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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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 polyanthemos--Prickly Poppy
Artemisia filifolia--Silvery Wormwood
Artemisia frigida--Fringed Sage
Artemisia ludoviciana--Pasture Sage
Astragalus bisulcatus--Two-grooved Milkvetch
Astragalus crassicarpus--Ground Plum
Astragalus drummondii--Drummond Milkvetch
Bouteloua gracilis--Blue Grama Grass
Brassica rapa ssp. campestris--Broomrape
Bromopsis inerme--Smooth Brome Grass
Bromus tectorum--Cheatgrass
Buchloe dactyloides--Buffalo grass
Carex heliophila--Sedge
Castillija integra--Orange Paintbrush
Ceratoides 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 Puccoo
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 polycantha--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
Thalaspi 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 geyeri--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
Castillija miniata--Scarlet Paintbrush
Castilleja occidentalis--Western Yellow Paintbrush
Castillija rhexifolia--Rosy Paintbrush
Castilleja sulphurea--Northern Yellow Paintbrush
[illegible]stium 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
[illegible]tensia viridis--Green Mertensia
[illegible]oxis 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
Pentaphylloides 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
Senecoi sp.--Groundsel
Senecoi triangularis--Butterweed
Sibbaldia procumbens--Sibbaldia
Silene acaulis--Moss Campion
Solidego multiradiata--Goldenrod
Taraxacum officinale--Common Dandelion
Thermopsis divaricarpa--Golden Banner
Trifolium dasyphyllum--Whiproot C-over
Trifolium parry--Rose Clover
Trollius laxus--Globeflower
Vaccinium caespitosum--Dwarf Bilberry
Vaccinium myrtillus--Mrytle Blueberry
Veronica wormskjoldii--Alpine Speedwell
Zygadenus elegans--Death Camas

--Mirian 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 geyeri--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
Crunocallis chomissoi--Water Spring Beauty
Delphinium ramosum--Larkspur
Dodecatheon pulchellum--Shooting-star
Draba aurea--Golden Draba
Drymocollis 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
Frasera 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 trachypleura--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
Pentaphilloides floribunda--Shrubby cinquefoil
Physocarpus monogynus--Ninebark
Polemonium foliissisimum--Leafy Jacob's Ladder
Potentilla gracilis--Cinquefoil
Potentilla pensylvanica--Prairie Cinquefoil
Prunus virginiana--Choke Cherry
Pseudocymopterus montanus--Yellow Mountain Parsley
Rosa woodsii--Wild Rose
Rubus idaeus--Wild Red Rasberry
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 occidentallis--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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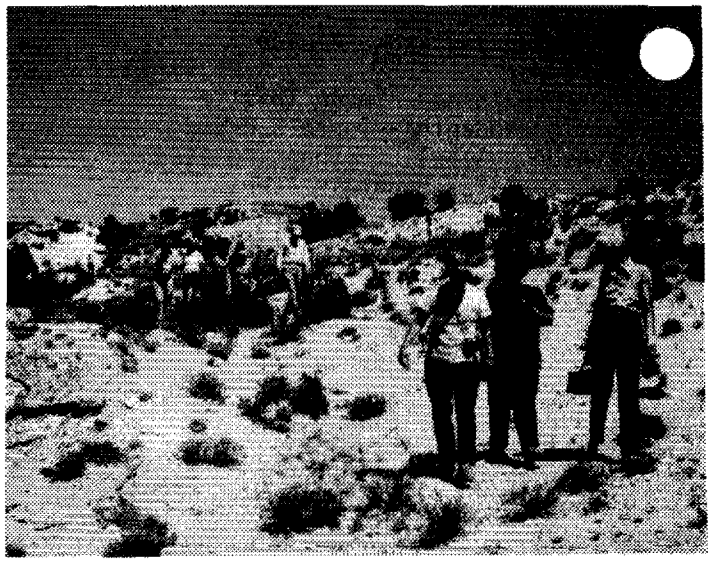


The CONPS at Raven Ridge.

An enthusiastic crowd rallyed 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.

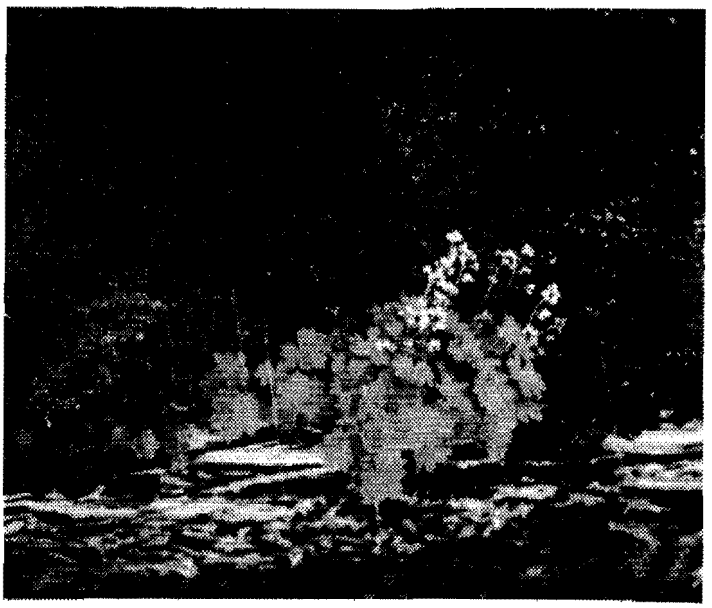
We left Meeker and entered the Piceance Basin at Rio Blanco. The first stop, along Piceance Creek, where the Mahogany zone of the Green River formation was exposed, was to visit a site inhabited by Utah fescue (Festuca dasyclada) and Barneby's columbine (Aquilegia barnebyi). By the time we had departed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



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

--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.

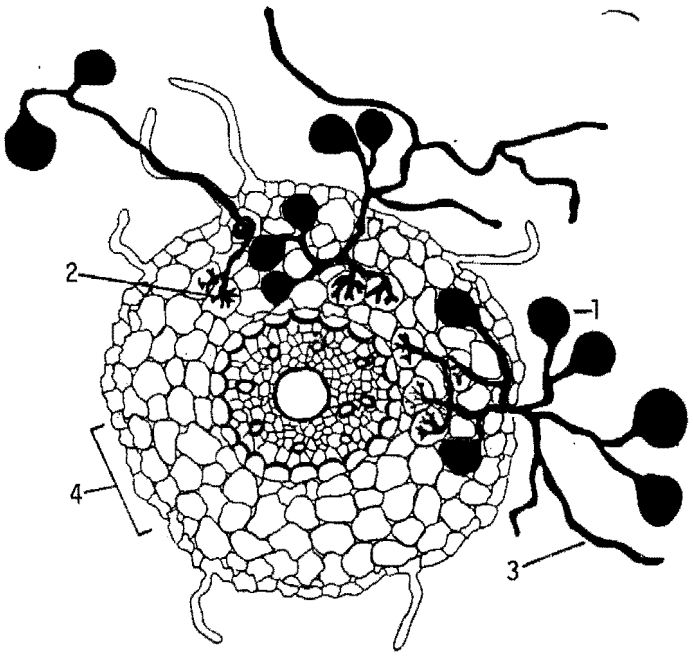
The election for five directors for 1981 will also occur at this meeting. Those directors whose term will be ending are as follows: Miriam Denham, Virginia Dionigi, Hugo Ferchau, Scott Peterson, and Mark Phillips. Nominations for the election are provided by a nominations committee and by petition from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