

Progress Report - DeDecker Grant 2023

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Project Title: *A Vascular Flora of the Sacatar Trail Wilderness*

The 2023 CNPS Bristlecone DeDecker Botanical Grant helped to cover most of my travel expenses for field work this past year. I made a total of 14 trips and spent 43 days in the field, yielding 673 new plant collections. Most of these collections were made in places I did not collect from in 2022, helping to better represent the flora of my study site as a whole, and facilitating greater coverage of sampling across the entire area.

Precipitation during this second field season could not be any more different than the first. The Five Mile Canyon RAWS (remote automatic weather station)¹, near the Sacatar Trail Wilderness eastern boundary, recorded only 2.24 inches of rain in 2022, compared to 14.65 inches in 2023. The Southern Sierra region as a whole received approximately twice as much precipitation last winter compared to the average rainy season.² Below-average temperatures brought snow down to the lower end of the study site (~4,000 ft. elevation) in February and March (see Fig. 1A), and larger quantities of snow at the high elevation melted into flowing streams in canyons that were bone-dry in 2022. These “new” streams persisted well into the summer months. Annual plants germinated and flowered prolifically in 2023, producing “superbloom” landscapes in the desert as well as in the mountains (Fig. 1B).



Figure 1: Examples of how above-average precipitation early in the year transformed the Sacatar Trail Wilderness. **A)** Left: Snow in Nine Mile Canyon, March 2023. **B)** Right: Montane monkeyflower “superbloom” with *Erythranthe barbata* (yellow) and *Diplacus* sp. (pink), in June.

At least 91 minimum rank taxa were collected in 2023 that were not seen during the 2022 field season. I believe several of these new discoveries may be attributed to the increased precipitation, yielding greater seed germination and plant health. I documented the first population of Dedecker’s clover, *Trifolium dedeckerae*, within the Sacatar Trail Wilderness (CNPS rank 1B.3), as well as the first population of Chimney Creek nemacladus, *Nemacladus calcaratus* (1B.2), in Inyo County (Fig. 2). Several new populations of Nine Mile Canyon phacelia, *Phacelia novemmillensis* (1B.2) were encountered as well. After discovering an extensive population of Kern bird’s beak, *Cordylanthus eremicus* ssp. *kernensis* (1B.3), I was able to make a conservation seed collection, now stored at the California Seed Bank in Claremont (part of the California Botanic Garden).



Figure 2: Notable rare species added to Sacatar Trail Wilderness checklist in 2023. **A)** Left: First Chimney Creek nemacladus, *Nemacladus calcaratus* (rank 1B.2), found in Inyo County. **B)** Right: Dedecker's clover, *Trifolium dedeckerae* (rank 1B.3).

Twelve iButton temperature data loggers³ were installed in March 2022 along two east-to-west transects at 1,000 foot intervals of elevation. These were intended to help analyze the degree to which temperatures vary between altitudes across the study area, leading to a better understanding of microclimate variability. All twelve iButtons were retrieved during August and September 2023. I am currently uploading and analyzing this temperature data to help visualize microclimate variation within the site. Vegetation surveys were conducted at each of these temperature-monitoring points to represent vegetation patterns along the Sacatar Trail Wilderness area's steep elevation gradient.

I am incredibly grateful to have been awarded the DeDecker Grant in 2023, as well as in 2022. As some may know, I withstood some serious injuries during a climbing accident back in September, but luckily my fieldwork was wrapped up at that point. Despite this setback in the fall, I am getting back into keying my specimens and planning to defend my master's thesis later this year. I will also be giving a talk about my project at the annual Wildflower Exhibit at the Maturango Museum in Ridgecrest this April, and I would love another chance to present at a CNPS Bristlecone Chapter meeting sometime soon. I am so excited to share everything I have learned from my research!

Sources:

1. *S. California RAWS Sites*, Western Regional Climate Center, 2024, raws.dri.edu/wraws/scaF.html.
2. California Department of Water Resources, 2023, *Water Year 2023: Weather Whiplash, From Drought To Deluge*,
https://water.ca.gov/-/media/DWR-Website/Web-Pages/Water-Basics/Drought/Files/Publications-And-Reports/Water-Year-2023-wrap-up-brochure_01.pdf.
3. *Temperature Logging iButtons*, iButtonLink, 2024, www.ibuttonlink.com/collections/thermochron.