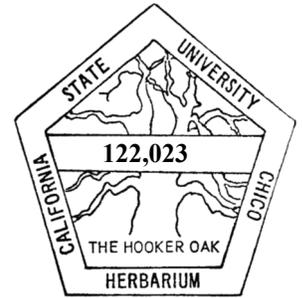




Friends of the Herbarium

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



Volume 25 Number 2

October 2019

Newsletter

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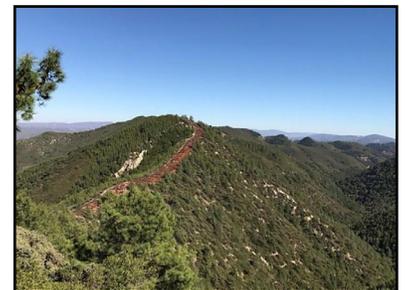
Friends of the Herbarium Annual Meeting

Fire Regime Alteration in Natural Areas

Guest Speaker:
Michelle Coppoletta
Ecologist, Sierra Cascade Province
USDA Forest Service

October 25, 2019
4:00—5:00 pm
Holt Hall 170

Omicron refreshments 3:30—4:00



Everyone is also invited to Holt 129 for:

Herbarium Open House: 2:30—3:30 pm

Friends' Annual Meeting: 5:15—6:15 pm

Including:

- ◆ 2019 Jim Jokerst Botany Award winners:
 - Constantin Raether—"Defense against herbivory"
 - Gabriel Wyatt—"Heavy metal phytoremediation"
- ◆ Image Processing Tour





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 Research Foundation 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.

BOARD OF DIRECTORS

Linnea Hanson	Elena Gregg
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Colleen Hatfield, Herbarium Director
Lawrence Janeway, Herbarium Curator

Newsletter

Volume 25 Number 2

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.

Endowment Drive update:

You may recall that we launched an endowment drive this last spring when a generous anonymous donor offered a \$20,000 challenge. Jessica Harrington with University Advancement helped us get the word out about the drive and, thanks to all who contributed and helped, we raised \$17,750 to add to the endowment. The anonymous donor opted to contribute the entire challenge amount to the endowment and as a result we increased the endowment by \$37,750 bringing the endowment balance to just over \$236,600. We will continue to work to build the endowment to ensure a sustainable funding source for the herbarium curator position, which is now funded primarily through interest on the endowment and FOH workshops.

Trump administration's proposed changes to Endangered Species Act

by Rob Irwin

The Trump administration has issued a proposal to strip the Endangered Species Act (ESA), the landmark 1973 environmental law, of key provisions which would reduce protections for species and allow increased resource extraction. The proposal is titled "Endangered and Threatened Wildlife and Plants; Revision of the Regulations for Listing Species and Designating Critical Habitat".

The proposal went into effect on September 26th. Key changes to the ESA include:

- Protections for threatened species would be made on a case-by-case basis.
- USFWS and NOAA must begin assessing economic impacts when determining how wildlife should be protected.
- Removal of a requirement compelling federal agencies to consult with scientists and wildlife agencies before approving permits for ventures such as oil and gas drilling and logging.
- Would allow climate change to be disregarded in assessing impacts to species.
- Facilitates removing a species from endangered or threatened status.
- Critical habitat changes—prioritize the areas that species currently are before looking at the areas they might be in the future (i.e. after recovery).

The ESA has been significant – protecting more than 1600 plant and animal species. 99% of species placed on the endangered list have not gone extinct. In California, approximately 133 plant species are listed as Endangered and 52 as Threatened under the ESA.

The proposal was published in the Federal Register on August 27. For more information use this shortcut to the Federal Register: ([bit.ly/33gFe4r](https://www.federalregister.gov/documents/2017/08/27/proposal-to-revise-the-endangered-species-act)).



Upcoming Workshops

For all upcoming workshops and how to register visit Friends' website:
www.friendsofthechicostateherbarium.com. Unless otherwise noted, all workshops are in the Herbarium,
 Holt Hall 129 on the CSU Chico campus.

Fire-Injured Trees: Predicting Mortality and Assessing Hazard—October 16, 2019

In the aftermath of fires, professionals are often asked to assess the health of trees with in private and public lands. But making decisions on the health and probability of mortality in fire-injured trees can be complicated. There are many factors to assess and this workshop will present information to aid in the assessment of the health of trees after a fire, particularly California native conifers and oaks.



The first part of the workshop will be in the Herbarium to discuss types of fire-related injuries, how to determine if a tree will survive fire related injuries, insect activity post-fire, post-fire decay and the potential hazards of decay. Following the classroom presentations the workshop will proceed to a field site within the Camp Fire burn scar to examine fire-injured trees and continue the discussion on how to assess hazard and predict tree mortality. Note, this workshop has been approved for Continuing Education Units through the International Society of Arboriculture—see the Friends of the Herbarium workshop website for details.

Creating Inks and Watercolors from Locally Sourced Plants and Minerals—October 26, 2019

Learn about the origins of color, work with select rock and plant samples, and take a local walk to learn about different species that can create exquisite colors for calligraphy, printing and painting. Each participant will learn grinding techniques, and take home a sample card of local colors, along with an instructional pamphlet on how to reproduce the process.



The workshop will be led by Melody Overstreet who is an Iranian-American artist, poet, and educator. She has exhibited her work locally and internationally, with her most recent series landing at the Rui Cunha Foundation in collaboration with the Yun Yi Arts and Cultural Communications Association in Macau, China.

Additional workshops in the works:

- Ethnobotany—March
- Introduction to Nature Journaling—April
- Manzanita—April
- Plant Collecting—May
- Botanical Illustration—April



How to name a new plant species

by Julie A. Kierstead

The excitement of stumbling across a new plant species may be sudden or may be the culmination of a long series of frustrating attempts to key the species, unsuccessfully, without realizing that the problem is not a bad key, or an inept botanist, but that the species IS NOT IN THE BOOK.

Shasta huckleberry, my first go

I stumbled into my first new species, *Vaccinium shastense*, in 1991 while doing a rare plant survey of Golinsky Mine, a bleak abandoned copper mine site recently acquired by the Forest Service on the west slope of Shasta Lake. The site was largely denuded of vegetation, hellishly hot in summer, and the first plant I saw when rounding the corner onto the mine site, was a huckleberry. It was a very weird place for a huckleberry—growing out of the side of a bare reddish rock outcrop. It keyed out to red huckleberry, *Vaccinium parvifolium*, except the berries were blue. Other than berry color and habitat, the plants did look very much like red huckleberry—deciduous, thin leaves; green, angled twigs; upright broomlike habit, several feet tall, single flowers in the axils.

I was very familiar with red huckleberry from the coast and Cascade mountains of Oregon, my home state, where red huckleberry is most often found on rotting stumps in damp forest, and this site looked nothing like red huckleberry habitat. This was growing on acid mine drainage bubbling up from the rock and along Little Backbone Creek, both above the mine in a “natural” setting (the entire area was completely denuded of vegetation by the Kennett copper smelter a hundred years earlier) and below the mine where the rocks were stained orange from the mine runoff.



Shasta huckleberry growing in acid mine drainage from the Friday Loudon mine west of Shasta Lake.
(Photo by J. Kierstead)

The *Vaccinium* experts I contacted had nothing to offer except “it’s *Vaccinium parvifolium*,” and I wrote it off as an anomaly. Over the next few years, however, the same huckleberry showed up at several other mine sites around Shasta Lake, and about a decade after the initial discovery, the Bureau of Reclamation (BOR) embarked on environmental studies to prepare for raising Shasta Dam to increase its storage capacity. BOR hired North State Resources (NSR) to do the biological investigations. Len Lindstrand III of NSR found more sites of the odd huckleberry, on other mine sites and in places that had not been mined, all on the west side of Shasta Lake.

Len and I wondered if the huckleberry had been brought in by miners. We wondered if the heavy metals and extreme acidity of the effluent from the mines could affect fruit color. To shed light on the genetic relationship between the Shasta huckleberry and red huckleberry, we commissioned the National Forest Genetics Lab (NFGEL) in Placerville to do a genetic study, which clearly demonstrated that the Shasta huckleberry and red huckleberry are distinct entities.

I mentioned the Shasta huckleberry at the Northern California Botanists Symposium in Chico, and Alison Colwell of the National Park Service stepped forward to say she thought they had the same huckleberry in the Sierra Nevada. Alison later compiled herbarium records of *Vaccinium “parvifolium”* from the Sierra Nevada, and noted a distinctive leaf margin feature that distinguishes *V. shastense* from *V. parvifolium*.

Another genetic study was commissioned by NFGEL, to include the Sierran populations. Based on the results, and Len Lindstrand’s exhaustive field work to relocate historical populations, we were convinced that we really did have a new species, and it consisted of separate subspecies, one in Shasta County and the other in the Sierra Nevada. We

(Continued on page 5)

(Naming a Plant Species Continued from page 4)

were ready to publish, but we didn't know how.

We read other new species publications and spoke to other authors of new species. In the end, our paper, "A new species Of *Vaccinium* (Ericaceae) from the southeastern Klamath Mountains and the Sierra Nevada, California, with two subspecies," was published in *Madroño*, the journal of the California Botanical Society, in 2015, 24 years after its discovery at Golinsky Mine.

Our publication included a detailed description, designation of a type specimen, a new illustration by Linda Vorobik, photographs of macroscopic and microscopic features, a new key to the taxa of *Vaccinium* in California, a summary of the genetic analysis showing distinctions between *V. shastense* and *V. parvifolium*, and range maps for both subspecies by county and Jepson biogeographic region.

Which of these things is required to publish a new species? Only a few. The authors must give the new species a name that meets the rules set by The International Code of Nomenclature for Algae, Fungi, and Plants. The Code was last updated in 2018.

- Species epithets can be derived from any source or can be made up; the gender or form must conform to the genus name.
- One cannot name a species after oneself.
- The genus name cannot be repeated as the species name.
- The name must be published in a journal or book that is available to the general public or at least to scientific institutions with generally accessible libraries. As of 2012, publication can be entirely electronic, in PDF format in an online publication with an ISSN or ISBN number. There is no requirement that the publication be a peer-reviewed journal.
- A type specimen with location, date, and collector name must be designated to which the name will be forever attached, and the specimen deposited in an accessible herbarium.
- The publication should include a description of the new species, and how it differs from other species in the genus. A description in Latin is no longer required.

I have seen new species publications that consist of nothing more than these basic items—no illustration or photo, no key, no range map (some species are named based on a single location), no genetic analysis, and a skimpy description. This was the rule rather than the exception for most of the new species discovered by early explorers in the American West. In this day and age, it strikes me as lazy.

My later experiences with finding and publishing new species have been much different (and quicker!) than the huckleberry, largely because expert help was available from at least one of the other authors.

Shasta maidenhair fern, as a minor coauthor:

Adiantum shastense, the Shasta maidenhair fern, was discovered at the Duke University herbarium by Layne Huiet, who was doing a genetic analysis of the genus *Adiantum* and noticed that the Shasta County specimen of *A. capillus-veneris* came out in a wildly unexpected place on the family tree. She called me to ask if I knew of an odd maidenhair fern in Shasta County, and I said there was one that didn't key out worth a darn, so we had been randomly calling it either *A. capillus-veneris* or *A. jordanii*, depending on the whim of the day. Layne flew out from the east coast, put together a collecting trip with colleagues from UC Berkeley and UC Davis, and subsequently published *Adiantum shastense*, kindly adding my name as an author. Her paper was published online in *PhytoKeys*, a peer-reviewed, open-access online and print botanical journal.

Shasta fawn lily, a collaboration with two other authors

A conversation among Dana York, Dean Taylor, and me about a beautiful and distinctive fawn lily we had each seen

(Continued on page 8)



Shasta Lake huckleberry
(*Vaccinium shastense*)
(Photo by J. Kierstead)

Highlights from Recent Workshops

Riparian Ecology Workshop—May 8, 2019

by Tom Griggs

On a beautiful late spring day, 16 participants explored the floodplain vegetation on the Army Corps of Engineers' Hamilton City project and the adjacent Pine Creek Unit of CA Fish & Wildlife. We paid special attention to the evidence of flood flows—hydraulics—upon the vegetation structure and the floodplain soil surface. We started at the Hamilton City Levee Setback Project by walking along the footprint of an old levee that had been removed the previous year. We examined sediment patterns as a result of flowing water from last year's wet-winter flooding. Walking east onto the CA F&W Pine Creek Unit, which has not seen a levee in recent years, we strolled through an arroyo willow forest at the edge of the river. Where the flood flows broke out of the channel, dramatic sediment patterns were evident. The highlight for me were the huge rafts of floating debris piles—several acres each—scattered across the floodplain. In summary, the workshop participants experienced several hours of floodplain ecology that cannot be experienced from the computer screen at your desk.



Workshop participants discuss floodplain sediment patterns. (Photo by Tom Griggs)

Native Bees as Pollinators—July 25, 2019

by Rob Irwin

With roughly 1,985 species of bees in California, there is plenty to learn and appreciate about these wonderful insects. I've taught this workshop with my colleague Rob Schlising for several years, and it is always a learning experience for us as well as the participants. The two-day workshop is geared to promote awareness and appreciation for the bee species that are around us, but often overlooked due to their small size and speedy flight. This two-day workshop begins indoors with a day spent learning about natural history, taxonomy, and morphology. Pinned specimens were examined under microscopes and keys were used to identify bees to genus. Further topics



Workshop participants eying pollinators at the Butte Creek House Ecological Preserve. (Photo by Rob Irwin)

ranged from how to observe bees and other pollinators in one's back yard, to biogeography and evolutionary history. We also talked about threats to pollinators and conservation efforts including the current proposal to list four bumblebees under the California Endangered Species Act, as well as other conservation efforts nationally and internationally.

A fieldtrip the following day was spent near Butte Meadows and Humbug Summit where we were met with a wonderful variety of flowers and bees. We stopped at patches of *Penstemon neotericus* to watch sweat bees (*Lasioglossum* sp.), *Osmia* bees, and pollen wasps (family Vespidae, subfamily Masarinae). At an open red fir forest

(Continued on page 7)

(Recent Workshops—Continued from page 6)

near Humbug Summit dry red fir forest and meadows at Butte Creek House Ecological Reserve, many bees were captured with nets and placed in glass bottles for examination before being released. And if you are into latin names, here are some of the species we encountered: *Bombus flavifrons*, *Bombus centralis*, *Bombus mixtus*, *Xeromelecta californica*, *Calliopsis* sp., *Sphecodes* sp., *Dufouria* sp., *Andrena* sp., *Osmia*, sp., *Megachile* sp., and several others that escaped our nets, despite our best efforts.

The Introduction to the Willows of California (Salicaceae)—May 11, 2019

by Rob Irwin

The Introduction to the Willows of California workshop was held on May 11 by John H. Bair, Riparian Botanist with McBain and Trush Inc., and a recognized expert in willow and cottonwood taxonomy and physiology. Many of the attendees were botanists or involved in riparian restoration, and like me, wanted to find ways of identifying willows.

John's lectures covered willow family taxonomy, recent taxonomic changes in the 2nd edition of the Jepson Manual, geography, and key identification characteristics. John brought a variety of fresh willow specimens which we examined and practiced keying using the Jepson manual. Another theme of the workshop was willow family ecology and the use of willows and cottonwoods in restoration projects.

John was generous with class materials which included a guide to riparian trees of the Trinity river (which I am still using for it contains keys to all but one of the willows I encounter in the Central Valley), a key to willows of the Humboldt Country Coastal area, a key to the willows of the Bay area, a species character matrix, and a California Transcet showing willow species from the Coast to the great basin.

Following the workshop, armed with one of John's keys, I visited a riparian site in Red Bluff and found six species of willows (*Salix exigua*, *S. gooddingii*, *S. laevigata*, *S. lasiandra lasiandra*, *S. lasiolepis*, and *S. melanopsis*) – all the willow species that occur in California's Central Valley.



Salix melanopsis from
Anderson, CA.

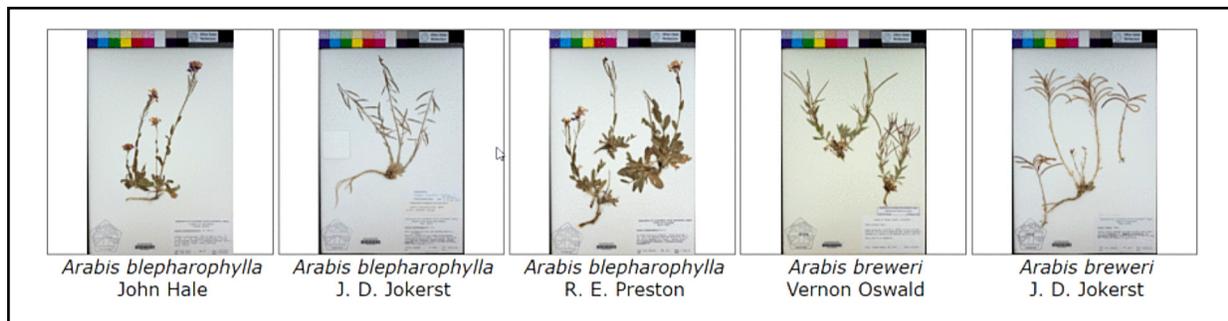
(Photo by Rob Irwin)

(Continued on page 10)

Imaging of Herbarium Specimens Update

By Colleen Hatfield

As previously reported in the Fall 2018 Newsletter, the Chico State Herbarium received funding along with 22 other California universities, research stations, natural history collections and botanical gardens to capturing images of specimens and linking them to their data records on the Consortium of California Herbaria Portal (CCH2.org). Since the project started, and with the help of four students and several volunteers, we currently have over 1,700 images uploaded and another several hundred in the wings ready for uploading. Below is just a sample of the specimens in the Chico State Herbarium collection that have been imaged and are now available on the portal. If one clicks on a particular image in the portal, it brings up the data record for that particular specimen. This is a very exciting milestone for the Chico State Herbarium and all collections across the state.



(Naming a Plant Species Continued from page 5)

in the limestone country north of Shasta Lake led to publication of the new species *Erythronium shastense* a couple years later. Dana did most of the work for writing the paper, and is the lead author for the Madroño paper published in 2015.

***Sedum* subgenus *Gormaniana*, as instigator but not principal author**

After extensive field work from 2011 to 2016, the Carex Working Group revised 17 members of the genus *Sedum*, with multiple new taxa named, following a contractual agreement between the Shasta-Trinity National Forest and the Carex Working Group, a group of experienced field taxonomists, including Barbara Wilson and Peter Zika. I instigated the agreement because of ongoing frustration trying to use existing keys to identify rare sedums that were subject to management protections on National Forest lands. The resulting monograph, including all of *Sedum* subgenus *Gormaniana* in California and Oregon, was published seven years after the initial agreement, in the online journal *Phytotaxa*, another peer-reviewed, open-access online and print botanical journal. The new species and revised taxonomy were based entirely on morphology, habitat, and range, as genetic analysis proved to be unworkable using the methods available at the time.

***Damnation Peak phacelia*, a Eureka! moment**

Driving through the burned landscape of the 2018 Delta fire in western Shasta County, being given a tour by Shasta Lake district botanist Martin Lenz of the rare plants found during post-fire surveys, we drove past a road cut covered with scree and a large multistemmed plant and green flowers, and I said MARTIN, WHAT IS THAT? He pulled over, we went to look, I said “I have never seen that before.” He said “I haven’t either.” We tried to key it out, and it went to the *Phacelia procera*/*P. bolanderi* couplet but clearly was neither of those. We took photos and many specimens, and I contacted Genevieve Walden that evening, sending the photos and asking her if she knew the species and who is the current *Phacelia* guru? Genevieve had been deeply involved in *Phacelia* taxonomy as a graduate student, and now works as a scientist for the California Dept. of Food and Agriculture. She responded quickly that she was finishing up the Flora of North America treatment of *Phacelia*, and the photos I sent were clearly something new. She offered her help with molecular analysis and writing the description of the plants for publication.

I sent out the information to other botanists working in the area and within a couple days Len Lindstrand III had found two more occurrences. Martin and I found more occurrences the next week. Genevieve came up from Sacramento twice to spend field days with us, visiting known occurrences, and collecting material for molecular sampling and voucher specimens. After a dry spell of a month or so with no new occurrences, Lawrence Janeway, Curator of the CSU Chico herbarium, found another occurrence several miles to the south. Ironically, this site is the exact location where Len and I took the Carex Working Group to look at *Sedum paradisum* during the kickoff of that investigation. How did we miss this large and distinctive phacelia growing along the road?

Genevieve is an old hand at publishing new taxa, and is familiar with current methodology for molecular analysis, and things are moving much more quickly with this publication than for Shasta huckleberry! Molecular analysis shows that it is a new taxon related to *P. procera* and *P. bolanderi*, with a very narrow range near Shasta/Trinity line.



Phacelia sp. nov. Shasta County
(Photo by J. Kierstead)

Layne Huiet, Martin Lenz, Julie Nelson, Kathleen M. Pryer, and Alan Smith. 2015. *Adiantum shastense*, a new species of maidenhair fern from California. *PhytoKeys* 53:73–81. doi: [10.3897/phytokeys.53.5151](https://doi.org/10.3897/phytokeys.53.5151)

Julie Kierstead Nelson, and Len Lindstrand III. 2015. A new species of *Vaccinium* (Ericaceae) from the Southeastern Klamath Mountains and the Sierra Nevada, California, with two subspecies. *Madroño* 62(3):167-180. (13 August 2015). <https://doi.org/10.3120/madr-62-03-167-180.1>

Dana A. York, Julie Kierstead Nelson, and Dean W. Taylor 2015. *Erythronium shastense* (Liliaceae), a new species from Northern California. *Madroño* 62(3):158-166. (1 July 2015). <https://doi.org/10.3120/madr-62-03-158-166.1>

Peter F. Zika, Barbara L. Wilson, Richard E. Brainerd, Nick Oetting, Steven Darrington, Brian J. Knaus, and Julie Kierstead Nelson. 2018. A review of *Sedum* section *Gormaniana* (Crassulaceae) in western North America. *Phytotaxa*, [S.l.], v. 368, n. 1, p. 1–61, sep. 2018. ISSN 1179-3163. Available at: <https://www.biotaxa.org/Phytotaxa/article/view/phytotaxa.368.1.1>. Date accessed: 24 sep. 2019. doi:<https://dx.doi.org/10.11646/phytotaxa.368.1.1>.



Joey Santore, YouTube Botanist

by Linnea Hanson

Joey is an amateur botanist who travels throughout North America identifying and discussing the plants he finds on his YouTube channel [Crime Pays But Botany Doesn't](#).

Joey films his nature adventures with his smartphone and includes scientific names with his thick Chicago accent and observations with humor and some off-color words thrown in. His humor, colorful style, and depth of knowledge are very popular. He said that a lot of scientific communication is really dry so he tries to add some humor to it.

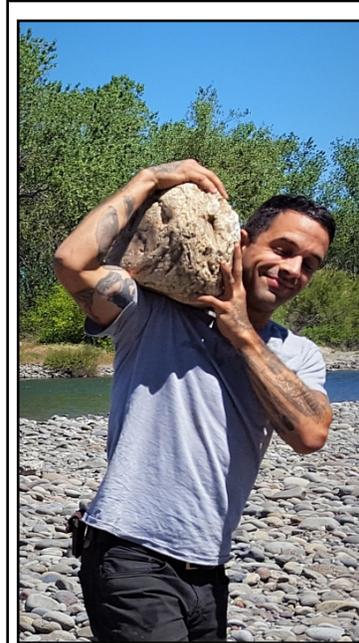
Joey is originally from the Chicago suburb of La Grange. After graduating from high school, he left the Chicago area to attend college in California but dropped out after two years. He decided to explore the U.S. mostly by riding freight trains. Joey saw diverse ecosystems and read science books in libraries across the country at that time. He now drives freight trains for a living in California.

Through his travels and YouTube videos, he hopes to inspire others to get outside and learn. He has been out with northstate botanists including John Dittes, Josephine Guardino and Julie Kierstead.

Joey has a great profile statement on iNaturalist at:

<https://www.inaturalist.org/people/joeyasantore>

Check out his YouTube Channel [Crime Pays But Botany Doesn't](#). It is entertaining while you learn about the interesting plants in Joey's travels.



Joey's visit to John Dittes and Josephine Guardino's home—April 7, 2017... "his first visit here at our place at Mill Creek. Jo and I had been admiring this big piece of Agate in the active channel in front of our house (agate is quite rare in this streambed). I mentioned my intention of bringing the ATV down to load up and bring back to the garden. Hearing this Joey said, "eh, dat aint no problem".... this year, it's next to sweet basil, Japanese Eggplant and Tomatoes..... " J. Dittes

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Mail to: Chico State Herbarium, c/o Biological Sciences Dept., California State University—Chico, Chico, CA 95929-0515*

(Previous Workshops—Continued from page 7)

Maintaining Native Plants in the Garden—September 21, 2019

By Rob Schlising

John Whittlesey and Rob Schlising presented their new FOH workshop “Maintaining Native Plants in the Garden.” Registrations for seats in the Herbarium were completed two weeks before the workshop date—probably reflecting the contemporary trend in which people use more native plants in their home and workplace gardens and in public parks/ plantings. The majority of the registrants were from Chico, but there were people attending from Paradise, Oroville, Sacramento, Lakeport and Sonoma. Many Master Gardeners were present! In the morning John presented a powerpoint show and discussion on maintaining woody native plants in gardens, with specific attention to most all of the natives that are often planted. Rob followed with attention to growing California annuals and herbaceous perennials. In the afternoon the group re-convened at Rob’s small urban garden. John highlighted shrubs and showed pruning techniques for woody species of *Ceanothus*, *Cercocarpus*, *Chilopsis* and *Salvia*. Rob illustrated techniques used in maintaining herbaceous plants and helped people gather seeds of easily-grown native *Argemone* and *Oenothera* and rhizomes of *Epilobium*, *Dicentra* and *Aster*. The instructors appreciated how engaged the participants were in this workshop, suggesting that it should be offered again in the future.



A garden of predominantly native plants outside Stonyford, CA.

(Photo: John Whittlesey)

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Friends of the Chico State Herbarium

California State University, Chico

Chico, CA 95929-0515