

# Rare Plant Symposium 2012

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Sponsors: CU Herbarium, USFWS, CNHP, USFS

Steve Popovich: Opening Remarks for 9<sup>th</sup> Annual Symposium

Jill Handwerk: Introduction to Symposium and Ground Rules

Jill Handwerk: Thanks to our sponsors CoNPS, USFWS, CNHP, and USFS. Here is a map showing previous locations of symposia. We will start with Southeast G2 and G3, and then follow with other rare species (G1, listed, etc. from all parts of the state). We will be reviewing just over 100 species. This is a range map that shows the location of all of the species that are found in the SE.

## **Southeastern Colorado G2 and G3 Species**

### **Presenter: Jill Handwerk**

#### ***Asclepias uncialis* (G3G4S2)**

Jill Handwerk: G3G4T2T3 S2. It is BLM/USFS Sensitive. Last observation was 2012 by Steve Olson in Holt Canyon.

Tass Kelso: Very active molecular work done by Larry Puffer at Univ. of Washington. They are using tissue samples that the CC herbarium provided. *A. uncialis* was suggested to not be a separate species, but with new molecular analysis techniques, they may have new results.

#### ***Cleome multicaulis* (G2G3S2S3)**

Jill Handwerk: Concentrated in a small area of the San Luis Valley. There are more than 5 million individuals known.

Bill Sutherland: There is a population in the Baca National Wildlife Refuge that is threatened by oil and gas drilling.

#### ***Delphinium ramosum* var. *alpestre* (G2S2)**

Jill Handwerk: Recognized by FNA as a distinct species. Known from 10,800-14,200 ft. We don't know a lot about this species in Colorado.

Tim Hogan: Not too uncommon in Sangres.

#### ***Delphinium robustum* (G2?S2?)**

Jill Handwerk: Most info very old, last observation in 1969. It is recognized by FNA as a distinct species.

#### ***Draba exunguiculata* (G2S2)**

Jill Handwerk: Mo Ewing and I located this at Summit Lake with Lorraine Yeats. Probably more than 250 individuals, but many records are from old label data. There are 18 EOs, including 8 historic. Found right along Continental Divide.

Mo Ewing: We found additional patches at Summit Lake after Jill and I surveyed.

### **Draba grayana (G2S2)**

Jill Handwerk: Occurrences clustered on Continental Divide. There are a few historic occurrences. Number of individuals is likely under reported.

Ginni Greer: We did find this in 2011 and 2012 in the Mosquito Range a few times.

### **Draba smithii (G2S2)**

Jill Handwerk: Somewhat restricted range in the state, with a total of 28 occurrences concentrated in Sangres and eastern San Juan Mountains. Species has white flowers.

Tim Hogan: Early blooming in the Sangre de Cristo Mountains, which is why it is not seen very often. We have about 20 records at CU herbarium.

### **Frasera coloradensis (G2G3S2S3)**

Jill Handwerk: Rank change, it is now a G2G3 S2S3. There are approximately 35 occurrences.

Tass Kelso: I think Dina Clark and Carolyn Crawford found it in Lincoln County.

Brian Kurzel: Does this map include the Two Buttes Population?

Jill Handwerk: Yes.

### **Herrickia horrida (G2?S1)**

Jill Handwerk: Found near the NM border, it does occur in NM. Habitat is on sandy soils in forest. Hollylike leaves.

Jill Handwerk: I saw this last year at Lake Dorothy.

### **Lesquerella calcicola (G3S3)**

Jill Handwerk: Originally a G2, but has changed to G3. It has a wide range in southern CO. There are at least 24,000 individuals over 38 occurrences.

Carol English: Found in Las Animas County in Jacks Canyon on Colorado State Land Board land.

### **Nuttallia chrysantha (G2S2)**

Jill Handwerk: This species is in the Conservation Action Plan for the Arkansas Valley. These are an effort out of the Rare Plant Conservation Initiative to prioritize conservation strategies. Most occurrences for *N. chrysantha* are small, with only a few individuals. Weber does not recognize this as a species.

Tass Kelso: I have not seen it in a couple of years because it responds well to moisture.

Brian Kurzel: Found it in Garden Park ACEC and Natural Area. We did a road closure project last fall, but have not been back to see how restoration is doing. We are working on conservation actions for this species.

### **Nuttallia densa (G2S2)**

Jill Handwerk: Range is farther west than *N. chrysantha*, and it also not recognized by Weber. He includes it in *N. multiflora*. It is bushier than *N. chrysantha*.

Brian Kurzel: Does anyone know the status of the OTR project? I think it was on hold.

Elaine Nowick: Yes, the project is on hold.

### **Oenothera harringtonii (G3S3)**

Jill Handwerk: Has been removed from USFS Sensitive list. It is now known from 62 occurrences. It is generally taller than *O. caespitosa*.

Tass Kelso: I saw it around Pueblo Reservoir in the summer of 2011.

Steve Olson: Krissa Scoggins is working on a pollination study. She has observed variation in size of population from other years sampled. I will be sending in EORs for her work.

### **Oonopsis foliosa var. monocephala (G3G4T2S2)**

Jill Handwerk: Not recognized by Weber but we do track it. It is localized near Pinyon Canyon Manuever Site. Most EOs contain high numbers of individuals. It grows in two tracks and disturbed areas.

Steve Olson: I have seen it in Otero County near Timpas in two track roads.

### **Oonopsis "puebloensis" (G2S2)**

Jill Handwerk: This species is similar to *O. foliosa* in number and habitat. High numbers of individuals present at sites. It has ray flowers and is more pubescent than *O. foliosa*.

### **Oxybaphus rotundifolius (G2S2)**

Jill Handwerk: Another Arkansas Valley Barrens species, very pretty, occurs on shales. There are disjunct populations in Pinyon Canyon. We retain the G2 status because it is a localized species and the number of individuals is low. This was included in the Arkansas Valley Barrens CAP.

Tass Kelso: I saw it this year, at the corner of 50 and Pueblo Blvd, near the mall. It was growing with lots of old mattresses and trash.

Brian Kurzel: The Southern Delivery System pipes water from Lake Pueblo. The pipes run through *Oenothera harringtonii* habitat and maybe habitat for this species. They are going to be treating habitat more carefully because we are collaborating with them. We may want folks to go out and salvage individuals and reintroduction. It may be a long shot, but worth trying. The volunteer efforts at Lake Pueblo are spearheaded by Warren Nolan for next summer.

### **Penstemon degeneri (G2S2)**

Jill Handwerk: Very localized distribution.

Carol English: This species responds well to lots of moisture, so 2012 was not a good year for it. When it is dry, it is difficult to detect.

Leo Bruderle: Andy Wolf and I are using samples that Carol English collection. We are finding that it exhibits polyploidy with some isolation by distance.

Brian Kurzel: Might be a High Mesa population, but Carol English has not confirmed identity.

### **Ptilagrostis porteri (G2S2)**

Jill Handwerk: On the Forest Service Sensitive list, mostly occurs in South Park. This is a wetland species. It was petitioned for listing.

Peggy: Don't we still have a population at Blue Lakes?

Jill Handwerk: I will look into that.

Steve Olson: Brian Mihlbachler, David Anderson and I collected some seed from Farish population. This population seems to be declining. I had the realization that since the population was declining, and there is an interesting fen at Severy Creek on Pike's Peak, we should see if we can introduce it there. Had been affected by Pike's Peak Highway, but since the deposition stopped, it seems like a good place to conserve genetic material. We also sent seed to Mary Goshorn at Denver Botanic Garden.

Steve Popovich: How do people feel about threat assessment for this species? Why aren't we finding more of it? There seems to be lots of suitable habitat.

Ellen Mayo: It seems to only like hummocks?

Steve Olson: The Farish Site seems to have an increase in tree species. Seems indifferent to grazing, but I don't have data to support this.

Steve Popovich: Since it is no longer a Candidate, we are open to introducing it to new sites and seed collection. It is Forest Service Sensitive Species.

Steve Popovich: Why are there not more populations of this species? Perhaps it has hydrological affinities that we don't know about? Perhaps we are underestimating how specialized its habitat preferences are. For example, perhaps grazing could be changing nutrient loads in habitats.

Steve Olson: I surveyed the Twin Lakes area, and was surprised to see how many wet spots there are in that area.

Mo Ewing: Did folks see this at the Bioblitz?

Carol English: Brad Johnson (CSU) found this at 4 Mile Creek.

Gay: Maybe pH and water quality contribute to habitat affinity?

### **Telesonix jamesii (G2S2)**

Jill Handwerk: Last observed in 2011 and 2012 by Pam Smith and Rich Scully. Split rank G2G3, can see it out the windows of Pike's Peak. Denise Wilson found it in June of 2012. This is going to be re-ranked as a G2G3.

Tass Kelso: Found it in Fremont County, which is not on map. The site was in Upper Beaver Creek.

Dee Malone: Has a wide elevation range from upper alpine to 8,000 feet. Really likes rocks.

Steve Popovich: I did some work in Bighorn National Forest this summer and found two new sites in there in Wyoming. It is more common in Wyoming.

### **Townsendia fendleri (G2S2)**

Tass Kelso: This species is much more restricted than we thought. This really occurs around the Buena Vista and Salida area, not so much around Pueblo and Colorado Springs area. It is tough to find and blooms late under pinyon-juniper in eroding arroyos.

Brian Kurzel: So if we found it near Colorado Springs, would that be *T. grandiflora*?

Tass Kelso: Yes. Under drought conditions, *T. grandiflora* can look like *T. fendleri*. *T. grandiflora* blooms in two rounds, once early in summer, and again later. A woman from Salida reported it from 2011. She is a Rare Plant volunteer.

### **[BREAK]**

Jill Handwerk: I have a few announcements. This year we have a new field form for Threatened, Endangered or Candidate Species. So if you have information about a T, E, or C plant, please use this.

Andy Kratz: Let CNHP know when you see species, because old Eos are considered "Historic" after 20 years.

## Collecting Ethics Presentation

### Presenter: Steve Popovich

Steve Popovich: We are going to talk about collecting protocol, ethics and permits. The concept seems really straightforward: don't hurt viability of collection. But implementation of the concept is fuzzy. Hopefully this will clarify some things. Many of you are familiar with the 1 in 20-never collect more than 1 out of 20 individuals. One paper states that 1 in 20 is minimum criteria to be met. But, I cannot find sound scientific data supporting this rule of thumb. Another paper Andy Kratz provided states that the digging up of the whole plants is not necessary. Make sure you know the legal ramifications of the plants you are collecting. Make sure they are not listed or otherwise protected. One paper recommends collecting 1 out of 100. Use photos to document if you cannot justify collecting. Unfortunately we cannot use photographs for genetic research, but more folks are using photos instead of specimens.

Dave Anderson: Is there a place for photo specimens?

Jennifer Ackerfield: A photo specimen would not work for looking at hairs and macro-characters. I would be very hesitant to accept a photo specimen. For instance, it would not work for looking at hairs on a *Boechera*.

Dee Malone: If I had a great macrolens, and photo documented key features, would you accept the photo specimen?

Jennifer Ackerfield: It would be difficult.

Dee Malone: Is there a way to create protocol for photo specimens?

Bill Sutherland: An extension tube works well for photo documentation.

Christine Taliga: If the Species is a T and E, the story is very different. We are putting together a protocol for photo documentation. We don't want to go through permitting for employees to collect specimens. Photo documentation works well for cataloging species.

Mitchell McGlaughlin: If the photo is not sufficient, then it goes in the "Indeterminate" part of the collection. Photo documentation cannot hurt, but sometimes it is not sufficient. I would like to see whole plant, details of flowers and fruits on the photo. A GPS point would be helpful. If there is a taxonomic question, then we could use the point to solve the question.

Bill Sutherland: What about collecting the whole roots?

Steve Popovich: I feel you should only collect roots if they are necessary for identification.

Dave Anderson: We have come up with situations where botanical collecting for documentation has been a problem. *Malaxis brachypoda* for example, has more specimens in herbaria than extant plants in populations in the field. We would rather have a photo and associated habitat data than have folks collect the last individual.

Pamela Allison: If you are in the field and there are a small number of individuals is there some small amount of genetic material that could be collected. Would this be a useful?

Tass Kelso: This touches on a larger issue of data collection and storage. Most of the printing that photographs have fade and don't hold up well. Most of data storage is rapidly changing, so the need for specimens is always there.

Tim Hogan: This is a huge issue. Most of what we know about biodiversity is housed in our natural history collections. A specimen is objective evidence for an organism. No one is asking anyone to collect anything if they have an ethical issue with collecting it. When the CNHP came to CO twenty years ago, they populated their database with collection data. The idea of rarity can be tricky. Lastly, we never know what kind of questions or techniques will be used in the field of science. Twenty years ago, the ideas of what we could do with molecular techniques now was unimaginable then. We do more damage driving to sites than we do collecting a few individuals. In regards to the genetic material, we always photocopy the label from which the fragment of the plant for genetic material came. So it is important to keep label data with any fragments used in molecular or genetic material. We loaned material to a researcher at Univ. of Washington working on *Mertensia*.

Steve Popovich: I have lots of specimens that are a single leaf for *Botrychium*. We don't have to dig up the entire plants.

Tim Hogan: Can the FS employees state their opinions on photo documentation?

Steve Popovich: Photographs can serve my purposes. I have a small collection of plants that serve as my reference herbarium. I make a judgement in the field to collect a real voucher specimen. If we collect sensitive species, that could put us in a liability situation. If I wanted to collect the FS Sensitive species, I would want to be very sure that the population could withstand this collection, and that we had a good reason to collect it.

Carol Dawson: I totally believe that a photograph is not going to be sufficient, and I advocate voucher specimens. I need folks who want to collect on BLM land to let me know what they are collecting. I cannot permit collecting T and E species. We have to have voucher specimens.

Andy Kratz: It's a complex issue. I think it is important to collect vouchers. A lot of the reasons that photographs won't work are the fact that key characters change and floras change. For willow collections, obviously, roots are not necessary. In a lot of cases, one of two stems is enough. New populations should be documented with specimens, but it is more complicated when the number of individuals are small.

Jennifer Kessler: A lot of us botanical illustrators rely on specimens to produce our work. Photographs are difficult to use.

Ellen Mayo: When we approve permits, there are conditions associated with that. We don't have any official rules for photographing.

Steve Popovich: Does the US Fish and Wildlife Service have a policy on photo specimens?

Ellen Mayo: We have not included thoughts on photography in the permitting process.

Andy Kratz: The FS definition of a plant includes propagules. The courts generally defer to agencies' biologists if push comes to shove.

Steve Popovich: Does the state of Colorado have a policy on photo collection?

Brian Kurzel: No.

Pam Allison: If you are on private land, does collecting permit need be in writing?

Steve Popovich: That is between you and the landowner. Obviously you need permission to be on private land, otherwise you could be in trespass and collecting could be considered trespass theft. When you are a CoNPS member, you should know the ethical considerations. "Do not collect whole plants, always deposit in a herbarium, be sensitive to what you are doing, do not overcollect, leave no trace, which may mean passing up a seed collection or cutting."

Pam Allison: What happens to data from private land?

Steve Popovich: Data sensitivity is a very sensitive topic. CNHP addresses this in their records and can fuzz locality data.

Bill Sutherland: You mentioned collecting 1 out of 20 or 1 out of 100. Do you think that decision should be tempered by life history of the plant?

Steve Popovich: I would answer that with using your best judgment about the species.

### **Group discussion - Use of photo specimens**

#### Pros

Avoids collecting of rare plants if photos will adequately serve goals

Alleviates need for collection permitting

Is one method for documenting taxa being used more and more

Can augment collected material (close-ups of characters when fresh, etc)

Can use photo for specimen along with collecting small amount of plant for genetic material, avoiding taking entire plant

#### Cons

Cannot always ID with confidence from photos; photos go into "indeterminate" file at herbaria



Protocols lacking for photo collections (how take photos in field, how many to take, use of scalar, color cards, how to curate in herbarium, etc)

Cannot magnify important characters to the right zoom

Lose genetic analysis capability

Lose gestalt of whole plant

Foregoes unknown future value of having genetic material in hand

Archival issues: color fading, acid-free paper, media changes, etc

### **Summary**

The following herbaria thought use of photo specimens for herbarium purposes is inferior to use of plant materials: CC, CS, COLO, RM, KHD. The BLM State Botanist and USFS Regional Botanist supported plant materials over photos except when photos could adequately serve purpose (eg. local working herbaria, informal ID booklets, training purposes, etc). NRCS supported use of photo specimens unless genetic material was needed. USFWS and State had no comment. It was pointed out to not forget about the value of illustrations.

### **BREAK FOR LUNCH**

## **RESUME DISCUSSION OF COLLECTING ETHICS AND PERMITTING**

### **Presenter: Steve Popovich**

Steve Popovich: You need to carry an original permit signed by both parties on you when in field.

There are fees for bioprospecting. You can have different levels of permits. There are terms and conditions associated with permits. These also protect you. If you are caught collecting illegally, then the agency may be required to investigate you.

Steve Popovich: I will hand out an example permit from USFS and BLM. There is usually a Sensitive List attached. The powerpoint I am presenting will be posted on the CNHP web site for symposia proceedings.

## **FEDERALLY LISTED SPECIES**

### **Presenter: Jill Handwerk**

Jill Handwerk: Last year we did an in depth review of listed species.

### ***Astragalus humillimus* (G1S1)**

Jill Handwerk: All occurrences are historical at this time. All are found on Ute Mountain Ute Tribal Lands.

No comments.

**Astragalus microcymbus (G1S1)**

Michelle DePrenger: We found only 10 individuals. We went to both Cebolla and Beaver Creeks this year.

Michelle DePrenger: We looked in Cebolla Creek.

Bernadette Kuhn: Alicia Langton and I went to BLM sites to do monitoring sites this year. We were planning a Bioblitz but cancelled it due to drought. Only found about 20 plants this year, most were very short.

Brian Kurzel: Ellen, do you know when the listing status might be resolved?

Ellen Mayo: The timeframes are budget driven, so we don't know.

Brian Kurzel: We put up signs to inform ATV and offroad travelers and to ask folks to stay on the trail. This seems to be working. People are staying on the trail.

Carol Dawson: We are continuing Troublesome Creek and Horse Gulch long term monitoring.

Peter Gordon: Flowering was low this year.

**Astragalus schmolliae (G1S1)**

Bernadette Kuhn: We have been conducting sampling at Mesa Verde over the last two field seasons. Looks like numbers have declined since initial sampling in 2001. We hope to continue sampling. Merran Owen helped collect data in the field.

**Astragalus tortipes (G1S1)**

Brian Kurzel: Have there been efforts to contact the tribe recently?

Ellen Mayo: We did get a brief report from the tribe from some management decisions on the shooting range. Tomo Natori authored report.

**Eriogonum pelinophilum (G2S2)**

Jill Handwerk: CNHP completed some surveys conducted this spring.

Peggy Lyon: We have done lots of monitoring at the Wacker Ranch, but BLM has taken over the monitoring. We tried to access private land, but it has been difficult.

Brian Kurzel: The model airplane club owners have a population with sheep grazing and OHV use. CNAP and BLM are working with them. We are trying to get fences up this year, but not sure what the timing is. However, it would be helpful if BLM waited until next year to conduct baseline monitoring.

Peter Gordon: We will start sampling at the airplane club site this summer.

Ellen Mayo: They have been out fence building in the last few weeks.

### **Eutrema penlandii (G1G2S1S2)**

Jill Handwerk: There have been increased efforts from different folks working on this species. CNHP found a new population near Climax Mine of the west side of the Continental Divide, Lake County.

Neil Peterson: We found 22 occurrences in the Mosquito Range.

Carol Dawson: Set up monitoring sites at Hoosier. We will be sampling plots annually.

Ginni Greer: At 5 or 6 sites we tried to put rocks up to deter hikers.

Leo Bruederle: *Eutrema edwardsii* is an allotetraploid so there are multiple putative parent taxa. Hoping it is going to solidify *E. penlandii* as a distinct taxon, as it is mostly diploid. It is diploid mostly, but likely some autotetraploids.

Mary Goshorn: MRHI helped us with seed collection.

### **Ipomopsis polyantha (G1S1)**

Jill Handwerk: Survey work was done this summer, DBG collected seed. This species was included in a Conservation Action Plan.

Christine Taliga: There is a cost share with USFWS to put up fencing on private lands.

Andy Kratz: Ellen, is there anything going on with the San Juan NF and reintroduction?

Ellen Mayo: There are two units on FS lands, north and south of Pagosa Springs that are intended to be used for reintroduction. It is suitable habitat. There are 95 acres of county land that they want to develop for ball fields, there are fiber optic cables that need installing, so the listing was timely.

Brian Kurzel: The State Land Board just passed a directive that requires environmental review for developing on state land.

### **Physaria congesta (G1S1)**

Jill Handwerk: Known from Rio Blanco County. Lots of oil and gas development in the habitat where this species occurs.

Jenny Neale: We are doing microsatellite work on this species. We went out with Zoe Miller and collected from sites including a new site 7 miles to the north. Looks like some individuals are polyploids.

Peter Gordon: The BLM set up two large monitoring plots for this species. It was too late to see flowering. One site is at Duck Creek.

Carol Dawson: Mark Paschke will or has signed an agreement to work with *Physaria congesta* habitat restoration. He is going to start working on this soon.

Dee Malone: Has anyone done pollination work on this? The fumes coming from well sites are overwhelming.

Brian Kurzel: Biologic is looking at impacts to this species and *P. obcordata*. So far there is no data suggesting that the plants are negatively affected by oil and gas development. These species might be more resilient than originally thought.

### **Oenothera coloradensis ssp. coloradensis (G3T2S1)**

Bernadette Kuhn: The Meadow Springs site has been developed with oil and gas wells. Test wells have been proposed for Soapstone Natural Areas.

Andy Kratz: This plant has never been found on the Pawnee National Grassland, but reintroduction might be an option.

Steve Popovich: I will follow up with USFWS on that idea.

### **Pediocactus knowltonii (G1S1)**

Peggy Lyon: Dee and I surveyed Navajo Lake but did not find it. We are trying to work with Southern Ute tribe to get access for surveys.

### **Penstemon debilis (G1S1)**

Jill Handwerk: This is listed as Threatened. The BLM is monitoring this species.

Peter Gordon: We saw this a few days ago. We find that the species flowers for a long time throughout the season. We have moved our monitoring to fall because they still flower. The number of flowers seems to be low this year.

Brian Kurzel: We were there in July, and it seemed like the flowers were aborted.

Ellen Mayo: There is designated critical habitat now.

Brian Kurzel: We monitored sites at Mt. Callahan and the Mt. Callahan saddle this year, Carol helped set the sites up. We did observe flowering at the site, but many flowers appeared to be aborted. Our monitoring protocol has the same methodology as the BLM. A couple BLM parcels have suitable habitat within critical habitat, so that could be an option for reintroduction. There is now a larger natural areas agreement, and we are going to implement pollinator BMPs for all Occidental Petroleum (OXY) lands. There are going to be benefits in the future for setting precedence for oil and gas companies to have incentive for them to voluntarily conserve plants.

### **Penstemon penlandii (G1S1)**

Peter Gordon: We have five monitoring plots on BLM land. We are looking at number of individuals and trends and population changes. We are looking at flowering effort and damage as well.

Bernadette Kuhn: We sent out letters to 12 land owners requesting permission to survey private land. We had no response.

Mary Goshorn: Is there a better response to phone calls?

Bernadette Kuhn: I tried knocking on doors as well, but did not get any offers.

Brian Kurzel: There is an ACEC proposed for this population.

### **Penstemon scariosus var. albifluvis (G1S1)**

Jill Handwerk: Most of the range is in Utah, but we do have a population in near Dinosaur.

Ellen Mayo: USFWS in Utah is looking into this species. We are providing them with info.

### **Phacelia formulosa (G1S1)**

Jenny Neale: I have some preliminary genetic data that shows that the Laramie River population is the same taxon as the Troublesome Creek plants.

Peter Gordon: The BLM has three monitoring sites that we visit. One is on the Arapahoe Wildlife Refuge, other two are on BLM.

### **Phacelia submutica (G2S2)**

Jill Handwerk: This is a narrow endemic.

Peggy Lyon: A lot of work was done training consultants to identify suitable habitat. This was done in a workshop led by Alicia Langton.

Ellen Mayo: She is continuing her research on soil characteristics and pollination system. Also critical habitat has been designated. No unoccupied habitat was included.

### **Physaria obcordata (G1G2S1S2)**

Jenny Neale: We have microsatellite data that indicates some of these are polyploid.

Peter Gordon: This is our second year of monitoring at Yellow Fence, data has not been analyzed.

Brian Kurzel: This is known from a State Wildlife area there, and they have stopped aerial spraying leafy spurge, except by hand.

Mo Ewing: The Yanks Gulch site is much bigger than previously mapped. I visited it this summer.

### **Sclerocactus glaucus (G2G3S2S3)**

Jenny Neale: We had a good flowering effort this year.

Mitchell McGlaughlin: My lab is wrapping up work looking at potential hybrids with *S. parviflorus*, and the hybrids out there are lower frequencies than previously thought. The plants near De Beque are very distinctive compared to Gunnison. My grad student is defending soon.

Peter Gordon: The BLM has four monitoring sites looking at grazing impacts to this species.

Brian Kurzel: The consulting firm Biologic is looking at Oil and Gas development impacts to *Sclerocactus glaucus*.

### **Sclerocactus mesa-verdae (G2S2)**

Jill Handwerk: Monitoring was conducted for 20 years, but the EOs have not been updated. The findings will be published in North American Naturalist soon.

Mike Kirkpatrick: I saw this doing powerline surveys on Ute Mountain Ute tribal land.

Mitchell McGlaughlin: I have seen it in New Mexico.

### **Spiranthes diluvialis (G2G3S2)**

Denise Larson: I could not find any at the Golden site, which is kind of trashed.

Dee Malone: New EO on Garfield/Pitkin county line.

Dave: We are doing a survey for this species at Wheat Ridge due to developments.

Jill Handwerk: A recovery outline has been done for the three new listed species (*I. polyantha*, *P. debilis*, and *P. submutica*). A recovery plan has been completed for *E. penlandii*.

**BREAK**

## **Review of Taxa Presented at Previous Meetings**

### **G1 Species**

#### **Presenter: Dee Malone**

##### **Aletes latilobus (G1S1)**

Dee Malone: Concentrated in Colorado National Monument area.

Mary Goshorn: Collected seed for this one last year, I need to send in EO.

##### **Aliciella sedifolia (G1S1)**

Dee Malone: Occurs right on Continental Divide.

Andy Kratz: It has been observed by Tim Hogan.

Gay Austin: Found this species at Half Moon Peak.

Tim Hogan: We were rained out for Sheep Mountain visit. I last observed the species in 2009.

**Astragalus deterior (G1G2S1S2)**

Peggy and Merran: We documented this at Mesa Verde National Park in 2012.

**Astragalus lonchocarpus var. hamiltonii (G1S1)**

Dee Malone: This species is no longer thought to occur in Colorado.

Jill Handwerk: The occurrence in Dinosaur was determined to be *A. lonchocarpus*.

**Boechera glareosa (G1S1)**

Dee Malone: Last observed in 2002.

Dave Anderson: John Lovell, a grad student at CSU, is studying this genus.

Jennifer Ackerfield: Yes, we could not identify anything in his collection to be *B. glareosa*.

**Botrychium lineare (G2?S1)**

Steve Olson: I saw the EO at Pike's Peak.

Ginni Greer: Did we see that in the field with Steve Olson?

Steve Olson: Actually, now I am not sure about that site.

Steve Popovich: Still a good species for now. Preparing a taxonomic realignment within the *B. campestre* group next year.

**Botrychium tax. nov. 'furcatum' (G1G2S1S2)**

Steve Pop: This is now subsumed under *B. lineare*. We should wait to formally combine with other taxa until Dr. Farrar's publication comes out, hopefully next year, that realigns the campestre group.

**Cirsium scapanolepis (G1G2QS1)**

Jennifer Ackerfield: This is synonym with *C. clavatum*. The species should be included in *C. clavatum*.

**Corispermum navicula (G1?S1)**

Dee Malone: This is a Colorado endemic, known from the north central part of the state. There are two occurrences.

Jenny Neale: We are starting taxonomic investigations; there is not a lot of polymorphism. We are sampling populations outside of the dunes. So far it looks different than anything else.

Steve Popovich: How are the threat levels for this species from OHV traffic?

Carol Dawson: The populations are not going away. The fences are protecting populations. There is a carpet of them.

Brian Kurzel: The north dunes are a tough place to control OHV land.

Carol English: There is an interpretative sign at the North Dunes.

Dave Anderson: Have you been able to tease apart the morphological variability?

Jenny Neale: For the population genetic work we're doing at the dunes, our preliminary assessment is that there is not a lot of polymorphism. For our expanded taxonomic work – based on field collections and observations from 2012 - Preliminary assessment is that the dune populations have much larger fruits than the populations on the way to the dunes.

### **Cryptantha gypsophila (G2S2)**

Peggy Lyon: I found another population on private land adjacent to BLM land.

Mitchell McGlaughlin: We are looking at genetic data on this as a distinct species.

Peggy Lyon: I asked Jim Reveal about it and he insisted it was a good species.

Mitchell McGlaughlin: *Oreocarya* will likely be revived as a genus for perennials in the group.

### **Descurainia kenheilii (G1S1)**

Peggy Lyon: Looked for it at Stony Pass. I went to the site, and then later asked Ken Heil about it and he said he was unable to relocate.

### **Draba malphigiaceae (G1?S1S2)**

Peggy Lyon: I went to two EOs this year, one I did not relocate, the other I was able to find. It is very close to *D. spectabilis*, hairs are very confusing.

Jennifer Ackerfield: It seems to depend on which leaf you are looking at.

### **Draba weberi (G1S1)**

Bernadette Kuhn: We mapped a large population that Scott Smith discovered at Mohawk Lakes. Steve Olson, Andy Kratz, and Ellen Mayo were there. We found plants growing in the trail on Forest Service Lands. Rick McNeill had an unconfirmed locality of this species that I looked at in McCullough Gulch. The plants fit within *Draba weberi*. We are up to four EO's for the species.



Andy Kratz: Plants have more highly variable habitat than previously documented, and a wide range of morphological variation.

### **Erigeron wilkenii (G1S1)**

Peggy Lyon: We had some occurrences that turned out to *E. nemotophyllus*. So at this point there are only two EOs for this species, all in Dinosaur National Monument.

Dee Malone: We did count more individuals than previously documented.

### **Eriogonum brandegeei (G1G2S1S2)**

Dee Malone: This species was included in a Conservation Action Plan. It was last observed in 2012.

Rebecca Kao: We counted 1,800 individuals in monitoring plots this year, so numbers are down a little.

### **Gutierrezia elegans (G1S1)**

Dee Malone: The known population is large: 30,000.

Peggy Lyon: So far only documented in Lone Mesa State Park, but it has been seen on BLM, private, state, and USFS.

Brian Kurzel: Lone Mesa State Park primarily, but since we have merged with DOW, there are discussions as to what happens to the Park.

### **Hackelia gracilenta (G1S1)**

Merran Owen: We found several thousand, despite how dry it was. We are mapping it throughout the Park.

### **Lygodesmia doloresensis (G1G2S1)**

Dee Malone: This is known from near the Utah border.

Peggy Lyon: I saw it near Gateway this year.

### **Mimulus gemmiparus (G1S1)**

Steve Olson: The population at Hankins Gulch has had a trail reroute and the population is benefitting from this. More individuals were seen in 2012 than what had been observed last year. Now, the population extends into creek bed.

Ellen Mayo: We published a positive 90-day finding on this species.

Jill Handwerk: Pam Smith did surveys and found impacts at Rocky Mountain National Park.

Brian Kurzel: Roughly 10 Staunton State Park reintroductions done by Mark Beardsley have so far about half of the transplants seem to have been successful. Staunton State Park will be open to the public within the next two years.

**Oreoxis humilis (G1S1)**

Steve Olson: It appears there is only one population that stretches for miles. The Pike's Peak highway is now paved, so there is no more road erosion and gravel erosion. Saw it in mid-July. We are working on monitoring in Devil's Playground area.

**Penstemon gibbensii (G1G2S1)**

Dee Malone: There are seven total EOs for this species.

Ellen Mayo: We had a negative 90 day finding on *P. gibbensii* from Wyoming.

**Physaria pulvinata (G1S1)**

No comments.

**G2 Species**

**Presenter: Peggy Lyon**

**Aletes humilis (G2G3S2S3)**

Rich Scully: A good update of the population at North St. Vrain Mountain was monitored in 1994, again in 2011, and the population is about 5,000-10,000 individuals. Alan Carpenter is monitoring. Some slash was piled on top of individuals.

**Aletes nuttallii (G3S1)**

No Comments.

**Aquilegia saximontana (G3S3)**

Neil Peterson: Found 14 new sites.

Jill Handwerk: We have new data from the Adopt-A-Rare-Plant Program volunteers for this species.

**Bolophyta alpina (G3S3)**

No comments.

**Carex oreocharis (G3S2)**

Dave Anderson: We found a new occurrence at East Lost Park.

**Draba crassa (G3G4S3)**

Jill Handwerk: We may stop tracking this species.

Ginni Greer: This is all over the Mosquito Range.

**Draba globosa (G3S1)**

No comments.

**Draba streptobrachia (G3S3)**

Ginni Greer: We saw two or three new populations in the Mosquito Range.

**Eriogonum exilifolium (G3S2)**

Jill Handwerk: I found some more in North Park.

**Nuttallia sinuata (G3S3)**

Jennifer Ackerfield: This is not a good species. In my opinion, it is just a range extension of *N. speciosa*. If you look at the specimens in the collection, many specimens have been annotated twice by the same expert in the group. No one has looked at genetics of this species.

**Oonopsis wardii (G3S1)**

No comments.

**Phacelia denticulata (G3SU)**

Jennifer Ackerfield: I saw it last year in Soapstone Natural Area. Prior to that trip, most of our specimens were from the 1950s.

Dave Anderson: Renee Rondeau and Tass Kelso found a new population at Air Force Academy.

**Physaria bellii (G2G3S2S3)**

Jennifer Kessler: We mapped a new occurrence on Boulder County property.

Dave Anderson: Are we tracking *P. vitulifera*?

Jill: Yes, we are tracking it as G3. We are tracking the hybrid as a G1.

**Potentilla ambigens (G3S1S2)**

Peggy Lyon: I saw it at Black Forest.

**Potentilla rupincola (G2S2)**

Steve Popovich: Finding more on the Arapaho National Forest, but the ID continues to be confusing with hybridization with *P. effusa*. I saw it in 2012 on the Forest.

Dave Anderson: I found more of it at Hermit Park this year.

**Sisyrinchium pallidum (G2G3S2)**

Jennifer Ackerfield: This seems questionable as a good species.

Carol English: Saw this on State Land Board land at Four Mile Creek, and it looked pale as in the key description.

**Astragalus anisus (G2G3S2S3)**

Peggy Lyon: We had a project on Black Canyon of the Gunnison National Park/Curecanti National Recreation Area, but did not see this.

Bernadette Kuhn: I found a few individuals at Curecanti National Recreation Area.

**Astragalus cronquistii (G2S2)**

No comments.

**Astragalus equisolensis (G5T1S1)**

Peggy Lyon: I saw this species at the Gateway Palisade Natural Area. Lorraine Yeats found a new occurrence there.

**Astragalus iodopetalus (G2S1)**

Gay Austin: Barry Johnston found it on BLM land, new EO.

**Astragalus naturitensis (G2G3S2S3)**

Jeff Coyle: I found a lot of it on BLM land and collected soils for analysis.

**Astragalus piscator (G2G3S1)**

Peggy Lyon: Lorraine Yeats found a new occurrence.

**Astragalus rafaensis (G2G3S1)**

Jeff Coyle: I found new occurrence. We should look at the genetics of this and *A. linifolius*. I might explore this in my graduate work.

**Boechera crandallii (G2S2)**

No comments.

**Camissonia eastwoodiae (G2S1)**

No comments.

**Castilleja puberula (G2G3S2S3)**

Tim Hogan: Are those dots in the Sangre de Cristos good? I looked for it there, and could not find it.

Jill Handwerk: They are not vouchered, and are questionable.

**Cirsium perplexans (G2G3S2S3)**

No comments.

**Draba graminea (G2S2)**

Peggy Lyon: The more you look, the more you find. I have always thought of it as threatened by global warming.

**Erigeron kachinensis (G2S1)**

Peggy Lyon: We used to have only two occurrences. One is erroneous. Lorraine Yeats found a new occurrence on top of the Palisade at the Gateway Palisade Natural Area.

**Eriogonum clavellatum (G2S1)**

No comments.

**Eriogonum coloradense (G2S2)**

Dee Malone: I saw a large population of it near Redstone.

**Lepidium crenatum (G2S2)**

Merran Owen: We found a huge population (15,000 individuals).

**Lesquerella pruinosa (G2S2)**

Peggy Lyon: We used to monitor this on Forest Service land. Population has maybe been decimated.

Denise Larson: I revisited a known location in 2011.

**Lesquerella vicina (G2S2)**

Lori Brummer: I found a new population in 2011.

Peggy Lyon: I found a new occurrence in April 2012.

Denise Larson: Two years ago, I saw this in Archuleta County.

Andy Kratz: We need to update the last observation date on the slide.

**Lomatium concinnum (G2G3S2S3)**

Peggy Lyon: There has been a lot of survey effort for this species.

**Lupinus crassus (G2S2)**

Peggy Lyon: I saw it in 2012. It is known only from Montrose County in the Paradox Valley.

**Machaeranthera coloradensis (G3S3)**

Carol English: I found three big populations in northern Fremont County.

**Oreocarya osterhoutii (G2G3S2)**

No comments.

**Physaria alpina (G2S2)**

Neil Peterson: We stopped mapping it because it is so common in the Mosquito Range.

**Physaria rollinsii (G1S1)**

Gay Austin: I saw it this year in the city limits of Gunnison.

**Puccinellia parishii (G2G3S1)**

Peggy Lyon: I looked for it this year, but none found because it was so dry.

**Salix arizonica (G2G3S1)**

No comments.

**Thelypodopsis juniperorum (G2S2)**

Lori Brummer: Peggy and I mapped dead plants from last year's growth. We found it on Black Canyon of the Gunnison National Park and in Black Canyon Wilderness Area.

**Townsendia glabella (G2S2)**

Harlan Cleaver: My wife and I checked two locations. We found it at Chimney Rock.

Peggy Lyon: I saw a lot of plants this year.

**Townsendia rothrockii (G2G3S2S3)**

Lori Brummer: Found it on the Uncompahgre Plateau and north of Engineer Pass.

Ginni Greer: We found a few occurrences.

**Astragalus debequaeus (G2S2)**

Jeff Coyle: One population was extirpated by an oil well this year.

***Ipomopsis globularis* (G2S2)**

Ginni Greer: *Ipomopsis globularis* is scattered all over Mosquito Range.

***Lesquerella parviflora* (G2S2)**

Brian Kurzel: I found more populations in Yank's Gulch.

***Limnorchis zothecina* (G2S1)**

Peggy Lyon: I found it at Dinosaur National Monument this year.

***Oenothera acutissima* (G2S2)**

Carol English: I found it on State Land Board in Moffat County. I have a voucher specimen.

***Oxytropis besseyi* var. *obnapiformis* (G5T2S2)**

Peggy Lyon: I found this at Dinosaur National Monument.

Peter Gordon: We monitored for *Penstemon grahamii*, and we looked for new populations to the northeast of Raven Ridge, and did not find more individuals.

Dee Malone: I went to all known sites and could not relocate.

Ellen Mayo: We did find some on the ridges near Highway 40.

***Penstemon fremontii* var. *glabrescens* (G3G4T2S2)**

Brian Kurzel: I saw this species at the Lower Greasewood ACEC.

***Penstemon scariosus* var. *albifluvis* (G4T1S1)**

No comments.

***Sausseria weberi* (G2G3S2)**

Ginni Greer: We mapped it in the Mosquito Range.

Tim Hogan: I have seen this species in the Sangre de Cristo Range.

***Thalictrum heliophilum* (G2S2)**

Brian Kurzel: I saw it at South Cathedral Bluffs.

***Thelypodium paniculatum* (G2S1)**

No comments.

## Boulder County Open Space Comprehensive Plan Update

### Presenter: Jennifer Kessler

Jennifer Kessler: This guides development in the county. Conservation easements, rec sites, etc. This is an aspirational document as well as a code document. The text is being updated from 1995, it should be going through a public process. I don't have dates for this yet. Fracking is also an issue in this area. The maps are being updated for rare and critical plants and communities. If you have more info about plants or wildlife let me know.

### 2012 Meeting Attendees

LAST NAME	FIRST NAME	Affiliation
Ackerfeld	Jennifer	Colorado State University Herbarium
Allison	Pam	CoNPS
Anderson	David	Colorado Natural Heritage Program
Austin	Gay	Bureau of Land Management
Bruederle	Leo	University of Colorado Denver
Brummer	Lori	Rocky Mountain Herbarium/Univ. of Wyoming
Burton	John	Natural Resource Conservation Service
Cepeda	Joseph	CoNPS
Cleaver	Harlan	CoNPS
Coverson	Darnisha	Bureau of Land Management
Coyle	Jeff	CoNPS
Cummings	Jennifer	CoNPS
Dawson	Carol	Bureau of Land Management
DePrenger-Levin	Michelle	Denver Botanic Gardens
English	Carol	Colorado State Land Board
Ewing	Mo	CoNPS
Foy	Elizabeth	Hayden-Wing
Gordon	Peter	Bureau of Land Management
Goshorn	Mary	Denver Botanic Gardens
Greer	Ginni	Mosquito Range Natural Heritage Initiative
Handwerk	Jill	Colorado Natural Heritage Program
Hazlett	Don	CoNPS
Hazlett	Marta	CoNPS
Hogan	Tim	University of Colorado Herbarium
Huggins	Janis	CoNPS
Hunter	Theron	CoNPS



Kao	Rebecca	Denver Botanic Gardens
Kelso	Tass	Colorado College/CoNPS
Kesler	Jennifer	Boulder County Open Space
Kirkpatrick	Michael	Rocky Mountain Herbarium/Univ. of Wyoming
Kratz	Andrew	U.S. Forest Service
Kristel	Selma	CoNPS
Kuhn	Bernadette	
Kuich	Nanette	CoNPS
Kurzel	Brian	Colorado Natural Areas Program
Larson	Denise	ERO Resources
Lyon	Peggy	Colorado Natural Heritage Program
Malone	Dee	Colorado Natural Heritage Program
Mayo	Ellen	U.S. Fish and Wildlife Service
McBride	Wendy	Colorado Natural Areas Program
McGlaughlin	Mitchell	University of Northern Colorado
Miller	Marlene	CoNPS
Murphy	Pat	CoNPS
Neale	Jenny	Denver Botanic Gardens
Nowick	Elaine	CoNPS
Olson	Steven	U.S. Forest Service
Owen	Merran	Mesa Verde National Park
Petersen	Neil	Mosquito Range Natural Heritage Program
Popovich	Steven	U.S. Forest Service
Richardson	Mary	CoNPS
Scully	Rich	CoNPS
Statwick	Joe	CoNPS
Stern	Stephen	Mesa State College
Sutherland	Earl	CoNPS
Taliga	Christine	Natural Resource Conservation Service
Wahle	Bruce	CoNPS
Wesley	Jannette	CoNPS
Wilson	Denise	CoNPS
Winder	Sama	Bureau of Land Management
Zielinski	Ann	CoNPS