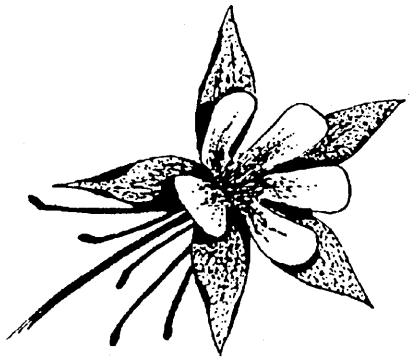
Aquilegia



Newsletter of the Colorado Native Plant Society

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

Volume 15, Number 2 **March/April 1991**

Recent Plant Discoveries at Roxborough State Park

Peter Root

Roxborough State Park in Douglas County about 25 miles southwest of Denver is located at the junction of the foothills and the plains. Although the park preserves a good assortment of plant communities, it does not have many rare species. It is chiefly known for relict populations of plants which are abundant farther east and have persisted in favorable spots at the foot of the Front Range. These include the American black currant (*Ribes americanum*), New England aster (*Virgulus novae-angliae*), and Joe Pye weed (*Eupatorium maculatum*).

Last summer a group of the park's volunteer naturalists were on a butterfly walk when Vickey Trammel found a plant that she did not recognize in a wet meadow. This was unusual because Vickey has been inventorying the plants in the park for several years. I recognized it as *Truellum (Polygonum) sagittatum* which I had encountered years before in New Jersey when I was more interested in snakes. It was easy to remember because this is a knotweed which has little saw teeth on its stems. It has been previously known in Colorado only from the Black Forest area near Colorado Springs. Perhaps it has spread recently along the Front Range, or it may have been hidden in that meadow for years.

A few weeks later, I began noticing a thistle that did not look quite right. It had bright pink flower heads, a little larger than those of the over abundant Canada thistle and I tried to identify it using a key to *Cirsium*. I was really frustrated until I realized that it was a *Carduus*, not the familiar *C. nutans*, but *C. acanthoides*. This European weed is widely distributed in North America, but has previously been found in Colorado only on the Western Slope. I think that I first saw it near the park visitor center bird feeder a couple of years before. It may have come in with birdseed or a "wildflower" seed mix planted when the visitor center was built. It would be interesting to know if it has appeared in other Front Range locations.

Discoveries like these are not really unusual. Our flora is dynamic and plants, especially weeds, are continually moving into areas which are recovering from disturbance. As we pay more attention to wetlands we will probably find more unusual plants hidden in them. If you become familiar with the plants of your area, you will recognize new arrivals or other unusual species when you find them. ♣

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Member Networking

Many of you may remember Marian Brandenburg, a long-time member from Longmont. She reports that she and her husband have sold their home and become full-time RV-ers, which provides many opportunities to get to know new plants, but limits her ability to attend Bill's workshops!

You can contact Marian through her address at: 581 Kansas St., Springfield, CO 81073-1331. Marian, you can contact the Arizona Native Plant Society at PO Box 41206 Sun Station, Tucson, AZ 85717 or drop in on a meeting of the Tucson Chapter (2nd Wed; 7:30 P.M. at Tucson Botanical Gardens).

Plant Vandalism

San Francisco's Golden Gate State Park has been subject to an unusual type of vandalism for the past 11 years. The botanically inclined perpetrator has been planting exotic *Arctotheca calendula* (South African capeweed) along an 80-km stretch of public lands from the park to Point Reyes National Seashore. This hearty groundcover is adapted to heavy foot traffic and spreads by runners. Park officials have organized a volunteer crew to undo the damage and estimate it will take thousands of hours.

Drought in California

Five years of drought in California are beginning to shake people up. Some of the implications were discussed by Suzanne Butterfield, California Department of Water Resources, in a February interview for USA Today. "There but for fortune. . ." —here as food for thought are some of her comments on the effects of drought on native flora and fauna:

"There is nothing we can do about the die-offs in the forests. We estimate that about a third of all trees in the Sierras are dead because of the drought. This could be the worst fire season in California history. . . . The impact on fisheries is very serious. There may be some species of fish that do not survive as a result of this drought. . . . More wildlife are coming down into urban areas. We may lose some. Agriculture and urban areas can weather this drought. People will lose a lot of money, will be very inconvenienced, but the environment may make the ultimate sacrifice."

Her solution: "New reservoirs."

Aquilegia

Aquilegia is published six times per year by the Colorado Native Plant Society. This newsletter is available to members of the Society, and others with an interest in native plants. Contact the Society for subscription information.

Articles from *Aquilegia* may be used by other native plant societies 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 the variety of native plants in Colorado. The Society sponsors field trips, workshops and other activities through local chapters and statewide. Contact the Society or a chapter representative or committee chair for more information.

Schedule of Membership Fees

Life	$250.00
Supporting	$ 50.00
Family or Dual	$ 12.00
Organization	$ 25.00
Individual	$ 8.00
Student or Senior	$ 4.00

Membership Renewals/Information

Please direct all membership applications, renewals and address changes to the Membership chairperson, in care of the Society's mailing address.

Please direct all other inquiries regarding the Society to the Secretary in care of the Society's mailing address.

Newsletter Contributions

Please direct all contributions to the newsletter to:

Peter Root
4915 West 31st Avenue
Denver, CO 80212

Deadlines for newsletter materials are February 15, April 15, June 15, August 15, October 15 and December 15.

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Announcements

Time to Renew

If you haven't paid your dues for 1991, this will be your last issue of *Aquilegia*. Check the date on your mailing label for the year through which your dues have been paid. If it says 1990, it's time to renew your membership.

Aquilegia is printed on

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Cloud Ridge Naturalists Seminars

Of Salt Domes and Frankenia: the Gypsum Flora

This trip to the Paradox Basin is scheduled for May 24 through 27, and will be led by Dr. William A. Weber. This immense basin formed along the western edge of the Uncompahgre Uplift about 300 million years ago. Periodic stagnation of sea water in the basin caused deposition of several thousand feet of evaporites, including layers of dolomite, gypsum, and salt. Because many plants cannot grow on gypsum soils, an interesting flora of plants tolerant of gypsum, and some that seem to require it, has developed. Many of the species encountered in the Paradox, Big Gypsum, and Little Gypsum valleys, are rare species as well as gypsum endemics, such as *Oreocarya paradoxa* and *Frankenia jamesii*.

The trip costs $325, including all transportation and lodging. To register, contact Cloud Ridge Naturalists, 8297 Overland Road, Ward, CO 80481; phone: (303) 459-3248.

Other Seminars

The Cloud Ridge schedule for 1991 includes several other seminars that may be of interest to CONPS members. Contact Audrey Benedict at the address above for more information on these and other seminars available this season.

Of Wind and Sand: Great Sand Dunes National Monument

June 7-9; led by Dr. William Bradley

Of Volcanoes and Redwoods: Florissant Fossil Beds

June 22-23; led by Dr. Emmett Evanoff and Dr. Boyce Drummond

High Color: Photographing Alpine Wildflowers

July 11-14; led by Linde Waidhofer

Life in High Places: Alpine Butterflies and Plants

July 18-21; led by Dr. Boyce Drummond and Audrey Benedict

Colorado's Old-Growth Forests: Forest Ecology Workshop

August 16-18; led by Dr. Wayne Shepperd and Dr. Richard Reynolds

Native Plant Education

Gary Finstad, Education Committee

As the new Chair of the Education Committee, I realize I still have a lot to learn about the committee's potential and about the Society in general. When committee membership is complete, we'll develop our specific goals and objectives more fully. For now, I have some preliminary thoughts to share with you.

CONPS members possess a collective knowledge and wisdom about our natural world which needs to be enthusiastically shared with the rest of our community – young and old, plant lover or not – in ways meaningful to them. This means finding new ways of communicating with more people. My principal goal is to assemble a committee which will work toward broad-based, creative approaches to educating the public about our native plant communities and their relevance to our existence.

We plan to use exhibits, slide shows, videos, speakers, and networking with the idea of getting other organizations and individuals to help us tell our story. It's essential that some common, accepted, "messages" are delivered whenever CONPS business is conducted, be it through newsletters, workshops, field trips, letter writing, or exhibits.

All of us represent the Society, and need to be aware of educational opportunities as we do. We'll also be examining ways to expand the opportunities for CONPS members to learn more. We hope to provoke discussion of traditional ways of thinking as well as new topics. Please share with us any ideas you may have for advancing the Society's educational goals. ♣

Ethics of Collecting

Recent concerns over collecting of native plants and plant parts, especially rare species, led the CONPS Board to begin developing a policy on this important issue. The issue was discussed at the January meeting of the Board, and it was agreed the Society should take a strong role in setting guidelines.

At the April meeting, Dorothy Udall presented a policy that had been drafted several years ago but never adopted. This draft is printed below for review by members. If you have suggestions to help in preparation of a final version of CONPS policy, please send them by July 1, 1991 to either Dorothy or Tamara Naumann at the addresses peovided. The Board plans to review the final draft at the September meeting and present the policy at the annual meeting in November.

Dorothy Udall
4300 West County Rd. 50
Ft. Collins, CO 80521

Tamara Naumann
940 Quinn St.
Boulder, CO 80303

Ethics of Collecting Native Plants
Statement of the Colorado Native Plant Society [DRAFT]

Increasing interest in the use of Colorado and regional native plants for horticultural and reclamation purposes raises questions about sources of both seeds and plants. Because of the present lack of commercial availability of many potentially useful species, the Colorado Native Plant Society (CONPS) supports the ethical and judicious collection of seeds and cuttings from plants in their native habitat, subject to the guidelines outlined below.

The hardiness and adaptability of many native species makes them ideal for use in the Colorado landscape, for they have evolved over long periods of time in the soils and climate of the Rocky Mountain region. We should, however, be sensitive to the particular environment in which a species is naturally found, as it will be most successfully re-established in a similar environment.

The encroachment of urban growth on native plant communities adds to the necessity of preserving native species. The Colorado Native Plant Society has developed the following guidelines for the ethical collection of native plant seeds and cuttings in order to maintain healthy natural plant communities:

1. Collect seeds or take cuttings; do not collect whole plants unless salvage recommendations have been made. (See #9 below.)

2. Collect only if you are, or are accompanied by, a trained individual who is knowledgeable about the species being collected, the proper methods of collecting, and the propagation of the plant material collected.

3. Become informed about species in Colorado and the Rocky Mountain region that are Threatened, Endangered, Sensitive, or otherwise of Special Concern. Such plants should never be collected unless special circumstances such as salvage operations pertain.

4. Keep good records of the location, habitat, and the geography of the environment in which the collection is made. Transfer this information whenever the plant materials change hands.

5. Always consider preparing a voucher specimen for deposit in a recognized, publicly accessible, herbarium in order to provide absolute identification of the plants collected. Be sure to record the data required by scientific herbaria for inclusion with the specimen.

6. Avoid propagating species that show tendencies to out-compete and possibly replace other plants.

7. For rehabilitation, revegetation, and projects that specify large plantings of "wildflowers," use plant materials derived from nearby sources of similar habitat. CONPS stresses the importance of protecting the genetic integrity of the surrounding native species and natural vegetation. The introduction of non-local genetic material may irrevocably alter the native flora.

8. Be sensitive to any area in which you collect plant materials. Do not trample areas outside of designated trails or disturb the environment by over-collecting from a single species. Use good judgment if only a few plants are available. Do not collect samples so large that they would adversely affect the plant's reproduction and survival. Never collect the only plant in a given location. The standard rule is to leave no trace of your visit, which may mean passing up a plant for seed or cuttings if it is not abundant or if the stand is not in good health.

9. When special circumstances exist in which an area is to be disturbed, so that plants will inevitably be destroyed, salvage collection of those plants (whole, but only if the plant is known to transplant) is encouraged. Collection should not be made in anticipation of possible destruction that could occur months or years in the future. The same records (see #4 above) should be made

— *continued next page*

Policy, continued

at the time of collection and should document the circumstances leading to the salvage. Do not collect plants from portions of a salvage site that will remain in a natural state.

10. Always obtain landowner's permission before collecting plants on private property and obtain any needed permits before collecting on public lands.

The Colorado native flora is one of our most valuable natural resources. We have the technology, the knowledge, and the ethical responsibility to use it wisely.

♣



Don't Eat the Bracken

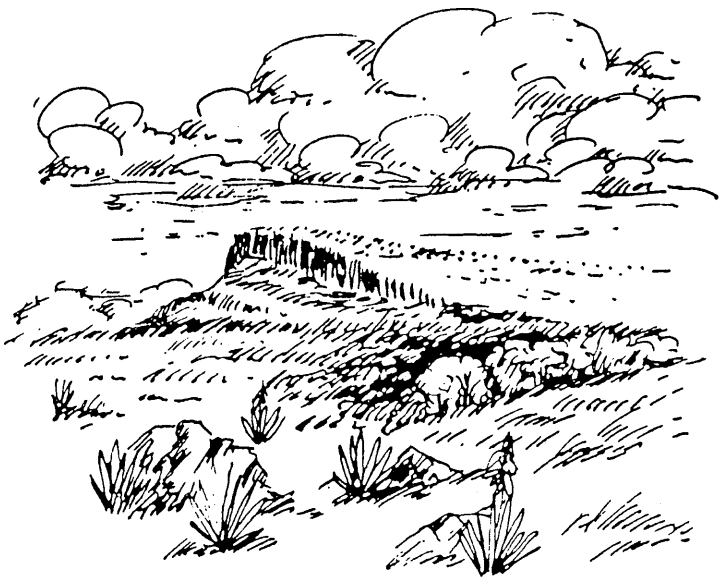
Peter Root

You can still find books on edible wild plants which include the young leaves or fiddleheads of bracken (*Pteridium aquilinum*) in their listing of edible plants. This fern is the most conspicuous one we have in Colorado and is abundant in some places in the foothills. In some countries such as the British Isles, it has invaded thousands of acres and proves to be almost impossible to eradicate. The mature leaves aren't very palatable to livestock and if they are eaten in quantity they are poisonous. In spite of this, it might seem a good idea to include the young leaves of this abundant plant in your diet.

The Japanese have long used the young leaves of bracken as food. They have even developed selected strains which have superior food qualities. Great quantities of the plant are eaten both fresh and pickled. The Japanese name for bracken is *warabi* and I wouldn't be surprised to find the pickled product being imported into the United States. Workers in the Pike National Forest have told me of seeing Koreans gathering buckets of the fiddleheads near Sedalia.

For some time it has been known that there are compounds in young bracken leaves which are carcinogenic and it has been suggested that the use of bracken for food is a factor in a high incidence of stomach cancer in Japan. I haven't spent any time in Japan, but I did spend over a year in rural Korea and I would have a hard time isolating one factor in the lifestyle there as the one cause of any health problem. Many Koreans I observed 25 years ago enjoyed the same bad habits that I enjoy. Recent British research has indicated that even the spores of bracken are carcinogenic and concern has been expressed about them contaminating water supplies. Many people now wish to avoid all possible carcinogens. If you feel that way, my advice is don't eat bracken.

There are edible fiddleheads which so far have not been accused of being more of a health hazard than any other vegetable. They are the young leaves of the ostrich fern (*Matteuccia struthiopteris*) which is found in northern North America and is cultivated in Colorado as a landscape plant. They are harvested in northern New England and Canada and are available canned or frozen in fine grocery stores. If you see them, try them, but don't experiment with other ferns as food.



Field Trips — 1991 Season

Golden Gate Canyon State Park

Saturday, June 8 Leader: Steve Austin

Golden Gate Canyon State Park consists of about 10,000 acres of forest, meadow, and riparian plant communities. It lies west of Golden and ranges in altitude from 7600 to 10400 ft (upper foothills, montane, and lower subalpine zones). The park has never had a formal inventory of its flora, and this year CONPS will begin such an inventory. This field trip will tour some of the areas where collections will be made throughout the summer to document the park's species. We will also see ruins of several old homesteads.

Some hiking will be involved, primarily to see ponds that promise many interesting species later in the season. The first hike will be less than a mile round trip and involves an elevation change of 200 ft. The second hike will be about 2.5 miles with an elevation change of 600 ft. The pace will be relatively slow, as time will be taken to identify and photograph the plants we find and the ruins we encounter.

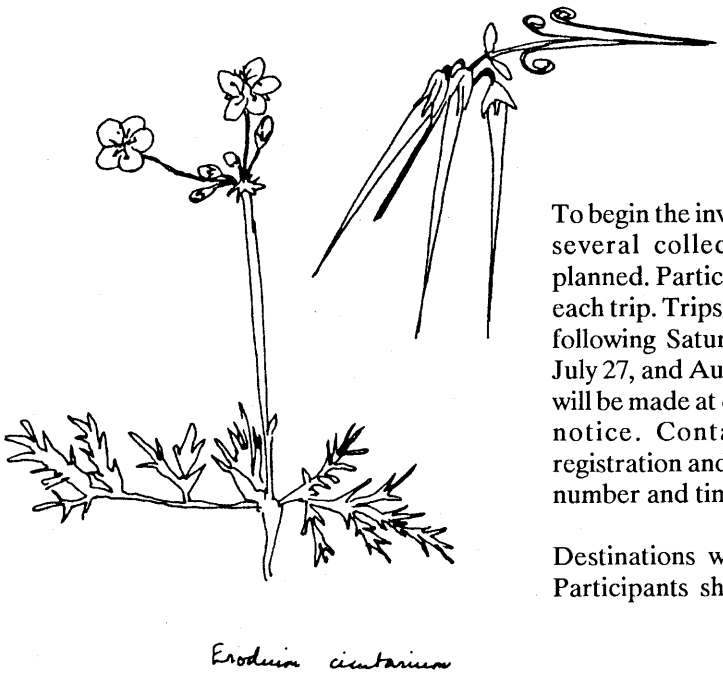
Participants will be limited to 20. Bring sturdy walking shoes, lunch, water bottle or canteen, sunscreen, rain gear, field guides, camera, and a day pack. We will probably eat lunch at the pond and homestead in Forgotten Valley.

The group will meet at the park visitor center at 9:00 A.M. To reach the visitor center, drive north from Golden (or south from Boulder) on state route #93 (take Washington from Golden) to Golden Gate Canyon road, which begins 0.5 mile north of Golden's city limits. Drive west on Golden Gate Canyon Rd. about 13 miles to the park entrance, pay the entrance fee ($3 per car), and continue about 0.25 mi to the junction. Turn right; the visitor center is about 100 yds ahead on the right.

Most roads are paved, however, we will be travelling a short distance on gravel and/or dirt roads, which can be washboard-like at times. Passenger cars should have no difficulty negotiating them.

Registration for the field trip should be made with Steve Austin at 722-8084 or Jeff Dawson at 722-6758. Steve can only be reached weekday mornings from 6 to 9:30 A.M. or evenings from 9:30 to 10.





Erodium cicutarium

Golden Gate Canyon State Park, Collection Trips

To begin the inventory described above, several collection trips have been planned. Participants are limited to five each trip. Trips are now planned for the following Saturdays: June 29, July 13, July 27, and August 10. Additional trips will be made at other times on very short notice. Contact Steve Austin for registration and instructions (see phone number and times above).

Destinations will vary with each trip. Participants should bring field equipment and supplies for a full day of field work, including appropriate collection tools (hand lens, cutting and digging tools, and a plant press if you have one).

Participants will meet at the park visitor center, location described above, at 9 A.M. The park will waive entrance fees for participants in the collection trips.

Geologic, Botanic, and Butterfly Tour of the Unaweep Canyon

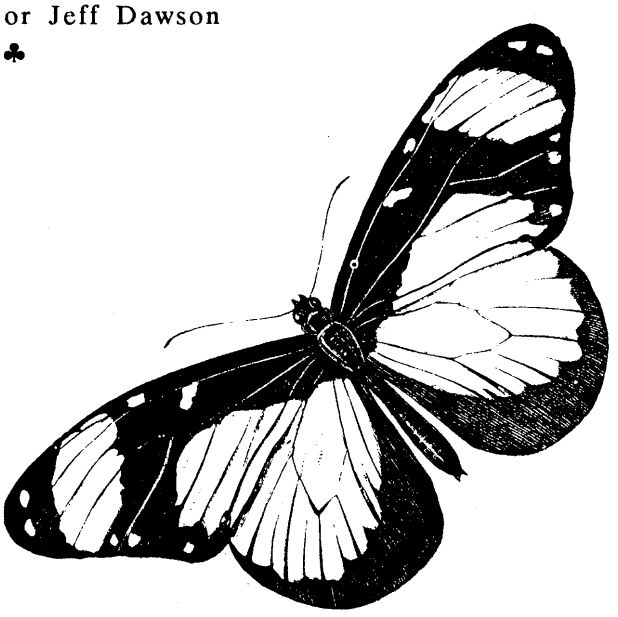
Saturday, August 10 Leader: Scott Ellis

We will traverse the Unaweep Canyon from Whitewater (vicinity of Grand Junction) to Gateway on the Dolores River in Mesa County. The granite-walled Unaweep Canyon cuts laterally across the Uncompahgre Plateau, and encompasses an intermingling of the Rocky Mountain montane floristic elements with those of the Colorado Plateau and Great Basin. The emphasis of this trip will be on the Unaweep Seep Area of Critical Environmental Concern (ACEC) east of Gateway along West Creek. The Unaweep Seep ACEC was designated to protect the Great Basin Silverspot butterfly, federally proposed for threatened status under the Endangered Species Act. This butterfly is an obligate wetland species that lives in small spring-fed meadows. Mr. Ellis will provide a field presentation on the biology and wetland habitat requirements of the Silverspot, which should be flying on this date.

We will also examine populations of some disjunct eastern tallgrass prairie and hanging garden species (*Panicum virgatum, Dichanthelium lanuginosum, Sorghastrum nutans, Eupatorium maculatum*), as well as several uncommon orchids (*Epipactis gigantea, Limnorchis ensifolia*) that inhabit this unique wetland. We will then travel toward Gateway to look at some Colorado Plateau floristic elements, such as blackbrush (*Coleogyne ramossimima*), *Cercocarpus ledifolius*, and hanging garden plants along the Dolores River, if time allows. We will return to Whitewater by late afternoon.

This trip will require walking up and down steep, muddy slopes under hot weather conditions for about 1 to 2 hours. Hiking will be completed before the hottest part of the day. Total distance walked will be less than 1 mile. Rubber boots, or sneakers that can be sacrificed, are required. Deerflies are sometimes a nuisance.

Participants will carpool from the intersection of Highway 50 and State Highway 141 at Whitewater, which is about 10 miles south of Grand Junction. Meet there at 9:00 A.M. This trip will be limited to about 20 people, or 5-6 cars because of parking and site access considerations. Motel accommodations are available in Grand Junction; camping sites are available in Colorado National Monument and on Grand Mesa. Campsites on the Uncompahgre Plateau are limited and difficult to reach; there are no accomodations in Gateway. To register, contact Scott Ellis (303/493-6069) or Jeff Dawson (303/722-6758). ♣



The Ecological Importance of Native Plants

Alison Peck

Colorado Native Plant Society members probably have as many reasons for loving native plants as there are members. I am becoming increasingly interested in the ecological importance of native plants – a topic which seems to get little attention. All native plants exist within a community of other plants, insects, animals, soil microorganisms, . . . etc. The loss or restoration of a native plant thus affects these other parts of the community as well. The conservation and planting of native plants therefore is important for the conservation and protection of **all** native flora and fauna.

I was alerted to this dimension of the use of native plants when I read about a study done in England on the insect populations of native and non-native trees. Trees indigenous to Britain had from 109 to 284 insect species living in association with them. Trees which had been introduced, even as long ago as 100 A.D., had a maximum of 15 associated species, with most having less than 10.*

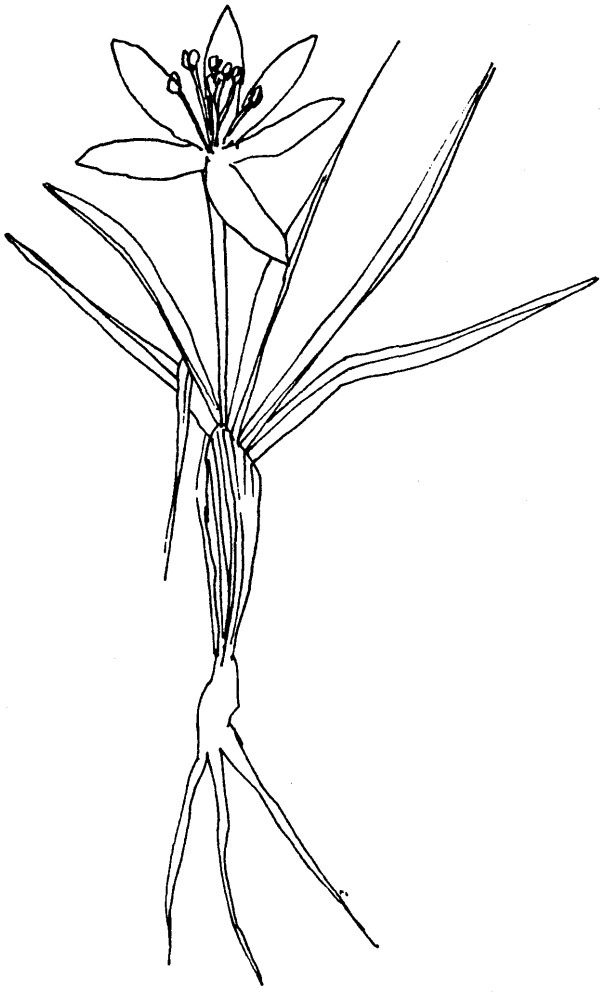
Closer to home, Fritz Knopf, a riparian biologist with the National Ecology Research Center in Fort Collins, has studied Russian olive stands in the western states. His research indicates that Russian olive is becoming the dominant riparian vegetation along many rivers in the west. Russian olives have been widely planted, and they have spread through seed dispersal by birds and small mammals. Although they do provide food for many birds and small mammals, they do not appear to provide important habitat for cavity-nesting birds or insectivores. This is probably because so few insects are found on these alien trees. The spread of Russian olives as the dominant riparian tree is believed to cause a serious loss of habitat for several species of birds which depend on a native riparian overstory. Fritz Knopf also discussed the benefits and problems of Russian olives at the April 9th meeting of the Boulder Chapter.

The vital connections between native plants and native fauna have been studied extensively and are well documented. However, most studies are of undisturbed, or at least relatively intact, ecosystems. I would like to find studies which address several questions:

- What are the detrimental effects of introduced species when they naturalize (particularly if these plants are being used or promoted for revegetation or landscaping)?
- What is the potential for providing habitat for native fauna by using native plants in revegetation and landscaping?
- Can we encourage native plants and animals and discourage alien plants and animals through the use of native plants?

These are very broad questions which can probably only be answered for particular situations, but I would enjoy further exploration of these questions if anyone is interested or knows of any relevant research. Contact me at 1545 Redwood Ave., Boulder, CO 80304; phone (303)443-0284.

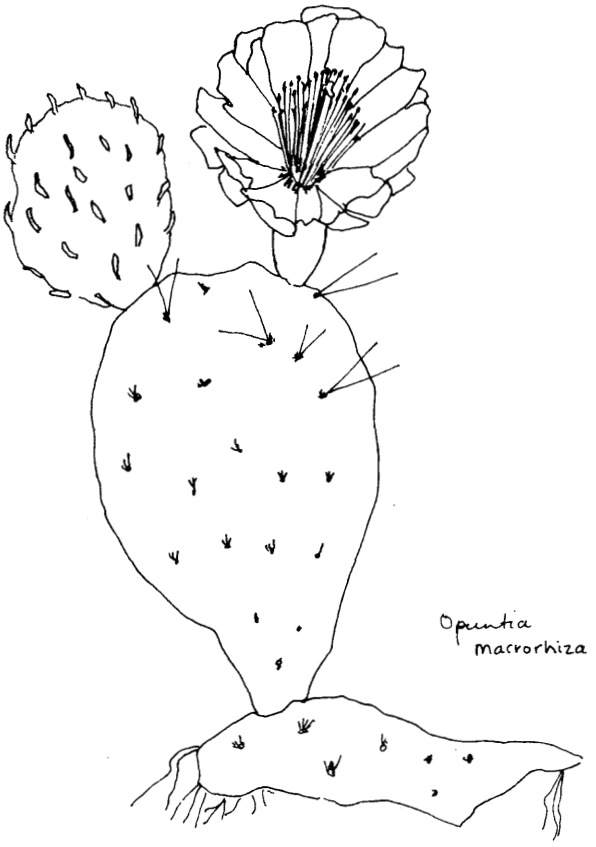
* Southwood, T.R.E. 1961. *The number of species of insect associated with various trees*. Journal of Animal Ecology 30:1- 8. ♣



A New Fern for Colorado

Peter Root

The small, pale moonwort which I mentioned in my Moonwort Update in *Aquilegia* 14:6 has been described as a new species by W.H. Wagner, Jr. in a recent article (Amer. Fern J. 80 (3) pp. 73-81). He has called it *Botrychium pallidum.* It is known to occur in Canada from southwestern Saskatchewan to Saquenay County, Quebec. In the United States it has been found around the Great Lakes and in Colorado. Probably this distribution reflects the distribution of people who look for moonworts. It should be looked for in Wyoming and other western states. Curiously, although it occurs in a variety of habitats in Canada and Michigan, the known locations for it in Colorado are all very open sites near tree line. Dr. Wagner, who has studied moonworts for nearly forty years, considers this species exceedingly rare and local. The description of this species gives the Colorado flora a total of eight described and at least two undescribed taxa in the small moonwort subgenus. ♣



Trustee Plant Protection Resolution Formalizes DBG Activity Beyond Gardens and Arboretum Sites

During its regular September 25, 1990, meeting the Denver Botanic Gardens Board of Trustees approved a resolution submitted by Life Trustee Dr. Moras Shubert aimed at formalizing the Gardens' long-standing commitment to conservation. The resolution expresses concern about all threats to the perseverance of plant species, encourages protection of all threatened vegetation and sets the Gardens on a direct course of active plant conservation.

Although this stance has been implicit in the Gardens' mission statement, Dr. Shubert and the board recognize that both the endangered plant conservation movement and the Gardens are evolving through a critical period when a strong reaffirmation of the Gardens' position is necessary. The full resolution follows:

Resolution on Plant Protection

WHEREAS Denver Botanic Gardens recognizes that all biological entities are interrelated and dependent upon each other and their physical environment,

AND WHEREAS the concerns of Denver Botanic Gardens extend beyong our actual gardens and arboreta,

AND WHEREAS it is observed that in Colorado and neighboring areas there are threats to individual plant species and to vegetational units by human activities such as fires, deforestation, water use, mining, road-building, and development in natural areas,

AND WHEREAS in keeping with the membership of Denver Botanic Gardens in the American Association of Botanic Gardens and Arboreta and the Center for Plant Conservation, and in our encouragement of other such organizations concerned with the conservation of plants and vegetation,

NOW, THEREFORE BE IT RESOLVED that the Board of Trustees expresses its concern about all activities which threaten species and vegetation types, particularly in our mountain and plains states,

BE IT FURTHER RESOLVED that Denver Botanic Gardens encourages and endorses programs and activities aimed at the protection and preservation of plant species and threatened types of vegetation,

BE IT FURTHER RESOLVED that Denver Botanic Gardens will engage in action to save rare, threatened, and endangered species.

Approved by the Board of Trustees on the 25th day of September, 1990. ♣

New Light on a Rare Milkweed

Jim Locklear

With financial support from the Nature Conservancy and the Colorado Native Plant Society, research was undertaken in 1990 to investigate the status of the dwarf milkweed, *Asclepias uncialis*. This seldom-collected plant, one of the rarest milkweeds in North America, has a distribution that includes scattered occurrences in eastern Colorado. Until recently this species was one of the most poorly known plants in the flora of the Great Plains.

Asclepias uncialis was first described by Edward L. Greene in 1880, from collections made by him near Silver City, New Mexico. Several collections of this plant had been made prior to 1880 in eastern Colorado, but these were largely determined to be *Asclepias brachystephana*, a species of northern Mexico, west Texas and southern New Mexico and Arizona.

It was not until R.E. Woodson, Jr. undertook a systematic revision of the genus *Asclepias* (published in 1954) that these and later collections were recognized as *A. uncialis*. Specimens of this plant, annotated by Woodson, are found scattered in some of the major herbaria in the United States and in England. By consulting the collections of 45 different herbaria, we now have a more accurate understanding of this species' distribution.

The distribution of the dwarf milkweed appears to be broken up into two separate geographical areas. The first is the western Great Plains, where it is known with certainty from eastern Colorado and northeastern New Mexico. This species has been reported from the Oklahoma panhandle (Texas County), but no specimens have been found to verify this report.

Well over half of the known occurrences of the dwarf milkweed are from eastern Colorado, where it has been collected at widely scattered localities from near the Wyoming line south to the New Mexico border. It is known historically from Baca, Bent, Cheyenne, Denver, Fremont, Huerfano, Kit Carson, Las Animas, Pueblo and Weld counties in Colorado. In addition, if the vague locality information on two nineteenth century specimens is correctly interpreted, this species may have been collected in Adams and Sedgwick counties.

The other area of occurrence for the dwarf milkweed encompasses southwestern New Mexico near Silver City, where Greene collected the specimens from which he described the species, and three scattered localities in Arizona. The plants from Arizona appear to differ somewhat from those that occur in the Great Plains and research is needed to determine whether the plants in these two widely separated areas are in fact the same species.

An additional, highly disjunct occurrence of the dwarf milkweed is known historically from western Wyoming (Sweetwater County). This collection, made by Charles Parry in 1873, came from a location 260 air miles distant from the nearest known occurrence of this species in the Great Plains (Weld County, Colorado). The dwarf milkweed is not known from any other locations in Wyoming.

Although apparently distributed over a large geographical area, the dwarf milkweed has been collected from only about 20 different localities within that area. About half of these collections were made in the 1800's by the likes of such prominent Rocky Mountain botanists as Charles Parry, Elihu Hall and J. P. Harbour, Townsend Brandegee, and George Osterhout. Several collections of the dwarf milkweed were made in the vicinity of Denver in the 1800's. It has not been collected in the Denver area since 1895.

Field work was undertaken in early May of 1990 to relocate certain historical collection sites in southeast Colorado and northeast New Mexico and make observations on the ecology and status of this plant. Populations of the dwarf milkweed were located in Las Animas County, in the vicinity of the Mesa de Maya, and just across the state line in Union County, New Mexico. This species was also found in Pueblo County west of Pueblo. In addition, John Anderson of the U.S. Fish and Wildlife Service was able to relocate the plant in Fremont County near Cañon City, at a site where it may have been collected by Townsend Brandegee in 1877.

The task of locating this species in the field was made difficult because of its very small size. As the common name implies, the dwarf milkweed is a tiny plant – probably the most diminutive member of the genus *Asclepias* in North America. The stems, which number from three to as many as twenty, only reach a height of 1 to 2-1/2 inches, making it extremely hard to spot individuals among the grasses with which they occur on the shortgrass prairie. The name *uncialis* literally means a twelfth, probably a reference to a height of one inch. The fact that the dwarf milkweed is difficult to see in the field may account in some measure for the few collections of this plant. As Bill Weber stated in his book, *Rocky Mountain Flora*, this species is either rare or it has simply been "overlooked."

Once located, several distinctive characters make it relatively easy to separate the dwarf milkweed from the other species of *Asclepias* that occur in the western Great Plains. Aside from being the smallest milkweed in the region, it is also the earliest flowering, coming into bloom in late April and setting fruit by late May. This early flowering period, and the rose-purple color of its flowers, separate the dwarf milkweed from the plains milkweed *A. pumila*, the species with which it is most likely to be confused. Found throughout much of eastern Colorado, the plains milkweed is also a small plant, but it blooms from July into September and has flowers that are creamy white in color. In addition, its leaves are uniformly filiform, while those of the dwarf milkweed are of two

– continued next page

Milkweed, *continued from previous page*

pes, ovate-lanceolate below, grading rather abruptly into linear-lanceolate on the upper portions of the stems.

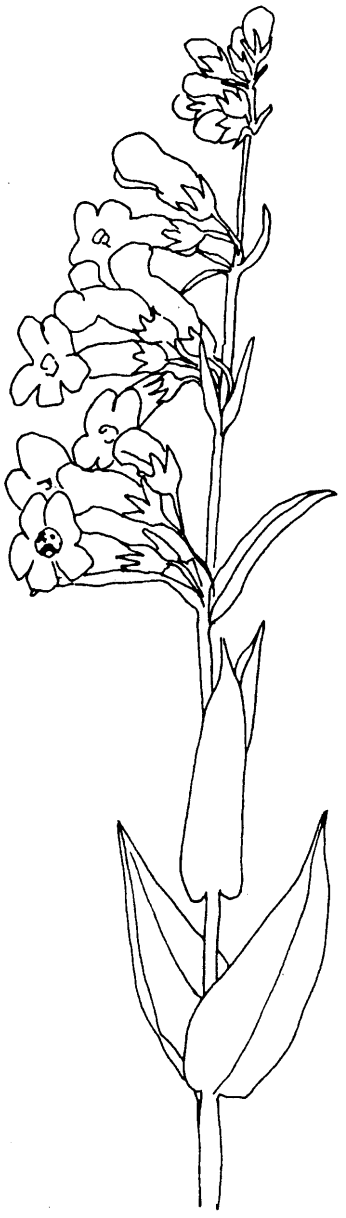
In the Great Plains, the dwarf milkweed occurs primarily as a component of shortgrass prairie vegetation. In the 1990 survey it was usually found growing on the lower sideslopes of escarpments, mesas or canyon walls, often in sandstone-derived soils. Otherwise, this species does not appear to have any specific habitat requirements or preferences.

One significant observation made during the 1990 field work was the small size of dwarf milkweed populations. Very few plants were found at any of the occurrences located in 1990, even when there was a considerable amount of apparently suitable habitat available. A typical occurrence had three to five individual plants within an area the size of an acre. The largest population found consisted of only nine individuals in an rea about 3/4 mile in length along the ase of an escarpment.

The initial information on the dwarf milkweed suggests that its status may be similar to that of Mead's milkweed *A. meadii*, a rare plant of the tallgrass prairie region of the central United States. Both have rather large areas of distribution, yet today occur in widely scattered, small populations. Mead's milkweed has recently been listed as a threatened species by the U.S Fish and Wildlife Service.

Small population size could be a critical factor in the status of the dwarf milkweed. Like all members of its genus, the flowers of this plant are highly modified in structure and require insect visitation to accomplish pollination. If a local population does not contain enough individuals to attract adequate numbers of insects (principally bees, wasps and butterflies), the number of successful cross-pollinations will be reduced, ultimately reducing the amount of seed produced each year. Researchers believe that low population size in Mead's milkweed is resulting in a low rate of reproduction, bringing this species near the brink of extinction.

Although we are beginning to gain a better understanding of this tiny plant, more information needs to be gathered. Additional inventory of historical occurrences, search of areas of potential habitat, and monitoring of known populations are needed to accurately assess the status of the dwarf milkweed and determine whether measures to insure its survival as a component of Colorado's shortgrass prairie flora are necessary. ♣



An Unusual Wildflower

Michael L. Petersen

In stalking wildflowers of the Rocky Mountain region from southern Colorado to Montana, I have come across a small and seldom seen flower, *Dicentra uniflora*, given the common name Steershead. The common name appropriately describes this little flower of the Fumariaceae family which inhabits the sagebrush hillsides of the western slope of Colorado.

This unique flower is visible only in late April to mid-May for a short time after the *Anemone patens* (pasqueflower) blooms. Normally this 1.5 to 2.5 cm sized flower towers some 7 to 10 cm above the plant's basal leaves on a single stalk. I have only seen this plant living in association with *Artemesia tridentata* after the snow melts and the soil temperature rises to 45 degrees F. This minute plant puts forth a flower that appears pink, orchid or purplish in color, and its structure ressembles the skeleton of a bovine critter long dried in the mountain sun. Because this flower is poisonous to cattle, some suggest that explains the skeleton appearance – who knows?

I have located these obscure flowers of the Bleeding Hearts family in Garfield, Mesa and Rio Blanco counties in Colorado. My observations have been on easterly or southerly slopes, in moderately deep to deep loamy soils in the mid-morning hours. The flowering period is only 1 to 3 days for each plant, so if you are pursuing the whereabouts of this flower, you will need to be watchful.

Note: This is another plant that blooms before many of us are out in the spring. There is no specimen of this species in the University of Colorado Herbarium (COLO). One should be collected to document this new species in our flora. PGR ♣

Help Make Water and Energy Conservation a Reality in Colorado

Elizabeth Otto

The Colorado Environmental Coalition is sponsoring a statewide drive for water conservation. CEC is mounting a campaign to end the waste of water and the destruction of Colorado's mountain streams by promoting the use of low-flow showerheads. Low-flow showerheads use up to 70% less water and require about 70% less energy than standard showerheads. And they provide a vigorous stream of water, too. (I have been using a low-flow showerhead for over a year and have found it to be better than my old showerhead.)

The environmental community has spent a lot of time and money fighting water development projects that would destroy our canyons and mountain streams. It's time to stop talking and time to start conserving water in our own homes. Ten thousand low-flow showerheads in use throughout Colorado would cut water demand by half a million gallons a day.

CEC has contracted with a manufacturer to provide high-quality, water-efficient showerheads at a discount price. The Niagara Deluxe Contemporary Model showerhead is made in the US and is rated at 1.65 gallons per minute at 40 psi. Each showerhead costs $10.00 plus $2.00 handling.

As a member group of the CEC, the CONPS is offering these showerheads to our members. The Society will make $2.75 on each showerhead bought by our members.

Buy your very own low-flow showerhead today and stop having to shower with a friend! (Or keep showering with a friend and save even more water!!!) Fill in the order form below and mail to the Water Conservation Project, Colorado Environmental Coalition, 777 Grant Street, Suite 606, Denver, Colorado 80203-3518.

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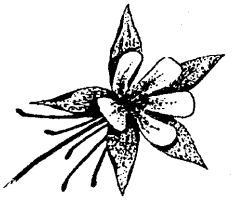
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