

Minutes from the First Annual Colorado Rare Plant Symposium

Steamboat Springs, Colorado

September 17, 2004

Overview

The symposium was held at the Olympian Hall in Steamboat Springs, Colorado, Friday, September 17, 2004, 1-6 p.m. It preceded the annual Colorado Native Plant Society (CONPS) meeting the following Saturday. It was attended by 55 people interested in botany and rare plants in Colorado, including government representatives, consulting groups, university and herbarium staff, Native Plant Society members, and the general public. The purpose of the symposium was to foster knowledge exchange and networking, and to provide updates to distribution, abundance, and threats of all federally listed Threatened, Endangered, or Candidate plants occurring in Colorado. It is hoped that the symposium will continue annually, with more plants being covered in future meetings.

Symposium agenda

Introduction- *Steve Popovich, USDA Forest Service*

Overview of Threatened, Endangered, and Candidate status Colorado plants- *Ellen Mayo, U.S. Fish and Wildlife Service*

Discussion and Presentation of Colorado's Threatened, Endangered, Candidate, and petitioned species- *Susan Spackman Panjabi, Colorado Natural Heritage Program*

Wrap-up and priority species - *Betsy Neely, The Nature Conservancy*

Informal dinner

Updated information gained at the symposium for each species reviewed, in the alphabetical order presented

***Astragalus humillimus* - Mancos Milkvetch**

Federal Status: Endangered (Also on Navajo Nation Endangered Species List)

Heritage Ranks: G1S1

Global distribution: New Mexico and Colorado

Last observed: 1989

Colorado occurrences: 4

Colorado individuals: 25,000

Primary threats: mineral, oil, and gas development, seismic exploration

Land Ownership: Ute Mountain Ute (Montezuma Co.)

Description: Mat forming perennial, purple flowers, spinescent leaf petioles from last year's growth, distinctive.

Habitat: Restricted to Point Lookout sandstone at south end of Mesa Verde

Juanita: disturbance from establishing gas wells can directly impact occurrences.

New Mexico people are monitoring this species.

Betsy Neely has seen this.

Don Hazlett: Arnold Clifford- Navajo botanist- good contact for this species. He might know of other populations.

Barry: sounds like more exploration is needed.

Ron: Ken Heil should be consulted.

Loraine: has seen this species near Farmington, NM.

Ellen: recovery plans for all species need to be revised

Barry: known since Brandegee found it in 1873.

***Astragalus osterhoutii* - Osterhout milkvetch**

Federal Status: Endangered

Heritage Ranks: G1S1

Global distribution: known only from Grand County, CO

Last observed: 1994

Occurrences: 9 (previously 10- one was flooded by Muddy Creek Reservoir).

Individuals: 25,000-50,000

Primary threats: recreation, mining, oil and gas development

Land ownership: BLM, private, state

Description: large, erect plant with creamy white flowers. Nectar robbing occurring on plant in photo.

Habitat: seleniferous clay soils (Niobrara, Pierre, and Troublesome Formations).

Barry: Any problem with weed control?

Susan: Carol Dawson did her dissertation.

Barry: road maintenance along highways may be an issue.

Tom: Carol monitored it from 1992 through 2001. Between 11 and 25 percent of it was destroyed where she was working, at the Wolford Reservoir between the reservoir and highway 40. Remainder of occurrence near dam has been fenced off, no human traffic.

Erin Foley: Chuck Cesar has been overlooking lots of populations near the reservoir. **A new population has been found** 1 mile north of Kremmling office, in a heavily used area with ATV tracks (BLM called this a "sacrifice area"). She has revisited other occurrences too.

Barry: take recreation threat off the list of threats?

Susan: seems like the habitat fragmentation is still an issue.

Erin: the area of *A. osterhoutii* is open to cross country travel in latest travel management plans

Tom: just south of reservoir a population has been grazed by horses for many years. Prolonged dormancy (can be four years). Lives 20 to 50 years. Seedlings germinated in early nineties still haven't flowered. Carol has tried to grow this for a long time unsuccessfully. Can get it to germinate but not grow. Even tried four-foot long tubes for root growth.

Barry: frustrating when visits are made but size of population is not assessed.

***Astragalus tortipes* - Sleeping Ute Milkvetch**

Federal Status: Candidate (also on Navajo Nation Endangered Species List)

Heritage Ranks: G1S1

Global distribution: Colorado

Last observed: 2000

Occurrences: 2

Individuals: 2000-3000

Primary threats: McPhee Reservoir canals, agricultural development

Land ownership: Ute Mountain Ute

One of the most recently described species in Colorado (in 1994, by J. Anderson and J. M. Porter). Common within its narrow range.

Description: a tall plant with conspicuous yellow flowers. Pedicel twists when ripe, and fruit is erect (distinguishing feature).

Habitat: found on lower slopes of Sleeping Ute Mountain. Gravels over Mancos shale.

Barry: hasn't been a complete inventory. More inventory work is needed on this species.

Marilyn Colyer did a survey of the known range of this species.

Dave: ORV impacts are becoming severe.

Ellen: USFWS started negotiations for its protection with the tribe, but these did not go anywhere.

Erin Robertson: all Candidate species have now been petitioned for listing.

***Botrychium lineare*- Narrowleaf grapefern**

Federal Status: Candidate (FS sensitive species list)

Heritage ranks: G1S1

Global distribution: New Brunswick, Quebec, Idaho, Montana, Oregon, California, Wyoming, and Colorado.

Largest populations in Montana.

Last observed: 2004

Colorado occurrences: 4 or more (known sites in Lake, El Paso, Boulder, Grand Counties; unconfirmed in Clear Creek, Summit)

CO individuals: about 60

Primary threats: weed invasion, road maintenance, possibly trampling/recreation, others?

Land ownership: USFS (Pike NF; unconfirmed on White River NF, historic presumed on Roosevelt NF), private, National Park Service, unconfirmed site on City of Denver (Mt Evans toll road)

Description: a very diminutive, inconspicuous dull green plant to 3 inches tall; ephemeral (mid-July to mid-August in CO) ephemeral, non-persistent.

Habitat: found in mixed height grassland in mixed deciduous/conifer forest; in Colorado mostly in subalpine historically disturbed areas at elevations roughly 7,800 to 10,750 feet.

Steve Popovich: Drs. Don Farrar and Cindy Johnson-Groh do an annual workshop on *Botrychium* species. The contents of the 2004 workshop are included in full as an electronic folder on the CNHP FTP site in a folder called USFWS_2004BotrychiumWorkshop.

Popovich update: About 29 populations world wide, 15 known to be extant. 13 are historic. One in CO near Leadville might be extirpated due to mining and a bicycle path. A biologist on the Arapaho-Roosevelt NF discovered a new site on Henderson Mine private property near Empire. Hands and knees are needed to find this species. May be 100s or thousands in MT. Only monitoring species wide is at Pikes Peak (contact: Steve Olson). Downward trend apparently, but difficult to say. Farrar now believes its ally *B. campestre* does not occur at high elevation sites; *B. lineare* is there instead. Farrar may publish *B. lineare* as an infraspecific subspecies under *B. campestre*. Won't affect listing status. Steve Popovich believes that it does not warrant listing. Can only manage where plant occurs, its not obviously habitat limited, so can't manage huge tracks of potential areas. Likes historically disturbed areas. *B. campestre* at Mt. Evans should now be considered *B. lineare*, according to Farrar. Broadmoor Garden Club has been actively monitoring this species at Pikes Peak, CO.

Ron: any *Botrychium* should not be listed because they cannot be easily found and true rarity is difficult to ascertain.

Barry: would be better to conserve this species through a network of natural areas.

Steve Popovich: "gobs" of moonwort (*Botrychium*) species have been found in 2004 in Forest Service lands in Colorado and Black Hills and Idaho. Seems to be good expression of *Botrychium* across large geographic area this year. Then why didn't we find more *B. lineare* – seems truly more rare than others.

Ana Child: it is possible to do DNA analysis on older *Botrychium* specimens. (Steve Popovich had said Farrar didn't want to analyze the Mt. Evans "*B. campestre*" specimen because of its age, but that it is best regarded as *B. lineare*).

The most up-to-date overview of *B. lineare* in Colorado is found in the Popovich 2004 report found on the web at <http://www.fs.fed.us/r2/projects/scp/assessments/popovich.pdf>.

***Eriogonum pelinophilum* - Clay-loving wild buckwheat**

Federal Status: Endangered

Heritage ranks: G2QS2

Global distribution: Colorado

Last observed: 1998

Occurrences: 23

Individuals: 30,000

Threats: residential and agricultural developments, ORV, overgrazing, oil and gas exploration.

Land ownership/ management: private, BLM

Distribution: Delta and Montrose Counties.

Description: sub shrub with tightly revolute leaves, creamy white flowers.

Habitat: Mancos shale badlands.

Some conservation easements and ACEC protection, also BLM RNAs.

Peggy: last observed in 2004.

Jim Reveal says this is distinct from *E. clavellatum* in his treatment for Flora of North America.

Barry: USDA PLANTS database synonymizes it with *clavellatum*- causes problems for him.

Ron: says taxonomy can't be controlled by federal status.

Andy Kratz: species can be delisted when they are synonymized.

Peggy: did surveys at Gunnison Gorge NCA. Looked at threats from ORV. Management plan is still being written. *E. pelinophilum* is not very threatened by ORV because it grows in flat sites. Most ORV use is up on hills in other parts of Gorge. However, other parts of this area are being heavily impacted by ORV use.

Erin: plan has been released now. CNE has protested this plan because it does not control ORV use.

Peggy: intensive use of the area is on hilly sites where *E. pelinophilum* grows. Probably great loss because it probably originally grew where the town of Montrose is now.

Ron Ewing: how do verify data from people with varied botanical skills?

Steve Popovich: might need verification from another person if you are unsure of what you are identifying.

Peggy: fragmentation and development are main threats.

***Eutrema penlandii* - Penland's alpine fen mustard**

Federal Status: Threatened

Heritage Ranks: G1G2S1S2

Global distribution: Summit and Park Counties, Colorado

Occurrences: 15

Individuals: 11,670

Primary threats: mining, recreation

Land ownership: private, USFS, BLM

Description: diminutive mustard, style is barely evident.

Habitat: Possibly connected with calcareous limestone substrates in wet alpine sites. Often at base of a snowfield where moisture is available all summer.

Kim Fayette has been doing her Master's Thesis on this species.

Barry: Benjamin Madsen did a survey of all known populations in 2003.

Barry: I wrote the report that led to its listing. Usually in moss next to small rivulets. Tass Kelso has done water chemistry work on it. Not found in shade.

Ana: is there still a question of its taxonomic distinctness from *E. edwardsii*.

Susan: yes, there is still a question. Weber still has it as a subspecies of *edwardsii*.

Ron: Al-Shebaz at MOBOT is working on mustards.

Barry: Weber thinks it is closer to being a full species than a subspecies.

Tom: Carol collected seeds in 92 and 93- these seeds are banked at Fort Collins, were used by Kim for her work.

Barry and Andy: American Mining company is a good contact. Had a vested interest in finding all of it. Didn't find more.

Susan: Mosquito Range is a hotspot for rare plants. The mining companies hotly contested

Mosquito Range RNA. Mining remains a big threat to plants there because of thousands of mining claims- change in economic viability of mining could cause mining to increase there.

BREAK

***Gaura neomexicana ssp. coloradensis* - Colorado butterfly plant**

Federal Status: Threatened (FS sensitive species)

Heritage ranks: G3T2S1

Global distribution: Wyoming, Nebraska, and Colorado.

Last observation in Colo: 1999; extant at Larimer/ Weld county border. One introduced population in Boulder County, and a historic location in Douglas County.

Colorado occurrences: 1 (previously 8). 23 rangewide.

Colorado individuals: 1000

Primary threats: grazing, hydrological alterations, weeds, and proximity to I-25

Land ownership: City of Ft. Collins, private, state

Description: white flowers fading to pink, fruit a four-angled hard nutlet. Biennial or short-lived perennial. Reddish color to foliage. Up to four feet tall.

Habitat: often grazed. Grazing might help - degree of threats not known. Sub irrigated wetlands in mixed-grass prairie.

Barry: do populations move around?

Jill: yes

Don: did a survey for USFWS. Appears to be in soil seed bank. Can pop up under favorable conditions. 55 reproductive individuals at Meadow Springs. Used a quantitative sampling method. At Warren AFB, appears to not move around. 110 stream miles of designated critical habitat. Surveyed 80 of these. 20 percent were rated poor. 30 were good and 30 were fair.

Greg Brown has done genetic work on this. Only looked at Warren AFB. Need to look at difference between *G. neomexicana* and *ssp. coloradensis*. Might be like the Preble's Meadow Jumping Mouse taxonomically. New pops found within 4 or 5 miles of the known populations. Thought that this plant flowered in late summer, but it was in full flower by first week of June, shedding seeds in July. In CO it is on clay-loam soil, where it flowers about 1 month later. All other pops are on sandy soil. Estimated over 20K reproductive individuals rangewide, even after a series of drought years.

Ellen: several years ago a pop was introduced by TNC near Westminster in Jefferson County.

Betsy: City of Westminster is managing it. It is a very small parcel that was willed to TNC

Andy: there was discussion of NRCS doing seed increasing to get seed for restoration efforts in WY. Don't know status of this: Mary Jennings is the contact for status of this. Need to assess genetics of the species first.

Tom: Center for Plant Conservation is doing seed collecting for this species.

***Ipomopsis polyantha*- Pagosa gilia**

Federal status: currently being evaluated for Candidate Status (FS sensitive species).

Heritage ranks: G1S1

Global distribution: Colorado, only known from Highway right-of-ways and private lands, centered on intersection of 160 and highway 84.

Last observed: 2004

Individuals: 10,000

Primary threats: residential development, road construction and maintenance, over grazing

Land ownership: private, highway right of ways

Habitat: outcrops of Mancos Shale with Ponderosa pine.

Andy: need to get seed into storage.

Peggy: most threatened on list.

***Lesquerella congesta* - Dudley Bluffs bladderpod**

Federal status: Threatened

Heritage ranks: G1S1

Global distribution: NW Colorado

Last observed: 2000

Occurrences: 9

Individuals: 100,000-500,000

Primary threats: oil and gas exploration, Nahcolite and oil shale mining, ORV, others

Land ownership: BLM, state, private

Description: a diminutive cushion plant in the mustard family; yellow flowers.

Habitat: Found on white shale of the Green River formation in the Piceance Basin.

Erin: a pipeline was planned to enter one of the ACECs but that was rerouted. Designated ACECs are functioning.

Tamara (BLM): have refused to allow pipeline to affect population.

Jeff Brasher: oils (hydroxy fatty acids) in *Lesquerella* species have value as a strategic material- might be able to use this to support conservation efforts. Research being done by Andrew Salywon with USDA in AZ. Also Dave Dierig.

Barry: lots of *Lesquerella* species have a natural affinity to disturbance. Does this one?

Susan: habitat has some level of natural disturbance.

Barry: if it can handle a little disturbance it is easier to conserve.

Tamara: only found on very barren vegetation. Appears to be out competed where other species are present.

Green River shales are constantly cascading down. Species living on them have adaptations to this.

***Pediocactus knowltonii* - Knowlton's cactus**

Federal status: Endangered

Heritage ranks: G1S1

Global distribution: New Mexico/Colorado

Last observed in CO: 1995

Occurrences: 3? in Colo; 1 NM

Individuals: 9000

Primary threats: cactus collection

Land ownership: private, Southern Ute

Habitat: Alluvial gravels in the Pinyon-juniper sagebrush zone

TNC established a preserve in NM to help the population recover. Had diminished to 100 individuals in 1978.

Peggy: need to delete Archuleta County record reported by J. Castellano (USFS).

Susan: some question as to whether there are still plants in Colorado.

Peggy: people in NM have said that there aren't any on CO side, or maybe only six or seven plants. Population to the north is not viable- a site was selected where it was transplanted to but it didn't work. Really only one population.

Barry: has been successfully transplanted. Hochstädter is a German propagator who has successfully reproduced it. Observed collection of the species.

Juanita (provided on September 20, 2004 after the symposium): John Kendall, T&E biologist with the BLM in New Mexico, has been involved in the survey and monitoring for this species.

Mr. Kendall has data from a BLM plot from 1991 to 2004. Bob Sivinski (MNG&F) monitors the only other known natural Knowlton's cactus population that falls on land owned by the Nature Conservancy (adjacent to the BLM plot). There are also some transplant sites on BLM land that are also monitored. Bob Sivinski also monitors these sites and has the data.

Contact information for John Kendall T&E Biologist:

Bureau of Land Management

1235 La Plata Highway

Farmington, NM 87402

(505) 599-8910

***Penstemon debilis* - Parachute Penstemon**

Federal status: Candidate

Heritage ranks: G1S1

Global distribution: Colorado; only in Garfield County

Last observed in CO: 1998

Occurrences: 5

Individuals: 6750

Primary threats: oil and gas exploration/development, oil shape development, and recreation

Land ownership: not owned by DOE. Only owned by private and BLM. Largest population is owned by Occidental Oil on Mt. Calahan.

Habitat: Mahogany zone of the Parachute member of the Green River Formation.

Recreational use is a potential problem- mainly hang glider use.

Nicola Ripley: monitoring with Carol Dawson and Carla Scheck- monitoring the Anvil Mines population. Second year of monitoring in 2004. It is a very healthy population. Hundreds of individuals. Need to drive through the Garfield landfill, and oil and gas development everywhere. Threatening to open another road.

Tamara: Occidental oil might have been sold to Encana Oil and Gas Co.

Susan: made a potential habitat map in 1995.

Peggy: petition for emergency listing now.

Erin: petitioned in March. Botanists have had difficulty getting access to Mt. Calahan.

***Penstemon grahamii* - Graham's beardtongue**

Federal status: Candidate

Heritage ranks: G2S2

Global distribution: Colorado/Utah

Last observed in CO: 2000

Occurrences: 39 rangewide; 8 in Colo.

Individuals: 5000 rangewide

Primary threats: oil and gas development, overgrazing

Land ownership: BLM

Description: plant with light pink flowers.

Habitat: Green River Formation, pinyon juniper zone.

Tamara: very restricted to the Raven Ridge area and adjacent Utah. Monitored by BLM from 1986 to 1995.

Susan: Utah occurrences have not been visited in a long time.

Erin: petitioned with Native Plant Society for listing. Most Utah sites were found in surveys in 1979 and 1982. Partnered with Vince Tepedino to monitor and document pollinators. Nothing in the works now on the petition. BLM has leased property in CO and UT for oil and gas.

***Penstemon penlandii* - Penland's beardtongue**

Federal status: Endangered

Heritage ranks: G1S1

Global distribution: Colorado

Last observed: 1994

Occurrences: 2

Individuals: 7500

Primary threats: road widening/maintenance, ORV use

Land ownership: BLM, private

Description: distinctive mat forming purple flower.

Habitat: Troublesome Formation in Troublesome Creek fine particle soils in sagebrush. Highly seleniferous soils.

Tom Grant: a spatial statistical analysis was done by Mark Mitten as an under graduate thesis. Mark now with Smithsonian.

Erin R.: Habitat is included in the Walford Mtn travel management plan. Area may still open to cross country travel.

Erin Foley: BLM monitoring it; Chuck Caesar aware of population. A high concentration found in disturbed area where there is a lot of motor vehicle use. Seems to respond well.

Susan Spackman: only a couple of occurrences.

Ellen Mayo: Chuck is aware of proposal to widen road and cut off portion of population.

John Proctor: Ernie Nelson has seen it. Need to contact him for more information.

***Penstemon scariosus* var. *albifluvis* - White River beardtongue**

Federal status: Candidate

Heritage ranks: G4T1S1

Global distribution: Colorado/Utah

Last observed: 1999 in Colo.

Occurrences: 13 rangewide; 1 in Colo.

Individuals: 23,000 rangewide; 50-100 in Colo.

Primary threats: over grazing, oil/gas development, and ORV use

Land ownership: BLM, private

Habitat: Green River shale.

Tamara: BLM is a good contact.

Erin T.: Saw on CONPS field trip in 2003, still there. Told by Rusty Roberts that it is on private land near White River but no idea how big, not documented. Mapped as going onto private according to Spackman.

Barry: are there taxonomic issues? Described by Larry England. Larry is lead on species. Not likely to be any taxonomic revisions any time soon.

***Phacelia formosula* - North Park phacelia**

Federal status: Endangered

Heritage ranks: G1S1

Global distribution: Colorado

Last observed: 2004

Occurrences: 9

Individuals: 8000

Primary threats coal, oil, and gas exploration/mining; over grazing, ORV use

Land ownership: BLM, private, USFWS

Habitat: Habitat shale barrens, sparsely vegetated. Fine particle soils. Substrates are susceptible to erosion. OHV has severe impacts on easily eroded slopes where *P. formosula* occurs. In North Park it is found on the Coalmont formation.

Georgia Doyle: a new site has been confirmed in Larimer County for either *P. formosula* or

glandulosa. Duane Atwood has looked at the specimens and indicates that they may be *P. formosula*; their identity is currently undetermined. At least three occurrences were found in the Laramie River Valley in 2004. Occurrences in North Park and Larimer County occur on different geologic strata.

In North Park it is found on the Coalmont formation, while it is found on Niobrara shale in the Laramie River Valley. At one site in Larimer County it was found on the upper slope, with *Eriogonum exilifolium* below it. It often occurs with *E. exilifolium* (G3S3).

Natural areas monitoring. Is it still going on?

Tom: 10-15 plants were lost at a CNAP site in North Park. Aimy Bauer is the contact in Walden. She is with Owl Mtn Partnership.

Sandy Slianiau (970) 723-4736.

Chuck Cesar interested/monitoring in 2004.

Arapaho wildlife refuge site.

Georgia: more inventory work is needed in the Laramie River Valley for this species and for others including *E. exilifolium* and *Haplopappus wardii*.

***Phacelia submutica* - DeBeque phacelia**

Federal status: Candidate (FS sensitive species)

Heritage ranks: G4T2S2

Global distribution: Colorado

Last observed: 2004

Occurrences: 27

Individuals: 25,000

Primary threats: oil and gas development, over grazing, ORV use, oil shale mining

Land ownership: BLM, private, USFS, DOD

Habitat: brown outcrop, Wasatch formation in PJ. Up high on slope. Road north out of DeBeque on brown clay and grey clay.

Barry: two inches of effective soil before get to hard claypan. Nothing much else growing there. Small patches in shallow soils. Not outside patches. Fluctuates year to year as an annual. Some years see none. Others get a flush. Only found in Garfield County on barren clay outcrops.

Nicola: looked at the site in habitat slide this year; it is still extant. Found on Atwell Gulch and Shire members of Watsatch formation.

Lisa Tasker: have aerial photos of occupied areas.

Peggy Lyon: new populations found along potential pipeline route. Not along but within a few yards of pipeline route.

Erin R.: will be looking at *Phacelia submutica* next, will do a species status review. Oil and gas development are a threat.

***Physaria obcordata* - Piceance Twinpod**

Federal status: Threatened

Heritage ranks: G2S2

Global distribution: Rio Blanco county, Colo.

Last observed: 2000

Occurrences: 12

Individuals: 23,000

Primary threats: oil and gas exploration/mining; over grazing, ORV use, Nahcolite mining, trampling by wild horses

Land ownership: BLM, private, state

Habitat: Piceance Basin endemic. On white outcrops of the Green River Shale. Plants on steep shale slopes.

Mary Fisher: my husband and I are land stewards in Upper Greasewood Creek. Searched and found 20 plants. Have excellent pictures. As a steward we go every year. Four wheel drive in.

Erin R.: BLM offered lease in ACEC with stipulations; ACECs functioning.

Susan Spackman Panjabi: management plans are critical, need to be written.

Jeff B.: *Physaria* and *Lesquerella* might have the same chemical compounds of interest to military or public safety and could provide some protection.

Physaria and *Lesquerella* may be moved to the same genus.

***Ptilagrostis porteri* - Porter's feathergrass**

Federal status: Petitioned (FS and BLM sensitive species)

Heritage ranks: G2S2

Global distribution: Colorado

Last observed: 2004

Occurrences: 25

Individuals: 408,000

Primary threats: water development; over grazing, peat mining, ditching

Land ownership: USFS, private

Description: awns feathered and distinctive

Habitat: grows in peat lands. Fen habitat.

Barry Johnston: wrote species assessment, will be available on Internet.

Barry summarizes: Historical in Lake CO. Not rediscovered and Brian couldn't find around Twin Lakes but map accuracy is low. Not known how far from Twin Lakes.

Don't think grazing is a threat. Suggestions that grazing is slightly beneficial. Occurs in wetlands but not in true fens. Think it is a willow carr species. Areas with hummocks.

Transitional situation. Largest population is in E. Lost Park. Calculated 380,000 plants. So much larger than any others that wonder if more out there like that. 3 pops on NFS lands

monitored for 6 or 7 years. So far shows some slight declines not statistically significant so far. One where increase, and is grazed. One where decreased, and isn't grazed.

Steve Olson overseeing monitoring on FS sites.

Placer Mining Club. Permit doesn't allow them to dig into population but right next to it.

Peat mining only occurred on private lands. Must have had an impact. Likely lost a bunch of populations. No one has observed that.

Generally willows dominate on hummocks. In low are tufted hair grass, *Carex utriculata*, etc. Not in wetter parts.

Allotments in S. Park up for re-permit. Recommends East Lost Park be a Designated Natural Area.

Other sites no one has visited recently. A lot of country needs to be surveyed. A lot of private lands.

Erin R.: add water depletion as threat in South Park. Dewatered much of South Park. Oil and gas new threat. BLM leased most land with mineral rights in the past few months. Two private populations leased mineral rights in Feb. 2004. Deadline for 90 day preliminary finding is Feb. or March 2005.

Barry: there is a wetland protection effort in place in South Park. Local groups are trying to conserve resources in S. Park. Park County is trying to preserve the species.

Denise Culver looked for/didn't find. Is it on State Land?

Tim Hogan: East Lost Park site had more cattle than permitted for a few years. This is first year of suspension of grazing permit due to abuses.

***Sclerocactus glaucus* - Uinta Basin hookless cactus**

Federal status: Threatened

Heritage ranks: G3S3

Global distribution: Colorado/Utah

Last observed: 2001

Occurrences: 90-100 in Colo.

Individuals: 7600 in Colo.

Primary threats: oil and gas development; residential development, cactus collecting

Land ownership: FS, BLM, private, state

Habitat: alluvial material along major rivers; Colorado River, Green River and Gunnison River. A lot of habitat is in PJ zone.

Karen Caddis: folks with Mesa State looking at pollination, mycorrhiza and transplanting. Eric Rachel had 90% success in transplant with correct technique. Eric suggests get as much of the soil around plant to keep the mycorrhiza, find a nurse plant. Dig hole. Spray water in hole. Plant it to the scar where soil was. Found that when transplanted, plants emits stress signal and get attacked. Put cages around to protect it from attack.

Barry: Hochstädter has data re splitting off UT populations to *S. wetlandicus*.

Susan: lots of EORs but most are small or even individual plants.

Forest service also has one occurrence.

Peggy: small occurrences can be under reported because takes time to count and they are small.
Larry England the primary authority on plant, would like to keep it listed, even if split from UT populations.

How threatened is this? Barry thinks not threatened. Consensus of group is not threatened!!!!

***Sclerocactus mesae-verdae* - Mesa Verde cactus**

Federal status: Threatened

Heritage ranks: G2S2

Global distribution: Colorado/New Mexico

Last observed: 2004

Occurrences: 79; (23 in Colo.)

Individuals: 2000+ in Colo.

Land ownership: Ute Mountain Ute

Primary threats: oil and gas development; cactus collecting, ORV use.

Plant monitored for last 19 years. Janet Coles produced report. Mortality observed in recent years in response to drought conditions or beetle eating flowers. Plants have been observed 19 years and long lived.

Barry: Someone (Barry?) has a map of dead PJ, coyotes, and development. No single culprit killing plants.

Juanita Ladyman: ATV traffic increase incredible and *Sclerocactus* sites hammered. You can't find any, where once were thousands and thousands.

Barry: on Fed lands NEPA.

Juanita: oil and gas in the area.

Rob: Eric Lane mentioned reports about an exotic cactus moth that is spreading across the southern U.S.

Juanita: it's the *Cactoblastus* moth. Came into Florida and has been heading west. It was used in Australia as a biocontrol but is causing problems here.

Andy: thinks it is specific to the genus *Opuntia*- therefore may not threaten *Sclerocactus*.

Barry: many insect species haven't yet been described.

***Spiranthes diluvialis* - Ute ladies'-tresses**

Federal status: Threatened

Heritage ranks: G2S2

Global distribution: Colorado, Idaho, Washington, Montana, Wyoming, Nevada, Utah, Nebraska

Last observed: 2004

Occurrences: 17 in Colo.

Individuals: 5000-10,000 in Colo.

Land ownership: NPS, Cities of Fort Collins, Boulder, and Wheatridge, Jefferson County, USFWS.

Primary threats: weeds, residential development, and hydrological alterations/water depletions.

Habitat: sub irrigated wetlands, also along creeks, often with *Juncus balticus*.

Stan: discovered it along Clear Creek in Golden. 100's of plants growing there. Tremendous growth in favorable years.

Susan: Rick Brune has also noticed populations this year where they haven't been seen before.

Bruce Rittenhouse: Confirmed this observation.

Barry: seeds are tiny. Habitat management efforts will help the species much more than working on the species by itself.

Don: probably a subterranean perennating organ.

Denise: Yellow ladies' slipper appears sometimes at new sites, but this can be due to seeds washing down.

Ana Child: said her PhD on *Spiranthes diluvialis*.

Don: no record in Bible of Mary wearing tresses. Thus the oral tradition of this name may only be preserved in the common name. Question: why don't *Gaura* and *S. diluvialis* grow together?

Barry: sensitivity to habitat may be undetectable- could be very sensitive to habitat variables that we do not understand.

Steve Popovich: Ellen, where are we with the recovery plan for *Spiranthes*?

Ellen: Lucy Jordan in Salt Lake City has a new draft of the recovery plan. Ellen does not know what the status of it is.

Denise: Other good contacts for Boulder are Kathy Damas and Lynn Reidel. The largest known population. Manage with fire, mowing, grazing, and haying. Appears to be successful. Ana Aft also did her work at this site.

Steve Popovich: there is a interim survey protocol guide written by the Colorado USFWS Field Office in Denver. You should be qualified by that guide to look for *Spiranthes*. Check with Ellen Mayo, who keeps a list of those qualified.

BREAK

Wrap-up and priority species - Betsy Neely

Which species reviewed appear most imperiled? What actions are needed to protect these species?

Criteria to consider for selection on top five or more list: Recovery, Inventory, Listing, Land Protection, Active Management, Research, and Documented Declines.

By audience participation, the top 8 plants of most concern were determined to be (listed in order of priority):

Ipomopsis polyantha

Peggy: Currently has no federal status, extremely threatened, very small range. Has potential for active management, possibly cultivation in protected areas. Needs leadership for conservation action; needs land protection.

Ellen: may not be considered for candidate status this year.

Erin: listing is just a tool to achieve conservation goals.

Notes: needs land protection immediately.

Sclerocactus mesae-verdae

Barry: Needs research. Has high mortality.

Juanita: Janet Cole's 19-year monitoring study is excellent. Only on Navajo and Ute land.

Notes: need to identify causes of mortality. Impacted by off-road vehicles damage. Need to explore land management options.

Phacelia submutica

Juanita: Declines have been observed.

Susan: oil and Gas development is a very serious threat to P. submutica, also to Penstemon debilis.

Brian Elliott: need multi-year studies.

Susan, Nicola: needs land protection.

Notes: have observed definite declines, but are these annual variation or real declining trends?

Needs immediate land protection. More inventory work is needed.

Astragalus osterhoutii

Needs land protection and management action, more inventory and assessment of threats from ORV.

Penstemon penlandii

Land protection is needed (only two occurrences). ORV use is serious threat. Need to investigate potential damage of future widening of Troublesome Creek road (planned).

Barry: this species needs work on propagation and planting seeds in unoccupied habitat. Needs inventory.

Notes: only known from two populations. Needs land protection and inventory. Threats from ORV, recreation, and road building are increasing.

Gaura neomexicana ssp. coloradensis

Erin: sites she visited were badly overgrazed. Needs active management and land protection.

Need land owner education to reduce grazing; most populations on private land.

Steve Popovich: Don H. thinks that current management is ok, and that there seems to be sufficient sites and persistence to perhaps consider delisting if management can be effected.

Pediocactus knowltonii

Betsy: will contact peers about seed collection and current status.

Tom: Partners for Colorado Native Plants- potential source of crews to do some volunteer or contracted survey work.

Notes: research is needed on the known populations (see discussion above for notes on ongoing monitoring and available data). More introductions may be needed.

Physaria obcordata* and *Lesquerella congesta

More inventory and surveys are needed immediately. Pipelines are proposed that pose an immediate threat to populations of these species.

Questions from symposium

Question

Where does one get copies of the most current recovery plans and designations of critical habitat or CCA's for the species we reviewed? Are these all available on a USFWS web site? If not, tell me where I can get them. Which species have recovery plans? Which have designation of critical habitat? Which have both? Which are in the works -- for those, who would I contact to ask about info?

Answer

There are no current recovery plans for the reviewed listed plant species. The existing older recovery plans, which need to be updated, are available as a PDF file from Ellen Mayo. Colorado butterfly plant is the only species with designated critical habitat. There are as yet no candidate conservation agreements (CCA's) for plants in Colorado. Most CCA's are for animals, although some for plants are being used in other western states.

Question

Clarify how to positively field identify a plant if one prefers not to or is prohibited from collecting a sample, for example, if the plant is Endangered. What is the best way to properly field identify a Threatened, Endangered, Proposed or Candidate plant without collecting it?

Answer

Don't collect plants or even any plant parts for any Threatened, Endangered, Proposed, or Candidate species unless you have a proper legal authority to do so. Authority is determined only by the US Fish & Wildlife Service under special conditions.

To identify the plant without disturbing it, try the following.

- 1) Take a competent authority with you to the field. This is the best method. You may have to bribe the person with ice cream, but often the person will go of his or her own free will, as he or she is as enthusiastic about the find as you are!
- 2) You may need to observe the plant when the needed identification parts are doing their thing, e.g., in flower or fruit. Go back again if you need to come at a later time. If you are too late, it may be difficult to accurately identify plants for that season.
- 3) Take good close-up and general occupied habitat color photos or videos in the field, and take good notes specifically describing the parts needed for positive identification. Take close-up photos of those specific parts. Know what the parts and colors and lengths and so on are before you go to the field. Too many photos are better than too few. Also, note the occupied habitat – soil, particular type of rock outcrop, slope, aspect and elevation may be critical. Show these photos or videos to an expert.
- 4) Before you go back to a site to try a better identification armed with new info, review the plant and its look-alikes in the herbarium using known samples and compare that to what you see in the field. Using a plant key, run the key through the herbarium samples, noting the key's differences between the look-alikes and the rare plant of interest. Or, ask the herbarium staff to point out the differences to you. Then, try to use the key in the field, remembering and repeating what you saw in the herbarium. It is OK to touch the

plant, but not to damage it in any way or pull off plant parts.

- 5) If available, take existing photos of the rare plant and its look-alikes to the field with you and compare them to the plants you see. Many if not all of the rare plants we discussed have good-quality photos available.
- 6) If you can't positively identify the plant, fill out a CNHP new site report form anyway (!) and **state that the identification is uncertain**, and tell how you tried to identify it. If it was positively identified, state how that was achieved (e.g., "Ellen Mayo (USFWS) identified the plants with me in the field on June 5, 2004, after I promised her two ice creams.")

There is a web site <http://endangered.fws.gov> with printable handouts. Three of the available papers are entitled "Listing a Species as Threatened or Endangered", "Permits for Native Species", and "Candidate Conservation Agreements With Assurances for Non-Federal Property Owners."

Question

What are the associated species of *Botrychium lineare* for known sites in Colorado?

Answer

Botrychium lineare is now believed to occur in a wide range of habitats, so we don't know the full range of associated species. However, there seem to be a number of plants that very often co-occur with it and other *Botrychium* in Colorado. These are useful indicators to know that one is in *Botrychium* potential habitat that could contain *B. lineare*. The habitat can change drastically in a few short meters, from "good" potential to "not" potential, so these species' presences are often at a very localized, small scale, along the order of square meters, not acres. Look for the presence of one or more (there are usually 2, 3, or more of these species) co-occurring at a site: *Solidago simplex*, *Antennaria* species, *Fragaria* species, *Androsace septentrionalis*, and moss species (patchy, not dominant). Also, until we know more, it is prudent to presume that anywhere its allied *Botrychium* occur, so perhaps is the potential to find *B. lineare*. In Colorado, other associated *Botrychium* observed at or near *B. lineare* occupied sites include *B. pinnatum*, *B. minganense*, *B. lanceolatum*, *B. echo*, *B. pallidum*, *B. hesperium*, and maybe *B. lunaria*. In Colorado, *Botrychium simplex* and *B. multifidum* usually occur in areas currently considered too mesic and riparian-like for *B. lineare*.

Habitat for other *Botrychium* associated with *B. lineare* in Colorado is usually historically disturbed in nature, typically disturbed 10-60+ years ago, often has recruiting conifer trees knee-to shoulder-high, is in full or partial sun, and often has a patchy, often rocky, soil microsite with some moss, some open space, some needles, some duff, some bare ground, maybe some lichen, is often forb rich, and one or more of the associated species. *Botrychium lineare* is found in Colorado between about 9,700 and about 10,750 feet, in mostly subalpine settings, but could occur outside these bounds.

The most up-to-date overview of *B. lineare* in Colorado is found in the Popovich 2004 report found on the web at <http://www.fs.fed.us/r2/projects/scp/assessments/popovich.pdf>.

Question

What Colorado plants discussed at the symposium have Forest Service *Species Assessment* reports available?

Answer

Completed reports can be found on line at the US Forest Service public web site <http://www.fs.fed.us/r2/projects/scp/assessments/index.shtml>.

Because most of the plants discussed at the symposium are already considered rare and of management concern by the Forest Service, few assessment reports for them have been generated. The only plants with completed USFS assessments are *Botrychium lineare* (if you visit the site, make sure you see the “new info” part under this species as well) and *Phacelia submutica*. On the web site, *Phacelia submutica* is referred to as *Phacelia scopulina* var. *submutica*. An assessment for *Ipomopsis polyantha* is in final revision. Assessments for *Ptilagrostis porteri* and *Penstemon harringtonii* (another species that was discussed at the symposium) are currently in draft. At this time, no other assessments are perceived by the USFS to be needed or planned for the species covered at the symposium.

Comments by participants regarding what logical species groups to cover at next year's meeting

1. Cover all G1 species tracked by Colorado's Natural Heritage Program, which are not federally listed. This would be about 18 species (we did 20 this year).
2. Cover all species tracked by Colorado's Natural Heritage Program (this would be hundreds). This would represent nearly all plant species of concern in Colorado.
3. Cover all species tracked by United States Forest Service ("Sensitive Species"), Bureau of Land Management ("Species of Special Concern"), National Park Service, and State of Colorado. This would be less than 100 plants total. This would represent the major public landholders in Colorado who are most responsible in managing these plants.
4. Cover all species tracked by Tribal Affiliations, maybe thrown into the groups above. The list could only include those that are of rarity or long-term viability concern to Tribes, not a comprehensive list of all plants tracked by them such as medicinals and cultural, which would be far to large a group and not of sufficient interest to the general symposium participants.

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