

Abstracts

Utah Rare Plant Meeting

hosted by the Utah Native Plant Society

March 4, 2025

Online Meeting via Zoom

(in order of appearance on [Agenda](#))



Mindy Wheeler, Utah Rare Plant Program, Salt Lake City, UT. mindywheeler@utah.gov

Update from the Utah Rare Plant Team

Aaron Roe, Bureau of Land Management, Utah State Office, Salt Lake City, UT. aroe@blm.gov

BLM Botany Updates

Tova Spector, US Forest Service, Region 4, Monticello, UT. tova.Spector@usda.gov

Region 4 of Forest Service Botany Updates

Max Taylor, Hopi Ethnobotanist, Second Mesa, Hopi Nation, mt.bluecanyon@gmail.com

Hopi Ethnobotany

This presentation covers some of the native plants that the Hopi people have used in the past and now in the present. It is important to preserve this plant knowledge and share it with our Hopi people, so that it is not lost. I give examples of these culturally important plants, their Hopi names, English common names and Latin names. Information is presented that the gatherer would need to know to find and properly collect and maintain these plants, including the plant type by seasons and soil type. Information on seed collection, cleaning, processing, and some examples of food preparation, and preservation is provided.

Through community and school presentations and food tasting, the interest in learning and collecting these plants has grown among our youth and young adults. For the elderly it has revived memories of times past when they relied heavily on these plants as sources of food, medicine and for utilitarian uses. However, the amount of plant knowledge and uses today are a fraction of what was known and used in the past. It is my hope through continued research and talking with the elderly to revive and catalog some of what was lost.

I realize the knowledge I have gained pursuing this passion has become very valuable and I am honored to be able to share it with our Tribal members and have this very important knowledge preserved.

Ava Brinkley, Northern Arizona University, Salt Lake City, UT. sb3445@nau.edu

Molecular Results for *Astragalus loanus* and *welshii*

Building on last year's [presentation](#) of morphological data, this year we'll focus on the genomic methods used for species delimitation of *Astragalus loanus* and *Astragalus welshii*. Using RADSeq, we conducted a series of analyses to better understand the genetic boundaries between these two species. Our results revealed distinct genetic clusters that correspond to the morphologically defined species, and suggest a possible closest relative to them. This project, supported by UNPS, integrated genomic and morphological methods to contribute to a clearer understanding of their taxonomy. In addition, the genetic findings have implications for conservation and management of these species.

Zach Coury, Utah Rare Plant Program, Salt Lake City, UT. zachrc98@gmail.com

***Cycladenia jonesii* in Washington County, and a new species of *Townsendia* from Utah**

In May 2024, the Utah Rare Plant Program (Utah State University, Department of Wildlife Resources) located three populations of the federally listed threatened species *Cycladenia jonesii* (Jones' waxy-dogbane, Apocynaceae) in Washington County. This is a significant finding, as the nearest population in Utah is over 150 miles away, and the species has never been previously documented in the county. These populations are likely closely related to a population in Arizona, and these may prove to be genetically distinct from more northern populations of *Cycladenia jonesii* in Utah. Taxonomic background, discovery details, habitat requirements, and future research opportunities will be discussed.

Separately, a manuscript describing a new species of *Townsendia* from Grand County is in review, authored by Leila Shultz, Tim Lowrey, and Zach Coury. The description assigns a name to an extremely rare plant that has previously been treated as *T. strigosa* var. *prolixa*. It is a narrow edaphic endemic, requiring calcareous soils, and is known from Courthouse Rock, as well as a disjunct population from Sinbad Valley, Colorado.

Kyle Zeyer, BLM, Kanab Field Office, Kanab, UT. kzeyer@blm.gov

Efforts to protect Welsh's milkweed (*Asclepias welshii*) at Sand Hills in the Kanab Field Office

The rare (federally listed as threatened) Welsh's milkweed (*Asclepias welshii*) grows on sand dunes in only a few places in southern Utah and Northern Arizona. Off-road vehicles sometimes were going off the BLM permitted routes onto sand dunes with *A. welshii*. As an herbaceous plant, the above-ground

stems senesce and blow away in winter making the dunes seem unvegetated to OHV drivers. In an effort to protect this rare plant, the BLM installed barriers around dunes to prevent OHVs from driving on areas that support this rare plant. BLM has also educated guide companies on the importance of staying off these dunes. Initial indications are that OHV drivers are following the guidance of BLM and are no longer driving on those dunes; the barriers seem to be working. Research is needed to document the ongoing effectiveness of these barriers to protect this rare plant (contact Kyle Zeyer or Marc Coles-Ritchie if you are interested in conducting such research).

(also see [Susan Meyer talk](#) about this plant from 2024 Rare Plant Meeting)

Ciara Green & Dr. Loreen Allphin, Brigham Young University, Provo, UT.
loreen_woolstenhulme@byu.edu

Demographic and Reproductive Analysis of *Castilleja parvula* (Tushar Mountains Paintbrush): Assessing Population Viability and Implications for Conservation

Castilleja parvula Rydb, (the Tushar Mountains paintbrush), a high alpine plant endemic to the Tushar Mountains in Utah, is currently classified as imperiled (G2 status). Despite its imperiled status, it has been largely understudied. This has resulted in a lack of knowledge of major aspects of its life history and population dynamics. In order to assess the status and future for this species, we collected five years of population, vegetative, and fecundity data from four different populations across the species range in the Tushar Mountains. We analyzed these data to determine the demography, reproductive biology, and life cycle of this *Castilleja* species. We used population viability analysis to create better predictions about the stability of its populations and persistence of this imperiled species. Initial monitoring has shown that this taxon is in decline, with some populations heading toward local extinction. Statistical analyses of the data show that multiple factors and/or disturbances are impacting the species' success and survival. We posit that restoration efforts will be vital to maintain some of the species' populations into the future.

Dr. Robert W. Heckman, USDA Forest Service Rocky Mountain Research Station, Cedar City, UT.
robert.heckman@usda.gov

Impacts of recreation and introduced mountain goats on sensitive plant species in the La Sal Mountains

Alpine habitats in southern Utah occupy small areas with harsh climates, which likely facilitates the evolution of endemic plant species. Alpine plant communities are typically characterized by slow-growing plants in small populations, which makes alpine plant populations particularly sensitive to increased disturbance. In this study, we examine how populations of three rare alpine plant species in

the La Sal Mountains of southern Utah—*Erigeron mancus*, *Androsace chamaejasme*, and *Senecio fremontii* var. *inexpectatus*—respond to increasing disturbance caused by recreational use and ungulates, including the recently introduced mountain goat (*Oreamnos americanus*). We annually monitored the populations of these three sensitive species as well as the abundance of plant function groups and ground cover types in permanent plots for eight years (2016 – 2023). The three sensitive species had different relationships with ungulates and recreation usage over the eight years of monitoring. Ungulates appear to have had a consistently negative impact on *E. mancus* from 2018 onward but had no discernable impact on *A. chamaejasme* var. *carinata* or *Senecio fremontii* var. *inexpectatus*. Higher recreation use had a negative impact on *A. chamaejasme* var. *carinata* in the last three years of study (2021 – 2023). High recreation use may have also negatively impacted *E. mancus* from 2020 onward, but additional study is needed to confirm long-term trends.

Dr. Bill Gray, Natural History Museum of Utah & University of Utah, Salt Lake City, UT.
cyberflora80@gmail.com

Are Pinyons and Bristlecones Hybridizing?

Wind-pollinated trees are particularly susceptible to hybridization in areas where their ranges overlap. Oaks and pines are well known for this phenomenon, which can lead to the development of distinctive forms or even new species. In long-lived hybrids, genetic diversity may serve as a reservoir that helps buffer populations against short-term environmental change and long-term climate variability. One easily measured trait in *Pinus* is the number of needles per fascicle, a key characteristic used to differentiate species. In hybrid zones, this trait can vary among individual trees and even fluctuate from year to year on the same branch. On the West Tavaputs Plateau, Colorado Pinyon (*Pinus edulis*, 2-needle) and Great Basin Bristlecone (*P. longaeva*, 5-needle) co-exist at approximately 7,000 feet in elevation. Needle count patterns strongly suggest ongoing hybridization between the two species. While high-elevation Bristlecone populations remain inaccessible, we are actively expanding our dataset to gain a broader geographical perspective. Future genomics studies will provide more definitive insights into the extent and implications of this hybridization.

Rachel Christensen, University of Utah, Salt Lake City, UT. u1358906@utah.edu

Exploring responses in the stomatal conductance of conifers using stomatal density as a proxy through changing atmospheric conditions: an analysis using *Pinus longaeva*

Aljexi Olson & Dr. Tara Bishop, Utah Valley University, Orem, UT. aljexinolson@gmail.com.

Ages and Stages for Juniper tree Communities

Pinyon-juniper (PJ) communities span a vast area across the western U.S. and are pervasive across the Southeastern Utah Group (SEUG) of national parks and monuments where they play a critical role in provisioning natural and cultural resources, but are at risk from future climate change, wildfire intensification, management actions such as clear cutting, and other stressors. Natural resource managers require a stronger foundation of information of when and where PJ communities are vulnerable and where management actions may mitigate loss of resources associated with these important communities. In this study, we partnered with Grand Staircase Escalante National Monument (GSENM) to sample juniper trees across various geomorphic settings for PJ communities to help build a knowledge base for decision making tools for monument managers and surrounding communities. Our project objectives are to (1) ascertain the ages of juniper trees within PJ communities, (2) collect and analyze other ecosystem data associated with the sampled trees that could then be linked with population age, and (3) at some point, increase spatial inference through various mapping exercises. Currently, within the initial stages of this project we will share insights into possible environmental correlate links with the ages of currently sampled trees. At the conclusion of this project, we also aim to provide science communication tools to share with local managers and invite insight and feedback in the development of those products.