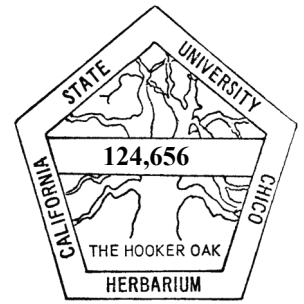




Friends of the Herbarium

**The Chico State Herbarium
California State University, Chico**



Volume 28 Number 1

June 2022

Newsletter

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Chico State Herbarium has a NEW Name

In a very special dedication ceremony the first week of June, 2022 the Chico State Herbarium officially became the

Ahart Herbarium

11th Annual California Native Plant Photo Contest Organized and Sponsored by Friends of the Herbarium



Grand Prize Winner: Morgan Strickrod

Harlequin lupine, *Lupinus stiversii*, vibrantly adorning Mehrten Formation volcanics along Peavine Ridge, El Dorado County.

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The **Friends of the Chico State Herbarium**, California State University, Chico, was formed to help maintain the high quality of work known to be associated with the Herbarium. The primary purpose of the group is to provide community support for the Herbarium. This includes raising funds for items that are not covered under the University budget, in particular the curator's position. Scientific and academic pursuits as well as community outreach are the focus of the group. The Friends also offer low cost workshops and classes on various botanical topics.

The **Friends of the Herbarium** operates under the auspices of the Chico State Enterprise at the California State University, Chico, and as such enjoys non-profit status and has access to the use of University classrooms and equipment.

Memberships are renewed on January 1 of each year.

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Colleen Hatfield, Herbarium Director
Lawrence Janeway, Herbarium Curator

Newsletter

Volume 28 Number 1

The Newsletter is published two times per year by the **Friends of the Herbarium**, California State University, Chico. Subscription is free with membership. Submissions on herbarium-related topics are welcome.

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11th Annual California Native Plant Photo Contest Results

Organized by Tim Hanson

Thanks to all who submitted a photo to the Friends of the Chico State Herbarium—California Native Plant Photo Contest! We look forward to seeing the beautiful submissions every year and this year's entries were yet again amazingly beautiful. Entries ranged from stunning close-up photos of individual flowers to breath-taking landscapes. In a contest like this, all are winners.

Visit our website (www.friendsofthechicostateherbarium.com) and click on 'Photo Contest' for a gallery of this year's entries which are also shown in this newsletter.



Honorable Mention:

Justin Luong
Juncus patens

Honorable Mention:

Robin
Carter-Ervin
Thermalito Vernal
Pool



(Continued on page 14)

The Ahart Herbarium—the legacy continues into perpetuity

Herbarium Collections and Contributions

Lawrence Janeway, Herbarium Curator

How can I, curator of the Chico State Herbarium, ever find enough words to thank Lowell for his tremendous and continuing contributions to the herbarium? His financial assistance has helped keep the herbarium functioning for many years, but his collecting of specimens for the Chico State Herbarium, and for local and distant researchers, is legendary, as can be partly seen in the number of species that have been named after him.

Obvious thanks are needed for the thousands of specimens that he has mounted for the Chico State Herbarium. My quick calculation shows that he has mounted about 60,000 specimens for this herbarium!!! That is well over half of the vascular plant specimens housed in this herbarium! Lowell's mounting of specimens started early on, with his own collections in the 1970s, but increased when he and Vern Oswald went on collecting trips together between 1987 and 2002, where Vern kept the collection numbers, processed the specimens and made labels for them, but Lowell did the actual pressing and mounting of the specimens. In about 1994 Lowell started mounting the herbarium's backlog of around 4000 specimens, and since then has mounted almost all of the specimens coming into the herbarium. That total is around 57,000 accessioned specimens, plus 3000 more in the accessioning backlog, equaling 60,000 total mounted specimens!

But within that total of mounted specimens are the more than 20,700 that he has collected himself, mostly from northern California, mounted and donated to the herbarium! In addition, Lowell has collected almost 1000 specimens of bryophytes and lichens, which are stored in folded paper packets rather than mounted. Of these 21,700 specimens, most included one to several unmounted duplicates that have been distributed to other herbaria by Lowell himself or by the Chico State Herbarium, greatly enriching scientific study throughout North America and beyond.



Eriogonum umbellatum var. *ahartii*
— Ahart 7875. Collected by Lowell in 1997



Rosa pisocarpa subsp. *ahartii*—Ahart
9680 collected by Lowell in 2002

Paronychia ahartii - Ahart
7570 collected by Lowell in
1995. Below, a blowup of
individual plants



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(Continued from page 3)

Lowell was also indirectly involved in the formation of the Friends of the Herbarium in 1995. His collecting specimens with and for John Thomas Howell, a famous botanist from the California Academy of Sciences, led “Tom” Howell to donate much of his personal botanical library to the Chico State Herbarium upon his death in 1994. A special seminar in honor of that donation was presented to a full lecture hall (Holt 170) that fall by Director Kingsley Stern, volunteer (at the time) Lawrence Janeway, and others. That event, along with the impending retirement of Dr. Stern and the resulting concern for the future of the herbarium, led directly to the formation of the Friends of the Chico State Herbarium.

For all these things and much more – THANK YOU LOWELL!!!



Lowell with Barb Castro and Lawrence Janeway in the Ahart Herbarium circa 2005

Herbarium Operations

Colleen Hatfield, Herbarium Director

A central theme throughout this newsletter is to recognize the significant contributions that Lowell Ahart has made to botanical knowledge. Many of you in the botanical world are already very familiar with Lowell Ahart. His contributions to botanical knowledge not only spans decades but has also had a notable impact on botanists throughout California and beyond. His botanical passion reaches beyond the plants though as he has been a key supporter of the Chico State Herbarium. His generosity has helped augment the Friends of the Herbarium’s workshop efforts to fund the curator position for the herbarium as well as students who have worked in the herbarium over the years. More recently Lowell has been instrumental in supporting the herbarium’s imaging project, which to date has more than 78,000 of the 83,230 vascular plant specimens in the collection imaged and made available through the Consortium of California Herbaria. There is no question that Lowell Ahart’s love and fascination for plants has been key to the success of the herbarium that now bears his name.

Lowell has established a generous endowment for the Ahart Herbarium at CSU Chico, which will help fund the curator position and herbarium operations. Importantly, the endowment also helps fund a faculty position at CSU Chico whose mission will be to instill a love for plants and botany for generations to come. Those of us at the herbarium and the Friends of the Herbarium are so very grateful to Lowell on so many levels and look forward to honoring Lowell’s legacy as we continue to strive to preserve and document the botanical resources of the region and beyond. Thank you Lowell!



Lowell being honored at the Friends of the Herbarium Annual Meeting in 2019. The Friends presented Lowell with a book they had compiled highlighting his many specimen collections.



Chico State Herbarium accessions during 2021

By Lawrence Janeway, Curator

Twenty-three years ago Vern Oswald started the annual tradition in this newsletter of summarizing all of the collections newly accessioned into The Chico State Herbarium (CHSC) during the preceding year by county and collector. Here is the summary for 2021.

The total number of new accessions for 2021 was 1030 specimens, as documented in our herbarium database (at www.cch2.org/portal/). There were 866 accessions in 2020. We were thus able to incorporate a significant number of new specimens into the collection!

As we have done for many years now, all new incoming specimens are databased before they are filed. Our wonderful volunteers Cindy Weiner, Noelle Davis, Barb Castro, Nancy Groshong, and Amanda Howey have accomplished the databasing during the past year and all of the filing of the specimens.

We continue to owe a HUGE debt of gratitude to our volunteer mounting specialist and plant collector extraordinaire, Lowell Ahart. Aside from a few exchange sheets that came to the herbarium already mounted, Lowell has mounted almost all of the specimens accessioned into the herbarium in 2021. In fact, Lowell has mounted almost all of the specimens accessioned into the herbarium each year since 1995! For 2021, this means that Lowell prepared more than 1000 beautifully mounted specimens that were accessioned into the collection during the year (and a few more that haven't been accessioned yet), all as a volunteer! Thank you once again, Lowell, for your continuing contribution of countless hours of invaluable time and service to further the goals of The Chico State Herbarium and northern California botany.

Also, thanks also to all of the collectors, as shown below, for their time spent collecting, identifying, and making labels for all of the specimens that they contributed to the herbarium. A tremendous amount of time goes into this process and I know that most, if not all, of this time is volunteer time on the part of the collectors.

The following table summarizes the new plant specimens accessioned into The Chico State Herbarium during 2021.

Specimens Accessioned in 2021					
by Plant Group		by Collector		by County	
GRAND TOTAL:	1030	LOCAL COLLECTORS		TOTAL CALIFORNIA:	
		– more than 5 collections –		– top 10 counties –	
Lichens	2	Lawrence Janeway	490	Butte	211
Bryophytes	10	Lowell Ahart	395	Shasta	161
Ferns	13	Chris Ivey	8	Siskiyou	97
Conifers	7	Sara Taylor	6	Trinity	88
Flowering Plants	998	Jacob Ewald	6	Nevada	80
		A. Hayes	6	Yuba	59
				Lassen	55
				Tehama	37
				Plumas	32
				Sierra	28



Marks in Time, a Preliminary Note on Lowell Ahart's Service to Scientific Botanical Researchers

By John Dittes

On the 24th of April, 2022, Josephine Guardino and I headed again to visit our friend Lowell Ahart at his home in Honcut, southern Butte County, California. We went to drop off another stack of Josephine's backlog of plant specimens for mounting, and check out the freshly mounted. These collections were made in 1993 and 1994 from the Ash Creek Wildlife Area in northeast California (Lassen and Modoc Counties, California). As Lowell has done for all specimens accessioned into the Chico State Herbarium for more than **25 years**, he is mounting Jo's for scientific use and posterity.

On this visit to Lowell's home however, another important matter was in mind. A few weeks earlier, Colleen Hatfield sent an e-mail, asking if I'd write an article about Lowell, "about your collecting trips with Lowell and/or special moments?" for the Friends of the Chico State Herbarium Spring Newsletter. This is to be a "special" issue, coinciding with the University's dedication and renaming of the herbarium in Lowell's honor, in recognition of his many contributions to the Chico State Herbarium, and recent generous endowment.

Of course, it's an honor to write an article, but where to start?! We've spent so much time together afield since Josephine first suggested we bring Lowell along to collect specimens, formally documenting plant diversity on our second contract-survey with the Plumas National Forest (Watdog Defensible Fuels Profile Zone Project). This was back in 2003, three years into our budding *Dittes & Guardino Consulting* endeavor. During the 19 years since, we've gone afield together on numerous occasions, working on rare plant surveys, conservation easement projects, and wetlands delineations throughout northern California. We've gone on many "pleasure trips" as well, exploring and documenting areas of specific interest. Throughout these many trips, special moments and collections we've grown to be good friends.

Approaching a newsletter article got me thinking about how many other people, and in how many ways, Lowell has helped, encouraged and affected, through his decades dedicated to plant collecting and sharing? Lowell's provision of material for others to study is partially reflected in the 4 plant taxa named in

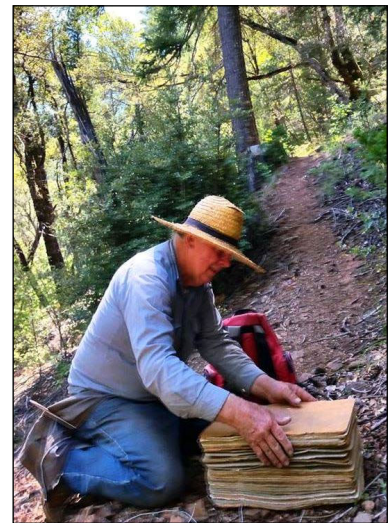
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Lowell is a true artist when it comes to mounting specimens that display the plant's traits but also with a keen eye for design. Photo by John Dittes.



Lowell with John Dittes and Josephine Guardino in the Herbarium ~2002.



Lowell on collecting trip with John 2016

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his honor: Ahart's Nailwort (*Paronychia ahartii*), Ahart's Dwarf Rush (*Juncus leiospermus* var. *ahartii*), Ahart Rose (*Rosa pisocarpa* subsp. *ahartii*), and Ahart's Buckwheat (*Eriogonum umbellatum* var. *ahartii*). Each of these plants bearing his name has a story starting with Lowell's intention, effort, and collections shared.

On our consulting projects, Lowell has voluntarily collected many "voucher specimens," adding scientific veracity to our floral lists, and furthering knowledge of the northern California Flora. So often too on these trips (and on our "pleasure trips"), he collects for others with specific research requests in mind. This, I got to thinking, would make for a worthy and interesting newsletter article.

So over lunch at Lowell's kitchen table this past April 24th, with voice recorder running, I asked if we could come up with a list of investigators that he's helped with requested collections of plants to study. As we conversed, it became apparent that this story will take a little more time to address appropriately. As Lowell suggested, we'll need to go through decades of journals, letters and e-mail correspondences. His journals are now kept at his house, and the letters are archived at UC Berkeley and Jepson Herbaria. Lowell suggested that I archive his e-mails and take them home to research through, which I will.

Over the next hour or so, we talked about the subject, some stories already familiar, others new. He reminded Jo and I of his early collections of "quality" material for use by Dr. John Thomas Howell, who suggested to Lowell that the Sutter Buttes and Sierra County were areas of particular interest, and were "so poorly collected." This Lowell has remedied! Lowell recalled his sending the first box of duplicate specimens to Howell at California Academy of Sciences in 1970. He shared the detail that Arnold Thiem, now-renowned explorer of the Nevada Flora and Curator of the University of Nevada Reno Herbarium, was present with Howell when that first box arrived and was opened.

He mentioned collecting duplicates for Mary Sue Taylor at the Missouri Botanical Garden, which were shared widely. We touched again on a few stories of his years collecting and collaborating with Dr. Vern Oswald on the Butte County Flora, and on the first versions of Oswald's Selected Plants of Northern California and Adjacent Nevada. Of course, Jo and I already knew of his collections for Barbara Ertter's use (*Paronychia*, *Juncus*, Rosaceae & duplicates), and for Randall Morgan (*Trifolium*), Peter Zika (*Juncas*, *Luzula*, *Castilleja*, Fern Allies & duplicates), Janeway (*Carex*), and for Hamid Razifard (*Elatine*). Then there was Lowell's mention of "the researcher from Har-



Lowell on a collecting trip with John Dittes in Southern Cascades 2015.



Lowell with specimen of *Trifolium macrocephalum* from Ash Creek Wildlife Area—collected by Josephine Guardino and John Dittes #128 in 1993.

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(Continued from page 7)

vard who wanted *Bergia texana*,” and difficulty sending cryo-containers from the Chico Airport, because they “looked like bombs”! The gentleman in Canada was mentioned, who requested the *Festuca*, the lady from Oregon needing *Camassia*... and the woman in France, who Kristina Schierenbeck knows, who wanted *Bromus* to study, and... Lowell commented, “John, this could go on and on... I try to help people”.

Lowell described specific instructions from Peter Zika in his request for Paintbrushes, “For Heaven’s-sake, if you’re going to collect *Castilleja*, tear some flowers out of the inflorescence so I can see the bracts, so I can see the first leaves, so I can see the actual flower. And even dissect it so that I can see calyx and corolla.” Lowell continued, “So some at the herbarium are beyond beautiful... because I made a special effort to please him.”

About Hamid Razifard, Lowell commented on how happy he is to have been able to help him with research on *Elatine* for his PhD Dissertation. Lowell said in reference to Hamid, “if he ever wanted to write a little article”; he continued, then thinking out loud for Hamid, “Well I was studying for my PhD, and I met a guy out in California through John Dittes, and... he was *exactly what I prayed for*. I wanted *Elatine* put in these little bottles and sent so that I can study it.” Lowell then described to us how he thought to do better, and so also sent living plants on moist soil in plastic bags, so that in a few days Hamid had fresh material to grow and study. He mentioned how the living plants died, self-seeded and grew again in the lab. Speaking again on behalf of Hamid, Lowell exclaimed, “Bingo, I had exactly what I wanted!” Lowell then said with a smile, “*and he was super lucky*, everywhere I went, every place you took me, *Elatine*!! He went on, “Hamid’s a nice guy, he sent me a little bottle of maple syrup and a nice sweater.”

Sitting at the table that afternoon, I smiled inward, and in the moment could hardly contain myself. Lowell did not yet know that a week or so before, I sent an E-mail to Dr. Razifard, who is now doing his Post-Doctoral studies at Cornell University, asking if he’d like to write a little note for the newsletter about how Lowell helped him with his research, in celebration of the herbarium dedication and recognition of Lowell’s generosity and devotion to botany. He was more than happy in his reply. We already had a draft of Hamid’s fine article on our computer at home, as Lowell spoke. Jo and I thought Dr. Razifard’s heartfelt account would be a very nice surprise. His story is in this special newsletter, for our reading enjoyment.



Castilleja rubicondula collected and mounted by Lowell according to Peter Zika’s instructions in 2015.

About Mr. Ahart, a passionate botanist and a great friend

Hamid Razifard, Ph.D.

In May 2013, after months of struggle to put together some small funding, I flew to California for a two-week trip to collect *Elatine* (waterworts) to complement my PhD dissertation studies on the systematics of *Elatine* at University of Connecticut. In the first half of my trip, starting from San Diego and driving north, I managed to collect exactly zero *Elatines*! It was an especially dry year. While sitting in a motel room, digesting my failed attempts, I wrote to Mr. Lowell Ahart, whom I had contacted prior to the trip, being aware of his great collections and thanks to the introduction by Mr. John Dittes.

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It was a pleasant surprise to get a quick response to my email, from Mr. Ahart, inviting me to visit him in his home within his family ranch. Upon arrival, Mr. Ahart greeted me with great kindness, and I immediately noticed his passion for botany. He then invited me to his home, in which plant specimens were taking up nearly all the space. I saw a dusty printer that seemed to have only one function: printing labels for Mr. Ahart's numerous plant specimens. I saw many specimens in different stages of preparation: drying, mounting, etc. I saw boxes of herbarium specimens ready to be deposited in different herbaria. It looked like Mr. Ahart was swimming in herbarium specimens. I was especially impressed by the great details Mr. Ahart had provided on his specimen labels.

After a quick visit to Mr. Ahart's home, he invited me to join him on a ride in his truck. We visited different parts of his family ranch as well as the areas nearby. During the ride, Mr. Ahart talked about his love of plants and blew me away with his amazing knowledge of different plant species, their growth forms, habitats, etc. After visiting a few sites, I realized that I was not on just a joy ride, as I had assumed, but on Mr. Ahart's mission to find *Elatine* for me. By the end of the hour-long ride, and after visiting several more sites, we found no *Elatines*. Then, Mr. Ahart gave me a look and said, "I hate losing!" To me that was a sign of his great determination for finding and preserving plant species.

While driving back to Mr. Ahart's home, Mr. Ahart and I discussed many topics ranging from science to politics. At the end of the visit, Mr. Ahart gave me directions to areas farther north of Chico, California, which he informed me had a greater probability of finding *Elatine*. His directions read like what one finds in treasure hunts, something like "you will see an unnamed dirt road, with an abandoned barn at the end. Go behind the barn and look for a puddle. I have seen *Elatine* there". I followed his directions and found *Elatine* at nearly all the ten or so sites he had recommended. So, I believe you can imagine my delight for such level of success after seven days of no success.

Meeting Mr. Ahart was not only a turning point for that trip, but also for my dissertation research. His love of botany became a true inspiration for my work. After my trip to California, he continued to stay in contact with me by sending me multiple live *Elatine* samples that he later collected. Among those samples were the first record of *Elatine americana* from California, which I reported in Madroño.

My story about collaboration with Mr. Ahart is just one example of Mr. Ahart's great contributions to botany. His massive plant collections (held in different herbaria) help facilitate numerous current and future scientific research projects. Mr. Ahart's lifestyle is also highly inspirational, as he embodies someone living in harmony with the environment, while volunteering his time and energy to preserve Mother Earth's beauty.

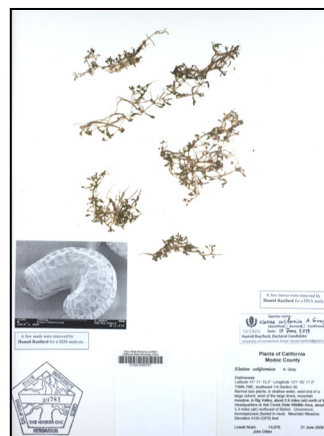
(Note: During the writing of this note, I held back tears on multiple occasions, tears of joy and appreciation for Mr. Ahart's help and contributions to botany.)



Elatine brachysperma Gray, collected during the 2013 field trip in California, following Mr. Ahart's directions.



Lowell collecting samples of *Elatine* in 2016



Voucher specimen at the Chico State Herbarium that aided in Dr. Razifard's dissertation research.



New Botanical Resources

Here are some interesting flora resources for you to check out.

Heritage Growers – A New Native Seed and Nursery Supply Company

Pat Reynolds, General Manager Heritage Growers
preynolds@heritagegrowers.com



Introduction

Use of seeds and plants of known genetic origin is an essential component of most habitat restoration efforts. It allows for the establishment of source-identified plant material that promotes resilience in restored habitats. Local, source-identified plant material (ecotypes) used in restoration projects ensures conservation of undiscovered cryptic diversity and preserves native plant evolutionary lineages (Silveira, 2021). Seed of unknown origin, commonly referred to as “variety not stated” (VNS), has not been shaped by the evolutionary pressures that make local source-identified seed well-suited for local restoration site conditions and can result in less successful establishment or even cause maladaptation of local germplasm from hybridization with non-local plant material (McKay et al., 2005). Maladaptation may occur because the introduced seed hybridizes with existing native stands, altering the genetics of natural populations in the vicinity. Widespread plantings of cultivars, such as what happened with large-scale planting of the iconic Texas bluebonnet (*Lupinus texensis*) can potentially swamp native germplasm and change the evolutionary history of species (Turner et al., 2017). Thus, to the extent possible, it is important to not only use native species but also local ecotypes. Heritage Growers (heritagegrowers.com), a program of River Partners, is a new native seed and plant supply venture providing source-identified native seed and plugs for habitat restoration. Our goal is to improve habitat restoration outcomes by making more species and more ecotypes available. All profits generated by Heritage Growers will be used to fund River Partners’ state-wide habitat restoration efforts.

History

River Partners has been effectively using native seed for their habitat restoration projects for more than two decades. The seed that they have used has been a combination of wildland seed and seed produced by commercial sources. The long-term goal of River Partners has been to produce much of their own seed for their own projects so they can better control the species and ecotypes used and thus improve restoration success. The source-identified native seed produced by Heritage Growers will be used to support River Partners’ projects with excess seed made available to improve habitat restoration outcomes in California.

Native Seed Production

At Heritage Growers, we are concentrating our efforts on producing source-identified California native seed for use in habitat restoration projects. We are producing “workhorse” species (species with a proven record of performing well in habitat restoration projects) whose origins are within regions of active and proposed habitat restoration projects along with



Source-identified *Lasthenia fremontii* (Fremont’s goldfields) in Heritage Growers’ seed production fields, April 2022.

Photograph Credit: Joan Bosque

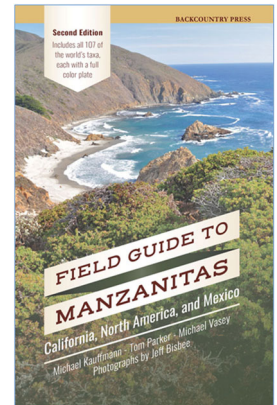
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Friends Presentations and Workshops

Workshops:

After two very long years since the last workshop, the Friends hosted their first workshop on June 4th, 2022—Introduction to Keying Manzanitas (*Arctostaphylos*, Ericaceae) led by Michael Vasey and Tom Parker. This is a double hitter for Tom, as he also gave the April presentation for the “All Things Botanically Related” seminar series on evolution of manzanitas (see below). Both workshop presenters recently came out with a Field Guide to Manzanitas: California, North America and Mexico, 2nd ed. which they referred to along with the Jepson Manual to guide workshop participants in how to approach keying the 90+ California manzanitas.

Stay tuned as the Friends work to develop more workshops this fall. Thankfully workshops are coming back!



“All Things Botanically Related” Presentation Series:

The series has resulted in quite interesting and delightful topics and speakers. You don't want miss out on the June 16th presentation by Steve Schoenig where he will present “Hey, Hey, we're the Monkees! We're too busy evolving to put anybody down” all referring to the monkeyflower genus Erythranthe. Also, Brett Hall, California Native Plant Program Director at UC Santa Cruz will present in July and Ann Willyard will present in August on her book highlighted on page 13 of this newsletter. You can also check previous presentations on the Friends website (www.friendsofthechicostateherbarium.com). Some of these fascinating talks have included a presentation on the genus Clarkia, bryophytes and ectohydry, and murderous plants to name but a few. Recordings of all previous presentations as well as information for upcoming events are available on the Friends webpage under “Events”. Below is an overview of Tom Parkers April presentation.

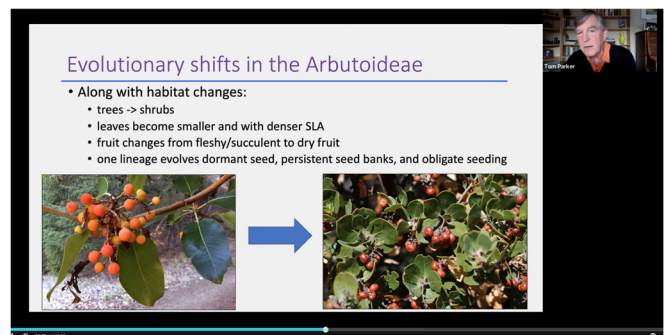
The Beauty and Complexity of Evolution April 21, 2022 Tom Parker, Professor of Biology, Emeritus, San Francisco State University

By Linnea Hanson

Tom Parker asked us, “What is hiding beneath the visible?” He talked about manzanitas that are tetraploids that don't hybridize with diploid ones. Also, there are two different clades of manzanitas and they don't hybridize.

Arctostaphylos is an example of a genus that demonstrates multiple paths to new species. Tom talked about who the manzanitas close relatives are and how manzanitas evolved all their principal adaptations to California's mosaic of environments.

We learned that manzanitas have mycorrhizal associations with conifers with high fungal diversity. The my-



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Botanical Resources - Continued

a diversity of other species to add diversity and improve habitat values for things like pollinating insects. For example, we are producing native milkweed (*Asclepias ssp.*) to support the monarch butterfly (*Danaus plexippus*), an iconic species that has suffered significant declines in recent years. Heritage Growers will have moderate quantities of source-identified native seeds available by fall 2022 and significant quantities available by fall 2023.

Native Plug Production

Heritage Growers' native plant nursery is currently up and running. We have many different species and ecotypes and thousands of plants that are available for use right now. We specialize in the production of plugs (1.25" x 2.5") that are grown out in 200-plant trays. We generally cater to habitat restoration projects, so our minimum plant order is 600 plants. Part of our service includes providing our customers with advice on how to best use the plants that we produce.

Native Grass Straw

Native grass straw is an excellent restoration tool. It provides good erosion control and often includes native grass seed that can enhance re-vegetation efforts. We provide recommendations on how to best utilize our native grass straw on projects. The straw that we produce will be certified as noxious weed free. We will have our first native straw available in fall 2023.

Seed and Nursery Amplification Contract Grows

For projects requiring large quantities or site-specific seed or plants, we set up seed amplification and nursery contract grows. We utilize the wildland stock seed provided by partners and clients and amplify that in our fields or grow it out in our nursery. If the seed is not sufficiently clean for amplification purposes, we clean the seeds further and have it tested by our seed lab partners. Based on the number of



Source-identified *Lupinus succulentus* (arroyo lupine) in Heritage Growers' seed production fields, April 2022. Photograph Credit: Joan Bosque

live seeds available, as determined by the laboratory analysis, we either directly seed into our fields, or grow the seed into plugs that are then installed into our production plots. We grow, maintain, harvest, test, bag, and tag the seed, returning it to the client for their projects. We set up similar contract grows with our nursery operation to ensure the desired plant material is available when needed

Restoration Design Consultations

At Heritage Growers, our primary interest is in the successful establishment of native vegetation from locally sourced native plant material. Thus, for most projects, we provide free consultation services to restoration practitioners with the goal of producing the best possible outcomes for the seed and plants that we provide. We consider ourselves partners on restoration projects and enjoy helping develop strategies to maximize success. In cases involving more in-depth consultations that include written products or site visits, we can set up small consulting contracts.

Seed and Plant Research

At Heritage Growers, one of our goals is to advance the practice and science of seed and plug based habitat res-

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(Continued from page 12)

Botanical Resources - Continued

toration. We are doing so by growing out new species and new ecotypes, implementing germination trails and utilizing new farming methods to produce native seed. For example, we are currently collaborating with the Xerces Society to trial seed treatments to improve germination of California milkweed (*Asclepias californica*), an early emerging species of milkweed with a high level of seed dormancy that could play a key role in saving the Monarch butterfly. Since Monarch butterflies are migrating earlier from their overwintering grounds on the California coast than in the past, they are now out of synch with the emergence of many milkweed species. California milkweed, one of the earliest milkweed species to emerge, has the potential to provide early breeding habitat for Monarchs when other milkweed species have not yet emerged. However, research is needed to determine the best means to break seed dormancy so container plants can be cost-effectively produced and out planted to establish potential breeding habitat in the initial stages of their long migrations.

Restoration Implementation

Heritage Growers, a program of River Partners, can call upon River Partners operations group to implement habitat restoration projects that utilize the source-identified native seed and plants that we produce. River Partners' has more than two decades of experience implementing hundreds of large-scale restoration projects covering more than 18,000 acres statewide. This breadth of experience, and the many lessons learned in implementing complex habitat restoration projects helps to ensure that the native seed and plants that we produced are used effectively on restoration projects.

Partnerships and Collaborators

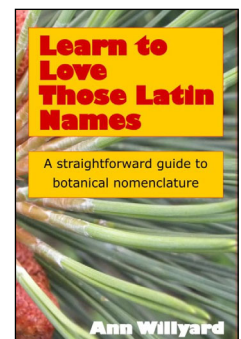
At Heritage Growers, we think that partnerships and collaborations are the key to improving restoration outcomes. Native seed and plant production is a resource intensive, complex endeavor that is not easily accomplished without working closely with like-minded organizations and individuals. We enjoy working with federal, state, and local agencies, other non-profit organizations, restoration contractors and any group or entity that shares our interest in improving habitat restoration. We are constantly seeking new partners and collaborators and encourage you to contact us at info@heritagegrowers.com if you want a partner on your restoration project so we can work together to successfully restore high-value, ecologically appropriate, resilient habitat.

Literature Cited

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- Silveira, Joe. 2021. Observations of Ecotypes Used for Native Grassland Restoration at the Sacramento River National Wildlife Refuge. *Grasslands* 31: 18-27.
- Turner, Kathryn G. D.I, Huang, Q.C.B. Cronk, L.H, Rieseberg. 2017. Homogenization of Populations in the Wildflower, Texas Bluebonnet (*Lupinus texensis*). *Journal of Heredity* 109(2): 152-161.

Hot off the Press—:

A paperback version of *Learn to Love Those Latin Names* by Ann Willyard is now available at Amazon.com. Willyard wrote this book as part of her quest to strengthen collaborations between native plant enthusiasts, amateur naturalists, and academic botanists. Her premise is that the scientific names of plants are critical to our communications about them, largely because there are over 386 thousand currently-accepted species of vascular plants in the world. In her opinion, the recent trend to ignore scientific names has handicapped, rather than helped, the talented folks who work with the species in



(Continued on page 14)

(Latin Names Continued from page 13)

their region. The author thinks that the simple and straightforward explanations in this book will be useful to botanists at many levels, partly by highlighting the problems created by relying only on common names.

From the book cover: "This book will help plant enthusiasts understand and use the scientific names for plants. Because these Latin names are used world-wide, they connect across all languages. Common plant names differ not only by language but also are not unique and not standardized within any language. Learning how to use scientific names will enable you to use all of the resources to identify species and to communicate with those who use other names for the same species. Some cool science tidbits are included because learning to love plant science will enhance your love of plants. There is also a simple overview of how cultivated plants are named."



(Beauty and Complexity of Evolution—Continued from page 11)

corrhizal association of manzanitas with oaks is not as strong as the one with conifers.

There are two life forms in manzanitas, those that resprout after fire and those that are killed from fire. The resprouters are using the same climatic pattern that was there when the original seeds sprouted. With the manzanitas that are killed by fire the present climate filters the genetics of the sprouting seeds. Rodents cache the seeds which aids in the dispersal of the manzanitas.

Tom then talked about the small subfamily, the Arbutoideae, of the blueberry/rhododendron/heath family (Ericaceae). Most of the genera in this subfamily occur in California, but only two are in northern California. We have to go to southern California and Baja and Mexico to find three more and explore the stepwise transi-



(Native Photo Contest Continued from page 2)

Native Photo Contest Entries—2022

Sponsored by Friends of the Herbarium

Here we showcase more of the amazing years contest:

photographs that were submitted to this



Kathyrn LaShure—*Pinus balfouriana*
(Foxtail Pine) below Cottonwood Pass,



Marcus Tamura—A fiery cacophony of bracts (*Arctostaphylos pajaroenensis*)



Martin Purdy—*Oxytropis borealis* on Coyote Ridge, Eastern Sierra Nevada, Inyo County

(Continued on page 15)

(Native Photo Contest Continued from page 14)



T. J. Samojedny - *Draba oligosperma* in Yosemite Alpine



Monika Monike Heredia - First day of Spring 2022 at La Selva Beach, California



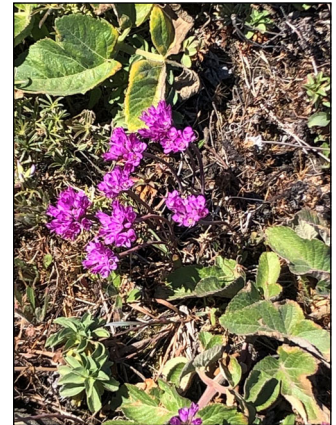
Matt Ritter - Ancient *Quercus durata* (leather oak) in San Luis Obispo



Robert Katz - *Salvia* Love



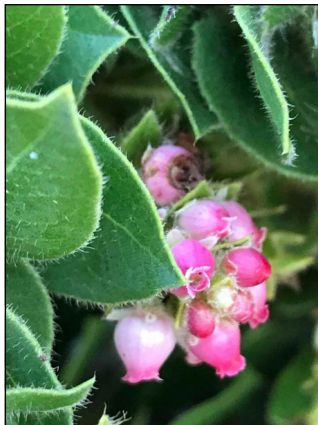
Michael Rogner - *Clematis ligusticifolia*



Earle Cummings - Unknown showy flower, Mendocino Co



Cindy Weiner - Ripening Salal Berries (*Gaultheria shallon*)



Elena Schuetzenmeister - January on San Bruno Mountain (*Arctostaphylos imbricata*)



Joanna Tang - The beauty of urban restoration: Hope for California's vernal pools



Monica Matthews - Sword fern catches the light



Joaquin Hale - Mountain lady's slipper catching the light



Cynthia Powell - *Silene verecunda*



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June 2022



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