

Eleventh Annual Colorado Rare Plant Symposium

October 3, 2014

Northside Aztlan Recreation Center

Fort Collins, Colorado

9:20 am

Rare Plant Symposium

Presenter: Jill Handwerk (Botanist, CNHP)

Thank you to sponsors. All slides were updated over the last year with funding provided by the USFS Arapaho-Roosevelt National Forests, supervisor's office, Fort Collins.

Explanation of G Ranks: G1 – known from less than 5 occurrences worldwide, G2=6-20, G3=>25. New maps of occurrences of G2G3 Species in Central and Northern Colorado were presented.

Explanation of Land Ownership slides and split ranks.

G2/G3 Plant Species, Central and NW CO

***Anticlea vaginatus* (G2/S2)**

Jill Handwerk: Last observed in 2012, 1100+ individuals. Known from Dinosaur National Monument, 7 occurrences, 1 historical.

Delia Malone: This would be a good species to look at the impacts of climate change as it is a hanging garden species.

***Astragalus debequaeus* (G2/S2)**

Jill Handwerk: Last observed in 2014 with 25 Colorado occurrences. Known from the Roan Plateau Area, lots of oil and gas development in its habitat. It is BLM Sensitive.

Carol Dawson: We are seeing a flush of seedlings every 3 to 5 years from Grand Junction to the Roan Plateau, and they are not as long lived as *A. osterhoutii*.

Delia Malone: To further what Carol is saying, we see flushes every two or three years.

Susan Spackman Panjabi: Remember to double check that 3 counties should be listed.

Carex stenoptila (G2/S2)

Jill Handwerk: We only have about 11 occurrences scattered throughout the state. 1999 was last observation.

Denise Culver: This occurs in uplands, although Jen Ackerfield's key states uncommon along streams and meadows.

Frasera coloradensis (G2G3/S2S3)

Jill Handwerk: Last observation was in 2013, 275,000 individuals but restricted range, re-ranked as G2G3. Wind energy is a threat due to surface disturbance and habitat fragmentation. We have new EOs from Daniel Fosha with lots of revisits.

Susan Spackman Panjabi: We are working with CDOT to develop best management practices (BMP's) for plants along roadsides as part of RPCI strategy. BMP's will be posted for 10-12 species on our website.

Ipomopsis aggregata spp. Weberi (G5T2/S2)

Jill Handwerk: There are 5 historical occurrences. Jen Ackerfield has lumped it under the full species *ssp. attenuata*.

Jennifer Ackerfield: Bill Jennings and I have looked at a lot of material, and we found no clear evidence of two different subspecies based on the tube shape. Flowers vary from pink to white. The tube shape distinguishing species, supposed to have a really *filliform* tube but integrates with other subspecies and not real clear cut so it is lumped with *ssp. attenuata*.

Susan Spackman Panjabi: I have been working with CDOT to raise awareness about G1 and G2 species, and this is one of those plants. We are trying to avoid gravel dumps on top of G1 and G2 plants, and are developing best management practices (BMPs). They will be available on CNHP website soon.

Brian Elliott: I did surveys across WAPA lines across private land. 25 subpopulations and 800 individuals total. I did a survey with Michael Kirkpatrick. We came up with criteria for navigating the taxonomy. There had to be at least one in each population with white flowers and filiform tubes. We did work several years ago at Muddy Pass. We found 120 initially, then in 2013 we only counted 2 plants. It's possible it could be seasonal variation. We don't know why the numbers have varied so widely. It likes a lot of bare soil with rocks. On Muddy Pass it might just be succession into shrubs that is causing the decline. The other interesting thing at Muddy Pass, the higher we went up the pass the less introgression we observed.

Ipomopsis globularis (G2/S2)

Jill Handwerk: Last observation was in 2014; there are 5 historical occurrences.

Ginni Greer: We have found new occurrences at Beaver Ridge that will be protected from off road vehicles. We are seeing a lot more off-road damage across the Mosquito Range.

Limnorchis zothecina (G2/S1)

Jill Handwerk: Last observation was in 2011; there are 5 Colorado occurrences.

Denise Culver: As Delia Malone mentioned, this might be impacted by climate change due to its habitat in hanging gardens.

Mertensia humilis (G2/S1)

Jill Handwerk: Last observation was in 2011; there are 9 historical occurrences.

Denise Culver: This is probably threatened by oil and gas that has now been developed in North Park where sagebrush habitat is getting impacted with roads.

Dave Anderson: The easternmost EO was burned in the High Park Fire, but we don't know the current status of it post-fire.

Nuttallia rhizomata (G2/S2)

Jessica Smith: I saw this species on Mt. Callahan and Logan Wash in 2014.

Oenothera acutissima (G2/S2)

Jill Handwerk: Last observation was in 2013; there are 14 Colorado occurrences, and 3 are historical.

Oxytropis besseyi var. obnapiformis (G5T2/S2)

Jill Handwerk: Last observation was in 2012 with 13 of the 14 Colorado occurrences being historical.

Penstemon fremontii var. glabrescens (G3G4T2/S2)

Jill Handwerk: There are 7 historical occurrences.

Penstemon scariosus var. cyanomontanus (G4T2/S2)

Jill Handwerk: Last observation was in 2013; there are 6 Colorado occurrences, and 1 is historical.

Leslie Ball: It seems like really rare species are up in that corner of the state that is not very populated, seems like there would be more rare species in populated areas.

Jill Handwerk: It has more to do with geology rather than human disturbance.

Susan Spackman Panjabi: This is why we need more awareness. This species' distributions are really small, so it wouldn't be hard to avoid disturbances with human development if there were awareness of the species.

Tim Hogan: But there are still lots of human impacts in those areas even if people don't live there.

Baili Foster: What is the difference between the *cyanomontanus* and *albifluvus* varieties?

Carol Dawson: I need to look in guide to review distinctions.

Delia Malone: The habitat is entirely different for the two varieties; *cyanomontanus* prefers slick rock/sand, while *albifluvus* likes shale.

Physaria parviflora (G2/S2)

Jill Handwerk: This species named changed from *Lesquerella*. Last reported observation was in 2012 with 28 Colorado occurrences.

Saussurea weberi (G2G3/S2)

Jill Handwerk: Last observation was in 2014; there are 5 historical occurrences, one in Custer Co. otherwise located in the Mosquito Range.

Susan Spackman Panjabi: Rob Shore (Zoologist, CNHP) uses distance sampling to get population size. He applied that to estimate population size in Mosquito Range and he came up with much higher numbers than mentioned here, and that is a published paper, so we should integrate that with info here.

Thalictrum heliophilum (G2/S2)

Jill Handwerk: Last observation was in 2013, with 18 historical occurrences.

Jessica Smith: I saw this species at Mt. Callahan and it was doing great.

Delia Malone: One site was very heavily browsed by elk. It was a historical occurrence so that could be a threat.

10:30 am

Threatened and Endangered Species

Presenter: Jill Handwerk

Astragalus humillimus (G1/S1)

Jill Handwerk: This species is located mostly on private land.

Brian Elliot: It is mostly in Ute land. We did not find it only in alluvial bottoms but we found it in NM in several sites. In 2013, there was a severe population crash in sites I had been to previously in NM; roughly 2/3 mortality in this long-lived perennial, don't I know cause of mortality.

Astragalus microcymbus (G1/S1)

Jill Handwerk: Last observation was in 2013; there are 6 Colorado occurrences with 17,800 individuals.

Michelle DePrenger-Levin: This is our 20th year of monitoring this species, and we added 2 new sites in Cebolla Creek. The previous two years have been bad years, but this year has been better. We've been going out every 3 weeks and have seen seedlings and reproduction this year.

Astragalus osterhoutii (G1/S1)

Jill Handwerk: Last observation was in 2013.

Carol Dawson: Populations are stable.

Phil Krenning: Rumor of a new Jackson County site on BLM land.

Astragalus schmolliae (G1/S1)

Jill Handwerk: Last observation was in 2014.

Bernadette Kuhn: 2014 was not a good year according to monitoring efforts done by Renee Rondeau. Very few individuals with few flowering and fruiting, compared to last year where we saw huge numbers of individuals. There has been some feral horse damage in Mesa Verde; public backlash followed the report. Since they are feral horses and not wild, we are not clear if they are under federal protection or not and how that impacts the management.

Ellen Mayo: The National Park Service is working on a new development plan and they are asking for input.

Jill Handwerk: This could be a letter writing opportunity for CoNPS.

Astragalus tortipes (G1/S1)

Brian Elliott: I did not see this species on my surveys on Ute Mountain Ute.

Pat Murphy: Have they been invited to attend the Rare Plant Symposium?

Steve Popovich: Yes, for the first few years, when we invited many possible stakeholders from various entities, and made them aware of the symposium's existence.

Jill Handwerk: Peggy Lyon may have more knowledge about this species.

Ellen Mayo: We do have permission to do modeling on UMU land. We have to decide this coming year whether or not to list this species. The UMU need to do a management plan for this species.

Eriogonum pelinophilum (G2/S2)

Jill Handwerk: Last observation was in 2013; there are 19 Colorado occurrences, 5 are historical; 280,000 individuals documented. There has been some monitoring on and off BLM land by CNAP.

Carol Dawson: We are in the early stages of monitoring this species at Wacker Ranch.

Brian Elliott: I have 5 years of data, and we found a new subpopulation of this species. Even though the species were accessible, I didn't see any impact.

Ellen Mayo: Elephant Skin Wash area is going to be fenced off to protect this plant from disturbance.

Eutrema penlandii (G1G2/S1S2)

Jill Handwerk: Last observation was in 2014; there are 18 Colorado occurrences supporting 20,000 individuals, an alpine species. I was able to go monitor this species with the BLM project. The Mosquito Range Heritage Initiative (MRHI) folks have found new populations in recent years.

Carol Dawson: We added 5 modified Whittaker plots.

Phil Krenning: I was under the impression that it fell out as a separate taxon than *E. edwardsii*.

Susan Spackman-Panjabi: We need to wait on the results from Leo Bruderle's work.

Becky Kao: It does appear to be different according to preliminary work by Leo. The sample size needs to be larger.

Brian Elliott: A change in taxonomy could likely affect its federal status.

Ipomopsis polyantha (G1/S1)

Mary Goshorn: One of our horticulturalists collected seed on this and we are doing a germination study this year.

Raquel Werstbaugh: We visited a county owned parcel and there were lots of plants this year. CNAP is trying to acquire this property from the county, it is approximately 80 acres. We have support from USFWS.

Ellen Mayo: Across the road on the Levine property, they are exploring thermal energy development.

Susan Spackman-Panjabi: Do we think there are more occurrences to be found?

Mary Goshorn: There is a group in Pagosa Springs that has probably done a lot of surveys.

Ellen Mayo: We have a 6.5 acre conservation easement at a site that is adjacent to BLM land with a powerline running through it.

Andy Kratz: The USFS has land nearby, but it has not been found there yet. If there is USFS land nearby, this could be a good place for reintroduction.

Ellen Mayo: Critical habitat has been designated on USFS land. We are writing the recovery plan for that species. It is going slowly, but should be done in a year.

Oenothera coloradensis ssp. coloradensis / Guara neomexicana (G3T2/S1)

Jill Handwerk: Last observation was in 2014; there are 14 Colorado occurrences supporting 18,000 individuals.

Denise Culver: The first year rosettes are distinct. I think it is still at Natural Fort.

Andy Kratz: The USFS lands were surveyed on the Pawnee, but none were found. They never found any on suitable habitat. Pawnee could be another introduction effort onto federal land for protection.

Denise: I looked for the Sedalia population but it was obliterated by RR tracks.

Steve Popovich: We entertained introducing it on the Pawnee in early 2000's but there was too much backlash at that time. May be better timing to renew this idea now.

Brian Elliott: I did surveys in Nebraska and most of those sites were historic.

Leslie Ball: Why is there such a difference between the state and global name?

Jill H: Just a result of changing taxonomy.

Pediocactus knowltonii (G1/SNA)

Jill H: We keep it on the list, but it is only known from NM.

Ellen Mayo: The NM Native Plant Society, who owns the preserve where *Pediocactus Knowltonii* is found, has been to the site this year and did some fence repair. They did not see many plants. There is some new oil and gas activity about to come into Colorado about 400m from the edge of the property on Ute Mt. land and it has been surveyed.

Ellen Mayo: I believe that a lot of the cactus collecting market is in Germany.

Penstemon debilis (G1/S1)

Jill Handwerk: Last observation was in 2014 with some monitoring.

Jessica Smith: Raquel and I did a short survey this year on CNAP property, and it looks like the population is increasing.

Carol Dawson: We tried to get to Anvil Points but we got stuck in a mud flow.

Andy Kratz: May be a good opportunity for drone surveys.

Mit McLaughlin: Journal of Systematics and Evolution says there is a new article by Andy Wolfe on genetics.

Ellen Mayo: There is a site owned by Occidental Petroleum with *P. debilis* and they are doing some remediation on the site that could affect the plant but they are working with USFWS.

Penstemon grahamii (G2/S1)

Jill Handwerk: Last observation was in 2013; there are still 2 historical occurrences. In lieu of listing, USFWS developed a voluntary conservation agreement among all the property owners, primarily in Utah. BLM has been monitoring the Colorado sites.

Carol Dawson: We are still working with BLM in Utah to see how we will implement all measures in the conservation agreement. This does mean there will be actions for folks to do and it looks promising.

Penstemon penlandii (G1/S1)

Jill Handwerk: Last observation was in 2012. This is in Grand County where the BLM monitors it.

Pat Murphy: We remapped and re estimated the population size. We estimate 5,000 plants per acre, a total of 1.4 million, which is a lot more than previously thought.

Ellen Mayo: Work will be done on the powerline and it will destroy some plants. We don't know exactly how many. We are working on closing one of the entrances to the BLM site.

Penstemon scariosus var. albifulvis (G4T1/S1)

Jill Handwerk: This species is BLM sensitive. Last observation was in 2014; there are 4 Colorado occurrences. It is also part of the agreement in Utah to manage voluntarily rather than list. Utah is the lead office in charge of agreement.

Delia Malone: Most of the records show that the pollinators are small, but we saw lots of *Bombus* species pollinating individuals.

Phacelia formosula (G1/S1)

Jill Handwerk: Last observation was in 2014.

Jenny Neale: We are adding a microsatellite component to look at genetic material we collected in 2009. We also did morphological measurements this year in the field. The population in Troublesome Creek was described as *P. ginaglennae* in 2013.

Carol Dawson: We are trying to standardize how we monitor this species. The Refuge contains a strong concentration of plants.

Trevor Roberts: We had a chance to visit the Laramie River population and it looked good there were no threats, no grazing, and no weeds.

Phacelia submutica (G2/S2)

Jill Handwerk: Last observation was in 2013; there are 23 Colorado occurrences.

Mit McGlaughlin: We are looking at genetic structure of this species and we are looking at if it self-pollinates and how that affects the species. Monitoring of this species could do more damage than good.

Brian Elliott: I did some work north of Rifle and worked with the BLM looking for it but we did not find it.

Andy Kratz: I have been thinking about climate change in regards to this plant. IF the climate shifts these species that are soil endemics have nowhere to go.

Ellen Mayo: We are seeing more work done on taking into account soil with climate change assessments.

Break for Lunch (11:30-1:00 pm)

Announcements

Steve Popovich reads an email from Ross McCauley from Fort Lewis who is doing a study of small herbaria and how they can contribute to larger herbaria. If you have a small herbarium you should contact Mr. McCauley.

Also, marijuana is now legal in Colorado and we have seen an increase in individuals growing it on public land. These are often hidden by overstory canopies, such as growing inside aspen stands. Be careful and always immediately leave area if you find a grow, and report it to local law enforcement.

Megan Bowes announced March 10, 11, and 12th High Altitude Revegetation is having a conference in conjunction with local chapter of Society for Ecological Restoration.

Threatened and Endangered Species, Continued

Presenter: Jill Handwerk

***Physaria congesta* (G1/S1)**

Bernadette Kuhn: Mark Pashke's student Sasha Victor had to do EIS to work on a transplant study. She didn't get approved.

Carol Dawson: Sasha Victor was working on this species but her thesis project had to be modified due to a prolonged battle between the BLM and Colorado Oil and Gas Association.

***Physaria obcordata* (G1G2/S1S2)**

Jill Handwerk: Last observation was in 2014; there are 11 Colorado occurrences.

Jenny Neale: The genetic data for this taxation shows that there are 3 distinct genetic clusters for this species and they should be maintained as such.

Carol Dawson: I plan to use this data to guide management and protection.

Sclerocactus glaucus (G2G3/S2S3)

Jill Handwerk: Last observation was in 2014 with 93 Colorado occurrences and 17 historical occurrences.

Jenny Neale: We are trying to further define the east/west boundary for *S. parviflorus* and *S. glaucus*. We are hoping to get our paper published. Genetics clusters into 2 groups, north and south.

Michelle DePrenger-Levin: 10 sites from north of DeBeque and monitoring data shows some fluctuation but fairly stable.

Brian Elliott: Weed invasion seems to be a big problem for this species especially heavily invaded by cheatgrass and *Poa bulbosa*. We did not find it in an area we surveyed north of Rifle.

Sclerocactus mesae-verdae (G2/S2)

Brian Elliott: I have found this in Colorado on Tribal Lands and Colorado sites are not historical, I observed them in 2012 and 2013, but cannot tell you where due to privacy issues. May not be as rare as perceived, main threats may be feral horses, OHV use, and weeds. *Malcomia africana* and *Halogeton glomeratus* have been seen invading the habitat. Once north of the Reservation, habitat disappears. It is found south to Shiprock, NM, west to near AZ, east of San Juan generating station, and north to Ule Pass. In 2007 another contractor left pin flags behind, and I saw plant skeletons by the flags, which could indicate these are short-lived plants.

Bernadette Kuhn: Karin Decker's paper showed they were long-lived from monitoring project.

Susan Spackman Panjabi: Yes, we should review the papers on this.

Spiranthes diluvialis (G2G3/S2)

Ellen Mayo: 2000 plants were found along the Roaring Fork in 2013. We saw good habitat near Dotsero.

Megan Bowes: Lynn Reidel's count in South Boulder Creek was within the natural range even though lower this year than last year. Colorado Department of Transportation is putting a bike lane through part of the property. They attempted to transplant plants and buying properly elsewhere as mitigation. There may be a flood berm installed, but that seems unlikely.

Denise Larson: I went to Clear Creek site and I did find at least one population which was not doing well on August 15. There is a lot of traffic from homeless individuals. There is a new pedestrian bridge in the area. The fencing is helping. The Clear Creek site did have 6 feet of ice last winter.

Pam Smith: I visited Clear Creek population a month after Denise looked and there were no plants. I also went to Wheatridge population and did not see any.

Bernadette Kuhn: We weren't able to find the site near Fort Collins. There haven't been any individuals at that site in 3 years. The site's had some hydrological changes.

Delia Malone: The Roaring Fork site was flowering late.

Consensus by group discussion: Flood of 2013 had no significant adverse impact on known sites

1:15 pm

Statewide G1 Species and SE Colorado G2

Presenter: Jill Handwerk

Aletes latilobus (G1G2/S1)

No updates.

Aliciella sedifolia (G1/S1)

Tim Hogan: I went to the “other Sheep Mountain” in the Uncompaghre a few years ago south of Gunnison. Did not find it. Dave Anderson’s work is what led us to find the original long lost type location.

Dave Anderson: I did a basic deductive model of habitat in the species assessment report, leading to Tim Hogan finding what could be the type locality.

Gay Austin: Barry Johnston has done some modeling for this species.

Tim Hogan: Yes, and his results led me to visit the “other Sheep Mountain”, where it indeed could have been.

Astragalus deterior (G1G2/S1S2)

No updates.

Astragalus lonchocarpus var. hamiltonii (G4T1/SNA)

Jill Handwerk: We don’t have this taxon in Colorado

Boechera glareosa (G1/S1)

Dave Anderson: We should find out what John Lovell from CSU is doing regarding publishing his results on his *Boechera* dissertation.

Botrychium lineare (G2G3/S2S3)

Susan Spackman Panjabi: I thought Colorado had many of the occurrences.

Steve Popovich: The range wide status of *B. lineare* is that more sites have been found in other states. Colorado now has about 55 sites and the taxon is secure, with more sites undoubtedly occurring in Colorado in appropriate habitats.

Andy: You should update the date on the slide that says 2005.

Steve Olson: The image on the slide is from Pike's Peak.

Botrychium tax. nov. "furcatum"

Steve Popovich: This genetic and morphological expression will be subsumed under the linear subspecies or variety of the *B. campestre* group by Dr. Donald Farrar, so will not be a separate taxon. Our research is complete, but the *B. campestre* re-alignment paper is in a backlog preceded by other higher-priority *Botrychium* papers describing other new species.

Cirsium scapanolepis

No updates.

Corispermum navicula (G1/S1)

Melissa Islam: We just developed microsatellite markers for it. We are also looking at morphology. The east dunes are probably not *C. navicula*. The east dunes are in better shape.

Oreocarya revealii (G2/S2)

Mit McLaughlin: We have done genetic work on this species and the northern dots are *O. paradoxa* and everything south is *O. revealii*. *Oreocarya* is an old name for perennial N. American species and it is well supported.

Phil Krenning: BLM set up monitoring in Big Gypsum Valley.

Descurainia kenheillii (G1/S1)

No updates.

Draba malpighiacea (G1/S1)

Jill Handwerk: Dee and Peggy went looking for this in the San Juans recently. Found some new locations maybe- not sure if diagnostic characters hold- needs review.

Draba weberi (G1/S1)

Jill Handwerk: Last observation was in 2014; there are 4 Colorado occurrences with less than 100 individuals total.

Susan Spackman Panjabi: It has the fewest number of all species.

Brian Elliott: I have a voucher in with Ihsan Al-Shehbaz. I showed it to Ron and Ernie at the RM. I found two possible new sites on White River National Forest. Pending ID at Missouri Botanical Gardens.

Steve Olson: What habitat was it in? I saw plants under spruce, not in typical habitat.

Brian Elliott: It was in classic *D. weberi* splash zone habitat.

Steve Popovich: Are we sure this is a clear, clean taxon now?

Susan Spackman Panjabi: No, I'm not totally comfortable yet.

Bernadette Kuhn: Perhaps the description is not sufficient because it hasn't been broadly sampled.

Andy Kratz: I agree the description was written based on one site. We should revisit the description and broaden it with more samples. We may have more than 100 plants total by now.

Erigeron wilkenii (G1/S1)

Jill Handwerk: This species is tricky to identify.

Eriogonum brandegeei (G1G2/S1S2)

Jenny Neale: We did not monitor this species in 2014. We now go every other year.

Becky Kao: We have gone every year previous and it is fairly stable.

Gutierrezia elegans (G1/S1)

No updates.

Hackelia gracilentia (G1G2/S1S2)

Bernadette Kuhn: Renee Rondeau surveyed this year and it was a great year for it.

Lygodesmia doloresensis (G1G2/S1S2)

No updates.

Mimulus gemmiparus (G1/S1)

Raquel Westbaugh: CNAP sites were revisited where transplants were done by Mark Beardsley.

Ellen Mayo: I saw two that were flowering in the wild.

Steve Popovich: Can Steve Olson comment on the site where the trail has been re-routed to avoid occupied habitat at Hankins Gulch?

Steve Olson: I have not been there this year but the trail reroute seems to be working. Last fall, after a rainfall, some plants that were near a stream at this general area were gone.

Ellen Mayo: No new info to report. Staunton State Park has successful introduction sites that are in areas not accessible to the public, so that is good.

Dustin Gannon: I went to Hankins Gulch this year and counted 400 plants.

Ellen Mayo: I don't have a deadline date yet for determining its status as potential to list as threatened or endangered. The reintroductions are in Staunton State Park.

Oreoxis humilis (G1/S1)

Susan Spackman Panjabi: I heard that they are opening a part of Pikes Peak's South Slope containment area. Will this impact plants? Has it been surveyed?

Denise Larson: Colorado Springs Utilities opened it up and the public will have to pay for access. I have done a weed survey.

Penstemon gibbensii (G1G2/S1)

No updates.

Physaria pulvinata (G1/S1)

Jill Handwerk: Last observation was in 2013. This species had been recently described.

Physaria scrotiformis (G1/S1)

Jill Handwerk: This species has recently been described. It is known from one occurrence and it would be good to do more survey work.

Asclepias uncialis ssp. Uncialis (G3G4T2T3/S2)

Dina Clark: I think I found a new site at the Picketwire Campground on the Comanche National Grassland in May.

Cleome (Peritoma) multicaulis (G2G3/S2S3)

No updates.

Delphinium ramosum var. alpestre (G4T2/S2)

No updates.

Delphinium robustum (G2/S2)

No updates.

Draba exunguiculata (G2/S2)

Dustin Gannon: We found some on the Continental Divide in between Park and Summit County with quite a few individuals along the ridgeline. We also found *D. globosa* in Sacramento Gulch. No specimens were collected.

Draba grayana (G2/S2)

No updates.

Draba smithii (G2/S2)

No updates.

Herrickia horrida (G2/S1)

No updates.

Nuttallia chrysantha (G2/S2)

No updates.

Nuttallia densa (G2/S2)

No updates.

Oenothera harringtonii (G3/S3)

No updates.

Oonopsis foliosa var. monocephala (G3G4T2/S2)

No updates.

Oonopsis puebloensis (G2/S2)

No updates.

Oxybaphus rotundifolius (G2/S2)

No updates.

Penstemon degeneri (G2/S2)

No updates.

Physaria calcicola (G3/S3)

No updates.

Ptilagrostis porter (G2/S2)

No updates.

Telesonix jamesii (G2/S2)

Andy Kratz: When I was out looking for it in Lost Park with Steve Olson, we found it in atypical habitat where it is possible that plant parts had been washed downstream from upstream rocky areas and taken root for a while in what could be unsuitable microsites/ habitat, and therefore may not survive in the long term. This might be an important distinction for conservation.

G2G3 Species of Northeast Colorado

Aletes humilis (G2G3/S2S3)

No updates.

Aletes nuttallii (G3/S1)

No updates.

Aquilegia saximontana (G3/S3)

Dustin Gannon: I found a few new plants in 2 or 3 locations.

Astragalus sparsiflorus (G2/S2)

No updates.

Bolophyta alpina (G3/S3)

No updates.

Carex oreocharis (G3/S2)

No updates.

Draba crassa (G3G4/S3)

Steve Olson: Are you still collecting data on *D. crassa*? Is it still tracked?

Jill Handwerk: We watchlisted it. It's not tracked electronically anymore but data is still collected.

Draba globosa (G3/S1)

No updates.

Draba streptobrachia (G3/S3)

No updates.

Eriogonum exilifolium (G3/S2)

No updates.

Nuttallia sinuata (G3/S3)

Jen Ackerfield: *N. sinuata* and *speciosa* is all now under *N. speciosa*.

Jill Handwerk: Taxon will become an S4 and range will be expanded to reflect subsumation of *N. sinuata* into *N. specios*.

Nuttallia speciosa (G3/S3)

No updates.

Oonopsis wardii (G3/S1)

No updates.

Phacelia denticulata (G3/SU)

No updates.

Physaria bellii (G2G3/S2S3)

No updates.

Potentilla ambigens (G3/S2)

Pam Smith: I saw a few populations at the Air Force Academy that are doing well.

Judy von Ahlefeldt: El Paso County report cites this as a G3- has anyone seen this enough to know?

Potentilla rupincola (G2/S2)

Steve Popovich: We found 3 new pops on USFS land and one has two subpopulations. They have a good share of what we think is good *P. rupincola* in the greater Cherokee Park area. Total number of plants is 1000.

Sisyrinchium pallidum (G3/S2)

No updates.

G2G3 Species SW Colorado

Astragalus anisus (G2G3/S2S3)

Mary Goshorn: I visited EOs for seed collection and the population is looking good.

Astragalus cronquistii (G2/S2)

No updates.

Astragalus equisolensis (G5T1/S1)

No updates.

Astragalus iodopetalus (G2/S1)

No updates

Astragalus naturitensis (G2G3/S2S3)

Delia Malone: We are seeing big population fluctuations with this species. I have seen a burned area where the *A. naturitensis* came back the next year after the fire, but area also had heavy weed infestation, especially by cheatgrass.

Astragalus piscator (G2G3/S1)

No updates.

Astragalus rafaensis (G2G3/S1)

Jenny Neale: Joe Statwick is working on genetics of this species compared to *A. linifolius*, developing MSATs, and also doing greenhouse work with selenium studies.

Boechera crandallii (G2/S2)

No updates.

Camissonia eastwoodiae (G2/S1)

No updates.

Castilleja puberula (G2G3/S2S3)

Dustin Gannon: We saw thousands of these this year.

Cirsium perplexans (G2G3/S2S3)

No updates.

Draba graminea (G2/S2)

No updates.

Erigeron kachinensis (G2/S1)

No updates.

Eriogonum clavellatum (G2/S1)

No updates.

Eriogonum coloradense (G2/S2)

No updates.

Lepidium crenatum (G2/S2)

No updates.

Lomatium concinnum (G2G3/S2S3)

No updates.

Lupinus crassus (G2/S2)

No updates.

Machaeranthera coloradoensis (G3/S3)

Melissa Islam: Pam Regensburg saw over 100 individuals on Aug 7th in Hinsdale County.

Raquel Werstbaugh: CNAP staff saw this species this year in Park County.

Gay Austin: I saw this species at Cochetopa Pass.

Oreocarya osterhoutii (G2G3/S2)

No updates.

Physaria alpina (G2/S2)

No updates.

Physaria pruinosa (G2/S2)

No updates.

Physaria rollinsii (G1/S1)

Mary Goshorn: We targeted *A. anisus* and *P. rollinsii* for seed collection.

Susan Spackman Panjabi: Is *P. rollinsii* as common as *A. anisus*?

Mary Goshorn: Yes, the species looks good.

Jill Handwerk: Maybe the *P. rollinsii* ranking should be reviewed.

Physaria vicina (G2/S2)

No updates.

Puccinellia parishii (G2G3/S1)

No updates.

Salix arizonica (G2G3/S1)

Jill Handwerk: There is still only one site known in Colorado, but it is now larger/ expanded. Gwen Kittel went out and found more clumps in existing occurrence so we now know of 21 dense clumps and had ID verified. Gwen did work with funding from CoNPS and found plants outside the enclosure. All observed new clumps were still within a mile of the *Salix arizonica* protection enclosure.

Thelypodopsis juniperorum (G2/S2)

No updates.

Townsendia glabella (G2/S2)

No updates.

Townsendia rothrockii (G2G3/S2S3)

No updates.

2:15 pm

**USFS Priority Species Pro-Active Survey Highlights
Presenters: Marika Majack, Brian Elliott, and Steve Popovich**

Steve Popovich: Several years ago, attendees of the annual Colorado Rare Plant Symposium identified priority survey needs for some of Colorado's rarest and over-looked plants. The purpose of the surveys was to gain information on their abundance and distribution in Colorado. In response to recognizing these needs, the Arapaho-Roosevelt National Forests, US Bureau of Land Management, and Colorado Native Plant Society (CoNPS) sponsored several individuals to perform proactive surveys to find more occurrences of the rare plants. "Proactive" surveys simply means the surveys were performed solely to gain knowledge about the target species, rather than being driven in response to a proposed project on public lands that could potentially conflict with plant conservation.

***Noteworthy Collections of New and Rare Aquatics in Colorado*
Presenter: Marika Majack, Master's Program Candidate, University of Colorado-Denver**

Marika Majack: I surveyed for rare aquatic plants as part of my Master's thesis under the tutelage of Dr. Leo Brudlerle. In 2014, I surveyed for rare aquatic plants on Forest Service lands. In 2013 and 2014, I visited a total of 152 wetland sites in north- and west-central Colorado, and documented 52 new aquatic plant populations; 14 of 16 native pondweeds, and about 35 county records! Among other finds, the following Forest Service Sensitive and/or Colorado Natural Heritage Program-tracked rare plants were

encountered: Robbin's pondweed (*Potamogeton robbinsii*) in Delta County, a State record; largeleaf pondweed (*P. amplifolius*); waterthread pondweed (*P. diversifolius*); whitestem pondweed (*P. praelongus*); other pondweeds (*Stuckenia* spp.); lesser bladderwort (*Utricularia minor*) and possibly yellowish-white and common bladderwort (*U. ochroleuca* and *U. macrorhiza*, respectively); twoheaded water-starwort (*Callitriche heterophylla*); western waterweed (*Elodea nuttallii*); and spiny-spore quillwort (*Isoetes tenella*). Furthermore, I documented several new occurrences of rare aquatic plant communities tracked by the Heritage Program. I also took clear close-up photographs of many of these aquatics, often showing diagnostic parts.

2013 Festuca Hallii Directed Surveys on the Arapaho-Roosevelt National Forests in Colorado
Presenters: Brian Elliott and Steve Popovich

Brian Elliott: I set out in 2013 to re-locate two vaguely-described historic sites for the rare subalpine/alpine grass Hall's fescue (*Festuca hallii*). There were five historic occurrences of this S1-ranked and Forest Service Sensitive Species in Colorado, two of which reside in northern Colorado on the Roosevelt National Forest. In 2003, I was able to relocate a historic site on the Spanish Peaks that was last observed in 1978. I estimated several thousand plants. In 2013, even though locality data were vague, my survey efforts resulted in successfully relocating both historic populations on the Roosevelt National Forest, one on Cameron Peak near Cameron Pass, and one further north in Shipman Park in the Rawah Wilderness of the Medicine Bow Mountains. These populations were last observed in 1956 and 1954, respectively – 60 years ago! The Cameron Peak site was expanded with more subpopulations, and 2,140 ramets (different individuals) were counted, while 316 ramets were estimated at Shipman Park. I even searched — to no avail — for Dr. William Weber's marsh pick accidentally left at the Cameron Peak site in 1956!

Steve Popovich: Thanks to Mr. Elliott, we now know that three of the five historic sites in Colorado remain extant and appear stable. Location information is so vague at the remaining two historic sites (Custer County and South Park) that re-locating them may prove to be unrealistic.

Middle Park, Colorado, Rare Lichen Survey Results
Presenters: Brian Elliott and Steve Popovich

Brian Elliott: In 2013 and 2014, I searched for rare (S1-ranked) lichens in the sagebrush-steppe of Middle Park and north of Kremmling. Lichens receive disproportionately less survey efforts in Colorado relative to other rare species, and we know much less about their ecology and habitat requirements. In 2011, Dr. Roger Rosentreter (lichenologist formerly with the BLM in Idaho) and Mr. Popovich were able to relocate the historic site and find one new site of the vagrant (i.e., rolls along the ground unattached to the soil) globally-rare Idaho xanthoparmelia lichen (*Xanthoparmelia idahoensis*).

Steve Popovich: There were only four known populations of this *Xanthoparmelia* in the world, one cluster of sites in Colorado, one site in Idaho, and two sites in Eurasia. Rosentreter and I also found populations of the rare lichen *Circinaria rogeri*, a new species named after Roger. Additionally, I found a

Colorado State record of the vagrant “form” of the reticulate silverskin lichen (*Dermatocarpon reticulatum*).

Brian Elliott: I used these data to further search for more of these lichens. With the help of Mike Kirkpatrick (Botanist on the Shoshone National Forest) and Scott Smith, we were able to document in Colorado 15 new *Xanthoparmelia* sites, 18 new *Circinaria* sites, and four new *Dermatocarpon* sites! Although still quite rare, results indicate that these species are more common, at least in Colorado, than previously believed. Results also confirmed the restricted soil substrates on which these lichens occur.

Conclusion

Steve Popovich: Survey results show the amazing amount of knowledge that can be gained simply by focusing on proactive surveys for targeted rare plants. The amount of funds expended by these individuals was indeed small compared to the amount of survey work and species knowledge gained. A little money *can* go a long way! As field studies chairperson for the Colorado Native Plant Society, I am delighted to see such work endorsed by federal land management agencies, CoNPS, and the University of Colorado. The PowerPoints are available on line at the Colorado Natural Heritage Program website where the minutes from this 2014 symposium are posted.

2:30 pm

Wyoming Plant Species of Potential Interest to Colorado Botanists

Presenter: Bonnie Heidel, Botanist, Wyoming Natural Diversity Database, Laramie

Bonnie Heidel: There are 69 rare plant species are tracked in Wyoming that are in a 10 km sliver adjoining Colorado. Of these, 14 are globally rare and tracked in Colorado and 6 are globally rare and not known in Colorado. *Oenothera coloradensis* was elevated to a full species and will now appear in FNA treatment. Larimer aletes (*Aletes humilis*) is only known in Wyoming and Colorado. *Astragalus leptaleus* is only known in one location in Wyoming collected by graduate student. *Rubus acaulis* was discovered recently in Fox Park area. It was first recorded in southern Wyoming; it is not known from Colorado. *Machaeranthera coloradensis* is in a big park just north of state line. It occupies high elevation in Colorado but occupies foothills in Wyoming with a gap in distribution between Wyoming and Colorado. *Eriogonum exilifolium*'s distribution is more continuous between states.

Penstemon gibbensii, *Astragalus nelsonii*, *Cirsium owenbyi*, and *Penstemon paysonii* are several other border species of interest.

Spiranthes diluvialis is found 40 km north of the state line in disjunctive distribution from Colorado.

3:15 pm

Priority Conservation Actions for the Coming Year – Group Discussion
Presenter: Jill Handwerk

Jill Handwerk: 117 plant species will be added as an Addendum for the State Wildlife Action Plan (SWAP).

Susan Spackman Panjabi: The SWAP will include a map of Important Plant Areas.

Andy Kratz: What conservation actions will be part of the SWAP?

Susan Spackman Panjabi: There are no actions associated; it's just to recognize these species at the state level which is not currently happening. For some history, the Rare Plant Conservation Initiative was started in 2008 to create a statewide strategy. The development of the strategy was funded by National Fish and Wildlife Foundation but that money is no longer available, so there is now no funding to implement the strategy. However, a group of us are working on implementing one objective of the strategy, to try to get a legislative mandate for plants, that would recognize and conserve rare plants in Colorado. We are hoping the Agriculture Department or the Department of Natural Resources will introduce a bill in 2016 legislative session.

Jenny Neale: What can we do to help?

Susan Spackman Panjabi: We need to raise awareness to legislators and their constituents. Create calendars or post photos of rare plants at the capital are a few ideas.

Andy Kratz: I have been interested in seed collecting of rare plants and to get them into the national seed storage facility in Fort Collins. It's not addressing the above directly, but is at least something we all can do to help conserve rare plants- collect their seed and get it into long-term cold storage.

Susan Spackman Panjabi: Also adding info in the Rare Plant Guide about seed collection is helpful.

Andy Kratz: And consider adding seed collection status to the presentation slides, so people know if a species needs seed collected.

Jenny Neale: We are also working to try to get the seeds to grow, so that if we want to do reintroductions, we would know how.

Becky Kao: At DBG, we are doing this and Mary Goshorn is leading the effort. There is a talk about this tomorrow. We are also working on how to grow our G1 and G2 species and have them at DBG well labeled. Learning how to grow them is important for reintroductions.

Susan Spackman Panjabi: *Mertensia humilis* needs work.

Jen Ackerfield: There are several species of *Mentzelia* that need work, *M. paradoxa*, *M. laciniata* for example. We need more information on these.

Judy von Ahlefeldt: Black Forest, Palmer Land Trust oversees land owned by El Paso Parks. Tess Kelso studies them, looking at disjunct species that have stable pops somewhere else. Many species are in shallow soils, relic tallgrass prairie species. Although we have some upland communities, we are not sure we have described the riparian communities, which is where many of these are found. Last Tuesday, County Parks released an updated Forest Management Plan. There is not much info about rare plants in the plan and the agenda is to salvage log this area. We need to see that there are best management practices in place to help preserve these habitats and species. We would like to try to initiate having CNHP, DBG, CoNPS help organize effort for next spring and summer to have Bioblitz for spring, summer and fall species to document and help develop best management practices (BMPs). About 900 acres of forested land, 78%, was moderately to severely burned, with only 12 acres of forested land not burned. We don't have the expertise in El Paso County to make this a big presence and need help.

Jenny Neale: Do you think Palmer Land Trust would be willing to coordinate?

Judy von Ahlefeldt: Yes, but they might be limited by staff. Their staff hasn't had adequate time to review report, and the report wasn't made public until 2 hours before the public meeting and had comments moved back to Oct 10. Right now, they say they don't have funding and potential funding probably is a season away, so I think we have time to survey next season.

2014 Meeting Attendees

Last Name	First Name	Affiliation
Ackerfield	Jennifer	Colorado State University Herbarium
Allison	Pam	CoNPS
Anderson	David	Colorado Natural Heritage Program
Anderson	Stacey	CoNPS
Austin	Gay	Bureau of Land Management
Ball	Chuck	CoNPS
Ball	Leslie	CoNPS
Borneman	Marlene	CoNPS
Bowes	Megan	City of Boulder
Bromberg	James	CoNPS
Brummer	Lori	Rocky Mountain Herbarium
Camacho	Adrian	CoNPS
Cepeda	Joseph	CoNPS/West Texas A&M University
Clark	Dina	University of Colorado Herbarium
Copp	Sara	CoNPS
Culver	Denise	Colorado Natural Heritage Program
Davidson	Deryn	Colorado State University

Davis	Christopher	CoNPS
Dawson	Carol	Bureau of Land Management
DeMasters	Carla	CoNPS
DePrenger-Levin	Michelle	Denver Botanic Gardens
Duwaldt	John	CoNPS
Elliott	Brian	Elliot Env. Consulting
Foster	Baili	Colorado Natural Heritage Program
Gannon	Dustin	Mosquito Range Heritage Initiative
Gluesenkamp	Dan	CoNPS
Goshorn	Mary	Denver Botanic Gardens
Grant	Ann	CoNPS
Green	Stephanie	CoNPS
Greer	Ginni (Virginia)	Mosquito Range Heritage Initiative
Handwerk	Jill	Colorado Natural Heritage Program
Harden	Dyan	Student, Colorado State University
Hauptli	John	CoNPS
Heidel	Bonnie	Wyoming Natural Diversity Database
Hogan	Tim	University of Colorado Herbarium
Hunter	Theron	CoNPS
Islam	Melissa	Denver Botanic Gardens
Kao	Rebecca	Denver Botanic Gardens
Koski	Ronda	CoNPS
Kratz	Andrew	CoNPS
Krening	Phil	Bureau of Land Management
Kuhn	Bernadette	Colorado Natural Heritage Program
Larson	Denise	ERO Resources
Lentz	Leah	CoNPS/ Mosquito Range Heritage Initiative
Levine	Danielle	CoNPS
Majack	Marika	Student of Leo Bruderle/UC Denver
Malone	Delia	Colorado Natural Heritage Program
Mayo	Ellen	U.S. Fish and Wildlife Service
McGlaughlin	Mitchell	University of Northern Colorado
Murphy	Pat	CoNPS
Neale	Jenny	Denver Botanic Gardens
Nogle	Jamie	GEI Consultants
Olson	Steve	U.S. Forest Service
Paulik	Laurie	CoNPS
Popovich	Steve	U.S. Forest Service
Richardson	Mary	CoNPS
Roberts	Trevor	U.S. Forest Service
Rountree	Lisa	CoNPS
Sapp	Joan	CoNPS
Scully	Richard	CoNPS
Skigen	Sarah	Consultant

Smith	Jessica	Colorado Natural Areas Program
Smith	Pam	Colorado Natural Heritage Program
Spackman-Panjabi	Susan	Colorado Natural Heritage Program
Tortorelli	Claire	Colorado Natural Heritage Program
Tripp	Erin	University of Colorado Herbarium
Turner	Charlie	CoNPS President
Turner	Jan	CoNPS
Tuthill	Dorothy	CoNPS
von Ahlefedlt	Judy	CoNPS
Wills	Brandee	CoNPS
Wahle	Bruce	CoNPS
Wertsbaugh	Raquel	Colorado Natural Areas Program
Wilson	Denise	CoNPS
Yarborough	Steve	Tetrattech
Zielinski	Ann	CoNPS