

Featured Story

Synopsis of the 2025 Colorado Rare Plant Symposium

By Grant Musgrave and the Colorado Natural Heritage Program Botany and Vegetation Ecology Team

The Twenty-Second Annual Rare Plant Symposium was held on Friday, September 19, at St. Cajetan's in Denver's Auraria Campus (shared by the Community College of Denver, Metropolitan State University of Denver, and University of Colorado Denver). The Symposium preceded the Colorado Native Plant Society's (CoNPS) Annual Conference, held on September 20 and 21.

The event opened with a welcome from David Anderson, director and chief scientist of the Colorado Natural Heritage Program (CNHP). David provided an introduction to CNHP's mission and recent efforts regarding their work on the Statewide Natural Heritage Survey, a project funded in part by Great Outdoors Colorado to expand and equalize biodiversity data across the state of Colorado.

Presentations began with an update from Jessica Smith (CNHP Botany/Vegetation Ecology Team lead) and Clark Hollenberg (CNHP wetland ecologist) on the Colorado Natural Heritage Program's updates to the Botany Tracking List. Jessica reviewed CNHP's ranking criteria before recognizing that CNHP now tracks 677 species of vascular plants, up from 585 in 2024. This increase came from a review of all plant



Table of herbarium samples at the Rare Plant Symposium. © Jess Cheadle

species in Colorado using resources such as NatureServe and iNaturalist. CNHP has also created a new category of their watchlist, for "poorly known" species, which encompasses G4 and G5 species that are S1S2 from preliminary data. These species require more information before being assigned to the tracking list, and thus attendees are encouraged to submit any iNaturalist observations, use CNHP's [data contribution resource link](#), or contact Jessica directly.

Clark Hollenberg reported on his collaboration with Barbara Thiers, Stacey Anderson, and Mo Ewing to integrate 517 occurrences of nonvascular plant and fungi records into CNHP's database and CODEX platform, georeferenced from BryoPortal. Clark also developed a rank estimator that suggests a majority of macrofungi will eventually be tracked; however, mycologists and lichenologists will need to provide further input on species verification and genetic sorting before this becomes definitive. This is a huge advancement in the tracking of nonvascular taxa!

Savanna Smith (rare plant program manager) and Hayley Schroeder (invertebrate and rare plant program supervisor) of Colorado Parks and Wildlife (CPW) presented an update on the Species of Conservation Interest Program (SCIP) and the State Wildlife Action Plan (SWAP). They began by detailing the origin and structure of the program, recognizing how House Bill 24-1117 provided much of the momentum surrounding pollinator conservation, which led to CPW receiving statutory authority to study and conserve invertebrates and rare plants. The initial priorities of SCIP include conservation planning and partnerships, education and outreach, research and monitoring, and conservation action.

Savanna reviewed the 2025 SWAP, which guides Colorado's approach to conservation of vulnerable species and the habitats they depend on. This plan identifies Species of Greatest Conservation Need (SGCN), which CPW divides into three tiers. For each of the species included in the SWAP, CPW considers information on the habitat requirements, threats, and existing actions. CPW hopes to develop digital tools to track implementation, build SWAP-related requirements into funding opportunities and planning efforts, and use the SWAP to guide monitoring and conservation actions. This year, CPW has made the SWAP information available in a [digital Data Hub](#). Savanna took the time to walk attendees through ►

Scientific Name (Synonym)	Common Name	G_RANK	S_RANK
<i>Aster alpinus</i> var. <i>vierhapperi</i>	alpine aster	G5T5	S1
<i>Eriogonum arcuatum</i> var. <i>xanthum</i> (<i>Eriogonum jamesii</i> var. <i>xanthum</i>)	Ivy League buckwheat	G5T2T4	S3
<i>Eriogonum umbellatum</i> var. <i>ramulosum</i>	Buffalo Bill's sulphur flower	G5TNR	S2
<i>Erythranthe gemmipara</i>	Rocky Mountain monkeyflower	G1	S1
<i>Mertensia humilis</i>	Rocky Mountain bluebells	G3	S1
<i>Oenothera coloradensis</i>	Colorado butterfly plant	G3T2	S1
<i>Oreoxis humilis</i>	Pikes Peak spring parsley	G1	S1
<i>Physaria bellii</i>	Bell's twinpod	G2	S2
<i>Physaria vitulifera</i>	fiddleleaf twinpod	G3	S3
<i>Ribes niveum</i>	snow gooseberry	G3?	S1
<i>Salix calcicola</i> var. <i>glandulosior</i>	lime-loving willow	G4G5T1T2	S1
<i>Spiranthes diluvialis</i>	Ute ladies' tresses	G2G3	S2
<i>Trifolium anemophilum</i> (<i>Trifolium dasyphyllum</i> ssp. <i>anemophilum</i>)	Laramie Hills clover	G5T2?	S1

Table 1: Summary information of 13 select taxa provided during the 2025 Rare Plant Symposium. Courtesy of Jessica Smith.

◀ the functionality of this resource, which includes the Tier 1 and Tier 2 species.

Next, Jessica Smith and Savanna Smith partnered to present a review of some central Colorado rare plant species. Summary information was presented on 13 taxa (Table 1), which included the Global (G) and Subnational (S) Heritage Ranks, Conservation Status, distribution, habitat, threats, identifiable features, and number of occurrences (recognizing both current and historical). Attendees of the Symposium were encouraged to offer comments on each of the species, with many offering comments or updates on identifiable features, phenology, distribution, and taxonomy. Herbarium specimens of species under discussion, courtesy of Molly Neprokroeff, head curator of Natural History Collections at the Kathryn Kalmbach Herbarium at Denver Botanic Gardens, were available for attendees to view throughout the day.

Following lunch, Sarah Quadt and Jay Ruebens from the US Fish & Wildlife Service (USFWS) presented their work on supporting rare plant conservation in Colorado. They highlighted the recent success story of the Colorado hookless cactus (*Sclerocactus glaucus*), which has been delisted due to documented population recovery. Only about 3% of species are delisted due to recovery (with another 3% being delisted due to extinction). The pair then connected this success story to how the Endangered Species Act (ESA) provides them with the tools to prevent extinction and promote the recovery of Colorado's rare plant species. Important updates from their talk include the re-opening of the public comment period for the North Park phacelia (*Phacelia formosula*), and the ongoing

five-year status review for species such as the Pagosa skyrocket (*Ipomopsis polyantha*) and clay-loving buckwheat (*Eriogonum pelinophilum*), among others. They were followed by Dr. Carol Dawson, the Bureau of Land Management's (BLM) Colorado state botanist, and Phil Krening, BLM ecologist. Carol gave an overview of BLM's Strategic Plans for Pollinator Conservation and Threatened and Endangered Strategy, which aims to preserve and recover listed species by collaborating across programs and increasing on-the-ground conservation. BLM will focus project funding on priority species, habitats, or geographic areas, as appropriate, to maximize conservation recovery success and focus these efforts on special status species. Phil then gave conservation updates on selected species, emphasizing the importance of long-term trend data from monitoring sites to assess inherently variable rare plant populations.

Dr. Mit McGlaughlin, professor from the University of Northern Colorado (UNC), then presented his genetic analyses of members of *Penstemon* section Glabri. The goal of this research was to determine the genetic characteristics of rare *Penstemon* species from northwestern Colorado in order to better understand the species concepts and distribution of this group to aid management. Results were presented for *Penstemon scariosus* var. *albiflavis*, *Penstemon scariosus* var. *cyanomontanus*, *Penstemon luculentus*, and *Penstemon gibbensii*. *Penstemon scariosus* var. *albidus* was determined to be a genetically distinct species (*Penstemon albiflavis*). The research into *Penstemon scariosus* var. ▶

◀ *cyanomontanus* indicated that this variety is not genetically distinct from *Penstemon scariosus* var. *garrettii*, and thus their combined distribution is wider, which may affect the conservation status rank.

Penstemon luculentus is another genetically distinct species with a close relationship to *Penstemon cyanocaulis*, whose southern population forms a distinct group. Lastly, genetic analyses of *Penstemon gibbensii* show distinct genetic structure based on geographic locality (west, central, and east) and is very similar to *Penstemon paysoniorum*—suggesting a possibility that this is a single species.

After a short break, we returned to hear from Dr. Michelle DePrenger-Levin from the Denver Botanic Gardens, who gave an overview of the Biodiversity Plan for Life on Earth. She discussed how the Global Biodiversity Framework has identified 23 targets under three categories that provide ideas on how to collaborate, use, and share data to address the biodiversity crisis. These three categories are: reducing threats to biodiversity; meeting people's needs through sustainable use and benefit sharing; and creating tools and solutions for the implementation of conservation actions. This work fits into the Global Strategy for Plant Conservation, a UN initiative founded in 1999, that works as a blueprint on how to address the biodiversity crisis. When pulled together, we can see where we are making significant progress and where there are gaps—allowing us to measure the success of conservation efforts in Colorado.

The final talk of the day came from My-Lan Le, also from the Denver Botanic Gardens, who described her research on *Physaria alpina* reproduction and habitat characterization. My-Lan's work indicated that an increased number of flowering individuals decreased seed set (competition for pollinators). Conversely, increased floral coverage improved reproductive

success (pollinator recruitment). Additionally, she showed that neither pollen supplementation nor survey site explained variation in seed set. And finally, she showed that the observed differences among sites may be driven by variations in forb and shrub cover, bare ground features, and possibly other unmeasured qualities of her survey plots. Interestingly, My-Lan also made significant natural history observations on *Physaria alpina*, including floral visitors and pollinators, herbivory, and a documented instance of parasitism by (potentially) gall midges (pending further identification).

We want to thank the Colorado Native Plant Society, Colorado Parks and Wildlife, Denver Botanic Gardens, our presenters, and attendees for making this year's Rare Plant Symposium such a success and hope to see everyone again next year!

Weblinks:

CNHP Contribute Data:

<https://cnhp.colostate.edu/ourdata/contribute-data/>

CNHP Rare Plant Symposia:

<https://cnhp.colostate.edu/projects/colorado-rare-plant%20symposia/>

CNHP Tracking List:

<https://cnhp.colostate.edu/ourdata/trackinglist/>

CODEX website: <https://cnhp.colostate.edu/maps/codex/>

Colorado SWAP: <https://cpw.state.co.us/state-wildlife-action-plan>

CPW SWAP Data Hub:

https://tableau.state.co.us/t/CPW_AquaticVisualization/views/2025SWAPDataHubProd/Colorado2025SWAPMenu?%3Aembed=y&%3AisGuestRedirectFromVizportal=y

NatureServe:

https://help.natureserve.org/biotics/Content/Record_Management/Element_Files/Element_Tracking/ETRACK_Definitions_of_Heritage_Conservation_Status_Ranks.htm



Oenothera coloradensis (Colorado butterfly plant), an endemic of the northern Front Range plains.
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Trifolium anemophilum (Laramie Hills Clover), known from one occurrence in Weld County. © Bonnie Heidel