

# Colorado Native Plant Society



## NEWSLETTER

VOLUME 4      NUMBER 4

JULY - AUGUST      1980

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

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LIFE	\$ 250.00
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### NEWSLETTER ARTICLES

Please direct all articles of interest to the CONPS to Dieter Wilken, Editor, CONPS. Deadlines for the 6 bimonthly Newsletters are the end of January, March, May, July, September and November.

### CONPS ANNUAL MEETING

Program: Wetlands versus Agricultural Lands: Perspectives on Values and Trade-Offs. by E.S. Mustard

Denver Botanical Gardens  
Saturday, 25 October 1980  
1:00 p.m.

FIELD TRIP REPORTS

The Plains Conservation Center trip was attended by twenty-eight people. We broke into four groups which were lead by Ann Armstrong, Sandy Emrich, David Buchner, and Miriam Denham. Each of the groups recorded the species found, and Sandy Emrich generated the list of the species printed below. The list will be forwarded to the Colorado Natural Area program to aid their inventory process. We visited a replica of an early sod house and heard a lecture about early farming techniques and the rigors of prairie living many years ago.

Agoseris glauca--Pale Agoseris  
Agropyron smithii--Western Wheatgrass  
Allium textile--Wild Onion  
Alyssum minus--Alyssum  
Ambrosia acanthicarpa--Sandbur  
Androsace occidentalis--Western Rock Primrose  
Argemone polyanthemus--Prickly Poppy  
Artemisia filifolia--Silvery Wormwood  
Artemisia frigida--Fringed Sage  
Artemisia ludoviciana--Pasture Sage  
Astragalus bisulcatus--Two-grooved Milkvetch  
Astragalus crassicaarpus--Ground Plum  
Astragalus drummondii--Drummond Milkvetch  
Bouteloua gracilis--Blue Grama Grass  
Brassica rapa ssp. campestris--Broomrape  
Bromopsis inermis--Smooth Brome Grass  
Bromus tectorum--Cheatgrass  
Buchloe dactyloides--Buffalo grass  
Carex heliophila--Sedge  
Castilleja integra--Orange Paintbrush  
Ceratooides lanata--Winterfat  
Chorispora tenella--Blue Mustard  
Chrysothamnus parryi--Parry's Rabbitbrush  
Cirsium arvense--Canada Thistle  
Cirsium undulatum--Wavyleaf Thistle  
Collomia linearis--Slenderleaf Collomia  
Comandra umbellata--Bastard Toadflax  
Descurainia pinnata--Pinnate Tansy Mustard  
Draba sp.--Whitlow-wort  
Equisetum arvense--Field Horsetail  
Erigeron divergens--Spreading Fleabane  
Eriogonum effusum--Bushy Buckwheat  
Erysimum asperum--Western Wallflower  
Gaura coccinea--Scarlet Gaura  
Glycyrrhiza lepidota--Wild Liquorice  
Grindelia squarrosa--Gumweed  
Gutierrezia sarothrae--Broom Snakeweed  
Keterotheca villosa--Hairy Golden Aster  
Koeleria macrantha--Prairie Junegrass  
Lactuca serriola--Wild Lettuce  
Lappula echinata--Beggars-tick  
Lathyrus polymorphus--Wild Sweetpea

Leucocrinum montanum--Sand Lily  
Lithospermum incisum--Narrow-leaved Puccoon  
Lomatium orientale--Salt and Pepper  
Lomatium foeniculaceum--Bisquitroot  
Lygodesmia grandiflora--Skeletonweed  
Melilotus sp.--Sweetclover  
Mentzelia sp.--Eveningstar  
Oenothera albicaulis--Prairie Evening Primrose  
Opuntia compressa--Prickly Pear Cactus  
Opuntia polyantha--Plains Prickly-Pear Cactus  
Penstemon albidus--White Penstemon  
Phlox longifolia--Long-leaf Phlox  
Poa arida--Plains Bluegrass  
Poa sandbergii--Sandberg Bluegrass  
Populus sargentii--Plains Poplar  
Psoralea tenuiflora--Slimleaf Scurfpea  
Rorippa sinuata--Spreading Yellow Cress  
Rosa arkansana--Arkansas Wild Rose  
Rumex crispus--Curly Dock  
Senecio sp.--Golden Ragwort  
Sitanion hystrix--Squirreltail Grass  
Sphaeralcea coccinea--Scarlet Globemallow  
Stephanomeria pauciflora--Wire-lettuce  
Stipa comata--Needle and Thread Grass  
Stipa viridula--Green Needlegrass  
Taraxacum officinale--Common Dandelion  
Thalaspis arvense--Penny Cress  
Tradescantia occidentalis--Spiderwort  
Tragopogon dubius--Salsify  
Verbascum thapsus--Mullein  
Viola nuttallii--Nuttall's Violet  
Vulpia octoflora--Six-week Fescue  
Yucca glauca--Spanish Bayonet

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The Pikes Peak/Mueller Ranch trip was attended by twenty-four people, and Colorado College provided the leaders for this trip. They were Sue Tabor, Sandy Tassel, and Kathy Darrow. Bob Heapes provided the location of the Yellow Lady Slippers and the photographers had a field day as four different species of orchids were seen on this trip. An added note of interest, Bob Heapes and Sandy Tassel saw a brown bear when doing the reconnaissance for this trip a week before. Everyone was impressed with the Mueller Ranch, and we're looking forward to its development as a state park. All in all, the field trips were successful and generated new members for the Society.

--Bob Heapes

The Long Lake/Niwot Ridge trip was attended by fourteen people, and Miriam Denham and Mary Jane Foley provided the leadership. The subalpine flowers were beautiful but everyone remarked about how dry the high ridges appeared. A list of the species observed is printed below.

Achillea millefolium--Yarrow  
Allium geberi--Wild Onion  
Anaphalis margaritacea--Pearly Everlasting  
Angelica grayi--Angelica  
Antennaria rosea--Pussytoes  
Aquilegia caerulea--Blue Columbine  
Aquilegia saximontana--Dwarf Columbine  
Arenaria fendleri var. tweedyi--Alpine Sandwort  
Arnica cordifolia--Arnica  
Betula glandulosa--Boy Birch  
Bistorta bistortoides--Bistort  
Bistorta vivipara--Bistort  
Caltha leptosepala--Marsh-Marigold  
Campanula rotundifolia--Harebell  
Castilleja miniata--Scarlet Paintbrush  
Castilleja occidentalis--Western Yellow Paintbrush  
Castilleja rhexifolia--Rosy Paintbrush  
Castilleja sulphurea--Northern Yellow Paintbrush  
Cistium beeringianum--Alpine Mouse-ear  
Cirsium scopulorum--Alpine Thistle  
Clementsia rhodantha--Queen's Crown  
Dodecatheon pulchellum--Shooting-star  
Dryas octopetala--Mountain Avens  
Equisetum arvense--Field Horsetail  
Chomerion angustifolium--Fireweed  
Erigeron melanocephalus--Black-headed Daisy  
Erigeron peregrinus--Lavender Daisy  
Erigeron pinnatisectus--Cut-leaf Daisy  
Erigeron simplex--Alpine Daisy  
Erigeron sp.--Fleabane Daisy  
Tonestus pygmaeus--Haplopappus  
Heterotheca fulcrata--Golden Aster  
Heuchera sp.--Alum-root  
Hymenoxys acaulis var. caespitosa--Actinea  
Hymenoxys grandiflora--Old-Man-of-the-Mountain  
Juncus drummondii--Drummond's Rush  
Lewisia pygmaea--Pigmy Bitter-root  
Lloydia serotina--Alp Lily  
Lonicera involucrata--Bush Honeysuckle  
Lupinus argenteus--Common Lupine  
Mertensia ciliata--Tall Chiming Bells  
Mertensia viridis--Green Mertensia  
Oreoxis alpina--Oreoxis  
Oxyria digyna--Alpine Sorrel  
Pedicularis bracteosa--Lousewort  
Pedicularis groenlandica--Elephantella  
Pedicularis racemosa--Curled Lousewort  
Penstemon alpinus--Alpine Penstemon

Penstemon virens--Small Flowered Beard-tongue  
Penstemon whippleanus--Dusty Penstemon  
Pentaphragmoides floribunda--Shrubby cinquefoil  
Phleum sp.--Timothy Grass  
Polemonium delicatum--Jacob's Ladder  
Polemonium viscosum--Sky Pilot  
Potentilla diversifolia--Subalpine Cinquefoil  
Primula parryi--Parry's Primrose  
Ramischia secunda--One-sided Wintergreen  
Ranunculus inamoenus--Unpleasant Buttercup  
Ribes montigenum--Subalpine Prickly Currant  
Rhodiola integrifolia--King's Crown  
Rumex crispus--Curly Dock  
Saxifraga hyperborea ssp. debilis--Pygmy Saxifrage  
Saxifraga rhomboidea--Snowball Saxifrage  
Sedum lanceolatum--Stonecrop  
Senecio canus--Woolly Groundsel  
Senecio sp.--Groundsel  
Senecio triangularis--Butterweed  
Sibbaldia procumbens--Sibbaldia  
Silene acaulis--Moss Campion  
Solidago multiradiata--Goldenrod  
Taraxacum officinale--Common Dandelion  
Thermopsis divaricarpa--Golden Banner  
Trifolium dasyphyllum--Whiproot Clover  
Trifolium parryi--Rose Clover  
Trollius laxus--Globeflower  
Vaccinium caespitosum--Dwarf Bilberry  
Vaccinium myrtillus--Mrytle Blueberry  
Veronica wormskjoldii--Alpine Speedwell  
Zygadenus elegans--Death Camas

--Miriam Denham  
 Mary Jane Foley  
 Bob Heapes

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The Golden Gate State Park trip unfortunately was cancelled for lack of interest, but we will probably schedule that trip next year. It is close to the Denver Metro area and offers an enormous number of flowers, some being unusual. It seems only right that we take advantage of this. Bill and Berta Anderson and Bob and Ann Heapes observed the area the week before, and the list that was compiled follows.

Achillea lanulosa--Yarrow  
Agoseris glauca--False Dandelion  
Allium geberi--Wild Onion  
Anemone canadensis--Meadow Anemone  
Anemone multifida--Wind Flower  
Aquilegia caerulea--Blue Columbine  
Aquilegia caerulea var. daileyae--Spurless Columbine

Arabis fendleri--Rock-cress  
Arctostaphylos uva-ursi--Kinnikinnik  
Arenaria fendleri--Sandwort  
Arnica cordifolia--Arnica  
Arnica latifolia--Arnica  
Astragalus adsurgens--Milk Vetch  
Astragalus alpinus--Alpine Milk Vetch  
Bistorta bistortoides--Bistort  
Campanula rotundifolia--Harebell  
Castilleja linariaefolia--Wyoming  
 Paintbrush  
Castilleja miniata--Scarlet Paintbrush  
Castilleja sulphurea--Yellow Paintbrush  
Cerastium arvense--Mouse-ear Chickweed  
Chamerion angustifolium--Fireweed  
Chenopodium capitatum--Strawberry Blite  
Cirsium parryi--White Thistle  
Collomia linearis--Collomia  
Crucifera chomissoi--Water Spring  
 Beauty  
Delphinium ramosum--Larkspur  
Dodecatheon pulchellum--Shooting-star  
Draba aurea--Golden Draba  
Drymocallis fissa--Sticky Cinquefoil  
Erigeron divergens--Spreading Fleabane  
Erigeron elatior--Tall Fleabane  
Erigeron flagellaris--Trailing Fleabane  
Erigeron speciosus--Showy Daisy  
Eriogonum umbellatum--Sulphur Flower  
Erysimum asperum--Western Wallflower  
Fragaria ovalis--Strawberry  
Fraseria speciosa--Monument Plant  
Gaillardia aristata--Blanket-flower  
Galium boreale--Bedstraw  
Geranium caespitosum--Common Wild  
 Geranium  
Geranium richardsonii--White Geranium  
Hackelia floribunda--False Forget-me-not  
Harbouria trachyleura--Whiskbroom  
 Parsley  
Helianthella quinquenervis--Little  
 Sunflower  
Heracleum sphondylium ssp. montanum--  
 Cow Parsnip  
Hydrophyllum fendleri--Water-leaf  
Ipomopsis candida--White Gilia  
Lappula redowskii--Stickseed  
Ligusticum porteri--Loveage  
Lilium philadelphicum--Wood Lily  
Linaria vulgaris--Butter-and-eggs  
Lonicera involucrata--Bush Honeysuckle  
Lupinus argenteus--Common Lipine  
Mertensia ciliata--Tall Chiming Bells  
Mertensia lanceolata--Bluebells  
Oenothera caespitosa--Stemless Evening-  
 primrose  
Oenothera coronopifolia--Cut-leaf  
 Evening-primrose  
Oenothera strigosa--Common Evening-  
 primrose  
Oxytropis lambertii--Colorado Loco  
Oxytropis sericea--White Loco  
Pedicularis groenlandica--Elephantella  
Penstemon alpinus--Alpine penstemon  
Penstemon virens--Foothills Penstemon  
Pentaphragmoides floribunda--Shrubby  
 cinquefoil

Physocarpus monogynus--Ninebark  
Polemonium foliosissimum--Leafy  
 Jacob's Ladder  
Potentilla gracilis--Cinquefoil  
Potentilla pennsylvanica--Prairie  
 Cinquefoil  
Prunus virginiana--Choke Cherry  
Pseudocymopterus montanus--Yellow Mountain  
 Parsley  
Rosa woodsii--Wild Rose  
Rubus idaeus--Wild Red Raspberry  
Rudbeckia hirta--Black-eyed Susan  
Rudbeckia laciniata--Tall Coneflower  
Scutellaria brittonii--Skull-cap  
Sedum lanceolatum--Stonecrop  
Senecio fendleri--Golden Ragwort  
Stachys palustris--Hedge-nettle  
Symphoricarpos occidentalis--Snowberry  
Taraxacum officinale--Dandelion  
Thalictrum fendleri--Meadow-rue  
Thermopsis divaricarpa--Golden Banner  
Thlaspi arvense--Penny-cress  
Tragopogon dubius--Salsify  
Valeriana edulis--Valerian  
Zygadenus elegans--Death Camas

--Bill & Berta Anderson  
 Bob & Ann Heapes

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The CONPS at Raven Ridge.

An enthusiastic crowd rallied on the morning of 28 June in Meeker, Colorado, to begin the botanical and geological excursion into the Piceance Basin. Participants came from Longmont, Boulder, Denver, La Junta, Hotchkiss, Ft. Collins, Craig, Vernal, and Salt Lake City. Karen Wiley-Eberle and I would like to thank all of you who travelled so far to make the trip a success. Additionally, CoNPS would like to thank the Vernal and Craig BLM districts for their cooperation.

We left Meeker and entered the Piceance Basin at Rio Blanco. The first stop, along Piceance Creek, where the Mahogany zone of the Green River formation was exposed, was to visit a site inhabited by U. fescue (Festuca dasyclada) and Barneby's columbine (Aquilegia barnebyi). By the time we had departed the site, we had tentatively identified almost everything in the area.

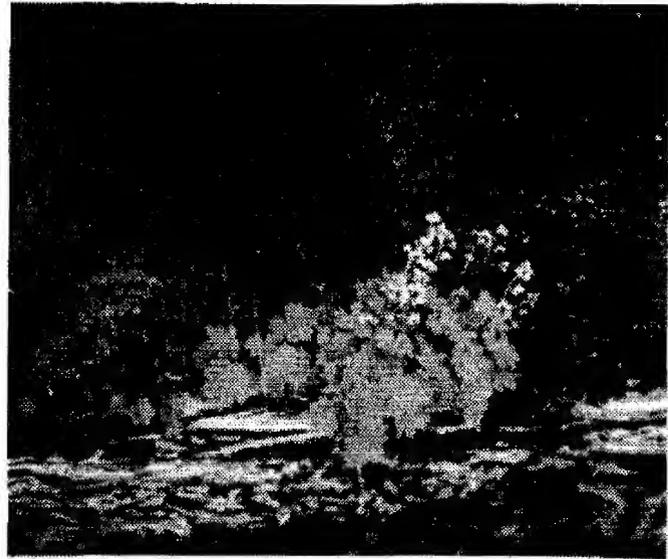
We then journeyed on to the C-b Oil Shale Tract leased by Occidental Petroleum, and met with Ed Baker, Environmental Coordinator. We looked over the site and were given an informative slide presentation of their operation. After the presentation, we had lunch at the site, and had an opportunity to further discuss energy development and its effect on the Basin with Ed.

We left Piceance Creek and made our way up Ryan Gulch, westward toward Cathedral Bluffs, stopping first to view the Dragon milkvetch (Astragalus lutosus) and the plants associated with its unique habitat. Several other stops were made to investigate the various vegetation zones as we proceeded higher in elevation. When we reached the crest of the Basin, we stopped and hiked to the edge to absorb the monumental view of the Cathedral Bluffs (proposed as a Colorado Natural Area).

Our last stop of the day was aimed at locating a "hanging garden" containing Sullivantia purpusii, a unique species in western Colorado. We were fortunate and did find this veritable oasis in the high desert, in which even existed a liverwort (Marchantia spp.). A very pleasing end to a long day.

Sunday morning, we departed Meeker and headed westward for Raven Ridge (located northwest of Rangely, of which a portion is proposed as a Colorado Natural Area). Outside of Meeker, we stopped to view the debris milkvetch (Astragalus detritalis), which appears to be quite rare in Colorado, though it is locally common in parts of northeastern Utah. After passing through the Rangely oil fields we stopped at Raven Ridge, an extrusion of a white shale member of the Green River formation upon which plants found in northeastern Utah can be found in Colorado. Those that we viewed included the following species: C. tantha rollinsii, Bolophyta ligulata, Mirabilis alipes, Penstemon grahamii, Chamaechaenactis scaposa, and Eriogonum ephedroides. Unfortunately, the herbaceous members were already at the fruiting stage. All in all, this

trip gave us a brief look at two of the



Sullivantia purpusii at Cathedral Bluffs.  
Note water falling on each side of plant.

more unique areas of our state, and allowed us a closer view of some of the more unusual native plants. [Participants may contact me if they desire a list of their fellow participants.]

--J. Scott Peterson

#### CoNPS ANNUAL MEETING

Speaker: Eldie W. Mustard  
State Biologist, Soil Conservation Service

Subject: Wetlands Versus Agricultural Lands: Perspectives on Values and Trade-Offs

Mr. Mustard is highly qualified in the field of wetland values and preservation. He has conducted studies on the Colorado River Salinity Control, San Luis Valley wetland habitat, Walden Pond restoration in Boulder County and other related projects. The speaker's emphasis will be on critical habitats or sites, and their importance for the perpetuation of numerous plant species that have severe site limitations. Included will be a discussion of land use and land use ethics.

Place: Denver Botanical Gardens, October 25 at 1:00 p.m.

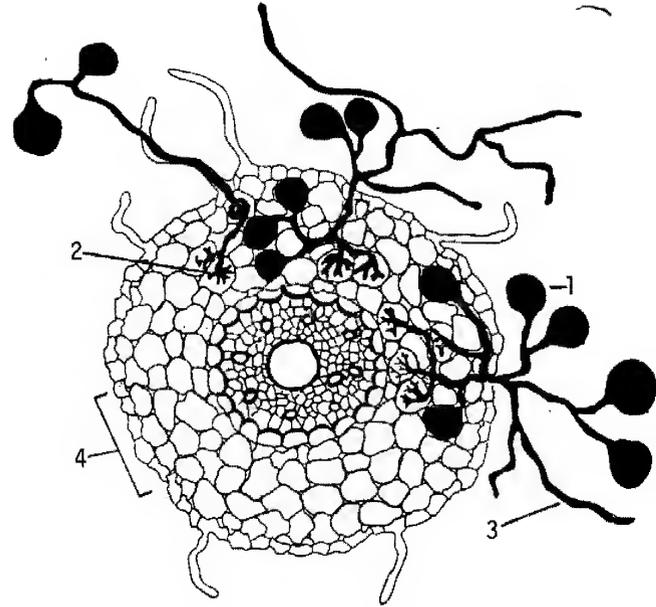
The election for five directors for 1981 will also occur at this meeting. Those directors whose term will be ending are as follows: Miriam Denham, Virginia Dionigi, Hugo Ferchau, Scott Peterson, and Mark Phillips. Nominations for the election are provided by a nominations committee and by petition from the general membership as provided for in the bylaws.

#### SYMBIOTIC COHABITATION ON THE WESTERN SLOPE

The majority of vascular plants growing under natural conditions are actually dual organisms, the plant and root fungi. This association of a root and a fungus has been given the name mycorrhiza. It has been shown that the fungus aids the plant in nutrient and water uptake, and the fungus gains the benefit of being supplied nutrients by the host plant, resulting in a symbiotic relationship.

There are three basic types of mycorrhizae: ectomycorrhizae, ectendomycorrhizae, and endomycorrhizae. Most of the research up to the present time has been done on ectomycorrhizae, which are associated primarily with timber species, such as the economically valuable Pinaceae (Pine Family) and Fagaceae (Oak Family). The fungus is visible externally as a mantle on the root. The second type, ectendomycorrhizae, is similar to ectomycorrhizae, except that the tubular filaments (hyphae) of the fungus penetrate the root cells. This type is found mainly in members of the Ericaceae (Heath Family).

The most ubiquitous type of root/fungus relationship is the endomycorrhiza. The morphology of the endomycorrhizal fungus is extremely variable. Generally, there is a loose hyphal network that surrounds the root. As illustrated in the line drawing below, the ends of this network terminate in bulblike structures called vesicles. These can occur either in the soil or the root cortex. The vesicles contain droplets of oil and function as food storage organs or reproductive structures for the fungus. Another interesting phenomenon of the endomycorrhiza is the formation of branching structures, known as arbuscules (little trees), from the hyphae within the root cortex. Recent research indicates that these structures function in the transport of nutrients, such as phosphorus, from the fungus to the root cell. Such mycorrhizae are referred to as vesicular-arbuscular mycorrhizae (VAM).



Cross-section of vesicular-arbuscular mycorrhiza. 1-vesicle, 2-arbuscule, 3-hyphae, 4-root.

With the increasing importance of energy resources (oil shale, tar sands and coal) on the western slope of Colorado and the semi-arid West, research on the revegetation of disturbed mine lands has become increasingly important. An important segment of this research has dealt with VAM and their importance in revegetation. Several studies have shown that indigenous VAM fungal populations on disturbed sites are severely reduced, potentially hampering the establishment of the original native community. Introduced species, such as *Salsola kali* (Russian Thistle), *Chenopodium album* (Lambsquarters) and *Chorispora tenella* (Blue Mustard), which become established on disturbed areas have been found to be nonmycorrhizal. Other studies being undertaken include long-term topsoil storage and the effects of retorted oil shale on mycorrhizal fungi.

We hope that this introduction to the microbiological part of the native flora will illustrate the importance of studying the nonvisible and underground portion of our Colorado native flora.

--Janine Sabaloni  
J. Scott Peterson