NORTHERN CALIFORNIA BOTANISTS

BOTANICAL LEAFLETS

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PRESIDENT'S MESSAGE

Hopefully, everyone is finishing their field work for the season. They say we are supposed to have a wet winter again. That would be great. My extended family lost our cabin in the Dixie Fire in 2021. We have hired a contractor and now we have a new two story cabin. It has walls and a roof and will be finished on the inside next year along with the outbuildings. How exciting!

We are planning our next symposium in January 2024. It will be an in-person and virtual event. More information about the symposium can be found in this newsletter.

We have added a student board member position and our first person in that position is Rebecca Nelson from UC Davis. Welcome Rebecca! And we also needed to fill the vacancy on the board since Israel left to become an assistant professor at Montana State University. We have added Nicole Jurjavcic from Stillwater Sciences as a new board member. Welcome Nicole!

Take care and see you in January 2024 at our symposium

Linnea Hanson
President

WELCOME NICOLE JURJAVCIC TO THE NCB BOARD!

Northern California Botanists is pleased to announce the appointment of Nicole Jurjavcic to the Board of Directors. Nicole has 28 years of experience as a botanist/plant ecologist conducting botanical studies in various ecosystems throughout California and parts of Oregon. She has been working as a consultant since 2002 and has been with Stillwater Sciences since 2004 where she is a senior botanist working with a growing staff of talented botanists, wildlife and fish biologists, geomorphologists, and engineers. Read more about Nicole on the BOTANISTS IN ACTION page in this NEWSLETTER. Welcome Nicole!

MYSTERY PLANT

This small, cute annual flowering plant tends to grow on rocky, bare ground, often in serpentine or clay soils. It's short in stature (<15 cm tall) and has fuzzy blue-green leaves. The genus name for this species aptly describes it's appearance. It is widespread across California and also into nearby Oregon, Idaho, and Nevada, but is easily overlooked.

Answer on Page 9

INSIDE THIS ISSUE:

NCB 2024 Symposium — Registration is Now Open!

Northern California Botanists will host our 12th botanical symposium on January 8-9, 2024 on the campus of California State University in Chico. The sessions will also be available online. Optional workshops will be held on Wednesday, January 10. A 2-day schedule of presentations by working botanists will include sessions on Vegetation Classification, Climate Change, Grassland Restoration, Bryophytes, Locally Rare Plants, Now the Good News, New Discoveries, and a session of Lightning Talks. The Keynote Address will follow the banquet on Monday evening, January 8, 2024 from 7:30 – 8:30 p.m. Although the banquet requires a paid ticket, the Keynote Address is open to all.

NCB 2024 Keynote Speaker

The 2024 Symposium Keynote Speaker will be **John Vollmar**. John is the President/Principal Ecologist for Vollmar Natural Lands Consulting. The subject of his talk is **"The Heart of Conservation - Engaging Human Passion for Conservation Success."**

Beginning with seed funding from the U.S. Environmental Protection Agency and East Merced Resource Conservation District in 1998, John Vollmar has worked over the past 25 years to conserve the expansive and rich vernal pool landscapes of eastern Merced County. These mostly intact landscapes are contiguous with the vast blue oak savannas and woodlands of western Mariposa County. Together, they create a Great Valley-Sierra Nevada Foothill block of mostly private natural lands connecting with two national forests, Yosemite National Park, and beyond. Protecting Merced County's vernal pool-grasslands is an essential component to conserving a contiguous, functional habitat corridor from the Great Valley, through the Sierra Nevada, to the Great Basin. But, how do we achieve meaningful, landscape-scale conservation, especially in areas with numerous private landowners? Working with landowners, land trusts, environmental consultants, mitigation buyers, and others, Mr. Vollmar has gained a unique perspective on how we achieve such conservation over time, and the critical role of human passion at its core. Building on this understanding, and analyzing data on geologic formations, rare species occurrences records, predicted habitat modeling for these species, and other factors, he and colleagues at Vollmar Natural Lands Consulting recently published a reference manual and user's guide for the 'Conservation of Great Valley Vernal Pool Landscapes.' It is intended to inspire, motivate, and guide ongoing conservation of these special habitats throughout the Great Valley. Mr. Vollmar will present a history of his work in eastern Merced County, key lessons learned along the way, and a walk-through of his recently published conservation guide as a model for others to consider in their pursuit of conservation interests, in the Great Valley and elsewhere.

NCB 2024 Symposium Sponsorships

Please help make the 2024 Symposium a success! Northern California Botanists invites sponsorship for our 12th Symposium to be held on 8-9 January 2024 at California State University, Chico. Your help is very important and allows us to keep our registration rates low, support student attendance, and keep our important programs moving forward.

If you or your company would like to partner with us in this event or if you have questions about sponsorship, you may contact us at ncbotanists@gmail.com or visit our website at www.morcalbotanists.org.

NCB 2024 Call for Posters

The NCB symposium planning committee invites you to bring a poster to share your work and knowledge of the biology, ecology, conservation or management of our Northern California plant life with others. Please forward this invitation to botanists and others with related interests from Northern California agencies, conservation organizations, consulting firms and academia. This will be a great opportunity for continuing education and networking.

For the 2024 Symposium, Tuesday morning's first session has been specially set aside as a dedicated, scheduled poster session. Space is limited to 40 posters. See the Symposium website for more information.

STUDENT POSTER CONTEST

Students, come present a poster to highlight your research and compete for this award! Northern California Botanists will be holding a contest for the best student poster presentations at the 2024 Symposium. Participating student posters will be evaluated by a panel of judges during the poster session on the second day of the Symposium. Three cash awards will be given to the top ranked posters. Winners will be announced at the Symposium and featured in the next issue of this Newsletter.

Northern California Botanists in Action

Aubrey Hayes is a Botanist at Sierra Pacific Industries (SPI) where she organizes and conducts habitat assessments and surveys for special-status plant species on SPI's ownership. She received her B.S. in Biological Sciences from UC Merced where she was first formally introduced to botany. She originally hails from the Mojave Desert of California but has been proud to call northern California her home for the last 5 years. Aubrey's work with SPI is primarily focused throughout California's North Coast, Klamath and Cascade Ranges, and Modoc Plateau. She thoroughly enjoys field botany: searching for and documenting special-status species occurrences, identifying tricky plants, and collecting vouchers while hiking through these beautiful bioregions. The volcanics of northeastern California teeming with underrepresented plant life holds a special place in her heart. Of course, she thinks the serpentine barrens and outcroppings of the Klamath are a special thing to behold too!

Nicole Jurjavcic has 28 years of experience as a botanist/plant ecologist conducting botanical studies in various ecosystems throughout California and parts of Oregon. Early in her career she spent time exploring the botanical richness of serpentine areas in the northern coastal ranges for UC Davis as well as backcountry meadows and areas impacted by prescribed fire at Sequoia & Kings National Park. She has been working as a consultant since 2002 and has been with Stillwater Sciences since 2004 where she is a senior botanist working with a growing staff of talented botanists, wildlife and fish biologists, geomorphologists, and engineers. Her areas of expertise include special-status and invasive plant surveys, vegetation mapping and classification, wetland delineation, restoration design, and monitoring of wetland and riparian ecosystems. Nicole is particularly fond of native grasslands.

Ella Matsuda is the Restoration & Nursery Manager for Friends of Sausal Creek, a community-based habitat restoration nonprofit in Oakland. She manages the propagation and outplanting of 150+ species native to Sausal Creek, and oversees 25 habitat restoration projects throughout the watershed. One of her favorite sites, a population of endangered pallid manzanitas, has rebounded from 3 to 127 individuals in the past 6 years.

Ella fell in love with plants while studying lemurs in Madagascar. From monitoring the impact of invasive guava on Malagasy epiphytes, to documenting undescribed orchid species in Ecuador, to studying climate change impacts on seedlings in Puerto Rico, the tropics were a spectacular introduction to botany. Ella has a B.S. in ecology & evolutionary biology and a B.A. in environmental sciences from Rice University. As a Natural Resource Specialist at the Houston Arboretum, she helped implement the first prescribed fire within city limits in 20 years, and led experiments to track the efficacy of different prairie restoration strategies.

Though the plants have changed in the different spaces she's worked, her passion remains the same: empowering individuals to take action in their own spaces to create healthier and more resilient ecological communities.

2023-2024 STUDENT RESEARCH SCHOLARSHIPS

Northern California Botanists is pleased to announce the recipients of this year's research scholarship awards. As in the past, we received many worthy applications. This year we awarded 12 scholarships of $1,000 each. The Sacramento Valley and Shasta chapters of the California Native Plant Society have teamed up with NCB and are each funding one of the scholarships.

Rachel Tageant is an MS student at Claremont Graduate University.

The title of her research **is "A floristic inventory of the Owens River Headwater Area, Mono County, CA."**

The Sierra Nevada occupies ~20% of California's landmass yet contains more than half of the state's plant diversity. Many areas in the Sierra Nevada, however, remain unexplored botanically. The Owens River Headwaters Area (ORHA) is one such area and is considered a "botanical black hole," an area with little to no documentation. The study area is approximately 52 mi2 and includes the Owens River Headwater designated wilderness area in the Inyo National Forest. The study area is unique as it is located near a transition zone between the California Floristic Province and the Great Basin Floristic Province. The elevational range of the OHRA is 7,200-11,520 ft and is characterized by pumice flats, volcanic outcrops, forested mountain slopes, high elevation meadows, creeks, and alpine summits. Over the course of two field seasons (2023-2024,) a comprehensive floristic inventory will document the vascular flora of this biogeographically unique area through the collection of voucher specimens and culminate in an annotated species checklist. Specimens will be distributed to several herbaria, including RSA, CAS, and JEPS. Specimen data and images will be added to the Consortium of California Herbaria (CCH2) and observations will be uploaded on the digital platform iNaturalist for public access. To date, one season of field work has been completed with a total of 1,011 specimens collected representing 32 families and 124 genera. This study will establish important baseline data on the floristic diversity of the OHRA, which will in turn facilitate a greater understanding of the diversity and distribution of California's native plants, assess future change in light of potential threats, such as climate change and OHV activity, and contribute to conservation management strategies for the ORHA.

Philippa Stone is a PhD student at the University of British Columbia.

Philippa Stone is a PhD student at the University of British Columbia.
The title of her research is **"Systematics in *Triantha* (Tofieldiaceae)."**
Shasta Chapter awardee

Triantha occidentalis (western false asphodel) was recently discovered to be carnivorous, using sticky hairs found directly below the inflorescence to trap insects. Triantha occidentalis is found down the west coast of North America from Alaska to California, and the genetic diversity of *T. occidentalis* is highest in Northern California. The current treatment of *Triantha* by Packer states that there are three subspecies of *T. occidentalis*, but initial genetic data from chloroplast DNA suggests that there may be an additional subspecies native to Northern California. I will collect new *Triantha* specimens and use these to conduct a phylogeographic analysis of *T. occidentalis* using DNA from 353 different nuclear genes, to confirm if there is in fact an additional subspecies native to Northern California. I will also combine new morphological observations with this target-enrichment based phylogeographic study to update *Triantha* species and subspecies circumscription, as part of an effort to produce an updated classification and key to the genus as a whole.

2023-2024 Student Research Scholarship Awards (Cont.)

Halina North is an MS student at the University of Nevada, Reno.

The title of her research is **"Quantifying tree mortality effects on plant community composition and phenology in the Central Sierra Nevada."**

Tree mortality is increasing in severity and extent across a variety of forest types across California. In high-elevation forests of the Central Sierra consisting of red fir (*Abies magnifica*), western white pine (*Pinus monticola*), and whitebark pine (*Pinus albicaulis*), mature trees create microsites and provide shelter for the understory plants beneath them. Thus, this research explores the cascading effects of tree mortality on understory plant communities, and asks if these sheltering microsite effects persist once trees are dead. In order to quantify these changes, plant phenology is sampled weekly throughout the growing season across three microsite types: live trees, dead trees, and open areas. The extreme swing in precipitation regimes in the 2022 and 2023 sampling years provided a unique opportunity to examine the myriad of factors that can alter forb species phenology in the Central Sierra Nevada. In addition, a greenhouse experiment is underway to determine if the effect of microsite canopy shading influences the growth of *Eriogonum umbellaum*.

Charolotte Miranda is a MS student at San Jose State University.

The title of her research is **"Soil Generalist, *Erysimum capitatum*, Shows Differential Adaptation to Serpentine Soil of Origin Across a California Latitudinal Gradient."**

The soil-plant interactions between serpentine and vascular plants have been well documented and serpentine is often used as a model system to understand evolution and adaptation. However, previous botanical studies often treat all serpentine as homogeneous environments ignoring the interspecific differences between serpentine formations of varying composition. As a result, little is known about how differences among serpentine soils may impact local adaptation in plants. *Erysimum capitatum* (Western Wallflower) is a widespread soil generalist found across Western North America. In California, it can be found inhabiting non-serpentine soil as well as numerous serpentine soil formations across the state. Thus, *E. capitatum* provides the ideal system to explore the extent to which populations growing on soils derived from different serpentine exposures are locally adapting to their serpentine soil of origin. The goals of this study were to test if *E. capitatum* populations are experiencing local adaptation, determine if a serpentine ecotype is present, and finally compare if populations are experiencing differential success when grown in their soil of origin vs other serpentine soils. I collected seeds and soils from eight populations found growing on serpentine and non-serpentine soil sites across California. I performed germination trials and a reciprocal transplant greenhouse experiment, growing about 1750 plants on four different serpentine soils. Over the course of six months, plant trait data was collected monthly and root/shoot biomass was collected at the end. Preliminary analyses suggest that plant adaptation to serpentine soils may be impacted by the differences in soil characteristics and supports the need for targeted conservation efforts to protect the diversity of native plants growing on serpentine soils of varied composition.

2023-2024 Student Research Scholarship Awards (Cont.)

Ash Gill is a PhD student at The Ohio State University.

The title of her research is **"Investigating cryptic diversity in California pinefoot."**

Pityopus is a monotypic genus of small herbaceous plants that lack chlorophyll and parasitize ectomycorrhizal fungi for all of their nutrition. These members of the Ericaceae are distributed predominantly from Northern California to Central Oregon, and are considered rare throughout their range. Due to their reduced and variable morphology, efforts to characterize diversity within the genus have historically been challenging, with two species at times being recognized. Genomic analysis has now facilitated a more detailed look at *Pityopus*, with preliminary data revealing three distinct clades that appear to follow recognized phylogeographic breaks in Northern California. My research investigates whether the clades of *Pityopus* warrant recognition at the species level, and what factors are driving diversification in the group. To gain species level status, I expect the clades to be robust to the incorporation of additional genomic loci and possess some unique phenotypic or ecological feature. I will test this through the application of phylogenetics, morphometric analysis, identification of hosts across the range, and ecological niche modeling. The dataset represents herbarium specimens spanning a century, and fresh collections gathered over the course of two years. Generous support from the Northern California Botanists is helping to cover costs associated with DNA sequencing.

Brooke Wainwright is a PhD student at the University of California, Davis.

The title of her research is **"Inter- and intra-specific drought-tolerant trait variation along a precipitation gradient in California grasslands."**

Climate change is causing increasingly variable and severe precipitation in California, creating shifts in plant community composition and diversity, species ranges, and productivity. While Northern California is expected to become wetter on average, extreme drought events are also predicted to be more frequent. One potential mitigation strategy for negative drought outcomes is to use drought-tolerant species or genotypes in restoration. However, planting recommendations rarely integrate functional traits that confer drought resistance. Under this project, I investigate how trait values vary inter- and intra-specifically in a common garden drought experiment. In 2022, In Davis, California I designed five drought shelters, simulating 50% reduction in ambient rainfall, and five control shelters in Davis, California. I planted seeds from five California grassland populations ranging from 1770-270 mm annual rainfall in fall 2020. From January - September 2023 I collected trait data including leaf mass area, leaf nitrogen, aboveground biomass, flower production, photosynthetic rate, and relative growth rate. Preliminary data shows that the effect of population origin on leaf mass area is dependent on drought treatment, and the effect of drought treatment is positive for some species and negative for others. Generally, species from high precipitation zones have significantly higher leaf mass area than low precipitation populations. These data could eventually contribute to a robust, novel drought framework that accounts for intra- and inter-specific variation, improving restoration and drought mitigation outcomes. This work will not only build on the existing knowledge of drought strategies but may subvert the current paradigm of drought strategies and provide needed insight into how to restore resilient grasslands.

2023-2024 Student Research Scholarship Awards (Cont.)

Hugh Leonard is a PhD student at the University of California, Santa Cruz.

The title of his research is **"The role of drought stress physiology in shaping post-fire succession in a mixed vegetation community."**

High-severity fire can drive the development of alternative stable states in ecosystems worldwide, shifting previous plant communities such as a forest, to novel ones, such as chaparral. However, the mechanisms driving plant community shifts in response to fire still need clarification. For example, while low-severity fires are known to promote ecosystem function and support established plant communities, high-severity fires may have the opposite effect. A key potential driver in establishing these alternative stable states is increased evapotranspiration and vapor pressure deficit (VPD), which increases in habitats following high severity fire due to loss of forest structure, increased solar radiation, and altered microclimate states. How plant communities recover under post-fire conditions is then contingent on the drought-tolerant traits of their species. To this end, I am studying the post-fire growth of resprouting adults for five species of California trees to compare low and high-severity fire effects on plant physiology and ability to grow. I have a research site in Pepperwood Preserve in Sonoma County, where the 2017 Tubbs Fire produced high and low fire severity effects on a contiguous mixed evergreen forest. I am coupling microclimate data from data loggers with leaf and stem physiological traits associated with water stress of five native evergreen tree species (*Arbutus menziesii*, *Notholithocarpus densiflorus*, *Quercus agrifolia*, *Sequoia sempervirens*, and *Umbellularia californica*) and branches of two establishing shrub species (*Arctostaphylos manzanita* and *Baccharis pilularis*). The results will have basic and applied scientific applications, helping address the knowledge gap in mixed evergreen forest fire recovery while informing land managers of species-specific responses to fire recovery.

Hayley Reid is an MS student at the University of Nevada, Reno.

The title of her research is **"Aboveground and Belowground Interactions Impacting Singleleaf Pinyon Pine Regeneration in Post-Fire Environments."**

While it is well-documented that *Pinus monophylla* exhibits a prolonged recovery period following fires, the specific reasons for this delayed establishment remain unknown. This research aims to investigate the key factors influencing the establishment of *P. monophylla* seedlings in a recent burn area, with a particular focus on both aboveground and belowground interactions. We seek to determine whether post-fire regeneration of *P. monophylla* is primarily constrained by aboveground factors, such as the absence of shade from nurse shrubs, or belowground factors, including the availability of mycorrhizal fungi and soil conditions. By understanding the relative importance of these interactions, our study provides insights into potential restoration strategies for these critical processes. Our study site, impacted by the 2021 Tamarack fire in the Humboldt-Toiyabe National Forest, employs a fully crossed experimental design where we manipulate shade and soil biota conditions to examine their combined effects on seedling establishment. Our research seeks to answer questions about how ectomycorrhizal fungal associations and shade influence *P. monophylla* seedling survival and whether these factors interact across an environmental gradient. This study contributes valuable knowledge to regeneration ecology, addressing the intricate relationship between aboveground and belowground interactions in post-fire ecosystems and offering insights into restoration strategies for the recovery of *P. monophylla*.

2023-2024 STUDENT RESEARCH SCHOLARSHIP AWARDS (CONT.)

Sage Ellis is an MS student at the University of Nevada, Reno.

The title of her research is **"Quantifying the status and long-term demographic trends of a Lake Tahoe alpine endemic, *Draba asterophora*."**

Tahoe draba (*Draba asterophora* var. *asterophora*) is an endemic perennial that occurs in a small number of alpine areas in the Lake Tahoe Basin in California and Nevada. It is designated by multiple agencies as a rare and sensitive species, however the last population survey of it occurred in 2015. Since this last period of population monitoring, historic droughts (2011-2017, 2020-2022), warming temperatures, and continued human development (e.g. ski run grading) has occurred in areas where populations are found. This has left the current status and long-term trends of Tahoe draba highly uncertain. My study aims to reassess the population numbers and demography to understand current trends and anticipate emerging threats before population declines occur that could threaten the long-term viability of this rare species. In 2022 and 2023 we successfully relocated all historically monitored transects of Tahoe draba and resampled the populations and plan to continue sampling for one additional summer. Using this current and historic data, we will analyze and assess long-term trends in draba populations as well as investigate bottlenecks to population stability and growth by examining the impacts of drought and human disturbance on demographic rates like survival and reproduction. Preliminary results indicate variability in trends across populations. Population growth in southern areas has steadily declined since 2015 while northern population growth has recovered somewhat after low values in the early 2010's. These results will allow us to pinpoint areas key for further conservation needs and management.

David Mitchel is a PhD student at the University of California,

The title of his research **is "Improving native tree and shrub restoration by amending degraded soils, enhancing mycorrhizal symbioses, and suppressing soil-borne *Phytophthora* disease."**

In Northern California's low-elevation rangelands, many historically-grazed riparian zones have lost tree and shrub cover and are now dominated by exotic grasses. Efforts to restore woody cover in these systems are often limited by poor establishment of planted trees and shrubs at the seedling stage. Factors that can limit seedling establishment include degraded soil conditions, scarcity of mycorrhizal partners, and soil-borne *Phytophthora* pathogens. I hypothesize that targeted soil management practices, namely organic soil amendments and inoculation with soil collected from mature stands, will increase seedling survival and growth, mycorrhizal associations, and resistance to *Phytophthora* disease. To test these hypotheses, I have established a field experiment at a riparian restoration site in Marin County, CA. This experiment includes two native woody species with distinct mycorrhizal associations: *Quercus agrifolia* (coast live oak), which associates with both ectomycorrhizae and arbuscular mycorrhizae, and *Frangula californica* (coffeeberry) which only associates with arbuscular mycorrhizae. Locally-obtained biochar and compost amendments were applied in factorial combination with soil collected from mature stands of the two target species. This winter, I will establish a greenhouse experiment to test how the same amendment and inoculum treatments affect disease impacts for these two plant species when exposed to the soil-borne pathogen *Phytophthora cactorum*. This research will determine whether inexpensive soil management practices can improve the success of ongoing efforts to reestablish native trees and shrubs along historically-grazed streambanks, and ultimately restore the ecosystem services provided by wooded riparian zones.

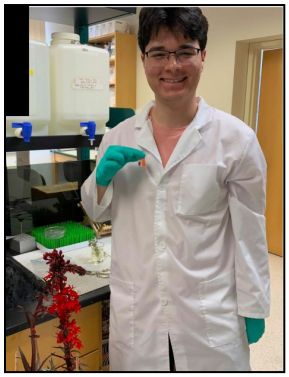
2023-2024 Student Research Scholarship Awards (Cont.)

Anjum Gujral is a PhD student at the University of California, Davis.

The title of her research is **"Investigating changes in forest structure through trait-demography relationships."**

Fire suppression is driving changes in forest structure in mixed-conifer forests in the Sierra Nevada. Deviations from historic fire regimes, and climate change induced drought in the region are contributing to type conversions, in which mixed-conifer forests are transitioning into non-forest shrublands or grasslands. Tree functional responses to disturbance regimes, including drought tolerance and fire resistance may explain demographic rates in growth, survival, and recruitment, providing context for long-term changes in forest structure. I conducted a comparative analysis at Blodgett Forest Research Station investigating whether tree physiology and demography can inform changes in forest structure between fire suppressed stands and stands with the reintroduction of fire through prescribed burning. This work was done in conjunction with the long-term Fire and Fire Surrogates study.

Victor Rossi is an undergraduate student , Davis.



As primary producers, plants provide the foundation for terrestrial ecosystems. Approximately 86% of the world's population acquires most of its nutrition from plants (UN Environment Program 2023). Since three-quarters of agriculturally important plant species are animal pollinated (Klein et al. 2007) and up to 87% of flowering plants rely on pollinators for reproduction (Ollerton et al. 2011), plant pollination is key. Flower color is the predominant signal to invite animal pollinators, but we know very little about the interaction between pollinator preferences and the floral pigments.

Red flowers provide insights into the world of pollinator preferences (León-Osper & Narbona 2022). In North America, hummingbirds often pollinate red flowers (Grant & Grant 1968; Abrahamczyk & Renner 2015; Figure 1). Originally thought to attract hummingbirds, experiments demonstrate that red flowers are more effective at deterring bees: the "bee-avoidance hypothesis" (Schemske and Bradshaw 1999; Bradshaw and Schemske 2003). However, not all hummingbird flowers are created equal. Some contain only red anthocyanins while others have a combination of anthocyanins and yellow carotenoids (León-Osper, Narbona and Whittall, unpublished data). Using the hummingbird visual system, preliminary data from hummingbird-pollinated California native plants indicates that red flowers with both red anthocyanin and yellow carotenoids have a larger chromatic contrast (more distinctive to hummingbirds) than those with just anthocyanin (Figure 2). We don't know how widespread this result is for red flowers across California. We also plan to use the large amount of data we collect from many species to try and understand why some red flowers have just anthocyanins, while others have both anthocyanins and carotenoids. By having so much data from a variety of species, we would be able to look at geographical location, phylogeny, climate, humidity, presence of certain pollinators, and other environmental factors that may have been responsible for this evolutionary mystery.

Answer to "Mystery Plant": *Ancistrocarphus filagineus* (Asteraceae - Sunflower family) – woolly fishhooks. This genus is fittingly named for the hooked tips of the inner paleae (Greek *ankistros*, fishhook, and *karphos*, chaff, referring to the paleae of the staminate flowers). Photo by Rebecca Nelson, 5 May 2023, on bare rocky soil in a serpentine meadow at the UC McLaughlin Reserve, Lake County, California.

NORTHERN CALIFORNIA BOTANISTS

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Check our Website for information about the 2024 Symposium!

If you haven't already, please renew your membership for 2024!

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