

# Colorado Native Plant Society



## NEWSLETTER

VOLUME 6                  NUMBER 1

JANUARY-MARCH                  1982

"DEDICATED TO THE APPRECIATION AND CONSERVATION OF THE COLORADO FLORA"

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### COLORADO NATIVE PLANT SOCIETY

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#### OFFICERS

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President:	Lloyd Hayes
Vice-President:	Sue Martin
Secretary:	Eleanor Von Bargaen
Treasurer:	Myrna Steinkamp

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Virginia Dionigi (82) Hygiene	776-2609
Karen Wiley Eberle (83) Craig	824-8261
Mary Edwards (82) Arvada	233-8133
Scott Ellis (82) Fort Collins	493-6069
Lloyd Hayes (82) Fort Collins	226-5365
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Sue Martin (82) Fort Collins	226-3371
Beth Painter (83) Fort Collins	482-2283
Myrna Steinkamp (83) Fort Collins	226-3371
Eleanor Von Bargaen (82) Denver	756-1400

#### COMMITTEES

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CONSERVATION	Barry Johnston	234-4011
EDITORIAL	Les Shader	484-0107
EDUCATION	Virginia Dionigi	776-2609
FIELD TRIPS	Scott Ellis	493-6069
GOVERNMENTAL AFFAIRS	J. Scott Peterson	886-5887
HORTICULTURE & REHABILITATION	Gayle Weinstein	575-2548
MEMBERSHIP	Myrna Steinkamp	226-3371
LOCALITY	Bob Bowman	221-3714
PERISSANT	Mary Edwards	233-8133

#### MAILING ADDRESS

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COLORADO NATIVE PLANT SOCIETY  
P. O. Box 200  
Fort Collins CO 80522

#### SCHEDULE OF MEMBERSHIP FEES

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LIFE	\$250.00
SUPPORTING	50.00
ORGANIZATION	25.00
FAMILY OR DUAL	12.00
INDIVIDUAL	8.00
STUDENT OR SENIOR	4.00

Nonmembership subscriptions to the NEWSLETTER are \$4.00 per year.

#### NEWSLETTER ARTICLES

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Please direct all contributions and articles to the EDITOR in care of the Society's mailing address.

#### MEMBERSHIP RENEWALS AND INFORMATION

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Please direct all membership applications, renewals and address changes to the MEMBERSHIP Chairperson, Myrna Steinkamp, in care of the Society's mailing address.

Please direct all other inquiries regarding the Society to the SECRETARY, Eleanor Von Bargaen, in care of the Society's mailing address.

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## ACTIONS OF THE BOARD OF DIRECTORS

At the December 2 and January 27 meetings, the Directors emphasized plans and objectives for 1982. The Conservation Committee will concentrate on rare and endangered species. Actions will include compiling available species lists, criteria for listing, develop site records and develop a list of "experts" involved in R and E plant work. The committee has been asked to develop a more detailed plan of action to be presented at the March meeting.

The Education Committee intends to start a second audiovisual show for use in secondary schools. The Committee also intends to develop catalog and file systems for the Society's slide collection.

The Field Trip Committee has already completed the scheduling and much of the planning for 1982 trips. You will find these discussed at length elsewhere in this newsletter.

The Governmental Affairs Committee's primary responsibility is to monitor proposed and pending legislation that might affect the Society's interests and to recommend actions to the Board. Present emphasis is on the Endangered Species Act which comes up for renewal in 1982. There are strong forces that seek to weaken the act. The Directors endorsed the statement prepared by Faith Campbell of the National Resources Defense Council in support of a continuing strong Endangered Species Act.

The Membership Committee reported 206 paid-up members on December 2. The Committee will continue to keep the membership records and prepare up-to-date membership lists.

The Editorial Committee will prepare four newsletters in 1982, one for each quarter. The quality and interest will depend on the quality and interest of contributions received. Each of you is invited (urged!) to contribute!

The Horticulture and Rehabilitation Committee received a special assignment. It will collaborate with the Field Trip Committee to plan and conduct a trip to learn more about the availability and use of native plants around the home.

The Publicity Committee escaped receiving any special assignments so far. Let them take warning! That situation will change!

In other actions the Board selected and approved Gayle Weinstein to chair the Horticulture and Rehabilitation Committee. We are fortunate to find someone having Gayle's background and abilities to fill that position.

--- Lloyd Hayes

## RENEWED YOUR MEMBERSHIP YET?

1982 membership renewals are now due! The address label shows the year through which your membership is paid, although very recently paid memberships may not be shown. CONPS cannot function effectively without the support of its membership, so we hope that you will take a few minutes now to renew your support. Please use the dues form and envelope included with the last newsletter.

-Myrna Steinkamp

## FORT COLLINS CHAPTER MEETING

April 1, 7:30 pm, Overland Trail Room, Fort Collins Museum, 200 Mathews, Fort Collins.

For our next chapter meeting, Dr. Edward F. Redente will be our guest speaker. He is presently the principal investigator of an interdisciplinary project evaluating the rehabilitation potential and practices for Colorado oil shale lands.

He plans to give a talk on the impact of oil shale development in Western Colorado and explain some of the current studies utilizing native plants for revegetation.

This presentation should be both informative and necessary for anyone concerned with native plants.

-Bob Bowman

## NATIVE PLANT WORKSHOP

A workshop on growing and propagating native plants will be held in Grand Junction on March 6. The workshop is being organized by Charles Weddle of the Weddle Plant Laboratory and Cortland Swift, Tri-River Extension Horticulturist. Speakers will include several nurserymen with extensive experience in raising native shrubs and herbs. Please write or call Susan Martineau, 442½ A Sandia, Grand Junction CO 81503, for details.

## BARR LAKE STATE PARK ROXBOROUGH STATE PARK

Share your interest and knowledge in nature by joining the volunteer training program for Barr Lake and Roxborough State Parks. The training sessions will prepare you to lead and assist with outdoor learning activities at either or both parks. This volunteer program is sponsored jointly by the Non-game Section of Colorado Division of Wildlife and Colorado Parks and Outdoor Recreation.

For applications and further information call Carol Jones at 693-3216, or Roxborough Park at 797-3986, or Barr Lake at 659-6005.

## ENDANGERED SPECIES ACT ENDANGERED

The Endangered Species Act (ESA) is the federal legislation that provides for the conservation and protection of plants and animals that are "endangered" (in danger of extinction in all or most of its range) or "threatened" (likely to become endangered in the foreseeable future). The Act authorizes and directs the Fish and Wildlife Service to carry out such protection. This legislation, originally passed in 1973, expires on October 1, 1982, and Congress must "re-authorize" the ESA or pass a new law.

Although the ESA as it has operated has been far from perfect, it is undoubtedly the most significant plant and wildlife conservation law ever enacted. It is expected that an ESA in some form will be passed, but the question is what that form will be. During the reauthorization process, Congress may change or eliminate any part of the Act, and significant pressures are being exerted to weaken the provisions of the present Act. In fact, IT IS POSSIBLE THAT PLANTS COULD BE EXCLUDED COMPLETELY from the new legislation---some Administration officials, Congressmen, and development interests have suggested eliminating both plants and invertebrates!

Congressional hearings on the new law have already begun. The timetable of Congress is such that the committees involved must have the new bills drafted and approved BEFORE MAY 15, 1982. The committee-originated bills then must be considered and approved by the House and the Senate, then any differences between them must be reconciled by a conference committee. The final bill must again be passed by both House and Senate and signed by the President. All of this must occur before October 1, 1982, if an Endangered Species Act is to continue without lapse.

Your Society has supported efforts of the Natural Resources Defense Council, the Environmental Defense Fund, and a number of other conservation groups to keep plants included and protected in the reauthorized ESA. We were among the twelve cosponsoring groups whose statement was submitted to the Subcommittee on Environmental Pollution for the oversight hearing on the Endangered Species Act, held December 8-10, 1981. In this statement, some of the reasons underlying the need for plant conservation were given, the primary causes for endangerment were considered, the performance of the ESA thus far was assessed with respect to plants (only 63 of the estimated 3,000 eligible plants have been "listed" and thus made eligible for the Act's protection), and most importantly, the groups' support for the inclusion and strengthening of plant protection provisions in the new Act was strongly stated. The Society will continue to support a strong ESA in any way possible, but IT IS VITAL THAT WE AS INDIVIDUALS SHOW OUR CONCERN FOR ENDANGERED PLANTS.

What can you do? Probably your most important help will be to write letters, at the appropriate time, to our Senators and Representatives before they vote on the Act. President Hayes has appointed Sue Martin as the CONPS coordinator for ESA reauthorization information. She will try to keep you informed of the contents and progress of the bills. This may require one or more special mailings---so please be on the lookout for these. When you receive one, don't put it aside "to do later"---later might be too late. Resolve now to take the time to write a few letters, or send a telegram, and let our elected representatives know that plant conservation is important to us in Colorado.

You might also contact local Garden Clubs or other groups in your area that would be concerned about plant conservation. Explain the situation and identify interested individuals who also might write letters supporting the Act. Remind them that three of our Colorado cacti, *Pediocactus knowltonii*, *Sclerocactus glaucus*, and *Sclerocactus mesae verdae*, are listed and thus protected by the current ESA, and our *Phacelia formosula* is in "proposed" status. We have many more plant species in Colorado that are potentially listable and protectable by ESA, but first we must see to it that a strong ESA is reauthorized!

--- Sue Martin

## FLORA OF WESTERN COLORADO

William A. Weber, author of Rocky Mountain Flora, is writing a new book for the Western Slope of Colorado. This project has a budget of \$93,000 and there is a severe lack of funding. Weber hopes to complete the project in three years and would like to have 10 pledges of \$3,000 per year for the three years. Lacking these pledges he will accept any donations, which are tax deductible, to the CU Foundation--Flora Book. More detailed information about this project may be obtained from the University of Colorado Development Office, 1305 University Avenue, Campus Box 462, Boulder, Colorado 80309.

## VACATIONING OUT OF STATE THIS SUMMER?

Your EDITOR is going to try to maintain, on his personal computer at home, a list of field trips and activities of Native Plant Societies we exchange newsletters with. If you want a listing of activities in an area during a particular time period write to the EDITOR, include a self-addressed stamped long envelope, the dates you will be gone, and what area you will be visiting.

## 1982 FIELD TRIPS

Field trips offer one of the best ways for Colorado Native Plant Society (CONPS) members to enjoy the native flora, and meet others with similar interests. Scott Ellis, newly appointed Field Trips Chairperson, has assembled a list of 8 trips for 1982. The decision to offer a larger number of trips is based on what we hope is a larger pool of interested people. Two trips offered this year are joint trips with the Denver Botanic Gardens (DBG) and The Nature Conservancy. These organizations and CONPS have agreed to publicize trips within each group's newsletter, and to share responsibility for managing the trips. Because of these joint efforts, field trip participation policy has become more formal. Field trip policy is summarized below.

This year's trip list follows the tradition of providing several easily accessible trips in the Front Range area, as well as more "exotic" long-weekend trips to the Western Slope. The CONPS is also committed to undertaking field inventory projects that benefit our state and federal parks, and agencies and organizations charged with conserving rare plants. The very successful Florissant Fossil Beds plant inventory begun last year will be continued; a search for additional populations of the extremely rare *Phacelia submutica*, known only from one small site in Mesa County, is scheduled for this year.

Finally, we have made an effort to publicize the CONPS field trips with native plant societies in adjoining states, and to learn about other state's activities for the coming year.

The Field Trip Committee always needs ideas for trips, field trip leaders, and people to help coordinate our efforts. Ideas and suggestions should be directed to Scott Ellis (Office - 493-8878, Home - 493-6069, before 9 pm).

### FIELD TRIP POLICIES

Registration. The individual(s) responsible for registration for each trip should be contacted by phone or mail by the cutoff date indicated. Registration cutoff dates are provided to define a decision point on whether a trip will happen. Late sign-ups will be accepted, but only if a decision has already been made to conduct the trip. Please note that some trips have a maximum participant size. Registration for field trips with a participant ceiling will be on a first-come, first-served basis. Please provide notice of cancellation as soon as possible so that someone else can take your place.

Fees. Other cooperating organizations (Nature Conservancy, DBG) charge fees for field trips. The purpose of these fees is to insure a commitment from registrants to participate, and to cover costs incurred while putting on the

trip. CONPS joint trips with other organizations will require payment of field trip fees. These registration (or admission) fees are noted for each trip. All fees are payable in advance, and should be paid to the individual in charge of registration.

Cost-Sharing. CONPS strongly encourages car-pooling. Consistent with the ride cost-sharing policy instituted by Bob Heapes in 1980, the following payment schedule to car drivers will be followed:

If the driver has two passengers sharing his/her car, each passenger will be assessed 4¢/mile; if three passengers are carried, the assessment will be 3¢/mile; and if four passengers are carried, the assessment will be 2¢/mile. Under this system the driver will not be responsible for paying for gas, but will have to bear the operational costs of the car.

Preparation. Be prepared for the weather you will encounter on the trip. Contact the field trip leader if you have questions.

### SCHEDULED TRIPS

March 13, Saturday, 9:30 am - 12 noon  
NATIVE AND ROCK GARDEN PLANT PROPAGATION  
Trip Leader: Panayoti Callas, Rock Garden Curator, DBG.  
Registration: Scott Ellis (493-8878, 493-6069),  
1011 W. Mountain Ave., Fort Collins CO 804  
Registration cutoff: March 6.  
Size: 25.  
Registration Fee: \$2 admission to DBG.  
Location: DBG, 909 York St., Denver CO 80206.

The purpose of this trip will be to observe the variety of ways that native and rock garden plants are propagated. Late winter is an excellent time to see seedlings and cuttings of many species that will be transplanted outside later. Panayoti will lead a tour of the DBG greenhouses, and will describe the techniques used to propagate many colorful species. Most of this trip will be indoors, but there is a chance that a few easter daisies (*Townsendia*) will be in bloom by this time in the rock garden.

April 24, Saturday, 9:30 am - 1:00 pm  
USES OF NATIVE PLANTS IN LANDSCAPING (CONPS  
Spring Meeting)  
Trip Leaders: Gayle Weinstein, DBG and Horticulture and Rehabilitation Committee Chairperson for CONPS; and Scott Ellis.  
Registration: Scott Ellis (see March 13 trip) or Gayle Weinstein, (575-2548), DBG, 909 York, Denver CO 80206.  
Registration Cutoff: April 17.  
Size: Unlimited.  
Registration Fee: \$2 admission to DBG.  
Location: DBG.

The native plant displays developed by the will be toured to learn about species selec-

ion, soil adaptation, and exposure and water requirements for a variety of woody and herbaceous species. If time permits, home landscapes in the immediate vicinity of the Botanic Gardens will be visited. Please bring a bag lunch. We will have lunch in Cheesman Park if the weather is good, inside if the weather is poor. Information on nurseries carrying native plants will be available at the meeting to assist members who wish to landscape their homes with native species.

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May 22-23, Saturday and Sunday

RARE PLANT INVENTORY - *Phacelia submutica*

Trip Leader: Barry Johnston, U.S. Forest Service, CONPS Plant Conservation Chairperson, (Work 234-4011, Home 423-2329), 5990 Field St., Arvada CO 80004.

Registration Cutoff: May 8.

Size: 12.

Registration Fee: None.

Location: DeBeque, 40 miles east of Grand Junction on i-70 (Mesa County).

Would you like to assist CONPS in trying to find additional populations of one of Colorado's rarest plants? *Phacelia submutica* is known from only one extant locality. *P. submutica* is one of the highest priority species identified for conservation efforts by The Natural Heritage Inventory and the U.S. Fish and Wildlife Service (USFWS). *P. submutica* has been classified as a Category 1 species by the USFWS, which means that they believe they have enough information to proceed with listing of the species as Threatened or Endangered. Since a Listing package has not been written, we will try to gather new data for a future package. The Colorado Natural Areas Program and the Bureau of Land Management, Grand Junction District Office, have cooperated to register the DeBeque site as a State Natural Area.

*Phacelia submutica* is a tiny, annual species that appears only when abundant winter and spring precipitation provide sufficient soil moisture to germinate the seeds. The 1981-1982 winter appears to be providing potentially favorable germination conditions in the coming spring. If conditions are favorable, Society members can make a considerable contribution to the knowledge and conservation of *P. submutica* by collecting field data, and possibly locating previously unknown populations.

Because of the very brief flowering period of this tiny species, some flexibility in the actual date of the field trip is required. Please contact Barry Johnston directly, since he will be monitoring the phenology of the site in order to pick the best time. This trip will require a substantial amount of walking, and intensive ground searches that will be highly generalized to most effectively find *P. submutica* plants.

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May 22, Saturday, 9 am - 2 pm

FOOTHILLS VEGETATION (Joint trip with DBG)

Trip Leader: James Ratzloff (Plant ecologist, photographer, and past leader of CONPS field trips)

Registration: Margaret Wallace, (575-2548), DBG, 909 York, Denver CO 80206.

Registration Cutoff: May 15.

Size: 25.

Registration Fee: \$2 admission to DBG; Field trip fee: \$3.50 for DBG members and \$10 for all others.

Location: Foothills west of Denver.

A study area in the foothills will be visited to identify the spring flora, and to describe the ecology of several foothills plant communities. Vegetation-soil interrelationships will also be examined. The trip will start with a slide show presented in Classroom C at the DBG at 9 am. Participants will then carpool to the foothills for a short hike. Please bring a bag lunch.

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May 29-30, Saturday and Sunday (See schedule below)

WESTERN COLORADO PINYON-JUNIPER AND CANYON VEGETATION

Trip Leaders: James Ratzloff; Walt Kelley, Mesa College.

Registration: Scott Ellis (See March 13 above); James Ratzloff (234-3580), 1388 Garrison, # G107, Lakewood CO 80215.

Registration Cutoff: May 15.

Size: Unlimited.

Registration Fee: None.

Location: Dolores River near Naturita (San Miguel and Montrose Counties).

This 2-day field trip will tour the vegetation of the red sandstone canyons of the Dolores River and adjacent pinyon-juniper woodlands. Highlights of the trip will be visiting the habitat of the rare Kachina Daisy, *Erigeron kachinensis*, which grows in shallow alcoves in canyons, and a population of the spineless hedgehog cactus, *Echinocereus triglochidiatus* var. *inermis*. We will also visit sites of the rare species *Lupinus crassus* and *Lygodesmia doloresensis*. Spring wildflowers should be at their peak during this trip.

Schedule:

---May 29, Saturday, 11 am - Meet at junction of Highway #14 and Big Gypsum Valley Road. Proceed to Little Gypsum Valley on gravel road (approximately 25 miles). Visit *Erigeron kachinensis* habitat in Dolores Canyon.

---Evening - Camp in Little Gypsum Valley.

---May 30, Sunday, Morning - Travel to Paradox Valley.

---10:30 am - Meet at Bedrock Store. Proceed to *Echinocereus triglochidiatus* var. *inermis* habitat and *Lupinus crassus* habitat.

---1:30 pm (Optional - depending on remaining enthusiasm) Proceed to *Lygodesmia doloresensis* habitat near Gateway.

No facilities are available at our camping site in Little Gypsum Valley. For those of less rugged constitution, there are motels in Naturita and Norwood. Jim will provide maps, names of motels, and information about rare species to people registering for the trip.

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June 25-27, Friday - Sunday  
PICEANCE BASIN

Trip Leaders: Bill Baker (Colorado Natural Heritage Inventory), and Karen Wjley Eberle (BLM, Craig District).

Registration: Scott Ellis (See March 13 above); Ann Hilstead, Nature Conservancy, (837-0505), 1732 Pearl, Suite 301, Denver CO 80203.  
Registration Cutoff: May 15.

Size: 25.

Registration Fee: None.

Location: Piceance Basin west of Meeker (Rio Blanco County).

This is your opportunity to learn about a very interesting area of the state that is slated for oil shale development. The CONPS made a trip here in 1980 that was a great success, and this one should be too. CONPS articles on the basin can be found in the Newsletter, Vol. 4, Nos. 1, 2, and 4.

The Colorado Natural Heritage Inventory will be conducting fieldwork in the Basin this summer. The results of this work will help devise a route that will encompass the best examples of rare plant sites, and native plant communities.

Schedule:

---June 25 - Arrive in Meeker the night before; camping available at City Park; motels available in Meeker, but reservations should be made a month in advance.

---June 26 - Depart Meeker City Park Campground at 7:30 am (!SHARP!) for the Piceance Basin; return to Meeker in the evening.

---June 27 - (Optional trip) Possibilities include the Miller Creek watershed, Flat Tops near Trappers Lake, the Upper Colorado Plant Materials Center, and Raven Ridge near the White River.

Registrants will be notified of trip details by early June. If you have any preferences for the optional Sunday trip, please let the leaders know.

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July 10, Saturday  
FLORISSANT FOSSIL BEDS PLANT INVENTORY

Trip Leader: Mary Edwards.

Registration: Mary Edwards, (233-8133), 2580 Parfet St., Lakewood CO 80215.

Size: unlimited.

Registration Fee: None.

Location: Florissant Fossil Beds National Monument, west of Colorado Springs (El Paso County).

The purpose of this trip is to continue the plant inventory project begun last year. The

principal tasks associated with the project include making voucher collections in areas that have not been previously surveyed, and updating species lists after collections have been identified. The Florissant vegetation consists of a ponderosa pine woodland broken by open grassy meadows, and intermittent wet swales. Mary Edwards has summarized the results to date, and has had identifications confirmed by Dr. William Weber at CU. Fieldwork is needed at all seasons. Person interested in working on this project should contact Mary Edwards to obtain maps of the area, learn about voucher collection techniques, and obtain species lists. Mary will lead the field trip noted above, but people are encouraged to visit the site at other times.

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Late August - Early September  
SUBALPINE-ALPINE TRIP (Joint trip with The Nature Conservancy)

Trip Leaders: To be announced.

Registration: Ann Hilstead, The Nature Conservancy, (837-0505).

Size: 25.

Registration Fee: \$5/person.

Location: Bunker Hill area, west of Nederland (Boulder County).

Details for this late summer trip are still being developed. More information will be forthcoming in the next Newsletter.

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FIELD TRIPS WITH OTHER ORGANIZATIONS

The Nature Conservancy and DBG are offering trips beyond those described here. For additional information, please call or write the respective trip coordinators:

Ann Hilstead  
The Nature Conservancy  
1732 Pearl St., Suite 301  
Denver CO 80203  
Phone: 837-0505

Margaret Wallace  
The Denver Botanic Gardens  
909 York St.  
Denver CO 80202  
Phone: 575-2548

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FIELD TRIPS IN ADJOINING STATES

Native Plant Societies in adjoining states are still formulating their 1982 field trip plans. Please contact the following representatives for information. The Colorado list will be forwarded to these organizations for inclusion in their newsletters as they see fit.

New Mexico Native Plant Society, Mary Wohlers,  
Route 3, Los Lunas NM 87031.

Utah Native Plant Society, Barbara Halliday,  
3043 Brighton Pl., Salt Lake City UT 84121.

Wyoming Native Plant Society, Rober Lichv.,  
1216 West 31st., Cheyenne WY 82001.

## ENDANGERED ECOSYSTEMS IN COLORADO

Thanks to the Endangered Species Act, in recent years there has been much concern for the nation's vanishing plants and animals. But there is no comparable Endangered Ecosystem Act, in spite of the extensive loss or alteration of many of the nation's major natural ecosystems: the tallgrass prairies of the eastern plains, northern hardwood forests of the northeastern U. S., tule-cattail wetlands in the uppermidwest, old-growth forests of the northwest coast, etc. There is no federal, state, or local mandate that confers concern for the little bluestem prairies that once covered considerable parts of the loess region in eastern Kit Carson, Cheyenne, and Kiowa counties in Colorado, or for the unique Bigelow sagebrush-Frankenian community that is restricted to limestone bluffs in the upper Arkansas River Valley, or the newly discovered curlleaf mountain mahogany forest (trees up to 20" in diameter and probably 300-500 years old) of Moffat County, or for the ephemeral freshwater ponds of the plains that bloom with fairy shrimp after heavy summer rains, or for the "hanging gardens" of Mesa County.

Colorado, because of its rugged topography, varied geology, and central geographic position is blessed with a rich ecosystem diversity, in addition to its rich floristic diversity. Yet much of this diversity has been lost or altered in the period since settlement. Grandparents who were born on homesteads in Colorado in the early 1900's may remember their parents talking of how much more grass there was in the early days. Much of the damage to the grassland vegetation of the state occurred during the period of unregulated grazing from about 1870 to 1920. Though many people feel the grasslands of Colorado are heavily overgrazed, most old-timers seem to agree that the ranges of the state are in much better condition now than they were in at the turn of the century, largely because of the work of the federal land management agencies.

It is possible to find "relict" natural grasslands in areas that are far from water or are isolated. Tiny examples of western Colorado's once plentiful Indian ricegrass-needleandthread grasslands were located by Jim Ratzloff, a botanist formerly with the BLM's Montrose District. They are isolated on mesa tops in the Dolores River Canyon, only accessible by helicopter.

Most ecologists today accept that fire is a natural part of the life of many ecosystems, particularly in the Rocky Mountains. But, evidence is accumulating, from tree-ring dating and fire history studies, that the state was marked by unprecedented large-scale fires that destroyed most of the older forest.

The annual flood cycle that may have created and maintained conditions suitable for devel-

opment of the vertebrate-rich riparian cottonwood forests of the South Platte and Arkansas Rivers is now under control by dams and irrigation. These cottonwoods appear to be dying out in many areas and invading in others, attempting to adjust to the new domestic water regime.

Aquatic ecosystems in Colorado have suffered extensively. In this dry region, there is very little water that is not used for some agricultural or human-related use. In preparing a preserve design for a segment of the Arikaree River in Yuma County, The Nature Conservancy, after consulting with a ground water hydrologist, discovered that, if current trends in use of water for center-pivot irrigation continue, the Arikaree River will have no surface water in 30-40 years, and the stream segment targeted for protection could be dry in 10-15 years. Current trends in water use in the region underlain by the Ogallala aquifer (a large part of eastern Colorado) are such that all streams in this region are drying from their headwaters toward the Kansas-Nebraska borders at the rate of up to a mile a year. In 40-50 years, there may be no surface water in any of this part of eastern Colorado, and this part of the aquatic diversity will be effectively extinct.

Similar scenarios are developing in western Colorado where energy-related water use is skyrocketing. Conservationists concerned with protection of the state's aquatic systems may have to change their scale of concern from protection of a few acres of riparian forest to protection of entire aquifers and complete watersheds.

## WHY PROTECT ECOSYSTEMS?

"To keep every cog and wheel is the first precaution of intelligent tinkering," said Aldo Leopold. An ecosystem is all the plants and animals (cogs and wheels) in a part of the landscape, plus their environment. In the same way that a machine is an organized structure of cogs and wheels, an ecosystem has structure: a characteristic group of plants and animals, certain food production and transfer paths, and character-nutrient cycles. The most persistent engineer, if confronted with a huge pile of wheels and cogs from all the dismantled machinery of the world, could never reconstruct the machines, particularly if he was without models, plans, or examples. The second rule of intelligent tinkering should be to keep a fully assembled example available for study. We need to not only protect the plants and animals, but also the ways in which they are organized into ecosystems. Land managers, with the good intention of repairing past damage, cannot know what needs to be done without knowing how the system used to look and function.

#### WHICH ECOSYSTEMS ARE IN NEED OF PROTECTION?

Humans have been a part of natural ecosystems for millenia, yet the explosion in population and accompanying resource use in the last century has resulted in drastic changes in the structure of ecosystems. Much of the change has involved simplification, so that the structure of the ecosystem is oriented solely toward production of food or fiber for humans. Because of this, ecosystems that formerly occupied valley land, areas of rich soil, or areas associated with water have suffered extensive conversion to agriculture. In the western United States nearly all of the remaining non-forested lands have been used for domestic grazing. Though grazing has been a natural part of many grassland ecosystems throughout their evolution, so that they are somewhat resistant to the impact of animals, other Colorado grasslands (e.g. mountain park grasslands such as the bluebunch wheatgrass grasslands of Middle and North Parks) probably did not evolve under the influence of large herds of wild ungulates, and now deteriorate rapidly with grazing by domestic animals. Forests, on the other hand, have mostly suffered from increased fires or lumbering, though certain kinds of forests have been extensively cleared to create agricultural lands. The overall impacts on forest are generally lower in the west in terms of changes in ecosystem structure than they are in grasslands and potential agricultural lands.

#### WHAT IS THE ROLE OF THE COLORADO NATURAL HERITAGE INVENTORY?

The Colorado Natural Heritage Inventory (CNHI), which is a part of the Natural Areas Program in the Division of Natural Resources of the State of Colorado, is beginning to serve as a central data base for information on the status of ecosystems in the state. For the past few months, CNHI has been preparing a list of the terrestrial ecosystems of the state. This list encompasses all the ecosystems that have been named and described in the scientific literature, including the recently prepared List of Habitat Types of Region 2 of the Forest Service, the Bureau of Land Management's Range Site Types, the Society of American Foresters' Forest Cover Types, etc. This list will be circulated for review by ecologists throughout the state. CNHI is currently inputting all available data on ecosystems and their locations in Colorado so that this information will be available for

any geographic area. The status of a particular ecosystem is then assessed by considering how widespread the system formerly was, etc. CNHI is developing, through the volunteer efforts of Steve Board, a comparable list for the aquatic systems. Though CNHI's role is strictly that of a data base, information on the status of ecosystems, location of remaining high quality examples, etc., is provided to anyone in the state, including federal and state land management agencies, private consulting firms, The Nature Conservancy, private individuals, and the Natural Areas Program. This information is being used on a regular basis.

#### WHAT CAN YOU DO?

CNHI needs help in many phases of data collection, input, and use. We would like to establish a statewide network of people who could periodically volunteer to assist in searching for examples of ecosystems and in photographing or collecting information on these systems. Particularly valuable are people who have a general knowledge of the geography of a particular area or some familiarity with plants or the ecosystems in some part of the state. Volunteers who have a fondness for forms, filing, or maps are needed in the Denver office.

Our current list of the state's ecosystems includes some 500 types, and is too bulky and costly for general circulation in January. These lists will be of those systems that appear to be most threatened and those systems for which we would like to find more locations and more data. Eventually, we plan to prepare an abstract for each ecosystem, which will describe the system, indicate its general range in Colorado, include all scientific references to the system and, hopefully, photographs.

If you would like to become involved in any of these activities, please send your name, address, phone number, a list of your general interests, background, training. If you have a particular geographic area of the state you know well or would like to help with, send that. We need someone who knows anything at all about some of the less spectacular parts of Colorado, such as Phillips County or Kit Carson County. Send all information to Bill Baker, Plant Ecologist, Colorado Natural Heritage Inventory, 1550 Lincoln St. #106, Denver, CO 80203. I may not be able to answer immediately, but you will be added to our network and contacted as some point.

--- Bill Baker