

Fifteenth Annual Colorado Rare Plant Symposium

September 14th, 2018

Slocum Commons

Colorado Springs, Colorado

Rare Plant Symposium
Moderator: Susan Panjabi (CNHP)

G2G3 Species of NE Colorado
Session facilitated by Jill Handwerk (CNHP)

Reminder: G1/S1 = 1-5 occurrences; G2/S2 = 6-20 occurrences; G3/S3 = 20-80 occurrences.

***Aletes humilis* (G2G3):**

Jill Handwerk: Secure because mostly on public lands in Boulder and Larimer Counties, numbers have not changed much.

***Aletes (Lomatium) nuttallii* (G3S1):**

Carol Dawson: Still there at Troublesome Creek.

Jill Handwerk: need habitat shot.

***Aquilegia saximontana* (G3S3):**

Scotty Smith: Found at Lake George, Colorado (lower elevation).

Kelly Ambler: Has also seen it at low elevation.

Susan Panjabi: We should update elevation range.

Brian Elliot: Working with CO 14ers Initiative, think it is pretty rare, not found many places, not more widespread than currently think; hard to tell it apart from common species when vegetative.

Jill Handwerk: Appears many populations are small (largest is 100 plants) or no number size recorded.

Brian Elliot: Wonders if this species should be a G2, given the number of historic occurrences?

***Astragalus sparsiflorus* (G2S2):**

Jill Handwerk: Used to be only 8 but now are up to 21 occurrences so moved down in rank to G2/S2 with more field work done. Still “sparse” as 10 of those are historical.

***Bolophyta alpina* (*Parthenium alpinum*) (G3S3):**

Jill Handwerk: A volunteer for Adopt a Rare Plant found a large population of it for CNHP.

Bob Lagire: Has lots of pictures.

Steve Popovich: Occurs on a series of escarpments, estimated millions of plants; secure on Pawnee National Grasslands.

***Carex oreocharis* (G3S2):**

Jill Handwerk: Not much has changed since 2010, more central in its distribution than north.

Pam Smith: Saw recently; CNHP will go to see it in a few weeks near Woodland Park, but in 2014 doing well, one population impacted by smooth brome.

Jan Midgley: Saw recently on Boulder Chapter CoNPS/WRV field trip, a mile north of intersection of 93 and 72, Jefferson County.

***Draba globosa* (G3S1):**

Jenny Greer: South of summit of Horseshoe Peak this year, believe it is in Sacramento Gulch; will send CNHP the records.

Brian Elliot: Documented one occurrence, several sub-populations at Loveland Pass doing work for Johnny Proctor, and will make sure he has sent data to Jill.

***Draba streptobrachia* (G3S3):**

Jill Handwerk: MRHI has updated this species sending in information on 6 new sites since 2013.

Brian Elliot: A couple of new occurrences in Pikes Peak – believes this one is easy to overlook (does not believe it is very rare). He will send EO to Jill.

Susan Panjabi: It is an endemic, which is why we have kept it on the list and if that changes should keep on the watch list.

***Eriogonum exilifolium* (G3S2):**

Jill Handwerk: Marti Aiken reported 6 new occurrences in North Park, bringing total up to 19; Marti would still leave it at this rank due to pending oil and gas exploration in North Park, she will send data to Jill.

***Oonopsis wardii* (G3S1):**

Jill Handwerk: Just drops down from WY, one occurrence from Georgia Doyle and Rich Scully in Laramie River Valley from 2004.

***Phacelia denticulata* (G3S2):**

Jill Handwerk: Recent work by Rich Scully and others, Jefferson County, have added information about this one, now an S2 (25 occurrences, 15 historical) in areas could be subject to development, so old occurrences could be gone.

Pam Smith: Looked for known occurrences in El Paso County – so dry and it's an annual, so bad year to find it; CNHP does collect negative data, but do not extirpate something unless multiple years of negative data.

***Physaria bellii* (G2G3S2S3):**

Jill Handwerk: Many plants, but threatened by development on the Front Range.

Pam Smith: Did a study with group of CSU students and an entomologist; this species has a wide variety of pollinators, from thrips to big bumblebees to parasitic flies.

Susan Panjabi: Found a new location (update to known occurrence) at Redstone Creek, a Larimer County property west of Horsetooth Reservoir.

Jessica Smith: CNAP has a volunteer checking it a Park Creek Hogback, stable.

Pam Smith: At City of Loveland on Coyote Ridge found an extension of known occurrence.

Dave Anderson: CSU students working with Crystal Strouse: Crystal's theory is nitrogen pollution from Front Range is increasing density of grass and competing with this.

Brian Elliot: None of this is found on federal land so this is a problem for the species and a powerline survey company wouldn't protect it as there is no status.

Steve Popovich: USFS took it off their radar, but there are some areas where it comes really close to Arapaho NF, could be some areas to check.

Pam Smith: Hybrid in Jefferson County – work on it being named: possibly *Physaria kencarylii*.

***Potentilla ambigens* (G3S2):**

Jill Handwerk: Saw some at the Air Force Academy this summer

Jennifer Ackerfield: Also at Park and Ride at RMNP, it's everywhere.

Pam Smith: Says it was planted there; she is interested in Jefferson County occurrence in 2011 and it was very small – wondering how it is doing?

Susan Panjabi: Elk love it.

Pam: It is a robust, knee-high plant, hybridizes with *P. hippiana*.

***Potentilla rupicola* (G2S2):**

Jill Handwerk: Endemic to CO, not found yet in WY.

Steve Popovich: He and Tom Bates have seen it at known sites at Arapaho NF up to 2016. USFS works around that plant when doing fuels management, etc.; they are aware of it.

***Sisyrinchium pallidum* (G3S3):**

Jill Handwerk: Widespread but all occupied areas are really small.

Jessica Smith: At Great Sand Dunes NP, talked with their seasonal botanist Bill Watson, and he had collected it there. Try to follow up with Bill/Park to get samples or an EO.

***Campanula aparinoides* (G5S1):**

Cathy Fisher, Elizabeth Taylor, and Barb Harbach rediscovered in Douglas County— previously had not seen since 1861 sample in Park County. Lorraine Yeatts verified the identity.

Jenny Neale: There are enough samples we can send one to each herbarium. Is found in at least 30 states and Canada so is a G5.

An Application for SEINet Data – Steve Olson (USFS)

A demonstration on SEINet searches by quad was presented. Steve displayed a project to create an analysis of distribution of plants of Pike/San Isabel/Comanche Grassland using SEINet; looked at over 200 quads, explored using coordinates. Also got a list of plants with only old records; identified data gaps: at Cimarron National Grassland – common species like big bluestem not documented. Lots of collections don't get to people who need to know: made a running list of tracked species and compared that to Heritage L1 and L2 data, and found ~ 250 records of tracked species that did not correspond to anything from this effort and sent to Jill Handwerk. Interesting to compare quads. Found one that had no documentation of specimens, by comparison found 1300 specimen records for Manitou Springs Quad. Also noticed some records duplicated 2-3 times by accident and some collections are shared among herbarium – end result, he completed a distribution of species across the forest. Challenge to others to fill in data gaps on the 1500 quads across state.

Mit McGlaughlin, a professor, teaches with SEINet tool regularly: You can also drop a point and do a radius search, mentioned this as a more user friendly way to do a search – so he has students make a plant list before going out, or draw a boundary box on map.

Jenny Neale, DGB: If you find mistakes on herbarium, you can notify the herbarium through SEINet, and they want you to do that so they can correct it.

Mit McGlaughlin: Soon we will have a Rocky Mountain Portal instead of AZ for this kind of data; grant running out of CU.

Dina Clark: The portal is “live” now but still growing it: Southern Rocky Mountain Herbarium – if you look at SEINET the portal is there now too.

Native Vascular Plants of Potential Conservation Interest On the CO Eastern Plains – Susan Panjabi (CNHP)

Are there species out there that CNHP should be tracking that aren't on our radar? Through CNAP funding she has tackled looking at diversity of plants on the plains – she used SEINet and Ackerfield flora

to note species known from 5 or fewer counties, noting taxa that appeared to be rare. She has developed a list of 115 taxa known from the Eastern Plains, and it is available for our review today; she would love feedback. These are species not tracked by CNHP, and she wonders if they should be. Are they common or rare? Are there plants we should be tracking? Should any be dropped? To make them more searchable by county, so people could look for them more easily. Next step would be looking at global distribution of these too. Almost all of these are a G4/G5 – supposedly secure globally, but on periphery of distribution. It would be helpful if anyone thinks these are rare on global scale to let her know.

Review of T&E Plant Species of Colorado - Jill Handwerk (CNHP)

***Astragalus humillimus* (G1S1, Endangered):**

Jill Handwerk: On all tribal land in CO so we don't know status here, but is still extant in NM per consultants.

Brian Elliot: He and Scotty Smith did a big survey for this in NM and found a good bit. He has worked on Ute Tribal lands and has not found it there; in last decade he has seen extreme population flux (70% decline at some sites) – may be drought or cold winter temp, but no clear explanation; says it takes a long time for it to get to size. Brian Elliot says he will send CNHP photos.

***Astragalus microcymbus* (G1S1, Candidate):**

Jill Handwerk: Undergoing SSA, which should be done this fall, and due for listing decision 2019 at earliest, maybe 2020; DBG is doing monitoring on this species, results presented later today.

Brian Elliot: One of the populations is bisected by transmission line and that should be added to EO.

***Astragalus osterhoutii* (G1S1, Endangered):**

Jill Handwerk: BLM monitors on regular basis.

Phil Krening (BLM): 5 study sites, good coverage of monitoring across range, mostly stable across range but Troublesome Creek population is in decline (significant decrease in plant density since 2011) and not sure why, it has no oil and gas or grazing, and it is setting seed; not seeing any larger changes in the greater plant community. Troublesome Creek has different soil than other areas, also this area not as affected as Wofford Creek by blister beetle.

***Astragalus schmolliae* (G1S1, Candidate):**

Jill Handwerk: SSA recently completed, listing decision will be this winter. Mostly on Mesa Verde NP land. CNHP has worked with NPS periodically since 2002 on monitoring the species. No strong trends seen from monitoring yet, burning helped initially and in long-term hurt, there is a positive correlation with winter precipitation.

***Astragalus tortipes* (G1S1):**

Jill Handwerk: Was a candidate but determined not warranted. Observed by USFWS in 2015. On tribal land only, not on BLM as was thought.

***Corispermum navicula* (G1?S1):**

Jill Handwerk: North Park on sand dunes. DBG and others have done genetic work.

Jenny Neale: Nothing new happening, BLM will be monitoring later this fall.

Phil Krening: 12 month finding coming up in 2022, and BLM refining monitoring plan.

Dave Anderson: Was it found in Oklahoma?

Jenny Neale: Can't verify that OK site was *C. navicula*, and can't relocate it.

Dave Anderson: So it only lives in north sand hills.

Jenny Neale: Yes.

Susan Panjabi: May be time to take this question mark off the global ranking.

***Draba weberi* (G1S1):**

Jill Handwerk: 12 month finding due in 2022.

Carol Dawson: 251 species need listing decisions, USFWS has plan 2017-2022 to roll out listing decisions – can get full listing plan off their website, a result from settlement with Wild Earth Guardians.

Jill Handwerk: Only 4 small populations, did update a few known occurrences this summer.

Brian Elliot: Really difficult to access.

***Eriogonum pelinophilum* (G2S2, Endangered):**

Jill Handwerk: BLM monitoring across range, includes Natural Areas too.

Phil Krening: This year exceptionally dry in Montrose, all plants dormant, still there but no reproduction; 6 monitoring sites across species range; black sage looks like it is gone.

Dave Anderson: Can you estimate mortality?

Phil Krening: We did not see significant mortality this year; things were stable between 2017 – 2018.

Raquel Wertsbaugh: BLM is doing quantitative monitoring on Wacker Ranch natural area for the state.

***Eriogonum brandegeei* (G1G2S1S2):**

Jill Handwerk: USFWS 21 month finding due 2022. BLM, CNHP (for CNAP) and DBG monitoring throughout species range. CNHP documented new site on fishing easement on state land on flat bench of Arkansas River near development, about 200 plants.

Mit McGlaughlin: Going to start genetics work on this starting in November.

Phil Krening: Royal Gorge field office has done an updated travel management plan and closed off roads to motorized use in these populations.

Susan Panjabi: Footprint of occurrences very small, recreational and OHV use extensive so protections would go a long way.

Scotty Smith: Has seen sites vary as to soils and geology.

Jessica Smith: CNAP revisited 3 populations on state land at Droney, all present.

***Eutrema penlandii* (G2G2S1S2, Threatened):**

Jill Handwerk: MRHI found more occurrences in past few years, were 18, now up to 23; draft recovery plan in works now, should be open for comment in winter. Occupied area really small so still G1G2.

Phil Krening: Set up demographic studies at monitoring plots – see huge swings in density from year to year, so trying to answer questions on how long these things live and other information.

***Ipomopsis polyantha* (G1S1, Endangered):**

Jill Handwerk: SSA underway, draft due in 2019.

Jessica Smith: CNAP, CNHP, USFWS joint effort to monitor, spent three days monitoring this year in June with qualitative and quantitative monitoring; quantitative monitoring showed numbers were down this year, likely due to drought. Overall; we think it is stable.

Susan Panjabi: Any local outreach?

Raquel Wertsbaugh: Al Pfister leading community outreach effort to conserve the species, training volunteers with USFWS assistance to have citizen monitoring of this species.

Jessica Smith: Actually have flag on street lights in town with Pagosa skyrocket on them.

***Mimulus gemmiparus* (G1S1):**

Dave Anderson: Footprint is 400 square meters.

Dave Steingraeber: Mark Beardsley visited Staunton late July – overall natural and experimental populations were about 1/10 of what he finds in normal years. Rob Baker from University of Miami, OH, visited late July and early August – Corral Dome and Hankins Gulch and Guanella Pass and similarly thought plants were small; suggested plants were smaller than normal, and with Mark's information concluded they had germinated late.

Mit McGlaughlin: Probably going to start genetics work on this species soon.

***Oenothera coloradensis* (G3T2S1, Threatened):**

Jill Handwerk: Proposed to delist but no final rule yet, some urban populations have been lost, but doing well overall.

Denise Larson: What about Denver Metro area populations?

Pam Smith: Have not been back to Denver site on Cherry Creek.

Denise Larson: Looked on Cherry Creek a few years ago and couldn't find it.

Pam Smith: Site is flood-prone.

***Pediocactus knowltonii* (G1SNA, Endangered):**

Jill Handwerk: Have not been able to find it in CO and only found at one site in NM.

Scotty Smith: Lots of people consider this a variety of *Pediocactus simpsonii*.

Mit McGlaughlin: More work needs to be done at population level to determine that.

***Penstemon debilis* (G1S1, Threatened):**

Jill Handwerk: CNHP using innovative method to monitor on State Natural Areas, so not walking on slope, using photographs; perhaps drones next year.

Carol Dawson: BLM site, road is now closed, communication tower moved, so long walk will protect population.

Raquel Wertsbaugh: Other three populations are designated natural area. CNAP met with owner of 2 of the 3 natural areas last summer and they have no plans for further oil and gas development at this point; landowner positive and cooperative; may try drones next year as well.

***Penstemon grahamii* (G2S1, Proposed Threatened):**

Jill Handwerk: Re-proposed for federal threatened status. Public comment period for next year, most is in UT and on the West Slope in Rio Blanco County. Has been off and on possible listing over the years.

Phil Krening: BLM monitors 1 study site at Raven's Ridge, been looking for years for better place to monitor and can't find any decent populations for better monitoring.

Carol Dawson: USFWS in Vernal field office in UT have done little monitoring and have now approached Carol to help, so may be trying to expand into UT to monitor (lawsuit now has to 2020).

***Penstemon penlandii* (G1S1, Endangered):**

Jill Handwerk: BLM and DBG work with species.

Phil Krening: Good monitoring representation across species range with 6 sites, 1st year since monitoring where something happened – downward tick this year, likely due to drought.

Becky Hufft: DBG not there this year, but last year, Center for Plant Conservation – collecting seed over years and done genetics work, lots of diversity, including private landowner seed collection – plants looked good on that site.

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

Jennifer Ackerfield: This has now been updated to species status (*Penstemon albifluvis*) not just variety – will send any publication information to Jill.

Susan Panjabi: So now would potentially be a G1 instead of G4T1.

Phil Krening: Have 3 sites for monitoring in CO – finding more of it than *Penstemon grahamii*.

***Phacelia formosula* (G1S1, Endangered):**

Jill Handwerk: Grows with *Eriogonum exilifolium*, endemic.

Jenny Neale: Some genetic structuring by population, but Larimer County ones are still *P. formosula* (not distinct species).

Phil Krening: Reported all 5 study sites across range went to 0, thinks is cause for concern although some have come back, but seems to have wild fluctuations.

Gina Beebe: CNAP saw at North Park natural area; population was significantly lower than 3 years ago.

Phil Krening: Have soil moisture probes at all sites now and hope to link that to population data.

***Phacelia submutica* (G2S2, Threatened):**

Jill Handwerk: Annual, ephemeral.

Scotty Smith: B Road poor showing.

Jessica Smith: CNAP volunteer Stephen Wenger looks for it every year, staff with him this spring: found only 2 plants at Pyramid Rock.

***Physaria congesta* (G1S1, Threatened):**

Jill Handwerk: USFWS working on a recovery plan that will be out in a few months.

Phil Krening: 4 study sites: 2 biggest sites were stable, at one study site, over 2,000 plants tagged – demographic data showing could be more long lived, 7-8 years; could use help to read tags.

Jessica Smith: CNAP read 3 monitoring plots, one which was set up in 2012, and 2 from late 1990s, all seem pretty stable from 2015, 2016; but 2 have declined from late 1990s (Dudley Bluffs and Duck Creek); eastern population at Duck Creek was really robust.

***Physaria obcordata* (G1G2S1S2, Threatened):**

Jill Handwerk: Has been Listed as threatened for a long time.

Phil Krening: Shorter lived than *P. congesta*, also seen ruderal behavior – found it colonizing on pipeline from 1970s as it appears to be the most robust population, set up plot there. Also found it growing on Calamity Ridge in road cuts; density varies by population.

***Sclerocactus glaucus* (G2G3S2S3, Threatened):**

Jill Handwerk: New population found at Cameo on State Lands; BLM and DBG monitor regularly.

Phil Krening: Have study coming out in next year, indicating minimum pop is closer to 200,000 individuals – working on refining that technique.

Mit McGlaughlin: CNHP should update current map and points – data puts line from where *S. glaucus* turns into *S. parviflora* is much further west – at 19 Road. New genetic information – applying new technique – shows still that the Pyramid Rock and DeBeque population is very different genetically, lots of genetic work going on, hooks or not can be the same species.

***Sclerocactus mesae-verdae* (G2S2, Threatened):**

Brian Elliot: Have seen it, but haven't been back to CO population recently, much more common in NM. Has seen pop flux due to drought and moth larvae, which damages and then it gets a disease and dies; looked rough this Spring in NM – found out they are quite short lived. Ones they had mapped precisely had died and new ones had come up. Have seen on Ute Mtn land along transmission line, but can't disclose data. Thinks plant is doing well in CO, think it is upper range of Jill's slide, or maybe more. Transplanted 6 in a road right of way (only 200' away and put fences around them) which was going to be bulldozed but not sure how they have survived. Think biggest threat is trampling by feral horses – if dead, usually by hoof punch.

Jill Handwerk: Problems with that at Mesa Verde NP.

Lisa Tasker: Did monitoring of this species in NM in 2000s and saw transplants – hardly any had survived.

***Spiranthes diluvialis* (G2G3S2, Threatened):**

Jill Handwerk: Undergoing SSA in 2019. The best occurrences on west slope.

Pam Smith: They did not find any in Wheat Ridge population this year, believes the site is drying out.

Irene Weber: Population in Jefferson County on Clear Creek, re-found 2011 population this year, which CNHP originally found.

Review of G1 Plant Species of Colorado – Jill Handwerk (CNHP)

***Aletes latilobus* (*Lomatium latilobum*) (G1G2/S1):**

West Slope. CO Natl Monument.

***Aliciella* (*Gilia*) *sedifolia* (G1S1):**

Jill Handwerk: New habitat photos of this plant are needed. One new population was found last year by John Bregar in SW Colorado.

***Astragalus deterior* (G1G2S1S2):**

Jill Handwerk: Found in Mesa Verde and in good shape.

***Boechera glareosa* (G1S1):**

Jill Handwerk: Described in 2002, so only recently described, but only know about it from its publication – needs more information, photo.

***Descurainia kenheilli* (G1S1):**

Jill Handwerk: One occurrence and people have looked repeatedly for this one and can't re-find it.

***Draba malpighiacea*(G1?S1):**

Jill Handwerk: Question about the validity of this taxon, so should it be discarded? Some say it looks like *D. spectabilis*.

***Erigeron wilkenii* (G1S1):**

Jill Handwerk: Taxonomy is “squishy”, claimed to be in Dinosaur;

Jill and Dina Clark: “more information needed”.

***Gutierrezia elegans* (G1S1):**

Jill Handwerk: Recently described.

***Hackelia gracilentia* (G1G2 S1S2):**

Jill Handwerk: Information has been updated in the last 10 years, with more information added from Mesa Verde NP.

***Ipomopsis ramosa* (G1S1)**

Jill Handwerk: Ross McCauley (Ft Lewis) and students worked on this, described by Al Schneider.

***Lepidium huberi* (G1G2 S1S2):**

Jill Handwerk: 18 occurrences based on label data so field surveys needed. 2012 was the most recent fieldwork.

***Lygodesmia doloresensis* (G1G2 S1S2):**

Jill Handwerk: Needs genetic work; how related, etc. to *L. grandiflora*?

***Oreocarya revealii* (G1G2, S1S2):**

Jill Handwerk: Mit has completed genetics work on this.

Phil Krening: BLM has a couple of monitoring sites set up for this species now, really dry, seen declines from 2014-2018, most plants pretty small and not many reproductive.

Bob Lagier: Saw them May 2nd and 3rd and looked healthier.

***Oreoxis humilis* (G1S1):**

Brian Elliott: Abundant on Pikes Peak, counted thousands (doing surveys for trail re-route).

Steve Olson: Keeps track of Pikes Peak populations – salvaging plants at Summit House construction on Pikes Peak.

Brian Elliot: Will submit EO.

***Packera mancosana* (G1S1):**

Jill Handwerk: Jennieffer Ackerfield lumps this into *P. werneriiifolia*. Ross McCauley and students have done a little genetics work, more needed.

***Penstemon gibbensii* (G1G2S1):**

Jill Handwerk: Some in WY and UT, but not much in CO. CNHP did document new occurrence in 2017 (1,000 Plants) in little snake BLM field office area.

***Phacelia gina-glennae* (G1S1):**

Jill Handwerk: Genetic work is being done by DBG.

***Physaria pulvinata* (G1S1):**

Jill Handwerk: CNHP is monitoring for CNAP on state lands in the San Miguel and Dolores area, 2018: was really dry and monitoring was challenging due to fires.

***Physaria scrotiformis* (G1S1):**

Jill Handwerk: a new site at Stony Pass was reported by John Bregar.

Tyler Johnson: How big – was there a count?

Bob Lagier: 2017 CoNPS field trip at Stony Pass with John Bregar, plant in fruit but grazing sheep there and some hoof impact.

Jill Handwerk: Think population size was less than 50.

Bob Lagier: On hillslope.

Scotty Smith: Saw it on West Slope and that was a good population, healthy.

Review of Forest Service Sensitive Species – Tyler Johnson (USFS):

Have Regional Foresters Sensitive Species list – species get on this list with a downward population trend, or heading towards listing; species on this list only have to be suspected or likely to occur. Going forward there will be Species of Conservation Concern (SCC) – based on new Sensitive Species Concept, each forest will have its own list. USFS keeping the sensitive species list for areas who have not updated their forest management plans yet but areas with new plans will use the new species of Conservation Concern Concept.

To be SCC – have to have two things: 1) has to be native and known to occur, and 2) there needs to be a substantial concern for its continued existence/persistence. G1 or G2 must be on it and indicators of substantial concern (these are written into manual): (1) climate change, (2) declining trend in population or habitat, (3) restricted range (disjunct or endemic), low population on the unit. They round down for rank – G2G3 would be a G2. These SCC lists are never final and can be changed at any time. Native and known to occur is the first cut for a species. They start all of this with G rankings, G1G2.

If a downward trend is based only on climate change, then can't stay on the list. Must always relate to what is happening on a particular forest. Can't pin down climate change impacts on alpine like they can with spruce canopy beetle damage, etc.

Rio Grande NF plants undergoing review; final plan has 31 SCC, plants and animals treated equally, 21 had substantial concern, 10 G1 or G2.

You do not have to have all 4 indicators, flexible. Examples:

Rio Grande: G1/S1 Stonecrop gilia, West Silver bladderpod – don't have great trend data and need info; has 31 species of Conservation Concern.

Astragalus ripleyi (G3S3) – vulnerable to climate change, substantial part of range in Rio Grande. That forest is key to keeping the species around; restricted to a narrow geology.

Slender Rockbrake – G5 S2, CCVI – decline in habitat (only have habitat trend due to spruce beetle taking habitat); extremely vulnerable to climate change. Wolf Creek Pass – 90% of canopy gone and so habitat is drying and therefore in decline. Don't need individual numbers because can extrapolate habitat is declining.

GMUG NF – 15 sensitive plant species; initial SCC is 65 plants; SCC does not slow down planning – management is different than Sensitive Species List.

Large flower globe mallow: all 4 indicators pertain to it, declines with fire suppression, declining trend due to that, GMUG has half pop, endemic to 4 corners; forest has a disproportionate role in the species continuance of large flower globe mallow.

Adobe hills thistle, G2G3 (so USFS calls it G2) NatureServe lists impacts due to biocontrol beetles, yet Barry Johnson had good documentation that the biocontrol is not affecting the thistle on GMUG, so it is not on the list there. ON GMUG, they don't have impact documentation like other areas; but it is listed as SCC.

Reindeer lichen – considered non-vascular plants (G5/S1) fen specialist, had all 4 indicators, impacted by road maintenance. Only 3 occurrences on the GMUG.

Brian Elliot: What is going to be the impact to the species from a project? New plan just says are you following the forest plan? If language is very vague in plan then protection will not be good. For example: brewer's sparrow needs 5 acre chunks to be viable, so plan says "when possible", don't create less than 5 acres. This is too vague.

Tyler Johnson: Project level analysis will look very different. Looking at ecosystems first. Huge difference! Are ecosystem processes still there? If not, then go to individual species analysis. Each species must have a plan component to insure viability

Brian Elliot: Language of standards or language of guidelines. Cannot deviate from a "standard" but can deviate from "guidelines". This is a "Coarse Filter" approach.

Dina Clark: What if weeds?

Tyler Johnson: They have a mechanism to add that into the Forest Plan or can make a species specific plan. Are meant to be iterative plans as opposed to huge cumbersome plans each time renewal comes up. If species is not covered by ecosystem plan component, then USFS will look at species component. i.e., and reiterated the example goal of "keep a fen a fen". If people find things in the forest, tell USFS and they can easily run it through the criteria to put it on the list if warranted. They are also interested in any trend data anyone wants to share.

Nomenclature follows Plants National Database so can be consistent. They will always note when CNHP uses a different name.

Susan Panjabi: Are any SCC not tracked by NatureServe?

Tyler Johnston: Few (at least a liverwort he thought).

Review of BLM Sensitive Species – Carol Dawson (BLM)

BLM Sensitive Species – list of species which BLM must be proactive about conservation. Mandated to them (the BLM) and they must be proactive about conservation. There are criteria to get on the list. This is a huge challenge to them. For one they have to occur in CO. Must document a downward trend either all across a range or on a significant portion of a range. A significant portion of the range must be on BLM. If only have 1% of occurrences on BLM, can't do much. If have specialized habitat that is helpful for actions and it's helpful if actions on BLM lands may impact species or if species have small or large populations or are under review by USFWS. Last updated list in 2015.

Carol hopes to update the list with field offices this year. They will work with many entities to create the list.

***Aletes lithophilus* (G3S3):**

Tyler Johnson: That is a species which came off Rio Grande list, as it didn't meet the criteria.

Brian Elliot: He was responsible for putting it on the USFS list in 2004, literature says it is limited to igneous outcrops, and therefore if you protect that habitat, then it is protected, but it is also outside of this habitat. Cattle grazing threat, recreation, it is a G3, but Brian disagrees with USFS decision to drop it – less than 50 occurrences worldwide, but Brian had only 38. Occurrence on the San Isabel being grazed really hard. He saw benefits to protection. Report by David Anderson notes recreation impacts.

***Amsonia jonesii* (G4S2):**

Carol Dawson thinks this species is at Unaweep Seep (but see S. Smith comment below); GJFO had Bob Clarke doing a survey there this year, but looks like he did not observe it

Scotty Smith: Unaweep Seep had 100 head of cattle this year when visited and the site was "wasted". Species is available on-line to use in gardening.

***Aquilegia chrysantha* var. *rydbergii* (G4T1QS1):**

No new information.

***Asclepias uncialis* var. *uncialis* (G3G4T2S2):**

Carol Dawson: Not sure they have any occurrences; want to keep on list. Royal Gorge F.O. Looking closely.

***Astragalus anisus* (G2G3S2S3):**

Carol Dawson: Lots of occurrences, population size OK, probably going to keep this on list, but may not be a top priority for monitoring and this will not change.

***Astragalus debequaeus* (G2S2):**

Carol Dawson: BLM active with monitoring program, Silt to Grand Junction, Webster Mesa, need more macroplots: this species has been misidentified in the past, this will stay on the list; some locations are now closed off to the public to protect it.

***Astragalus detritalis* (G3S2):**

Carol Dawson: 15 CO occurrences, will stay on list. Have contracts and assistance agreements with others.

***Astragalus duchesnensis* (G3S1S2):**

Carol Dawson: CNHP did document a new pop, 380 acres, in NW CO where we don't know much, stay on list.

***Astragalus equisolensis* (G5T1S1):**

Jessica Smith: At Gateway, surveyed by Lorraine Yeatts; not certain on BLM.

***Astragalus microcymbus* (G1S1):**

Carol Dawson: SSA hopefully peer-reviewed soon.

***Astragalus musiniensis* (G3S1):**

Carol Dawson: Will remain on list until much more information, 2 occurrences (2 historic) known in CO, field offices haven't reported on this.

***Astragalus naturitensis* (G2G3S2S3):**

Carol Dawson: One field office believes it responds well to fire and thinks it is doing great, other field office not concerned; may need a landscape level approach in future: document locations, then monitoring across landscape if 2 offices can agree. At minimum need to document where it occurs.

***Astragalus piscator* (G2G3S1):**

Carol Dawson: Think we should keep this on list, nothing done on it, but not many in CO.

***Astragalus rafaensis* (G2G3S2S3):**

Carol Dawson: Will be lumped with *A. linifolius* and probably remove it from sensitive species list, but need to develop a trend monitoring program to make sure stays stable if removed.

Joe Stadwick's report said grazing is not likely to be a threat, but Carol Dawson would like to monitor that; greater than 1,000 individuals, way more. Scotty Smith saw *A. linifolius* this year in Escalante.

***Astragalus ripleyi* (G3S2):**

Carol Dawson: Interested in collaboration with NM state botanist to monitor this species.

***Astragalus sesquiflorus* (G3G4S1):**

Carol Dawson: BLM needs data.

***Boechera crandallii* (G2S2):**

Carol Dawson: Need more data.

Jill Handwerk: Planning to change it to G3 S3 – 54 occurrences now, but no numbers on population sizes, a lot of those occurrences are based on herbarium label data.

***Bolophyta ligulata* (G3S2):**

Carol Dawson: Interested in this and can't find it at Raven's Ridge. Sheep Grazing there– Jessica Smith has seen this and will send Larry's GPS points and photos, and notes from 2017, did he see it this year?

7 of 10 occurrences are historical.

***Camissonia eastwoodiae* (G2S1):**

Carol Dawson: Will keep on list.

***Cleome multicaulis* (G2G3S2S3):**

Carol Dawson: BLM has not done much with this, will probably leave it on the list. In Rio Blanco in wetlands.

***Corispermum navicula* (G1?S1):**

Carol Dawson: On North Sand Dunes (OHV playground); have been monitoring for several seasons and putting up buck and rail fencing to keep people out of area; species does not grow in open part of dunes; DBG has done some work on genetics.

***Cryptogramma stelleri* (G5S2):**

Carol Dawson: BLM not doing anything with species; will stay on list.

***Cymopterus duchesnensis* (G3S1):**

Carol Dawson: Found in NW CO where work is needed; need updates – all populations are historical.

***Erigeron kachinensis* (G2S1):**

Carol Dawson: Populations in Coyote Wash, will stay on list.

***Eriogonum acaule* (G3S1):**

Carol Dawson: Need more info.

Jill Handwerk: Dee Malone and Lisa Tasker found some this summer.

***Eriogonum brandegeei* (G1G2S1S2):**

Carol Dawson: Lots of people working on this species, trend monitoring, genetic work will be done as well.

***Eriogonum clavellatum* (G2S1):**

Carol Dawson: May take off list, if can't find any on BLM, and is only on tribal lands.

Jill Handwerk: Peggy Lyon may have found some off tribal lands at some point.

Carol Dawson: Person who did the genetic work for Gina Glenne didn't write a report but Carol thinks they determined it was a separate species.

Dave Anderson asks about BLM subsurface ownership and Carol says if BLM owns subsurface, can cover plants.

***Eriogonum coloradense* (G2S2):**

Carol Dawson: More data needed about species.

***Eriogonum contortum* (G3S1):**

Carol Dawson: Many estimate numbers in in 1,000,000's, but will leave it on list until Carol can confirm. Carol thinks invasive weeds could be a huge problem, field office feels there are no threats.

***Eriogonum ephedroides* (G3S1):**

Carol Dawson: No field office indication that it should be dropped off list. Raven Ridge Area.

***Eriogonum tumulosum* (G3QS2):**

Carol Dawson: CNHP surveyed 2200 acres. Stay on list.

***Eriogonum viridulum* (G4QSH):**

Carol Dawson: Historical, need data.

***Frasera paniculata* (G4S1):**

Carol Dawson: Need data, historical.

***Gentianella tortuosa* (G3?S1):**

No new information.

***Gilia stenothyrsa* (G3S1):**

Carol Dawson: Keep on list.

***Gutierrezia elegans* (G1S1):**

Carol Dawson: Reported on earlier today.

***Lomatium concinnum* (G2G3S2S3):**

Carol Dawson: Stay on list.

***Lupinus crassus* (G2S2):**

Carol Dawson: One plot field office is monitoring, need more data, no plants in this plot this year.

***Lygodesmia doloresensis* (G1G2S1S2):**

Carol Dawson: May take off, not going to work on it due to taxonomy concerns.

***Mimulus eastwoodiae* (G3G4S1S2):**

Carol Dawson: Removed it from list in 2015, field office thought no threats.

***Nuttallia chrysantha* (G2S2):**

Carol Dawson: Needs genetic work to sort out.

***Nuttallia rhizomata* (G2S2):**

Carol Dawson: Road to Anvil Points closed off, will be beneficial for this population.

***Oenothera acutissima* (G2S2):**

Carol Dawson: Will take closer look, CNHP did surveys, could not find it in some places where they looked.

***Oreocarya caespitosa* (G4S2):**

BLM hasn't looked at this species.

***Oreocarya osterhoutii* (G2G3S2):**

BLM hasn't looked at this species.

***Oreocarya revealii* (G2S1S2):**

Carol Dawson: starting to monitor.

***Oreocarya rollinsii* (G3S2):**

No new information.

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

Carol Dawson: CNHP found some and will keep on list.

***Packera pauciflora* (G4G5S1):**

Carol Dawson: Per Jennifer Ackerfield, not in state of CO, we have *Packera debilis*. If so, then take off list.

***Pediomelum aromaticum* (G3S2):**

BLM needs more info.

***Penstemon acaulis* var. *yampaensis* (G2S2):**

BLM needs to work with field office, no population information.

***Penstemon degeneri* (G2S2):**

Carol Dawson: Field office is setting up monitoring.

***Penstemon gibbensii* (G1G2S1):**

BLM hasn't worked on this yet.

***Penstemon harringtonii* (G3S3):**

Carol Dawson: May need to expand monitoring, but may also remove from list.

***Physaria parviflora* (G2S2):**

Carol Dawson: No recent information, will stay on list.

***Physaria pruinosa* (G2S2):**

BLM hasn't worked on this yet.

***Physaria pulvinata* (G1S1):**

BLM hasn't worked on this, most on state land.

***Physaria vicina* (G2S2):**

BLM hasn't worked on this, need to know about potential conflicts; grazing/private lands.

***Sisyrinchium pallidum* (G3S3):**

Carol Dawson: May take off list, as only 1% on BLM lands.

***Sphaeromeria capitata* (G3S1):**

BLM hasn't worked on this.

***Thalictrum heliophilum* (G2S2):**

Carol Dawson: Stays on list.

***Townsendia strigosa* (G4S1):**

BLM needs more info.

***Trichophorum pumilum* (G5S2):**

BLM needs more info.

Carol feels can't make good decisions without quantitative data and feels she cannot make decisions without it. They must have a majority of the population to manage a species.

Steve Popovich: Could be a good priority to have folks check on the historic populations for BLM sensitive species, as there seems to be a high % of historic occurrences for these species

Announcement Jenny Neale: Rare Plant Technical Committee meeting on 2/8/2019 at Gardens open to anyone with interest in Rare Plants in CO; may include a workshop about monitoring methodology, research priorities, survey priorities (strategize about who is doing what to maximize resources) – can email Jenny now if you have strong feelings on agenda.

Field Season Highlights:

Anemone virginiana – Irene Weber (Jefferson County OS) and Audrey Boag (Consulting Naturalist)

Audrey: This species found with *Sanicula marilandica*, *Aralia nudicaulis*, *Corylus corunata*, and other eastern relics. 193 species of plants in narrow drainage in southern Jefferson County. Weber had one record from Cuchara Valley; collected in 1934, and sample was annotated several times, FNA map has it up in Canada and NE USA; secondary involucres on lateral pedicels is the difference with *A. cylindrica*; Populations in 3 separate drainages; (2 on private land); populations were 65, 12, and maybe 30 plants; one of these pops has an unauthorized trail and Jefferson County wants to enforce closure.

Astragalus microcymbus, Eriogonum brandegeei, and Sclerocactus glaucus monitoring – Michelle DePrenger-Levin (Denver Botanic Gardens)

DBG has been conducting demographic studies with tagged plants and following how many seeds, survival, etc., focus on 3 species a year:

Sclerocactus glaucus: Moral of story: think about what timeframe are you looking at – she had long-term data, and if only looked at short portion, you see a decline.

Astragalus microcymbus:

Data since 1995, decline for first 10 years, and now back on upswing; plants across the different populations are showing similar trends.

Eriogonum brandegeei:

Sites in Fremont County only, had a plot by Salida but abandoned due to steep slopes; seemed stable, but in 2009 started going every other year; they count rosettes (vs. main stems which can be connected underground); both monitoring sites have declined since 2009, and have not picked up again. Garden Park West appears to have declined more steeply than Garden Park East.

CPC Seed Collection 2018 – Alexandra Seglias (Denver Botanic Gardens)

Alex reviewed the list of species that she targeted for seed collection in 2018. They collect no more than 10% of viable seed of rare plant populations; like to collect from 50 plants to get genetic variability. Results follow:

Asclepias uncialis:

Lake Pueblo SP EO 2629 no plants; 13839 only 3 plants.

Potentilla rupicola:

EO 1198 found plants but need to confirm ID, suspects hybrids there.

Penstemon degeneri:

EO 4453 found plants; 11799 found plants along drainage; 11443 not found.

Oreoxis humilis:

EOs: 15026, 6692, 2494 could not find, rough roads; EO 9187 found plants, need to confirm ID; *O. alpinum* also there she thinks; she believes you need to look at oil glands on the seeds, so would need to be in fruit to ID; leaves were not always glabrous, even when oil glands went all the way around margin of seed, so her plants appeared to have fruits of *O. humilis*, but not the leaves; she believes it needs a more cautious ID.

Physaria bellii:

EO 4622 seed collected; population in Open Space did not look as good in 2018 as 2017.

Physaria alpina:

Missed seed collection window at EO 4320; she found it at Fourmile Creek, collected seed here.

Castilleja puberula:

EO 14097, found plants could be hybridizing with *C. occidentalis*?; EO 14111 healthy, seed collected; EO 14251 healthy pop, seed collected.

Ipomopsis globularis:

EO 4435 collected; EO 9135 plants found, missed seed collection window; EO 11005 Boreas Pass could not find.

Kelly Ambler: someone saw it this year near Boreas Pass; DBG would like to do a tissue culture with Chicago BOT Garden.

Saussurea weberi:

EO 6425 collected; EO 9155 could not find.

Telesonix jamesii:

EO 13648 found.

Mirabilis rotundifolia:

Good last year, but no plants this year, too dry?

Discussion and wrap up – Susan Panjabi

Andrea: Why are we not collecting seed of hybrids?

Susan Panjabi: Ones we talked about have not been identified as hybrids in literature, just suspected; but these types should be documented.

Ann Grant: Would it only be a true hybrid if from seed?

Mit McGlaughlin: Hybrids not protected under ESA, self-sustaining hybrid should produce fertile seed; with climate change there could be a higher occurrence of hybrids (different species coming into contact even things that separated millions of years ago), and they will be viable; consider how much phenotypic

variation is in a species typically. Example is *Sclerocactus glaucus* where we see hooked and hookless cacti. May see a whole range of morphologies all being driven by environment in the future.

Susan Panjabi: we should compile all of those notes on particular species, the variabilities being seen. Should seeds be collected, pollinators be documented, etc. CNHP has a field form that is specific to insect visitation to rare plants. Looking for any photos with an insect in it, then can work with entomologist's in the future to ID pollinators of species..

Jill Handwerk: Herbarium collection of common species may be lacking, as Steve Olson noted.

Mit McGlaughlin: Should collect weeds at sites of rare plants for a voucher otherwise can't prove they are there even if they say they are; get a collecting permit.

Dina Clark: There are new species in our backyard – keep eyes open.

Audrey Boag: Is there any kind of looking into raptor nesting before sending out a drone? Can you make a requirement to do avian survey first?

Dave: Anyone have drone license?

Jenny Neale: Gardens has drone and have staff get pilot license. DBG photographer took drone footage of *S. glaucus* at Pyramid Rock.

Irene Weber: Jefferson County requires permit to do survey, and as part of issuing permit, they look at sensitive features like raptor.

Lisa Tasker: FAA issues certification.

Pam Smith: Received a grant for work on FQI ranking of more species; will be asking for help, working on getting this done over next couple of years.