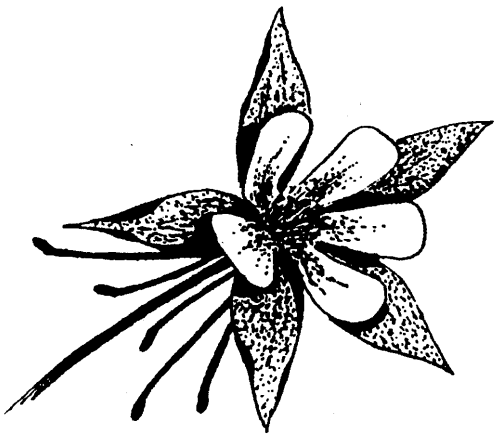
Aquilegia



Newsletter of the Colorado Native Plant Society

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

Volume 18 Number 2 March/April 1994

The Genetics, Ecology, and Conservation Management of the Rare Orchid *Spiranthes diluvialis*

Anna Maria Arft

University of Colorado at Boulder

Spiranthes diluvialis is one of twelve species federally listed as Threatened or Endangered in Colorado. During the past three years, I've been engaged in research on this species since little was known of the genetic, ecological, and demographic processes affecting its life history and long-term survival. My research addresses three areas concerning the evolution and long-term survival of S. diluvialis: phylogenetic or genealogical history, genetic variation within and among populations, and life history and environmental requirements. Through this research, I hope to provide information critical to the formulation of conservation management plans as well as data on the basic biology of this threatened species.

Spiranthes diluvialis is a terrestrial orchid species known from three areas in the western United States: the Front Range in Colorado, the Colorado River drainage in eastern Utah, and the eastern Great Basin of Nevada and Utah (U.S. Fish and Wildlife Service, 1994). This rare orchid inhabits wet meadows near streams, springs, or lakes at elevations between 4300 and 7000 feet, stands 5-18 inches tall, and blooms from July through September producing tubular white flowers arranged in a spiral (Jennings, 1990). Small, inconspicuous leaf rosettes may emerge at the end of the growing season and persist

through the winter months. Reproduction appears to be strictly sexual with bumble bees (*Bombus* species) as the primary pollinators (Sheviak, 1984; Sipes et al., 1993). Upon germination, many species of *Spiranthes* are infected by a mycorrhizal fungus and may persist underground for many years before leaves emerge above ground. These individuals may not flower in consecutive years or under unfavorable conditions, and may survive due to specific symbiotic relationships with mycorrhizal fungi (Wells, 1981).

Currently, less than 10,000 individuals of *S. diluvialis* are estimated to occur in fourteen locations within Colorado and Utah (U. S. Fish and Wildlife, 1994). Five of the approximately twenty historically documented populations of *S. diluvialis* have been extirpated as a result of urban development. The remaining populations exist in wetland habitats such as subirrigated meadows, alluvial terraces, and abandoned stream channels where the soil is saturated at least temporarily during the spring and summer growing season. Potential threats to the species' habitat include stream channelization, water diversions, urban development, and agricultural use.

Phylogenetic Origin

Although *S. diluvialis* is currently recognized as a distinct species, in the past some controversy has surrounded its status. The distinctness of *S. diluvialis* as a species forms the basis for its protection under the Endangered Species Act. I hope to clarify the allopolyploid origin of *S. diluvialis* by determining its relationship with its putative parents, *S. magnicamporum* and *S. romanzoffiana* (Sheviak, 1984). Whereas diploids, such as humans, have two sets of

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In Memoriam - Dorothy Udall

It is with deep sorrow that we report the death of Dorothy Udall of Fort Collins. At the time of her death and for several preceding years, Dorothy was Chair of the Society's Horticulture and Rehabilitation Committee. As evidenced by her work with that committee, Dorothy had a great interest in the uses of native plants to reclaim and restore damaged land. Among the products of her committee was an important Society guideline on uses of native plants in landscaping.

Dorothy was born in New York State, and earned B.S. and M.S. degrees from Cornell University. She and her husband, Dr. Robert H. Udall, had lived in Fort Collins since 1951.

Dorothy and Rob have been steadfast supporters and participants in CONPS activities, both with the Fort Collins Chapter and at the state level. In addition, they have been major driving forces in several other conservation groups in the Fort Collins area. Dorothy was a vital member of the Poudre River Trust, a group working to protect and redevelop the Poudre River's corridor through the city of Fort Collins. That interest worked in harmony with her CONPS activities in the Gustav Swanson Nature Area, where the Fort Collins CONPS Chapter participated with several other groups and the city's Natural Resources Department to revegetate a beautiful spot along the river with native plants. Dorothy and Rob could always be found at work with shovel, bucket, trowel, or whatever was needed. They also devoted time to their beautiful foothills property near Fort Collins, which they generously opened for much-enjoyed CONPS spring field trips or other activities.

In memory of Dorothy, several of the organizations to which she contributed so much plan a work day on April 30th at the Gustav Swanson

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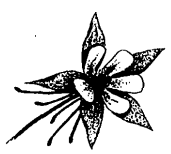
Aquilegia



Aquilegia is published four to six 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. Contact the Society for subscription information.

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

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
Organization	$ 30
Family or Dual	$ 15
Individual	$ 12
Student or Senior	$ 8

Membership Renewal/Information

Please direct all membership applications, renewals and address changes to the Membership Chairperson, 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.

Newsletter Contributions

Please direct all contributions to the newsletter to:

Tamara Naumann
940 Quinn Street
Boulder, CO 80303

Short items such as unusual information about a plant, a little known botanical term, etc. are especially welcome. Camera-ready line art or other illustrations are also solicited.

Please include author's name and address, although items will be printed anonymously if requested. Articles submitted on disks (IBM or Mac) are appreciated. Please indicate word processing software and version.

***Udall,** continued from page 2*

Nature Area. Work plans include removing two "exotics" (non-native crack willows) and replacing them with a group of native cottonwood trees, plus some additional landscaping work around the cottonwood grove. Anyone who wishes to remember Dorothy in this way is welcome to join the work group at 9:00 a.m. on April 30; call Myrna Steinkamp or Sue Martin (both 303-226-3371) for directions. Contributions towards the development of this memorial grove and other activities in Dorothy's memory, which will be described later, may be made to:

Poudre River Trust - Dorothy Udall Fund
201 South College Ave.
Fort Collins, CO 80524

A dedication ceremony for Dorothy Udall Memorial Cottonwood Grove will be held at a time to be determined, probably in early summer; it will be announced in *Aquilegia.*

Dorothy's quiet demeanor, delightful personality, intellect, and drive will remain in the memories of those CONPS members and other friends lucky enough to have known and worked with her. Truly, she will be missed among us.

Aquilegia

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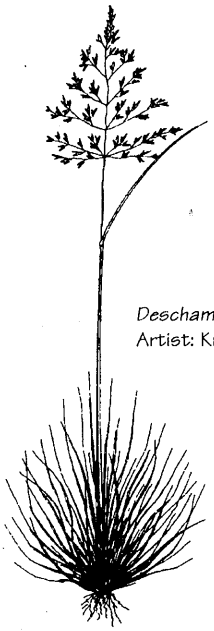
TUNE IN TO NATIVE PLANTS!

Jim Borland is co-hosting the Gard'n-Wise Garden Talk Show with Keith Funk on KHOW radio (630 on your AM dial.) Jim is a past-president and active member of CONPS. Tune in on Saturday mornings at 8 a.m. to this one-hour show, sponsored by Gard'n-Wise. What a great opportunity to promote the use of native plants in Colorado landscapes! Listen for new ideas or share your ideas with others.

ANNOUNCEMENTS

ASTRAGALUS SEARCHERS SOUGHT

The BLM's Gunnison Resource Area is looking for individuals to volunteer a day or a weekend to search for *Astragalus microcymbus* (skiff milkvetch) and *Astragalus anisus* (Gunnison milkvetch). These "category 2" species are candidates for listing under the Endangered Species Act. Time will be spent examining existing colonies and searching for additional populations along South Beaver Creek, located approximately six miles southwest of Gunnison within the sagebrush ecosystem. Uplands adjacent to the drainage are moderately to steeply rolling with slopes ranging from 5 to 30 degrees; elevations range between 8,000 and 8,500 ft. The date for the inventory effort is July 9, 1994, meeting at the Gunnison BLM Resource Area Office at 9:00 a.m. (216 N. Colorado Ave., Gunnison). Work can be extended to July 10th if any volunteers are interested in staying an extra day. BLM will provide a map of locations to search, a visit to known populations, and some transportation to the sites. For further information, or if you want to volunteer on other dates, call Joe Capodice at (303) 641-0471.



Deschampsia caespitosa
Artist: Kris Meiring

LAST CALL!

Check your mailing label... if it says PAID THRU 1993, your membership has expired, and **THIS IS WILL BE YOUR LAST NEWSLETTER!!** Renew quickly to avoid missing the coming season's field trips, workshops, and chapter meetings and other exiting activities — including an excellent Annual Meeting planned for October 15th, 1994 by the Fort Collins Chapter.

ROCKY HORROR HORTICULTURAL SHOW

Is it a wildflower or a weed? If you've ever wanted to know the differences, this slide show developed and presented by the Colorado Native Plant Society can answer your questions. Many of our familiar roadside flowers are actually problem weeds from faraway places; often they have been brought here deliberately. As Colorado's native wildflower heritage is threatened by the spread of these exotic newcomers, so are many of our most important wildlife habitats. Learn how to tell a weed from a wildflower, the problems weeds cause, what's being done, and what you can do to help reduce the threats from "invading barbarians." This program is of special interest to gardeners, as new weeds are often brought to Colorado through the horticultural trade.

This slide show is currently being presented by Society volunteers to interested groups and organizations. If you would like to present the slide show to a civic group or organization near you, please call Bobby Henig (297-9762). Full-length text to accompany the text is provided to presenters.

***Spiranthes,** continued from front page*

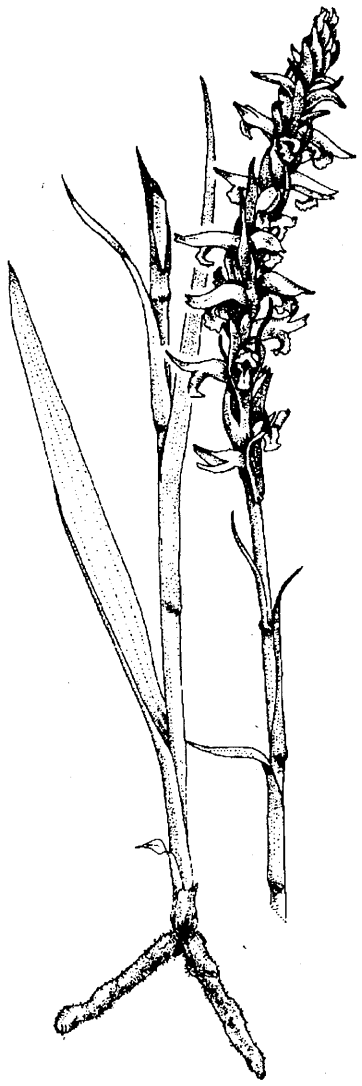
chromosomes (one from each parent), a polyploid is an organism with more than two sets of chromosomes. Allopolyploidy (i.e., the formation of a polyploid following hybridization between two genetically distinct diploid species) is an important mechanism of speciation in flowering plants. The duplication of chromosomes giving rise to a polyploid confers "instant" speciation on the new fertile polyploid due to complete reproductive isolation from the parental taxa (Ranker and Arft, in press).

During the past three years, I've conducted a genetic survey employing protein electrophoresis on nine populations of *S. diluvialis*, as well as several populations of its putative parental species (Arft and Ranker, 1993). Protein electrophoresis separates isozymes (different forms of an enzyme) in an electric field, thus providing an indirect measure of the genetic makeup of individuals. Generally, isozymes are useful for detecting allopolyploid hybridization because the isozymes present in each of the putative parental species will be combined and detectable in the hybrid species (Ranker et. al., 1989). Results indicate the genetic makeup of *S. diluvialis* is a combination of those found for the putative parental taxa, thus supporting the hypothesis that *S. diluvialis* is a distinct species resulting from the hybridization of *S. magnicamporum* and *S. romanzoffiana.*

Genetic Variation

Maintenance of genetic diversity is crucial for the long-term survival and evolutionary response of populations to changes in the environment (Huenneke, 1991). Loss of genetic variation may reduce a population's ability to adapt to changing environmental conditions. Population genetic analyses of rare plants are particularly important for designing management programs which will allow for the conservation of maximum levels of natural genetic variation and local adaptation. The second part of my study employs protein electrophoresis to assess genetic variation and structure within and among populations of *S. diluvialis.*

In terms of conservation biology perhaps the most relevant information is gained in comparing genetic variability among different populations. For the nine populations I've examined, the presence of population unique alleles and genotypes indicates differentiation among populations and argues for the preservation of each population as a unique genetic entity. Genetic diversity may be critical in buffering populations of *S. diluvialis* against the genetic problems associated with small isolated



Spiranthes diluvialis
Artist: Carolyn Crawford

populations and may allow for its continued evolutionary change and adaptation.

Life History and Environmental Requirements

Genetic factors may play the most critical role in terms of long-term evolutionary change. However, demographic factors may be of more importance in the short-term (Lande, 1988). Detailed ecological studies of rare plants help to elucidate factors constraining the continued persistence of the species. The third phase of my research involves collecting demographic and environmental data on experimental managment and control plots containing *S. diluvialis.*

Although some of the sites where *S. diluvialis* occurs have been used agriculturally in the past, it's unclear whether the resulting habitat alteration is neutral, beneficial, or detrimental to the orchid (Cross, 1991; McClaren and Sundt, 1992). In Colorado, the largest population of *S. diluvialis* is on City of Boulder Open Space property at the Van Vleet Ranch, which has been used agriculturally for the past 50-75 years and is still grazed each year in the winter, mown in the summer, and irrigated during the spring and summer. Since its discovery in 1986, the orchid population at Van Vleet has been monitored by the City of Boulder Open Space Department. Large annual fluctuations in population size have been reported. However, due to the difficulty in finding vegetative individuals, the monitoring counts were based only on flowering individuals.

During the past three years, I've established experimental management (grazing, mowing, burning) and control plots at the Van Vleet Ranch. For comparative purposes, demographic plots also have been established along Clear Creek in Colorado and Deer Creek in southern Utah. Individual plants are monitored on a monthly basis from May to September to characterize the life cycle of *S. diluvialis* and the impact of the environmental treatments on that cycle. For each individual, data are collected on growth and reproduction (e.g. phenological state, longest leaf, height of inflorescence, number of flowers, number of fruits, seed set, and seed viability) as well as environmental variables including herbivory, associated vegetation, vegetation cover, soil characteristics, light intensity, mycorrhizal associations, and microsite hydrology.

Data from the first two seasons indicate: 1) the proportion of flowering individuals varies each year; 2) herbivory may prevent a large number of orchids from reproducing; and 3) it remains unclear whether past

- continued on page 5

***Spiranthes,** continued from page 4*

management practices such as grazing and mowing are beneficial or detrimental to sexual reproduction in *S. diluvialis*. The data suggest the large fluctuations in population size reported in the monitoring counts may be fluctuations of flowering individuals, with many individuals remaining vegetative or subterranean. The proportion of flowering individuals increased from 58% in 1992 to 80% in 1993 within the control plots, indicating flowering plants alone may not be a good indicator of population size.

Perhaps the most surprising observation is the number of orchids that were damaged by herbivores other than cattle. Vole herbivory may be the greatest single threat to the long-term survival of *S. diluvialis* at the Van Vleet site. Numerous tunnels or runways constructed by field voles (*Microtus pennsylvanicus)* were observed; in many cases, if an orchid was on or near one of the runways, the inflorescence was chewed off and left lying a few inches away, uneaten.

At this point ecological data are conflicting as to whether the long-term persistence of *S. diluvialis* is enhanced by management techniques. For example, plots within traditionally grazed and mown areas produced the highest proportion of flowering plants; however, fruit set was low due to mowing or vole herbivory. Similarly, although management techniques reduce vegetation cover and may contribute to a reduced vole population, fruit set may be adversely affected since some bumble bees use rodent burrows for nesting. Analysis of environmental variables are currently in progress.

I hope my research will provide a better understanding of this threatened species and aid in conservation management decisions affecting its fate.

(I would like to take this opportunity to thank the Colorado Native Plant Society for their financial support and Sharon Collinge, Vicki Frey, Sara Simonson, and Kathy Damas for their prodigious efforts collecting field data.)

Spiranthes diluvialis range extended!

One of two significant discoveries was made last summer when B.E. Nelson, manager of the Rocky Mountain Herbarium in Laramie, WY, came across the Ute ladies' tresses orchid *(Spiranthes diluvialis)* in southeastern Wyoming on a parcel of state school land.

Approximately 10 plants were observed on August 17, 1993 growing amidst *Aster, Solidago, Glycyrrhiza, Phleum, Achillea, Mentha, Medicago, Sisyrinchium, Ratibida, Dalea, Muhlenbergia, Panicum, Agrostis, Bidens, Iva, Lycopus, Equisetum, Spartina, Elymus, Juncus* and *Carex,* along Bear Creek — approximately 14 air miles southeast of Chugwater in Goshen County, Wyoming.

The orchids were growing on a streambank approximately one foot above the surface water level and two to three feet from the creek's edge — a habitat similar to other populations known from Colorado and Utah. Additional suitable habitat reportedly exists in the vicinity.

Two weeks later, Ellen Wheeling, a botanist searching for *S. diluvialis* at the request of Colorado State University, came across 13 orchids along the Poudre River-fed Pleasant Valley and Lake Canal in the northwestern Forth Collins area. Associated species included *Agrostis gigantea, Festuca arundinacea, F. pratensis, Juncus nodosus, J. dudleyi, J. longistylis, Lobelia siphilitica, Equisetum laevigatum, Sporobolus asper,* and *Verbena hastata.*

These two discoveries significantly extend the previously known range of *Spiranthes diluvialis* approximately 125 miles to the north and 40 miles to the east. These two discoveries are not surprising, given the corresponding northerly ranges of *S. romanzoffiana* and *S. magnicamporum,* the parental species of our threatened hybrid orchid.

Those of us roaming the wetlands of the eastern plains this summer should keep our eyes peeled for the orchid in late July and early August.

(*Editor's note:* Anna Arft is a recipient of the John Marr Fund, an endowment made possible by the Colorado Native Plant Society.)

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FIELD TRIPS - 1994

NORTH TABLE MOUNTAIN WILDFLOWER WALK

Leaders: Sally White and Loraine Yeatts
Saturday, May 14: 8:30 a.m. to about 4 p.m.

Enjoy spring-flowering wildflowers and wide-ranging vistas from the top of this lava-capped mesa north of Golden. A moderate climb of 800 feet in elevation will take you to the top.

The steep slopes and rolling top of the mesa support a wide variety of plants of the foothills to the west and the plains to the east. Lakes and springs on top have a variety of wetland species. Lava flows support interesting lichen communities, and a nice needle-and-thread grassland occurs at one place. If you've taken Jan Wingate's or Loraine Yeatts' Basic Plant Identification classes, this will be a great refresher and you might learn a few new species. Bird watching and other wildlife watching will also be tolerated!

North Table Mountain is a threatened island surrounded by development. Will it also be converted to subdivisions or rock quarries, or can it be protected as open space? Join us for a close look at a place you've always wondered about and the problems that face it.

Meet at 8:30 AM in the parking lot of Table Mountain Ranch east of Highway 93 on the south side of 58th Avenue (between 93 and Easley Road). 58th Ave. is about 2.5 miles north of Golden. Bring lunch, water, etc. To register, contact Sally White at 697-5439. Trip is limited to 20 people.

CAP ROCK PRESERVE

Leader Terri Schulz
Saturday, May 21, 1994

Join Terri Schulz, Stewardship Ecologist for The Nature Conservancy, for a strenuous hike to the Cap Rock Preserve northwest of Fort Collins. We will be scrambling over rocks on part of the short but rigorous hike to the preserve.

This preserve contains very high quality foothills shrubland and grassland communities. The rare Larimer aletes (*Aletes humilis*) is also found on the preserve (unlikely to be in bloom this late). The pristine vegetation on the preserve occurs among convoluted granite outcrops. The difficult access to this site has excluded cattle grazing but the site continues to be used by wildlife (black bear, deer, elk, etc.) This small preserve is a fine example of what the presettlement foothills vegetation was probably like in the area.

Bring lunch, water, and sturdy hiking boots. This site is about 75 minutes drive from Fort Collins — not many miles but slow roads. Contact Terri Schulz in Ft. Collins at 303-223-8879 to register and for directions to meeting place. Limit 15 people.

RATTLESNAKE CANYON AND SEWEMUP MESA, WESTERN COLORADO

Leader: Dr. Walt Kelley
Saturday and Sunday, May 28 & 29, 1994

On Saturday we will visit the Rattlesnake Canyon area to see the beautiful arches and flora of this region adjacent to Colorado National Monument. The spring flora should be great at this time. We can search for *Cryptantha aperta*, the missing *Cryptantha* unseen since Alice Eastwood collected it in Grand Junction on 27 May 1892. The hike to Rattlesnake Canyon is about 6 miles round trip, hiking up to the arches from the Colorado River. The hike to inaccessible Rattlesnake Canyon is made much shorter thanks to access across private property provided by local landowners Bob Sherrill and Judy Ronzio.

On Sunday we will head down to Gateway for a hike to the top of Sewemup Mesa. This is a beautiful, isolated, and untouched area of western Colorado. The top provides a view of Lone Cone Peak in the San Juans, the Uncompahgre Plateau, and the La Sal Mountains near Moab. We will explore interesting slickrock formations and their associated flora. We should find *Quercus turbinella*, perhaps hybridizing with *Q. gambelii*. This hike will also be about 6 miles round trip.

Possibly joining us for one or both of these trips will be Robert Sherrill and Steve Werman. Mr. Sherrill is a geologist who will provide us with historical and geologic information about these areas. Dr. Werman is a herpetologist who will point out some of his favorite creatures that we often see running about or hiding under our plants.

If time permits on our way back to Grand Junction, we may stop at the Unaweep Seep. We will probably be too early to see much in flower at this site.

Both trips can be accomplished with normal transportation and will involve moderate hiking. Bring lots to drink, lunch, sunscreen, and insect repellant. We should (?) be early enough to escape the gnats but come prepared. More details about times and meeting places will be provided to registrants.

Trip limit: 20 adults.
To register contact: Dr. Walter A. Kelley, Biology Department, Mesa State College, Grand Junction, CO 81501, (303) 248-1650 or (303) 245-6130 **OR** Rick Brune, (303) 238-5078.

FIELD TRIPS - 1994

SANDHILLS FLORA OF THE COLORADO HIGH PLAINS

Leaders: Bruce Bosley and Don Hazlett
Saturday and Sunday, June 4 & 5, 1994

Join us in exploring the sandhills ecosystem between Wray and Holyoke. Sandy soils, an 18" average precipitation, and the fact that the taxa from this region have been poorly collected are all reasons to attend this trip. Eminent Great Plains botanist Don Hazlett will provide his technical expertise.

Very little of the sandhills region of eastern Colorado is open to public access. This is an excellent opportunity to see plant communities and plants not often included in field trips.

The field trip will be limited to 35 people and no more than 10 vehicles on the tour. Ample water plus sun, rain, and wind protection are advised.

For registration and information on camping, lodging, or other needs, contact Bruce Bosley at 303-867-2493 (days) or 303-842-

Ranunculus odoneus
Artist: Kris Meiring

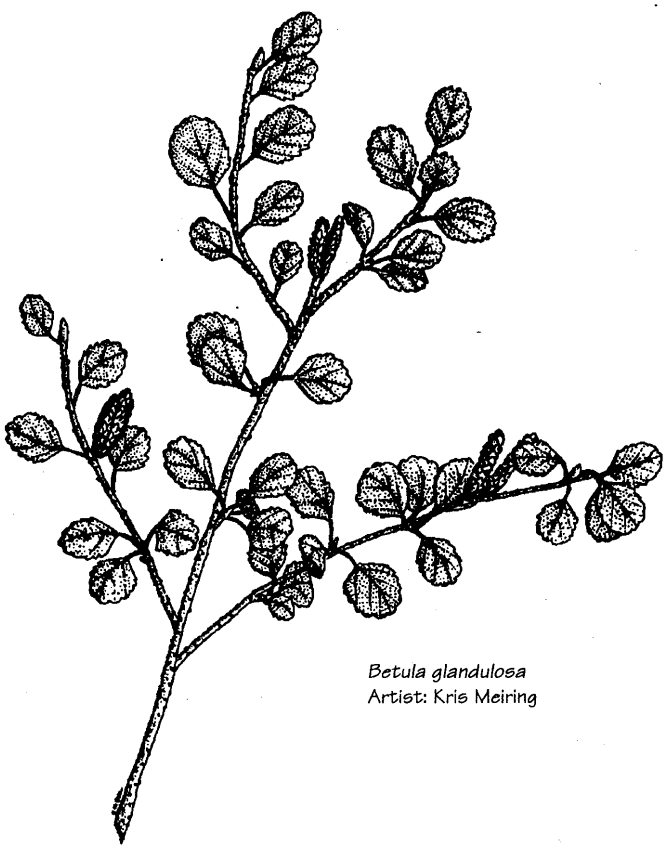
HABITAT IMPROVEMENT AND PRAIRIE RESTORATION AT ROCKY MOUNTAIN ARSENAL

Leader: Carl Mackey
Sunday, June 12, 1994, 8 AM to Noon

Habitat improvement projects with the goal of restoring short grass, tall grass, mixed grass, and sandhills prairie have been ongoing at Rocky Mountain Arsenal since 1989. A range of sites from newly seeded areas to locations in their sixth season of development will be toured. The grassland restoration process as it has evolved for the Arsenal will be explained and discussed.

Editors note: The CONPS 1994 Annual Meeting will be about revegetation, thus this should be a particularly interesting field trip.

To register and for directions, contact Sherry James at the U.S. Fish and Wildlife Service at 289-0132.



Betula glandulosa
Artist: Kris Meiring

BLUE RIVER QUAKING FENS

Leaders: Jonathan Friedman and Mike Scott
Saturday, July 9, 1994, 9:00 a.m.

Jonathan Friedman and Mike Scott of the National Biological Survey will lead a field trip to a rich fen along the Blue River north of Green Mountain Reservoir. Mike and Jonathan discovered this quaking peatland two years ago while driving along Colorado 9. This is one of the lowest-elevation rich fens in Colorado (7700 feet), and the first wetland of its type discovered in this area. The site has never been thoroughly botanized and its affinity with the more extensive peatlands in South Park is unclear.

The purpose of this trip is to gather data on hydrology and vegetation of the site and to determine whether some form of protection is warranted. Get in on the ground floor of documenting this potentially important find!

Meet at 9:00 a.m. in Dillon for a one-day trip with the option of staying a second day to explore other botanical opportunities in the area. For more information and registration, contact Jonathan Friedman in Ft. Collins at 303-226-9318. 20-person limit.

FIELD TRIPS - 1994

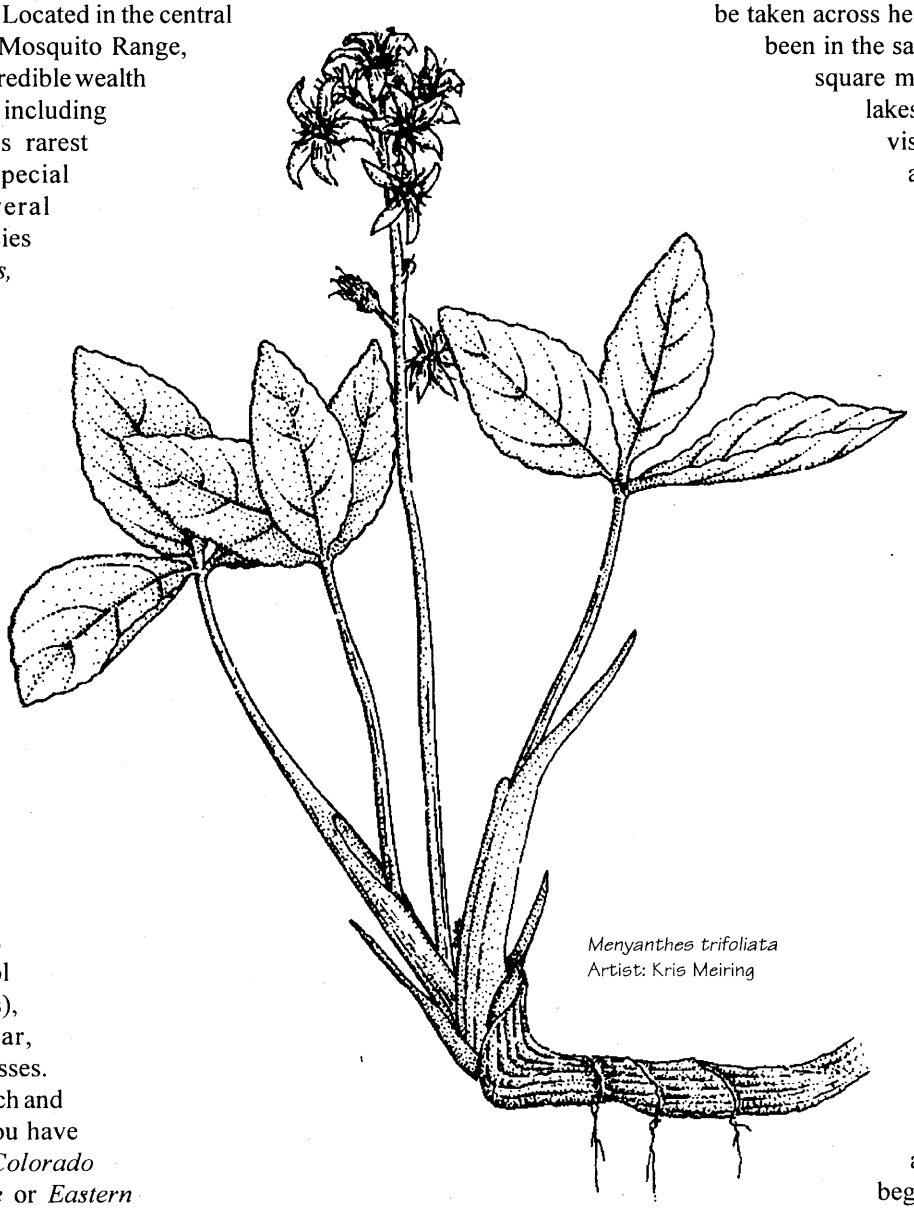
HOOSIER RIDGE

Leader: Robin Bingham
Sunday, July 17, 1994, 8:30 a.m.

Hoosier Ridge, known for its spectacular displays of alpine wildflowers and diversity of rare plants, will be the focus of this field trip. Located in the central region of Colorado's Mosquito Range, the ridge harbors an incredible wealth of botanical diversity, including several of Colorado's rarest alpine plants. Of special interest are several Pleistocene relict species including *Braya humilis, Braya glabella, Saussurea weberi, Draba borealis, Armeria scabra* ssp. *siberica, Eutrema edwardsii*, and *Ranunculus gelidus.*

We will meet at the Hoosier Pass parking area at 8:30 a.m. on Sunday, July 17. Hoosier Pass is on Colorado Hwy. 9 approximately 10 miles south of Breckenridge. **Be prepared for alpine conditions!** (Hoosier Pass is at 11,539 ft.) Bring lots of warm clothes (wool sweaters, hat, gloves), rain gear, wind gear, sunscreen and sunglasses. Please also bring a lunch and plenty of water. If you have copies of Weber's *Colorado Flora: Western Slope* or *Eastern Slope*, and *Rocky Mountain Flora,* tuck those in your day pack also.

To register, call Jeff Dawson at 722-6758 (h) or 740-2783 (W).



Menyanthes trifoliata
Artist: Kris Meiring

LILIES, LAKES, AND LORE

Los Lagos Ranch, Rollinsville
Leader Betsy Baldwin
Saturday, July 23, 1994, 9:00 a.m.

This will be an all-day trip led by Betsy Baldwin, a wholesale native plant grower in the Denver Metro area. The tour will be taken across her family's ranch (which has been in the same family for 100 years), a square mile of forest, meadows and lakes. You can count on beautiful vistas, a bit of history, and an abundance of wildflowers, with the highlight to be the viewing of a nice-sized colony of the wood lily, *Lilium philadelphicum*. You will visit an area hit by fire in 1910, a mountain fen, and will walk along what is now called the Flower Trail — a placer mine over a hundred years ago.

Those of you who sign up will be provided with a map to the meeting place which is approximately forty-five minutes to one hour west of Denver. The tour will meet at the south gate of the property at 9:00 a.m., Saturday, July 23. The entire walk will be approximately 3 miles. Please bring a sack lunch. There will be a bathroom and water available at the beginning and at lunch. Some of the walk may be a bit soggy on the feet. As the elevation is 8600 feet, there is a possibility of rain and cooler weather, so dress accordingly. Cameras, binoculars, I.D. books and lots of laughs are suggested.

To register, call Jeff Dawson at 722-6758 (h) or 740-2783 (W).

CONPS Field Trip Policy

The Society wishes to remind field trip participants of the guidelines for participation in Society trips. By joining a CONPS field trip you indicate acceptance of these policies.

Penstemon scariosus var. cyanomontanus
Artist: Melinda Smith

1. Plant collecting is forbidden on CONPS field trips, with two execptions:

(1) Collecing is permissible for scientific study (with the appropriate collecting permit, if one is required for the area in question).

"Scientific study" means, for the purposes of this policy, study by a trained botanical scientist with an expectation that the study results will lead to published information; collected specimens will be deposited in a recognized, publicly-accessible herbarium.

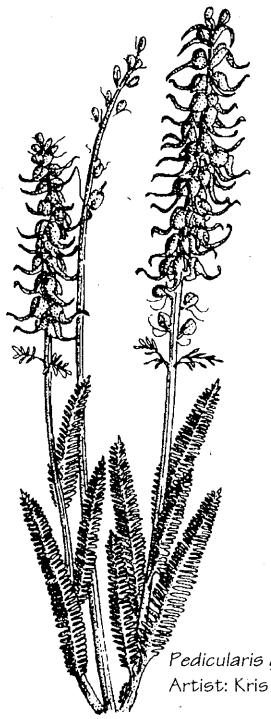
(2) A trip leader or other person whose responsibility is to instruct trip participants may collect plants for immediate demonstration, explanation, or keying for full identification.

Such collecting should be done inconspicuously (so that persons not with the trip group are not offended or motivated to do likewise), and with reasoned regard for any possible effect on the plant population. However, collecting of rare, threatened, endangered or sensitive species should never be done for instructional purposes.

2. Rides and Cost-Sharing Policy: Car-pooling and ride-sharing are encouraged on CONPS trips. All drivers who provide rides to others will graciously accept payment from passengers according to the following scale:

- 1 passenger (in addition to driver) 5 cents per mile
- 2 passengers 4 cents per mile
- 3 passengers 3 cents per mile
- 4 passengers 2 cents per mile

Passengers should pay the driver at the conclusion of the trip, without being asked.



Pedicularis groenlandica
Artist: Kris Meiring

3. No pets are permitted on CONPS field trips.

Pets trample plants, disturb wildlife, and annoy other trip participants. If pets must be brought along (although this is strongly discouraged), they must remain in or restrained to the owner's vehicle (i.e. walking about on a leash is NOT acceptable).

4. Field trips are designed primarily for adults, unless the trip description specifically states otherwise.

Parents should consider the appropriateness of a given trip to a child. If a child is brought, the parent assumes full responsibilty for keeping the child under strict control to prevent his/her damaging or disturbing the flora or fauna, or becoming a burden to the group. No child unaccompanied by a parent is permitted.

5. CONPS's expressed purpose is to promote appreciation and preservation of our flora. Use it lightly.

Take care not to damage the very features you have come to see and enjoy. Take photographs, make sketches, or use other means of recording the plants you see, but do not pick plants or plant parts.

Field trip participants must sign a waiver of liability.

Field Trip Lists Now Available!

For the past ten years the CONPS has requested that each field trip leader return to the Society a list of plants observed on his or her field trip. The intention was to create a valuable resource which would be available to guide future trip leaders and participants in these or similar areas. A Field Studies Committee, headed by Mary Edwards, accepted the responsibility of organizing and maintaining a file of information pertaining to all field trips. This has been accomplished at least partially by Loraine Yeatts, who has created a database of field trip plant records which she plans to update as information from future (or former!) trips is received. In addition to the plant lists, this file is intended to include any handouts given to participants, trip descriptions and locations, and a wish list of special plants or features to be observed.

Twenty nine plant lists have been returned thus far and are ready for distribution to interested CONPS members for the cost of production and mailing. It should be emphasized that the lists are based primarily on field observations and are not generally documented by specimen collection. Lists are available in two forms and either or both may be ordered for any trip:

1. Genus list with plants organized alphabetically by genus and species.
2. Family list with plants organized alphabetically by family, genus, and species.

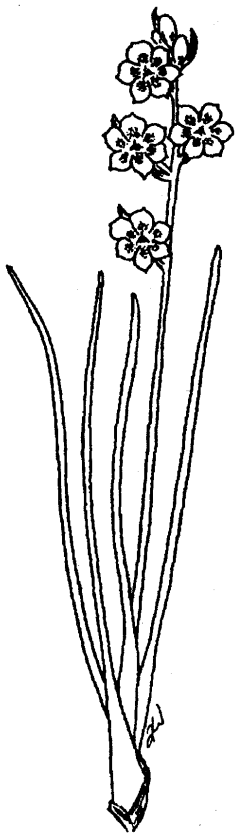
Nomenclature is according to Weber and Wittman, *Catalog of the Colorado Flora,* with commonly used synonyms and common names included. Any information in the database (such as author references, common names, etc.) can be included or excluded, by special arrangement. Also, lists from repeat trips to the same region can be combined.

Procedure for Ordering

For each field trip list desired indicate:

1. trip name
2. trip date
3. list format preferred, by family or by genus or one of each
4. total number of pages for all lists requested.

Calculate charges based on the rate of $.20 per page with a minimum of $.50 if ordering fewer than three pages. Enclose a check made payable to Loraine Yeatts for the total amount of your written order and mail both to her at 1395 Nile Street, Golden, CO 80401. Lists will be mailed unfolded so they may be easily copied. Like antiques, any outstanding field trip lists or trip information will be regarded as valuable and appreciated by the Field Studies Committee, so if you are a former trip leader with a list lurking in some hidden recess, please rescue it to share with fellow CONPS members.



Zygadenus elegans
Artist: Janet Wingate

Field trip Lists

Trip Name	Date	Leader(s)	# Pages Fam.	Gen.
Aiken Canyon	6/6/1992		5	4
Billy Pardee Ranch	6/6/1990	Rick Rhoades SCS	1	1
Butler Ranch	6/6/1990	Rick Rhoades SCS	3	2
Cedar Mesa & vicinity	5/15/1991	Rick Brune, Loraine Yeatts	5	4
Conejos River Basin	6/20/1992	Patsy Douglas	5	4
Devil's Head	8/5/1989	Judy Von Ahlefeldt	1	1
Dinosaur National Monument	5/1/1993	Lynn Riedel	4	3
East Carrizo Creek	5/21/1989	Rick Brune, Meg Van Ness	1	1
East Cottonwood Creek	5/21/1989	Rick Brune, Meg Van Ness	1	1
Florrisant Fossil Beds	6/27/87	Mary Edwards	4	3
Fort Carson: The Hogback	5/20/1989	Rick Brune, Meg Van Ness	2	1
High Creek Fen			2	2
Horseshoe Cirque	7/12/1992	Barbara Siems	4	3
I-25 Rest Area near Pueblo	5/19/1989	Rick Brune, Meg Van Ness	2	1
Kim Area	5/21/1989	Rick Brune, Meg Van Ness	1	1
Mesa de Maya	8/22/1987	Ivo Lindauer	5	4
Middle Park	6/18/1989		2	1
Moffat County	5/28/1987	Steve O'Kane	3	3
Mt. Evans	8/29/1993	Betty Willard	3	2
Pawnee National Grassland	5/29/1987	Rick Brune	4	3
Pawnee National Grassland	6/5/1993	Jim Borland, Rick Brune	6	5
Perly Canyon	5/20/1989	Rick Brune, Meg Van Ness	2	2
Phantom Canyon	6/10/1989	Alan Carpenter	4	3
Piñon Canyon	5/25/83	Tom Eamons	1	1
Poudre Canyon - Laramie River	6/30/1990		4	3
Pueblo West	7/8/1988		3	2
Rampart Range	6/28/1987	Dave Powell, Neal Osbourne	3	2
Rampart Range	6/25/1988	Frank Hawksworth	3	2
Taylor Arroyo	5/20/1989	Rick Brune, Meg Van Ness	2	2

Colorado's Forest Flora Needs Your Help

Every decade the U.S. Forest Service revises its major planning and policy document, the Forest Plan. Changes in forest planning policy reflect public demand for national forest management, advances in ecological understanding, increased knowledge of forest resources, and changes in priorities for allowable uses of public lands.

In general, Colorado's National Forests are moving from extractive industries such as mining, logging, road-building, and grazing to management favoring recreation and "ecosystem management." While this policy shift may seem unquestionably beneficial to native plants and wildlife, we must not blindly accept recreational use as a panacea to our forests' ills.

Recreational impacts to native ecosystems are neither fully documented nor completely understood, although one thing is clear. Increased trails, campgrounds, and ski areas, coupled with rising visitor use levels, contribute to forest degradation in the form of habitat fragmentation, exotic species invasion, trampling, compaction, and wildlife disruption. Recreation in Colorado is as industrial as mining; and while the extracted resource may simply be a peaceful state of mind, the ecological price we pay for networked multiple use trail systems may be as significant as the price paid for a timber sale.

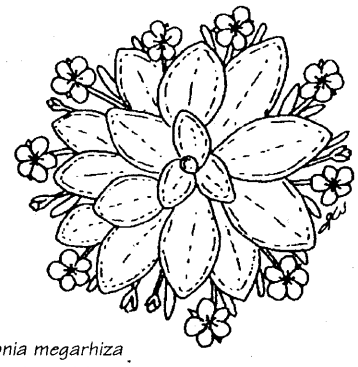
Now is the time to speak on behalf of the native flora as forest planners revise these plans. Imminent issues include, but are not limited to, reclaiming old roads with native species, keeping trails out of riparian areas, conducting thorough inventories and monitoring programs for rare plants and native plant communities, and practicing sound **integrated** weed management.

In Below is a schedule of the planning process for Colorado's forests. Public participation occurs and is encouraged throughout all phases until the Final Environmental Impact Statement is published. Contact your forest supervisor or district ranger and ask how you can help the process. Share your concerns about Colorado's native flora. You can obtain the forest supervisor's name and phone number by calling the Rocky Mountain Region in Denver at 275-5162.

Forest Plan Revision Schedule:

FOREST	WORK PLAN	PHASE I	PHASE II (DEIS)	PHASE III (FEIS)
Arapahoe/ Roosevelt	*10/90	*3/91-6/93	2/95	11/95
Rio Grande	*9/91	4/93-11/93	10/94	10/95
Routt	*12/91	*6/92-6/93	2/94	11/94
White River	6/94	12/94-1/96	7/96	6/97
Pike-San Isabel	6/95	2/96-6/97	1/98	12/98
Grand Mesa/ Uncompaghre/ Gunnison	10/94	6/95-6/96	1/97	12/97
San Juan	10/94	6/95-3/96	12/96	9/97

* completed phase
WORK PLAN: preliminary planning, inventory and data collection
PHASE 1: identify purpose & need, inventory and data collection
PHASE 2: formulation/evaluation of alternatives, Draft Environmental Impact Statement
PHASE 3: plan approval, Final Environmental Impact Statement.



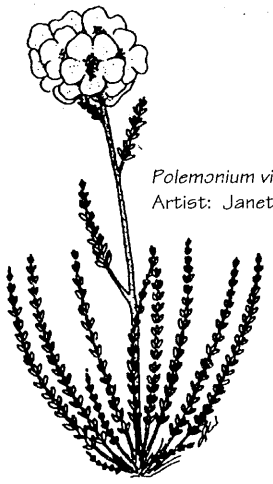
Claytonia megarhiza
Artist: Janet Wingate

Dr. June Latting

CONPS was saddened to learn of the death of Dr. June Latting of Riverside, California. Although she never lived in Colorado, June joined CONPS as a Life Member, and always followed the activities of the Society with interest.

June was an effective and tireless activist on behalf of conservation of the California Desert. She was for many years actively involved with the California Native Plant Society (CNPS), serving in many capacities including President of a large chapter and on the statewide Board of Directors. CNPS recognized and honored her conservation work by naming her a Fellow, CNPS's highest award.

Several CONPS members who formerly lived in California knew June Latting personally, and many others of us knew of her remarkable conservation efforts on behalf of native plants and the fragile desert ecosystem. We extend our heartfelt sympathy to her husband, H.B. Latting, and family.



Polemonium viscosum
Artist: Janet Wingate

HORTICULTURAL NOTES

A Perfect Match:

Selecting The Right Plant Means Taking Clues From Its Native Environment

Jim Borland

(*Editor's note*: A longer version of this article originally appeared in *American Nurseryman* Vol. 78 (12). Although intended to guide landscape and nursery professionals in the process of native plant selection and propagation, the article provides valuable insight for home gardeners as they evaluate native plants for use in their landscapes.)

Spring is the time when many of us dream up additions to our gardens and landscapes. Nurseries experiment with numerous varieties and species, trying to find something new and exciting for the perennial gardener. Unfortunately, most of these species are not native to our region, and if they are, are not given proper greenhouse conditions to ensure their survival and vigor. Consequently, native plants that could be commercially available often end up in the nursery compost heap, dying a death of poor understanding about growth requirements.

The current increase in the use of native plants is a step in the right direction, in part because native plants decrease long-term growing and maintenance problems. This movement deserves to be applauded by those who encourage a lighter touch when it comes to manipulating our environment. However, there is still ample evidence to indicate that even native-plant users have not completely grasped the entire concept. We are still guilty of using plants from a variety of habitats, and throwing them all into a single landscape while we stand back to see what happens. There must be a better way. And there is.

This approach includes more than a simple evaluation of personal preferences, such as height, width, and flower color. It also includes a complete evaluation of all known ecological characteristics.

In the West, a great deal of land is held by the government, and a significant portion of the economy is based on some aspect of native-plant biology. Westerners have access to a vast storehouse of plant-environment information, available from literature and government agencies.

If you take the time to look, you can find precise and extremely useful information on what native Western plants require to flourish. Although much of the native-plant data has generally been aimed at ranchers, farmers, foresters, and reclaimers of mines, most of it can be interpreted for horticultural benefit.

A lot of information I've gathered has come from the U.S. Forest Service, the Society for Range Management, and the U.S. Fish and Wildlife Service. For native plant information in areas without much federally held land, contact state and county forest, park, farm, soil-conservation and mineland reclamation offices. Libraries, university cooperative extension services, public gardens and arboretums may also be good sources.

Some of the available information on native plants, and its implication for horticulture, follows:

Plant Response to Grazing: Many of our native plants are browsed by animals at various times of the year. Details on how a plant species responds to browsing can predict the plant's response to pruning or shearing. Many herbaceous perennials are classified as either "increasers" or "decreasers" under heavy grazing. This information could be valuable, for example, to wildflower growers who intend to mow plants during the growing season.

Response to fire: How a species responds to fire temperatures at various stages of growth can indicate how it will react to light or rejuvenation pruning in the landscape.

Response to cutting: In an effort to rid areas of "weed" species, certain plants have been cut to the ground. How a species reacts to being cut to the ground is another indication of how it may respond to pruning in the landscape.

Response to chaining: One draconian method of clearing land of its woody vegetation is to drag a heavy ship's anchor chain between two high-powered earth movers. Plants that survive this are practically bombproof.

Root characteristics: Information of the depth, extent and type of roots has been gathered for many species. Root characteristics can be an excellent indication of how a species will perform during drought conditions. For example, deep, extensive or fibrous roots usually translate into high drought tolerance.

Method of reproduction: Information on how species reproduce can indicate a plant's potential problems or benefits in the landscape, depending on its intended use. Knowing whether a plant reproduces from seed, or by natural layering, suckering or other forms of root sprouting, can also be helpful to propagators.

Tolerance to soil elements and pH: Often, data on a plant's precise tolerance to individual or multiple elements such as sodium and selenium are available. Keep in mind, though, that tolerances are not absolute requirements for successful growth. Although a species may be found naturally inhabiting soils toxic to other plants, it rarely requires these soils. It could be that the species successfully competes with other plants in poor soils. In "better" soils, it may be an unsuccessful competitor. Tolerance to soil pH is important as well. While many species native to acidic soils do not perform well in more alkaline soils, the reverse is probably not as true.

Tolerance to soil types: Many species are found growing only in particular soil textures, such as rocky, gravelly, sandy, loamy or

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HORTICULTURAL NOTES

***Match,** continued from page 12*

clayey soils. While information on the plant's native soil type can be used to make a superior fit to the landscape, it does not always mean that a plant will not grow in another soil type. For example, plants showing a preference for clay soils will probably also grow well in sandy soils, though they will require extra attention to soil-water status.

On the other hand, plants found growing only in highly aerated rocky, gravelly or sandy soils often will not perform well in soils with lower aeration, especially when artificially irrigated. Natives found in soils incapable of holding much water are usually good candidates for droughty landscape situations.

Growth in varying soil depths: Species found only in deep topsoil may be expected to perform poorly when planted in shallow soil.

Moisture regimes: Also related to soil-texture data is information regarding not only soil-moisture content but seasonal soil changes in the native habitat. For example, some plants live in soils that are flooded during the latter portions of winter or early spring, but become dry to droughty as the growing season progresses. Expect plants native to such areas to experience problems when planted in soils with different moisture regimes.

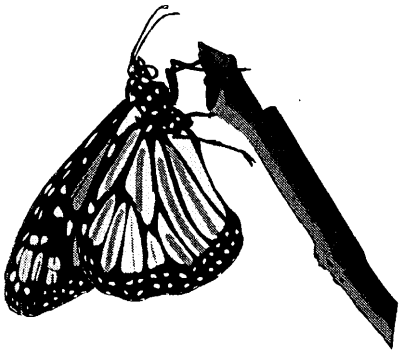
Snowfall: Climate maps depicting depth of snowfall can help you determine how a species would react without continuous snow cover in winter. Some high-elevation species will develop leaf burn if not protected from the bright winter sun of low elevations.

Disturbed-site indicators: Plants found growing in disturbed soil are not usually good competitors in more established plant communities. This is especially true of wildflower mixes that don't reseed well unless the ground beneath them is disturbed periodically. These species may not persist in a mixed grass and wildflower planting. If this characteristic were known about foreign plants, it would be a good indicator of the plant's ability to spread and become invasive.

Flowering time: Beginning and ending dates of flowering are useful, especially when correlated with data on a plant's native climate, elevation and range.

Nitrogen-fixing ability: Species with this capability have little or no need for supplemental nitrogen. In fact, these plants may suffer if given extra nitrogen.

Edible or poisonous: Information is available on the edibility or toxicity of most of our Western natives, and should be considered when planting areas frequented by small children, pets or livestock.



Livestock and wildlife value: A large number of Western natives are valuable as food or shelter for wildlife. This information will help those wishing to attract, or repel, wildlife to their landscapes.

Part of the challenge in growing natives, aside from knowing the plants' ecological characteristics, is being able to adapt growing procedures to suit their needs. It does not follow that, just because a species proves a bit more difficult to propagate and grow, it will not make a good landscape plant.

If you use data from just one of the above categories, you will find occasional solutions to specific plant problems. But if you combine all the available information and view it as a complete picture of what a certain species prefers, you create a powerful tool that allows you to more perfectly match a species to a site.

Golden currant (*Ribes aureum*)

Jim Borland

Although the scientific community seems perplexed about whether to assign all *Ribes* to the *Saxifraga* or to the gooseberry family, the horticultural community continues to use them for both aesthetic value and food.

Ribes aureum has many common names, all of which describe some favorable features of the species. These include golden currant, buffalo currant, Missouri currant, flowering currant, fragrant currant and slender golden currant, as well as clove bush.

Native to a large portion of the western U.S., golden currant can be found growing with many other native shrubs and trees from the Plains into the Rocky Mountains (zone 2). Although this shrub is more common to creek and riverside habitats, it has proved adaptable to drier sites and poorer soils.

Generally, golden currant's native soil is coarse to medium in texture, shallow or deep, well-drained and fertile with a pH of 6.5 to 7.0. Nursery container soils and garden soils that are either more acidic or alkaline generally result in excellent growth as well.

In May, golden currant produces many racemes of 3/4-1 inch long golden yellow, tubular flowers that are usually tipped with red and emit a wonderful clove or spicy odor. These flowers are coupled with bright green, 2 inch wide leaves attractively displayed on a 3 to 9 foot tall upright, branching, spineless shrub. The leaves' shape resembles that of gooseberry leaves.

Golden currant's fruits are unusually large for a wild currant (up to 1/2 inch in diameter) and are either red, yellow or black. These edible berries are excellent for people and animals.

While this shrub tolerates some shade, its growth is more compact and it produces

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***Ribes**, continued from page 13*

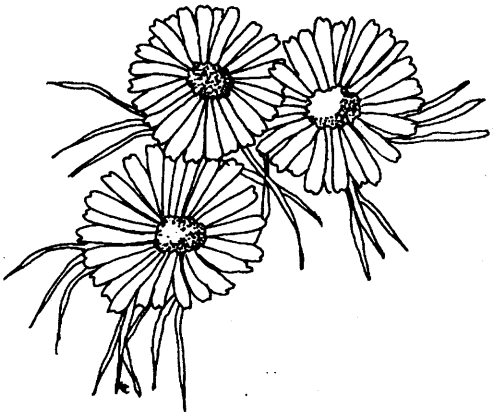
more flowers in full sun. Furthermore, its foliage turns to burnished yellows, reds and oranges in sunny locations in fall.

Golden currant propagates itself through underground root suckers, which indicates that additional plants can be propagated by division or by planting root pieces. Softwood and hardwood cuttings taken nearly any time of the year will also root through mist propagation or in outdoor beds.

In the nursery, this plant can be propagated by exposing the seeds to moist, cold (41 degrees F.) conditions for 60 to 90 days and then germinating them at 70 degrees F. A germination rate of 60 to 90 % can be expected from sound seed. Golden currant grows rapidly both in the nursery and landscape.

Due to its affinity to moist habitats, it is difficult to assign a definitive moisture requirement for this species. However, 15 to 20 inches of annual precipitation should ensure good growth. In full sun, additional moisture usually results in a larger, faster-growing shrub that does not become unruly or top-heavy. If pruning becomes necessary, periodically remove the canes entirely to the plant's base.

Although I have noted aphid infestations (among other gooseberry maladies) on golden currant, serious consequences are uncommon in the wild.

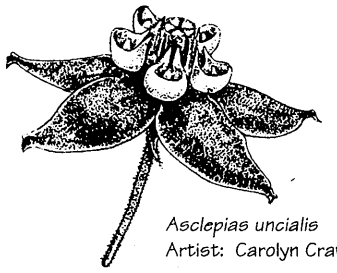


Townsendia hookeri
Artist: Ann Cooper

SPRING WORKSHOPS

Botanical Sketching in the Field
April 23 & 24 at 9:00 a.m.
Chatauqua Park, Boulder

Join well-known botanical illustrator Carolyn Crawford to learn the basics of botanical drawing in the field. Plan to meet at the Ranger Cottage at Chautauqua Park. Please bring a sketch pad and some colored pencils.



Asclepias uncialis
Artist: Carolyn Crawford

Forensic Botany
May 7 at 9:00 a.m.
Arapahoe Community College

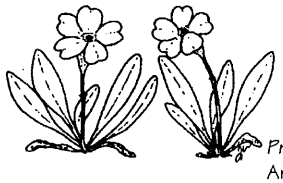
This will be your chance to solve a botanical mystery! Plant to meet Vicky Trammel for a morning session that will prepare you for an afternoon of crime solving. You will be given an "evidence bag," and with a binocular microscope and your plant knowledge, you will learn how to look for clues in the field. The afternoon session will take you to an outdoor location where you can put your newly acquired crime solving skills into action! There is a limit of 20 people for this workshop.

Basic Plant Identification
May 11, 1994: 10:00 a.m. to 3:00 p.m.
Red Rocks and Green Mountain

Jan Wingate is a taxonomist who teaches classes for the Native Plant Society and the Denver Botanic Gardens. This workshop will be held in the field (at Red Rocks and Green Mountain) and is for individuals who **do not** know how to use a botanical key to identify plants. Basic terminology will be covered and participants will learn how to use a simple key (*Rocky Mountain Flower Finder*) to identify plants in the field.

Please bring lunch, water, sunscreen, a hand lens, and be prepared to do some hiking. The *Rocky Mountain Flower Finder* will be available at the workshop if you do not have one.

The fee for each full-day workshop is $10 for CONPS members and $22 for non-members (see membership information on page 2). Payment is made on the day of the workshop. Checks should be made payable to CONPS. Call Susan Eubank (303-277-9458) to register for a workshop.



Primula angustifolia
Artist: Janet Wingate

WORKSHOP REGISTRATION FORM

NAME: _____

ADDRESS: _____

_____

HOME PHONE: _____ WORK PHONE: _____

Please register me for the following workshop(s):

Workshop: _____ Preferred day: _____

Workshop: _____ Preferred day: _____

Workshop: _____ Preferred day: _____

Mail to: Susan Eubank, CONPS Workshops, 710 1st Street, Golden CO 80403.

CHAPTER NEWS

Boulder Chapter

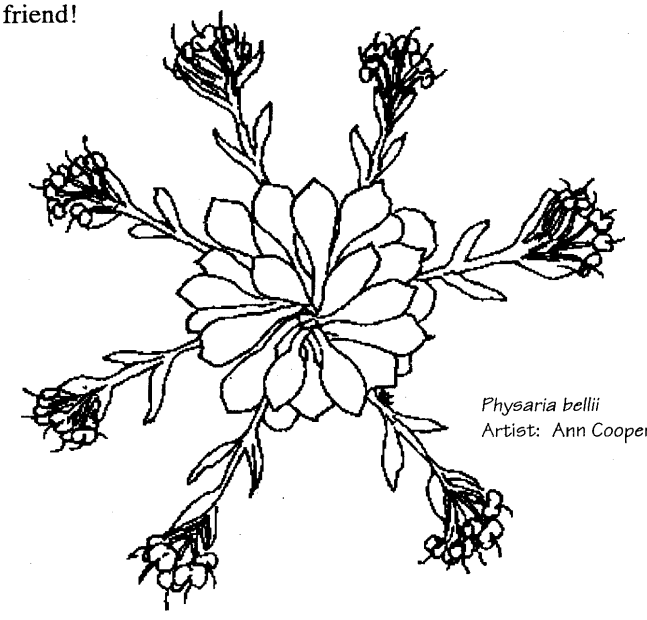
April 12: Native Plants For Sustainable Urban Landscapes

Janet Hughes, landscape coordinator and designer for the Colorado State Highway Department in the Denver metro area, will discuss her efforts to use native plants and xeriscaping along highways. Her work toward sustainable landscapes has resulted in a master plan and guidelines for landscaping in Denver, the formation of a non-profit public support group, an outreach program for at-risk youth, and many low-maintenance landscapes. Foothills Nature Center.

May 10 : Spring Walk and Open Space Update

Join Dave Kuntz, Open Space Planner, for an evening walk and update on City of Boulder Open Space planning and management activities in the Doudy Draw/ Eldorado Mountain area. Meet at 6:00 p.m. at the Doudy Draw trailhead (1.7 miles west of Hwy. 93 on Eldorado Springs Dr. on the SOUTH side of the road). Bring a sack dinner.

Monthly meetings are held from September through April on the 2nd Tuesday of the month at **7:30 p.m.** at the **Foothills Nature Center, 4201 North Broadway**, unless otherwise noted. For more information call Lynn Riedel (666-6687) or Elaine Hill (494-7873). Bring a friend!



Physaria bellii
Artist: Ann Cooper

Fort Collins Chapter

April 5: Riparian Plants of the Colorado River System

Renee Rondeau is a botanist with The Nature Conservancy. Over the past two years, Renee has been actively involved in surveying and classifying important riparian areas in Colorado. She will discuss riparian plants of the Colorado River drainage in Colorado, including some new records for the Western Slope.

May 3: *Spiranthes diluvialis* (Ute ladies' tresses orchid) in Fort Collins!

Ellen Wheeler, a local botanist, surveyed 31 sites for the City of Fort Collins. One of them contained a population of this endangered orchid, known recently in Colorado only from Boulder and Jefferson counties on the Front Range! Share her discovery and get to know the orchid's foothills wet meadow habitat.

Monthly meetings are held at **7:00 p.m.** at the **Headquarters for the Rocky Mountain Station/Arapaho-Roosevelt National Forest, 240 W. Prospect**, Large Conference Room (adjacent to the front patio). For more information call Michael Scott (226-9475 or 490-1788).

Metro-Denver Chapter

April 20: Rocky Mountain Xeriscape Plant Guide/and Denver Water's Master Plan for Sustainable Landscape By David Winger and Ken Ball

Two representatives from the Denver Water Department will describe current activities promoting Xeriscape in the Denver Metro Area. The Xeriscape Plant Guide is intended to be an important reference for commercial landscapers and designers, and homeowners. If you want to make sure it gives proper attention to native plants, attend this meeting! **Note**: this meeting has been rescheduled from April 27 to avoid conflict with the Richard Schultes lecture at the Denver Botanic Gardens.

May 27: Pot luck and presentation by Dr. Mike Grant: Natural History of Quaking Aspen

The pot luck will start at 6:00 p.m. Dr. Grant will begin at 7:30 p.m. Dr. Grant, a professor at the University of Colorado at Boulder, will discuss the ecology and natural history of aspens.

Monthly meetings are held on the 4th Wednesday of the month at **7:30 p.m.** in the **Morrison Center** at the **Denver Botanic Garden (DBG), 909 York Street**, unless otherwise noted. For more information call Jeff Dawson (722-6758).

CALENDAR OVERVIEW

1994 Workshops

Apr 23 **Field Sketching**
with Carolyn Crawford

May 7 **Forensic Botany**
with Vicky Trammell

May 11 **Basic Plant Identification**
with Janet Wingate

Chapter Meetings

Boulder Chapter

Apr 12 Native Plants For Urban Landscapes

May 10 Spring Walk and Open Space Update

Fort Collins Chapter

Apr 5 Riparian Plants of the Colorado River

May 3 *Spiranthes diluvialis* in Fort Collins!

Denver-Metro Chapter

Apr 20 Rocky Mountain Xeriscape Plant Guide/ Denver Water's Master Plan

May 27 Natural History of Quaking Aspens and Pot-luck

1994 Field Trips

May 14 **North Table Mountain**
with Sally White and Loraine Yeatts

May 21 **Cap Rock Preserve**
with Terri Schulz

May 28 & 29 **Rattlesnake Canyon & Sewemup Mesa**
with Dr. Walt Kelley

June 4 & 5 **Sandhills Flora of the High Plains**
with Bruce Bosley and Don Hazlett

June 12 **Habitat Improvement and Prairie Restoration at Rocky Mountain Arsenal**
with Carl Mackey

July 9 **Blue River Quaking Fens**
with Jonathan Friedman and Mike Scott

July 17 **Hoosier Ridge**
with Robin Bingham

July 23 **Lilies, Lakes, and Lore**
with Betsy Baldwin

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