartman, Tom Ranker, and Neil Snow to produce an online key and specimen database for the Vascular Flora of the Southern Rocky Mountain Region. His website is located at: <http://lamar.colostate.edu/~psimmons/>.
- **Neil Snow:** Neil is Assistant Professor of Botany at the University of Northern Colorado and Curator of the Herbarium (GREE). He holds degrees from Colorado State University (BS), University of Wyoming (MS), and Washington University in St. Louis (Ph.D.), where he also worked at the Missouri Botanical Garden. He spent two years in Queensland, Australia, where he worked for the state government as a Senior Botanist. His research specialties are the systematics of Poaceae and Myrtaceae. He is currently organizing the production of an on-line interactive key to the Colorado flora and is an active Board member of CoNPS.

— **WRITE-IN CANDIDATE** (Please provide contact information):

Name of candidate: _____

Phone, e-mail, or address of candidate: _____

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

Place
Stamp
Here

Colorado Native Plant Society
P.O. Box 200
Fort Collins, Colorado 80522

Deadline: 12 September 2002

CoNPS Field Trip Plant Lists Available!

Loraine Yeatts, Field Studies Committee

Plant lists for 79 CoNPS field trips, dating back to 1977, are on file with the Field Studies Committee and ready for distribution. Lists are based primarily on field observations and are not generally documented by specimens. Nomenclature follows Weber and Wittman's latest Colorado floras. Commonly used synonyms and common names are included, but any information in the database (such as author references, common names, etc.) can be included or excluded, by special arrangement. Lists from repeat trips to the same region can be combined.

To place an order, use this list as an order form. For each field trip list desired, please:

1. Indicate trip name and date by circling the trip number. For example, if you would like a list for Aiken Canyon, circle "01" for Aiken Canyon.
2. Indicate format preferred by circling the number of pages in the family and/or genus columns; choices include alphabetically by family or alphabetically by genus or one of each. For example, if you would like Aiken Canyon sorted alphabetically by family, circle "5" pages.
3. Total the number of pages for all lists requested from the subtotals on page one and two.
4. Calculate total charges, following the instructions on the reverse side of this form.

Trip name (1 - 33)	Date begun	Leader(s)	No. of pages	
			Family	Genus
01. Aiken Canyon	6/06/92		5	4
02. American Basin	8/11/95	Gay Austin	2	2
03. Billy Pardee Ranch	6/06/90	Rick Rhoades	1	1
04. Buffalo Creek Fire	5/30/98	Steve Vest, Rick Brune	5	4
05. Butler Ranch	6/06/90	Rick Rhoades	3	2
06. Cap Rock Preserve	5/21/94	Terri Schulz	3	2
07. Cedar Mesa and vicinity	5/15/91	Rick Brune, Loraine Yeatts	5	4
08. Chimney and Lewis Canyon	6/21/79	Don Hazlett, Bruce Bosley	6	5
09. Coal Creek	5/24/95	Mike Scott, Jonathan Friedman	2	1
10. Colorado Sandhills, Wells Ranch	6/13/98	Rick Brune	3	2
11. Conejos River Basin	6/20/92	Patsy Douglas	5	4
12. Devil's Head	8/05/89	Judy Von Ahlefeldt	1	1
13. Dinosaur National Monument	5/01/93	Lynne Riedel	3	3
14. Dinosaur National Monument	5/11/96	Tamara Naumann	3	2
15. Dolores River	5/21/94	Leslie Stewart	3	3
16. East Carrizo Creek	5/21/89	Rick Brune, Meg Van Ness	1	1
17. East Cottonwood Creek	5/21/89	Rick Brune, Meg Van Ness	1	1
18. Enchanted Mesa	4/24/77	Boulder Chapter	2	1
19. Florissant Fossil Beds	6/27/87	Mary Edwards	4	3
20. Fort Carson: the Hogback	5/20/89	Rick Brune, Meg Van Ness	2	1
21. Four Corners	5/28/95	Richard Moseley, Charlie King	4	3
22. Four Corners Area	5/16/98	Ken Heil, Mark Porter	4	3
23. Grays Peak	7/15/00	Jeff Dawson	4	3
24. Green Mt.	6/03/95	Gayle Weinstein	2	2
25. Green Mt.	6/01/96	Loraine Yeatts, Dick Yeatts, J. Wingate, V. Richards	4	3
26. High Creek Fen	7/11/92	Alan Carpenter	2	2
27. Hoosier Ridge	7/17/94	Robin Bingham	3	2
28. Horseshoe Cirque	7/12/92	Barbara Siems	3	2
29. Hovenweep Ruins	5/09/98	Leslie Stuart	5	3
30. I-25 rest area near Pueblo	5/19/89	Rick Brune, Meg Van Ness	2	1
31. Jackson County Kettle Lakes	7/10/99	John Sanderson	4	3
32. Kennebec Pass	7/30/94	Sue Komarek	3	2
33. Kim Area	5/21/89	Rick Brune, Meg Van Ness	1	1
34. Long Lake / Niwot Ridge	7/01/80	Miriam Denham, Jane Foley	3	2
35. Los Lagos Ranch, Rollinsville	7/23/94	Betsy Baldwin	4	3
36. McElmo Canyon (Sand Canyon)	5/13/95	Leslie Stewart, Sue Komarek	3	2
37. Mesa de Maya	8/22/87	Ivo Lindauer	5	4

page one subtotal for trips 1 - 33

Trip name (34-79)	Date begun	Leader(s)	Family Genus	
38. Mesa Verde	6/10/95	Dick Moseley, Charlie King	4	3
39. Middle Park	6/18/89	John Anderson	2	1
40. Moffat County	5/23/87	Steve O'Kane	3	3
41. Montezuma County	5/28/83	Carol Brandt	3	3
42. Mt. Bross	7/14/85	William A. Weber	3	2
43. Mt. Evans	8/29/93	Betty Willard	3	2
44. Mt. Zirkel Wilderness Area	7/16/77	Fort Collins Chapter	4	3
45. Neota Wilderness	7/27/96	Jody K. Nelson	5	4
46. North Table Mt.	5/14/94	Sally White, Loraine Yeatts	5	4
47. North Table Mt.	5/23/98	Paul Kilburn	4	3
48. Pagosa Springs Country	6/11/94	Dick Moseley, Charlie King	4	3
49. Pagosa Peak	7/31/99	Charlie King, Richard E. Moseley, Jr.	4	3
50. Pawnee National Grassland	6/02/79	M. Shoop, J. Dodd, R. Engle, G. Turner	2	1
51. Pawnee National Grassland	5/29/87	Rick Brune	4	3
52. Pawnee National Grassland	6/05/93	Jim Borland, Rick Brune	6	4
53. Perly Canyon	5/20/89	Rick Brune, Meg Van Ness	2	2
54. Phantom Canyon	6/10/89	Alan Carpenter	4	3
55. Phantom Canyon Preserve	7/15/95	Nature Conservancy	3	3
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57. Pinon Canyon Maneuver Site	5/10/98	Carolyn Crawford, Dave Anderson	6	5
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CHAPTER NEWS

Boulder Chapter

The Boulder Chapter invites you to join us for a guest speaker, refreshments, book sales, and socializing at 7:00 PM on the second Thursday of the month from October through April. We now meet at the City of Boulder Open Space and Mountain Parks offices, 66 South Cherryvale Road. From South Boulder Road, go south on Cherryvale one-tenth of a mile and turn west onto a lane that leads back to the offices. We'll meet in the north building conference room. For more information, contact Chapter President Kathy Damas at (303) 543-1492.

Fort Collins Chapter

Monthly meetings are scheduled October through April at 7:00 PM in the Main Conference Room of the National Center for Genetic Resources Conservation (formerly National Seed Storage Laboratory) at CSU located west of the railroad tracks, about one block north of Pitkin St.; enter on west side of building. Members are invited to join the speaker for dinner at Coopersmiths in Old Town, Fort Collins at 5:30 PM prior to the meeting. For more information, contact Chapter President Annette Miller at (970) 482-3063 or almiller@lamar.colostate.edu.

Metro-Denver Chapter

Monthly meetings are held from September through April at the Denver Botanic Garden. For exact DBG location, which may vary, or for more information, please contact Chapter President Rita Berberian at (303) 513-0591 and rberberian@hotmail.com or Leo P. Bruederle at lbruederle@earthlink.net.

September 24, 2002 Tuesday at 6:00 PM Native Gargens at Denver Botanic Garden
The 2002 - 2003 Metro-Denver Chapter Program will "kick off" with a 6:00 PM tour of the native gardens at the Denver Botanic Garden. **Dan Johnson** (Denver Botanic Garden) will lead this tour emphasizing Colorado native gardens, with a few other Western and Southwestern species thrown in for good measure. Specifically, we will be visiting the Plains garden, as well as the

Gates Montane, Dryland Mesa, and new Western Panoramas. Refreshments and an opportunity to renew acquaintances will follow in the Waring House.

October 29, 2002 Tuesday at 7:00 PM Using plants for Environmental Cleanup
Dr. Elizabeth Pilon-Smits (Colorado State University) will discuss her research on phytoremediation, which involves the use of plants and their associated root microbes to clean up environmental pollution. Elizabeth, her colleagues, and students are trying to understand the mechanisms by which plants take up, metabolize, and accumulate pollutants (heavy metals, selenium, and organic pollutants), with the goal of improving their capacity to remove these compounds from the environment. They study all aspects of phytoremediation, from the molecular level through the whole plant to the field. Additionally, they use genetic engineering to manipulate plant metabolism and a plant's capacity to remediate pollutants. It is hoped that knowledge gained from these studies will help improve the efficiency of phytoremediation. Prior to the meeting at 5:30 PM, members are invited to join the speaker for pizza at Angelo's located at 620 East 6th Avenue (between Pearl and Washington) in Denver.

Plateau Chapter

Chapter activities are scheduled throughout the year. For more information, contact Chapter President Jeanne Wenger at (970) 256-9227 and Bluecrow2u@aol.com or Program Chair Lori Brummer at (970) 641-3561 and lbrummer@gunnison.com.

July 20 - 21, 2002 Saturday - Sunday 9:00 AM High Altitude Field Studies, Part II.

Saturday will be a continuation of last summer's efforts to document populations of two Colorado endemics, *Astragalus molybdenus* (Leadville milkvetch) and *Physaria alpina* (alpine bladderpod) in Gunnison County. This trip will focus on the Cumberland Pass area. Sunday will be a general alpine flora and lichen day. Botanists of all levels are welcome both days! Meet at the City Market parking lot in Gunnison at 9:00 AM both days for car-pooling, or at the top of Cumberland Pass

at 10:30 AM both days. Contact Lori Brummer at (970) 641-3561 or lbrummer@gunnison.com for more information.

August 2 - 3, 2002 Saturday - Sunday

Wildflower Identification for the Amateur

This workshop will be offered Saturday, August 2 and Sunday, August 3 under the auspices of the Colorado Native Plant Society. It will be taught by **Dr. Keith Longpre** (Professor Emeritus, Western State College) and **Gay Austin** (U.S. Forest Service). The workshop will provide an introduction to identifying wildflowers in the field utilizing an illustrated handbook designed for the layperson. The course will consist of a Saturday morning introductory session followed by an afternoon field trip and an all-day Sunday field trip. The leisurely field trips will not require any lengthy walking or strenuous climbing. The fee for the course is \$50.00, which will include: text, hand lens, and membership in CoNPS. This workshop is limited to 15 people, so please register by July 27, 2002. For more information and registration, contact Gay Austin at (970) 641-6264 or austinaceae@frontier.net.

August 16 - 18, 2002 Friday from 5:00 PM through Sunday at 12:00 PM

Eriogonum Identification Workshop

Dr. James Reveal will teach a fairly technical workshop focusing on identification and ecology of *Eriogonum* species of the Western Slope and Colorado Plateau. This advanced workshop will be held in Grand Junction. Fresh specimens and microscopes will be available. A workshop fee of \$27 includes a box lunch. Contact Gay Austin at austinaceae@frontier.net or (970) 641-6264 to register.

August 23 - 25, 2002 Friday - Sunday Storm Ridge Plant Survey

This trek, which has been rescheduled from last summer, will involve searching Storm Ridge for occurrences of *Eriophorum gracile* (bog wool or cottonsedge), which hasn't been recorded since 1964. Storm Ridge is in the West Elk Wilderness; getting there requires a one-day backpack from Horse Ranch Park over Beckwith Pass to camp at Cliff Creek crossing (4-1/2 miles and 1000 foot elevation gain and loss). On Sunday, we'll hike cross-country

(at least six miles, with up to 2000 feet elevation gain) into the basin north of Storm Ridge to survey several lakes and ponds for populations of *E. gracile*, *E. altaicum*, and possibly *Comarum palustre* (purple cinquefoil). We will return to the trailhead on Monday. There is a 25 person limit, so please register by calling Larry Sanders at (970) 527-3618.



Eriophorum altaicum
Artist: Janet Wingate

September 15, 2002

Sunday

Sagebrush Identification

This event led by **Roger Rosentreter** (Idaho State BLM) will emphasize sagebrush identification on the Uncompaghere. Join us in the field near Grand Junction or Glenwood Springs, and learn to identify sagebrush species and subspecies. Although there is no cost for this event, please register with Gay Austin at austinaceae@frontier.net or (970) 641-6264.

Southeast Chapter

Activities for the Southeast Chapter are scheduled throughout the year. For more information, contact President Dan Fosha at (719) 572-6972 or danfosha@aol.com.

Southwest Chapter

For more information regarding news and activities, please contact Chapter President Sandy Friedley at (970) 884-9245 or by e-mail at friedley@frontier.net.

August 3 Saturday at 10:00 AM
American Basin and Cinnamon Pass

Dick Moseley will lead this trip exploring the wildflowers of American Basin. Meet at the trailhead for an opportunity to see the gentians, columbines, and other wonders that make this area so spectacular. After lunch, we'll head up to Cinnamon Pass to explore alpine communities and possibly some unique wetlands. Contact Dick at (970) 731-5918 for more information.

XERISCAPING WITH NATIVES

Miki Brawner, Owner

Harlequin's Gardens, Boulder

What group of plants has the longest proven record of success in Colorado for enduring the radical ups and downs of our weather, including droughts? Our native plants, of course. And if we give them similar conditions to what they have in nature, they will succeed with little care. Here are a few of my favorite native plants that have thrived in my xeriscape garden for the past ten to 15 years.

Liatris punctata, the dotted gayfeather stores its energy in a thick taproot that helps it produce flowers even after a dry summer. The tufts of rough, narrow leaves are little-noticed until they shoot up their thin flower spikes to ten to 16 inches, and burst into bloom with lavender-violet "feathers" in August or September. They are especially dramatic in groups of four to ten plants, and can continue to bloom for a month or more. *Liatris punctata* is native to the foothills and plains of Boulder County and, unlike cultivated varieties, needs no supplemental water once established.¹

One of the most abundant and showiest penstemons in the Boulder area is *Penstemon secundiflorus*. The long spoon-shaped leaves are blue-gray and are very architectural, cupping against the ten to 16 inch stems. The spring-blooming flowers are a bright lavender-violet and look best in a drift.

After they bloom, I dead-head half the flowers to keep the plants longer lived and then, when the rest of the seeds are dry and ripe, I crush the seed pods in a gloved hand and scatter the seeds to add to my drift. Like most penstemons, this one is drought tolerant.

Calylophus serrulatus is sometimes called *Oenothera serrulatus*, but this "evening primrose"-like perennial is more of a subshrub and blooms all day long. It is densely branched, six to eight inches high, and eight or more inches wide, with glossy toothed leaves. Its glory is the covering of

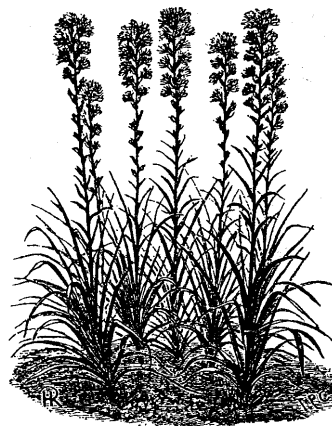
beautiful, yellow, four-petaled flowers, which can bloom from May to August. It is well behaved and long lived, needing little or no water once established.

There are many great native shrubs for the xeriscape garden, but one of the most attractive is cliffrose, *Cowania mexicana*. In late spring, this three to eight foot shrub is clothed in creamy yellow, five petalled, rose-like flowers, which have a sweet fragrance. The leaves are small, toothed, and nearly evergreen; and the bark gets shaggy with age. Although it looks somewhat delicate, cliffrose has done well in my unwatered area, staying only three feet tall, but blooming nicely every year.

In a dry year, flowers are few in the fall, but there are several natives we can count on for bloom. One is rabbitbrush and, while not everybody has a garden that can accommodate the big, lanky variety, there is a dwarf variety that can fit into the most sophisticated urban setting.

Chrysothamnus nauseosus var. *nauseosus* is not as sickening as the name implies. It forms a neat mound of fine-textured blue or green foliage 12 to 24 inches high and wide. The flowers, like those of the taller form, are in masses of golden yellow. If the flowers are sheared after blooming, the form remains tidy and it will not self-sow.

This plant is extremely drought tolerant and

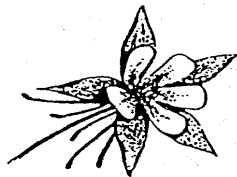


Liatris

could be used as a short hedge or a specimen, far from the reach of the hose.

¹ When describing these plants and saying that they do well without much water "once established," we should point out that any new planting will require at least some water in the first one to two years before they can be considered fully established. Common sense dictates where no blanket rules can be applied; conditions will vary by season, year, location, and the species in question.

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.

Schedule of Membership Fees

Life	\$250
Supporting	\$50
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Membership Renewal/Information

Please direct all membership applications, renewals, and address changes to the Eric Lane (Chair of Membership), Colorado Native Plant Society, P.O. Box 200, Fort Collins, CO 80522. Please direct all other inquiries regarding the Society to the Secretary at the same address.

Aquilegia

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

Articles not exceeding 2000 words in length and shorter items fewer than 500 words in length, such as unusual information about a plant, are especially welcome. Previously published articles submitted for reprinting require permission. Camera-ready line art or other illustrations are also solicited. Please include author's name and address, although anonymity may be requested. Articles submitted via e-mail or on disks (MAC preferably, or IBM) are appreciated. Please indicate word processing software and version; if possible, submit as an RTF (rich text format) file.

Please direct all contributions to the newsletter to:

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Finance	Denise Culver ..	970-225-1930
.....	and Georgia Doyle	970-491-6477
Horticulture and	Kathy Damas	303-543-1492
Restoration ..	and Lisa Tasker ..	970-544-3633
Membership ..	Eric Lane	303-239-4182
Newsletter	Leo P. Bruederle ..	303-556-3419
Sales	Ann Armstrong ..	720-564-2052
.....	Sue Kamal	970-353-9240
.....	and Laurel Potts ..	970-625-4769
Rare Plant	Eleanor	
Monograph ..	Von Barga	303-756-1400
Research Grants	Neil Snow	970-330-4823
Website	Bob Clarke	970-242-6067
Workshop: East	Bill Jennings ..	303-666-8348
West	Gay Austin	970-641-6264

MEMBERSHIP APPLICATION AND RENEWAL FORM

Name(s) _____

Address _____

(Address) _____

City _____ State _____ Zip _____

Phone () _____ E-mail _____

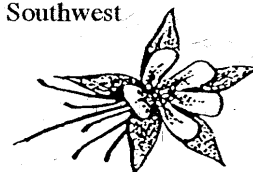
Chapter: ☐ Boulder ☐ Fort Collins ☐ Metro Denver ☐ Plateau ☐ Southeast ☐ Southwest

In addition to my membership, I have included \$_____ as a contribution to the John Marr Fund (endowment in support of small grants-in-aid of research), \$_____ as a contribution to the Myrna P. Steinkamp Memorial Fund (endowment in support of small grants-in-aid of research), or \$_____ as a general contribution to the Society.

MEMBERSHIP CLASS:

Dues cover one calendar year.

- ☐ Individual, \$15.00
- ☐ Family/dual, \$20.00
- ☐ Senior, \$8.00
- ☐ Student, \$8.00
- ☐ Corporate, \$30.00
- ☐ Supporting, \$50.00
- ☐ Lifetime, \$250.00



CoNPS IS A NON-PROFIT ORGANIZATION — DUES AND CONTRIBUTIONS ARE TAX-DEDUCTIBLE

CALENDAR

CHAPTER EVENTS

Metro-Denver Chapter

September 24 Native Gardens at Denver Botanic Garden (6:00 PM)

October 29 Using plants for Environmental Cleanup

Plateau Chapter

July 20 - 21 Gunnison High Altitude Field Studies

August 2 - 3 Wildflower Identification for the Amateur

August 16 - 18 *Eriogonum* Identification Workshop

August 23 - 25 Storm Ridge Plant Survey

September 15 Sagebrush Identification

Southwest Chapter

August 3 American Basin and Cinnamon Pass

SOCIETY EVENTS

Annual Meeting

Sept 20 - 22 Glenwood Springs, CO

FIELD TRIPS

July 20 Longmont's New Open Space

August 3 Elevational Transect of Willows

August 24 - 25 Middle St Vrain Weed Pull & Backpack



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

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