



# THE JEPSON GLOBE

A Newsletter from the *Friends of The Jepson Herbarium*

VOLUME 27 NUMBER 1, Spring 2017

## Curator's Column: Revisiting species richness and endemism across California

By Bruce G. Baldwin

Botanists focused on the evolution, ecology, biogeography, and conservation of Californian plants have long been interested in spatial patterns of floristic diversity across the state. Jepson considered areas of endemism in his *Manual of the Flowering Plants of California* (1925), as did Stebbins and Major, whose article 'Endemism and Speciation in the California Flora' (1965, in *Ecological Monographs*) was particularly influential in thinking about native floristic regions and the distributions and histories of range-restricted plant taxa in California. Over the last 50 years, additional investigations have sought to refine understanding of such patterns, in part by improving spatial resolution of plant distributions and conducting new types of diversity-focused analyses. As part of the NSF-funded California Plant Phylo-diversity Project (*Jepson Globe* V24#1), a collaboration of the Mishler, Ackerly, and Baldwin labs at UC Berkeley, we have completed a study (*American Journal of Botany* V104 no.3 487-501) that used ~1.4 million collections in the Consortium of California Herbaria to characterize geographic distributions of taxa and recently developed metrics of species richness and endemism to re-examine patterns of floristic diversity throughout California at the scale of a 15 by 15 kilometer grid.

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## In Memoriam Benito C. Tan 1946-2016

Benito (Ben) Ching Tan, an internationally recognized bryologist and Research Associate at the University and Jepson Herbaria died in December 2016. Among his many honors, Ben was a fellow of the California Academy of Sciences and recipient of the prestigious Richard Spruce Award of the International Association of Bryologists.

Ben specialized in the systematics and biogeography of mosses, especially the family Sematophyllaceae, and published many studies on East Asian bryophytes. He was considered the world's foremost expert on tropical bryophytes and was often sought after to identify rainforest taxa.

Ben was a Research Associate of the University and Jepson Herbaria at

(Continued on page 9)

## Walking with Wildflowers; Citizen Science along the Pacific Crest Trail

By Nicholas Kooyers and Benjamin Blackman

Calling all hiking, backpacking, and nature enthusiasts! Scientists at UC Berkeley are teaming up with the USA-National Phenology Network to launch a new citizen science project called Walking with Wildflowers along one of the nation's longest and most famous hikes, the Pacific Crest Trail (PCT).

The PCT stretches from the Mexican to the Canadian border, and across its more than 2500-mile path, it traverses many difficult to access regions of the Sierra Nevada and Cascade Ranges. These wilderness areas may be particularly vulnerable to the impacts of global change; they are also some of the most challenging for scientists to regularly monitor because they are so remote. Therefore, following in the footsteps of citizen science projects that have been established to observe wild populations worldwide, Walking with Wildflowers is recruiting PCT hikers to generate a continuous stream of information that will help document how

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### ALSO IN THIS ISSUE

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## New faces in the University and Jepson Herbaria

**Isaac Marck** is a California naturalist who joined the Jepson Herbarium as a graduate student in the Baldwin Lab in Fall 2016. Isaac grew up in Los Angeles, where he discovered his love of plants while exploring the coast, mountains, and deserts of Southern California. His main interests are evolutionary ecology, systematics, and the assembly of diverse floras, such as the California Floristic Province.


Isaac first got involved in research on plants while working in the laboratory of Michael Singer at Wesleyan University in Connecticut, where Isaac completed undergraduate and masters studies. His research at Wesleyan focused on the evolutionary ecology of dietary specialization in herbivores of forest trees. In 2010, Isaac visited Costa Rica and fell in love with diverse tropical forests. After finishing his master's degree in 2012 he moved to Costa Rica to work as a high school instructor and to document and describe tropical biodiversity.

In 2014, Isaac came full circle and returned to Los Angeles to work as a

plant ecology research technician at Cal Poly Pomona. Isaac was devastated to find that urban expansion and drought had extinguished many populations of formerly abundant native plants in the environments he knew when he was younger. At Cal Poly Pomona he designed and experimented with plant restoration approaches using windbreaks, fog drip, and geographical information from remote sensing data. He also started *Natural Progressions Landscaping*,

which focused on installing native plant gardens in public gardens, schools, parks, and homes. Before moving to the Bay Area to begin graduate school, Isaac did some exploring in the Chilean Floristic Province where he was astonished by the convergences in plant form be-

tween Chile and California.

At UC Berkeley, Isaac's goals are threefold: (1) to work on documenting the plant diversity of California, especially where threatened by habitat loss or climate change, (2) to educate fellow Californians about California natural history and threats to biodiversity, and (3) to contribute to understanding of the evolutionary processes that give rise to biodiversity in the California Floristic Province. 




Isaac Marck holds up a capitulum inflorescence of *Eriogonum fasciculatum* var. *foliolosum* during a botany workshop in the San Gabriel Mountains, Los Angeles County. Photo by June Okada.

**Mick Song** is a PhD student in the Rothfels lab where he studies how whole genome duplications have impacted the evolutionary trajectories of both ferns and flowering plants. Having grown up all across America and being an avid traveler, he finds ferns an attractive group to study as many of them are just as cosmopolitan as he is and some even more so!

During his undergraduate years, he worked for several summers with Dr. Jeff Doyle and Dr. Jeremy Coate at Cornell University and Reed College studying the patterns of gene retention and loss following whole genome duplications in a group of young allotetraploids in *Glycine* subg. *Glycine*. After completing his degree in molecular biology and biochemistry at Reed College, Mick travelled to Taiwan to study the Chinese language. However,

hiking through the amazing national parks there rejuvenated his early love of plant variation and motivated him to apply to Dr. Rothfels lab in the Integrative Biology program.

While at Berkeley, he hopes to marry approaches that investigate model organisms with those that study non-model natural populations in order to tackle the "big question" of the role of polyploidy in plant evolution. His research is also concerned with the role of transposable elements in plant evolution as well as the history and philosophy of botany.

Outside academia, Mick loves to botanize (meaning his hikes never get too far) and visit wine country. Whether on a mountain or a veranda, he always enjoys a good book, friendly company, and unique and rare plants. 



Mick Song. Photo by Orla O'Sullivan.



## *Jepson eFlora* Revision 4

Revision 4 involves treatments that have changed taxonomically (taxa added or deleted) since the publication of the second edition of *The Jepson Manual* (2012). A summary of the changes incorporated in the *eFlora* is presented below. See [ucjeps.berkeley.edu/eflorasupplement\\_summary.html#rev4](http://ucjeps.berkeley.edu/eflorasupplement_summary.html#rev4)



*Eriodictyon sessilifolium*  
Photo by Genevieve Walden



*Ceanothus decornutus*  
Photo by Vernon Smith



*Adiantum shastense*  
Photo by Neal Kramer

### Summary of changes made in Revision 4 of the *Jepson eFlora*, December 2016

#### ATHYRIACEAE

*Athyrium* transferred to Athyriaceae from Woodsiaceae

#### BLECHNACEAE

*Blechnum spicant* transferred to *Struthiopteris*, as *Struthiopteris spicant*, leaving no *Blechnum* in California

#### CYSTOPTERIDACEAE

*Cystopteris* transferred to Cystopteridaceae from Woodsiaceae

#### PTERIDACEAE

*Adiantum shastense* newly described, added, as native

*Pentagramma glanduloviscida* newly described, added, as native

*Pentagramma maxonii*, elevated to species rank from *Pentagramma triangularis* subsp. *maxonii*

*Pentagramma rebmanii*, elevated to species rank from *Pentagramma triangularis* subsp. *rebmanii* (which was mentioned in a note under *Pentagramma triangularis* subsp. *triangularis* in TJM2)

*Pentagramma viscosa*, elevated to species rank from *Pentagramma triangularis* subsp. *viscosa*

#### ASTERACEAE

*Bahia neomexicana* transferred to *Picradeniopsis*, changed to *Picradeniopsis multiflora*, leaving no *Bahia* in California

*Amauriopsis dissecta* transferred to *Hymenothrix*, changed to *Hymenothrix dissecta*; *Amauriopsis* is a synonym of *Hymenothrix*

#### BORAGINACEAE

*Eriodictyon sessilifolium* new to California, added, as native

#### RHAMNACEAE

*Ceanothus decornutus* newly described, added as native, a segregate of *Ceanothus jepsonii*

Plants called *Ceanothus vestitus* in TJM2 are *Ceanothus pauciflorus*; *Ceanothus vestitus* is a synonym of *C. pauciflorus*



*(Pacific Crest, Continued from page 1)*

a warming climate is affecting these sensitive habitats.

The two project leaders are Dr. Benjamin Blackman, Assistant Professor of Plant and Microbial Biology and Curator of Plant Adaptation in UC/JEPS, and visiting scholar Dr. Nicholas Kooyers. Support for Walking With Wildflowers comes from the National Science Foundation and through collaboration with Dr. Kathy Gerst and other staff at the USA-National Phenology Network.

This is the first year of the program, and the pilot season's efforts will focus on twenty California native plant species along segments of the PCT within Yosemite National Park, Crater Lake National Park, and North Cascades National Park. Volunteers will be trained to make simple observations at pre-specified site locations about whether a particular species or individual is flowering and how many open flowers are on a plant. The participants will record these observations on their smartphones with the Nature's Notebook mobile app, and the stored data will be later transmitted to the USA-National Phenology Network's database.


Although a single hiker may observe a given plant at a particular site just once, different hikers along the



*The Pacific Crest Trail (PCT) runs through the High Sierra next to Thousand Island Lake and wildflower meadows. Photo by Nic Kooyers.*

PCT will record observations on the same plants over time, producing a season-long and multi-year data set. This crowd-sourced information will be extremely valuable for allowing researchers to answer important questions about how plant species are responding to climate change. For instance, the flowering observations that are generated by Walking with Wildflowers will be used to identify which California native

species are shifting when they flower to thrive in ever earlier, warmer, and drier growing seasons. Furthermore, by examining year-to-year variation in flowering patterns, researchers will be able to compare different species responses and better understand why certain species are able to respond and others are not.

If you are planning a trip to Yosemite, Crater Lake, or North Cascades this summer or have friends who may be hiking the PCT, definitely get in touch! The PCT crosses diverse environments that are inhabited by spectacular wildflower, shrub, and tree communities, and being a citizen scientist with Walking with Wildflowers is a fantastic way to enrich your knowledge of these fascinating plants while also advancing much needed conservation research. To get involved, please visit the Walking with Wildflowers website, <https://pct.usanpn.org/>. 



*The view from a PCT phenology site within in Lyell Canyon in Yosemite National Park. Photo by Nic Kooyers.*



*A PCT trail marker in North Cascades National Park. Photo by Nic Kooyers.*



## Burning for Food Sovereignty

By Edith Friedman

“Enhancing Tribal Health and Food Security in the Klamath Basin of Oregon and California by Building a Sustainable Regional Food System,” also known as the *Klamath Basin Tribal Food Security Project*, is a multi-partner collaboration led by Dr. Jennifer Sowerwine, Cooperative Extension Specialist and Curator of Food Plants at the University and Jepson Herbaria. It aims to rebuild a food system in the Klamath Basin that supports healthy communities, ecosystems and economies among the Karuk, Yurok and Klamath tribes. It includes formal scientific research conducted by Dr. Arielle Halpern on burning plots of tan oak (*Notholithocarpus densiflorus*, Fagaceae). Her results support traditional ecological hypotheses that fire reduces insect consumption of acorns and that traditional acorn gathering criteria are extremely effective in distinguishing consumption-quality acorns from those that are infested with insects and mold.

In the Klamath River Basin, prescribed fire is being reintroduced to prevent devastating wildfires and manage the forest—and the culturally important food sources within it. For thousands of years, native people used

fire to manage the landscapes in which they lived. As Heather Rickard, Natural Resources Technician for the Karuk Tribe, explains: “Cultural burning is central to native food sovereignty: the majority of traditional foods, fibers and medicines require fire in order to be usable and accessible to people. Fire can reduce bugs in acorns, madrone berries, and willow sticks; stimulate regrowth of hazels, willows, huckleberries, gooseberries and more; invite game to graze; and make plant food resources and hunting, fishing, and ceremonial locations more accessible.”

Last October, University and Jepson Herbaria research partners the Karuk Tribe of California, Mid Klamath Watershed Council, and numerous other groups led volunteers in burning over 400 acres in the Klamath River Prescribed Fire Training Exchange (TRES).


Project partner Dr. Frank Lake, US Forest Service Research Ecologist and Karuk cultural practitioner, monitors burn sites for improved access and gathering efficiency. Last year he recorded “epic” results, gathering 1,300 acorns in 50 minutes in burned plots.

Prescribed fire, with its agency-monitored approach and focus on wildfire prevention, is different from cultural burning. But in the Klamath, collaborative implementation and tribal leadership have meant



Prescribed fire. Photo by Will Harling, Mid Klamath Watershed Council.

that TRES includes traditional food, fiber, and medicine plant monitoring, sharing Traditional Ecological Knowledge (TEK), and connecting traditional management approaches with skill development for young community members. Fire-safe communities, youth development, cultural education, and strengthened connections between tribal people and their ancestral food resources all contribute to building tribal food sovereignty and a more food-secure region for all residents. As Bill Tripp, Deputy Director, Karuk Department of Natural Resources explains, “Good Fire, such as that of indigenous management, is what we are beginning to return to the land.”

*The Food Security Project is supported by USDA-NIFA-AFRI Security Grant # 2012-68004-20018.* 



Acorns from test site. Photo by Frank K. Lake, USDA Forest Service.



Cultural Foods need fire. Photo by Stormy Staats, Klamath Salmon Media Collaborative.

## Digitizing microfungi at the University Herbarium

By Else C. Vellinga

Microfungi are fungi that are almost invisible to the naked eye; it is a convenient term, but all kinds of different fungi and various organisms that once were considered fungi are caught under this umbrella. Many important plant pathogens, food fermenters, slime molds, and water molds (such as the cause of Sudden Oak Death and Potato blight) are considered micro “fungi”. Just as humans have a wide array of micro-organisms on and inside them, so do have plants their own microbiome—either inside and not showing up on the outside, or visible on leaves, in flowers, or on stems. Rust fungi are quite visible, and you might be familiar with them as the lilac bumps on the underside of hollyhock leaves. Native plant species also have their own set of rust fungi, which are as diverse as the flora.

The University Herbarium (UC) has an estimated 50,000 collections of these different groups of organisms and, thanks to the National Science Foundation, their collection data are now digitized and directly available on the Microfungi Collections Consortium ([mycoportal.org](http://mycoportal.org)).

Some notable collectors that deposited specimens in the University Herbarium include W.C. Blasdale, a

chemistry professor at UC Berkeley who started the study of rusts in California; he named three species and also published a preliminary list of all rust species in the state. Lee Bonar, the first mycology professor at UC Berkeley, specialized in the ascomycete fungi on plants, and described many species as new. Harold E. Parks and Joseph P. Tracy were eager collectors of parasitic fungi in Humboldt County, and southern California collections made by C.F. Baker (who became an entomologist in the Philippines) also contributed to the wealth of California microfungi at UC.

I have been supervising this project and managing a team of undergraduate students who are barcoding and imaging the specimens and then entering the label data. I have also been databasing the type collections, the newly acquisitioned collections, such as those from the Los Angeles Country Museum, and the ‘problem folders’.

I also managed an earlier project to digitize the macrofungal collections, and am happy to be back at the University Herbarium after working on the project at the Harry D. Thiers Herbarium at San Francisco State University in San Francisco.

My work with fungi began in the Netherlands where I earned my PhD

studying the phylogeny of lepiotaceous fungi, the most beautiful mushrooms in existence, and I have been extensively researching California mushrooms since I moved to the US in 1998. I recently described a new species, *Helvella dryophila*. This elfin saddle fungus is common in California’s oak woodlands, which includes the UC Berkeley campus, which is its type locality! The main motivation for me to do taxonomy and systematics is to be able to deliver a foundation for conservation efforts. The digitization projects at the herbarium fit that mission perfectly! 🍄



Else C. Vellinga. Photo by Staci Markos.

## Genus of marine algae named after Dr. Kathy Ann Miller

By Richard Moe

What do these algal generic names have in common: *Dawsoniella*, *Gardneriella*, *Hommersandia*, *Isabbottia*, *Johansenia*, *Masonophycus*, *Norrissia*, *Papenfussiella*, *Paulsilvella*, *Searlesia*, *Setchelliella*, *Wynneophycus*?

They were all proposed by phycologists honoring colleagues associated with the Department of Botany and the University Herbarium at UC Berkeley.

In the October, 2016 issue of *Taxon*, a new name joins this distinguished assemblage: *Millerella*, named for Dr. Kathy Ann Miller, Curator of Algae.

The authors write: “The genus name, *Millerella*, honors Dr. Kathy Ann Miller, a perspicacious naturalist and Curator of Algae at the Herbarium of the University of California at Berkeley, U.S.A., who has greatly contributed to the taxonomy of marine red algae in California.”

Dr. Miller, who has probably spent more time observing California seaweeds in the field than any of the other namesakes, is currently distilling her phycological experience into an online flora, the *California Seaweeds eFlora*.





## A SPECIAL NIGHT CELEBRATING OUR MEMBERS

On October 14, 2016, we had a special members's night celebrating lichens and honoring Dr. Shirley Tucker for her generous gift that will establish the "Tucker Curator of Lichenology," a new position that will support the lichen collection in perpetuity. Before the evening reception, we dedicated the newly housed lichen collection to Shirley in appreciation of her enduring investment in lichenology at the University Herbarium. Following the festivities, Dr. Larry St. Clair presented a wonderful lecture on using lichens as biomonitors of air quality. We hope to host another event for our loyal members in fall of 2017.



Group photo with Shirley taken during Member's Night. Left to right, Brent Mishler, Cathy Chambers, Beth Burnside, Paul Licht, John Taylor, Stephen Sharnoff, Tom Carlberg, and Larry St. Clair. Photo by Ana Penny.



Shirley and Brent Mishler standing next to "Shirley Cotter Tucker and Kenneth W. Tucker," which was etched in the granite wall on the Builders of Berkeley monument honoring the university's leading benefactors (on the Doe Library Terrace, photo courtesy of UC Berkeley).

### The Jepson Manual included in the wedding ceremony of longtime members!



Ken Himes became a member of the *Friends of the Jepson Herbarium* in 1990 as part of the 1993 Jepson Manual Project. A loyal member ever since, we found it endearing that he and his wife Dee included that book in their wedding, during the ring ceremony. The photo captures Ken taking the ring from a much-used copy of TJM1 as Patricia Evans, the officiant and friend blessing

the rings, is saying, "Ken has carried this book on all his long and short hikes and trips so he could key out the flora. It is only fitting that I bless these two rings with *The Jepson Manual* symbolizing Dee and Ken's dedication and love for each other." Congratulations to this happy couple and thank you for sharing a part of your wedding with us! Photo by Gladys Gem Photography.

### Do we have your email?

One of the ways we keep in touch with our members is by email. We send announcements, invitations to special events, and *Jepson eFlora* updates. If you haven't been getting our messages, please call 510-643-7008 or email Staci Markos at [smarkos@berkeley.edu](mailto:smarkos@berkeley.edu)

## Recognizing Lifetime Members

Lifetime members demonstrate their dedication and commitment to the Jepson Herbarium, and share ideas with the Director and Curator. Each year, we host *Lifetime Members* for a hike and lunch with our Director and Curator to share ideas and enjoy the flora. This year, Kate Mawdsley will lead us on a tour of the Jepson Prairie Vernal Pool Preserve in Winters. We should be treated to a spring palette of wildflower color!

### *Lifetime Members*

Lowell Ahart  
Bruce Baldwin  
Robert & Evelyn Berman  
Central Coast Wilds (Institution)  
Alison Colwell  
Susan Crocker & Lee Gallagher  
Christopher Davidson  
Frank W. Ellis  
Barbara Ertter  
Wilma and William Follette  
Kenneth Fuller, in memory of  
Thomas C. Fuller  
Lawrence Giles  
Jeffrey and Judy Greenhouse  
Kenneth R. and Dee Himes  
Robert Terry Huffman  
Dwight L. Johnson  
Dale & Marie Johnson  
Alan I. Kaplan, in memory of  
Dr. Lewis A. Coveler  
Robert W. Kirby, Jr.  
Stefan Kirchanski and Ann Hirsch  
Shelby Kolstad  
Neal Kramer  
Ann Lambrecht



*Lifetime Member hike at Sugarloaf Ridge State Park, May 1, 2016. Photo by Staci Markos.*

Evelyne and David Lennette  
Park L. Loughlin  
Staci Markos  
Steve Matson  
Mary Ann Matthews  
Brent Mishler  
Michael Mitchell  
L. Maynard Moe, in memory of  
Larry Heckard  
Richard Moe  
Dennis Mudd

Jan Nachlinger  
Julie Kierstead and Jim Nelson  
Richard O'Donnell  
Roger Overstreet  
Catherine Park  
Stephen P. Rae  
Danica Harbaugh Reynaud  
Betsy Ringrose and Edward Adasiak  
Lynn Robertson  
Thomas J. Rosatti, in memory of  
Jean Ann (Seely) Rosatti and  
Edward James Rosatti, Jr.  
Robert A. Schlising  
Steve Schoenig  
Jacob Sigg  
James P. Smith, Jr.  
John C. Stebbins  
Dean Taylor  
Chris Walden  
Norm and Cathy Weeden  
Jennifer Whipple  
Marshall and Jenny White  
Marcia H. Wolfe, in memory of  
Dr. James Hickman  
Thomas Zavortink

### MEMORIAL, HONORIFIC, AND SPECIAL GIFTS

*The Jepson Herbarium is pleased to offer thanks to those who chose to honor or remember others with gifts to the herbarium.*

Peter Warner, in honor of Stephen J. Barnhart  
Alfred and Barbara Sattler, in memory of Mary Bowerman, and Bill and Genevieve Sattler  
Kathleen Dowdakin, in memory of Rick and Peggy Dowdakin  
Carole S. Hickman, in memory of Jim Hickman

Stefan Kirchanski and Ann Hirsch, in honor of Dorothy and Donald R. Kaplan and Cathy and Rod Park  
Gail Ward, in honor of Cynthia Knutson  
Theodora Lee Gregg, in memory of Robert Lloyd  
Paul and Diane Reeve, in memory of Dr. Marian E. Reeve and Dr. Roger M. Reeve  
Julia Ann Savelle, in memory of Glenn D. Savelle



## YOUR HELP IS NEEDED TO ESTABLISH A NEW BRYOPHYTE CURATION FUND

Bryology at UC benefited greatly from careful curation by Benito Tan. He and Dan Norris, a fellow bryologist, worked together in the collections for many years.

To honor their contributions, along with other UC bryologists past, present, and future, we are hoping to establish an endowment fund that will support bryological curation and studies at the UC herbarium in perpetuity.

We are two-thirds of the way toward our goal of raising \$50,000 by June 30, 2017. Please join Bill Doyle, David Lennette, Brent Mishler, Jim Shevock, and Paul Wilson with a contribution to the fund. Contact Brent Mishler ([bmishler@berkeley.edu](mailto:bmishler@berkeley.edu)) or donate online and specify "Bryophyte Fund" in the memo.

(<https://give.berkeley.edu/fund/?f=FU0840000>).



Photo by Brent Mishler taken on a trip with Benito Tan.

(Benito Tan, Continued from page 1)

UC/JEPS since 1998, and following a long and distinguished career in Singapore as an adjunct professor in the Department of Biological Sciences, National University of Singapore, and

curator in the Lee Kong Chian Natural History Museum, he moved to California and joined UC/JEPS full-time in 2013.

Ben will always be recognized and remembered for his significant contri-

butions to bryology and for those who were lucky enough to work with him personally, he will also be remembered for his kindness, generosity, and uplifting spirit. 🕯

### SUPPORT THE JEPSON HERBARIUM

Name(s) \_\_\_\_\_ Amount \$ \_\_\_\_\_ Visa \_\_\_ Mastercard \_\_\_  
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City, State Zip \_\_\_\_\_ Signature \_\_\_\_\_  
Telephone/ Email \_\_\_\_\_ Exp. Date \_\_\_\_\_

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**Basic Membership (\$45 individual, \$60 family)**

Basic members receive *The Jepson Globe* and discounts on Weekend Workshops.

**Sustaining Membership (\$200)**

Receive basic membership benefits plus acknowledgment in the *Jepson eFlora*.

**Lifetime Membership (\$5,000 total, or pledge a minimum of \$250/year)**

Demonstrate your dedication and commitment to the Jepson Herbarium with a lifetime membership. Gain recognition for your support in *The Jepson Globe* and the *Jepson eFlora*. Share your ideas with the Director and Curator at special, invitation-only events.

Please make your check payable to the **UC Regents**, charge your gift, or give online at:  
[give.berkeley.edu/fund/?f=FU0840000](https://give.berkeley.edu/fund/?f=FU0840000)

Jepson Herbarium, 1001 Valley Life Sciences Building #2465, University of California, Berkeley, CA 94720-2465

*Thank you for supporting the Herbarium and its programs!*

## Botanical Artists Visit the Herbaria

In January 2017, The University and Jepson Herbaria hosted an outing for the East Bay members of the Northern California Society of Botanical Artists, a chapter of the American Society of Botanical Artists. The one-day visit consisted of a tour of the herbarium by Assistant Director for Collections, Andrew Doran; listening to a lecture on Natural History, Botanical Illustration, and Teaching with Drawing by Ingrid Jordon-Thaden, Research Botanist; and pouring over some of our in-house botanical library collections with impressive original plates of illustrations, which were curated and presented by our Archivist, Amy Kasameyer. Andrew Doran also presented a lecture on the history of the relationship between the University of California Botanical Garden and the Herbaria. There were 16 members in attendance (below). Their East Bay Representative, Walter Denn (pictured on the far right), thanks the herbarium and staff for their hospitality and encourages everyone who reads *The Jepson Globe* to follow their exhibitions that are posted on [www.ncalsba.org/](http://www.ncalsba.org/).



Above, images from Edwards Botanical Register: 1816. These colored figures are of exotic plants cultivated in British gardens. Images used with permission from the The University and Jepson Herbaria Archives, maintained by Archivist Amy Kasameyer.



From left to right: Celia Bakke, Pat Martin (back), Connie van Ness, Joyce Martin (back), Dolores Morrison (front), Susan Bellone, Catherine Dellor, Sherry Johnson (kneeling in front), Barbara Ward, Leah Kaiser (back row), Ingrid Jordon-Thaden, Hanneke Van Oosterhout (front), David Mark-Raymond, Joanne Palamountain, Susan Mark-Raymond, Isabel Wade, and Walter Denn. Photo by Walter Denn.



Above, *Nelumbo lutea*, American water lotus, a drawing by American botanical illustrator, Isaac Sprague. This illustration is from Gray, Asa, and Isaac Sprague. 1848. *Genera Florae Americae Boreali-Orientalis*, one of the first American botanical illustrated works that was accepted by the European botanical community for its high-level of scientific illustrations that were done in America.




(Curator's column, continued from page 1)

Patterns of species richness across the state were resolved largely as previously suggested, with strong concentrations of diversity in areas of high topographic heterogeneity, mostly within the California Floristic Province. Similar results were obtained using a relative-endemism metric called weighted endemism, which gives greater weight to taxa with narrower ranges—not to be confused with absolute endemism, which examines the proportion of taxa that are completely restricted to a particular area or environment. Areas of high weighted endemism were generally of more limited extent and were concentrated at higher elevations than were areas of high species richness. Two exceptions were the Klamath Ranges and Channel Islands, where areas of high weighted endemism were more extensive than areas of high species richness, as might be expected based on their substantial diversity of range-restricted taxa. Areas of high weighted endemism were also much more extensive in the higher montane areas of the southern Great Basin (east of the Sierra Nevada) and Mojave Desert than were areas of high species richness.

Strikingly different results were obtained from a randomization test to identify areas of significantly high relative-endemism, which were more concentrated in the Great Basin and Mojave Desert than in much of the California Floristic Province. The Death Valley region and ranges to the north and south, including the Sweetwater Mountains, White-Inyo Range, Clark Mountain Range, New York Mountains, and Providence Mountains, were resolved as strongholds of significant relative-endemism in the California deserts. The possibility that those findings were attributable to exclusion from the analysis of out-of-state desert areas where California desert species often occur widely was ruled out for the

southern Great Basin and Mojave Desert by obtaining similar results when the analysis was restricted to include only absolute endemics of California. In general, our results bring the southern California deserts into stronger focus as areas warranting attention from a conservation standpoint, even by comparison with the species-rich California Floristic Province to the west.

Areas of both high species richness, in terms of either raw richness or weighted endemism, and significantly high relative-endemism include the desert ranges listed above and, in the California Floristic Province, such areas as the Klamath Ranges (including the Siskiyou, Marble, Scott, and Trinity mountains), Mt. Shasta vicinity, high central and southern Sierra Nevada crest, higher reaches of the San Bernardino Mountains, and the Santa Rosa Mountains (Peninsular Ranges). Comparisons across the areas of significantly high endemism showed that highest floristic similarity often was shared by taxa occurring in the same geographic subdivision of California, but sometimes not. For example, the areas of significantly high endemism in the Sierra Nevada foothills showed more floristic similarity to those of the Great Valley and South Inner Coast Ranges than to the areas of significantly high endemism in the high Sierra Nevada, which in turn showed highest floristic similarity to those of the Cascade and Klamath Ranges, except for the central Sierra Nevada crest and southern Sierra Nevada, which were most similar to the areas of significantly high endemism in the Great Basin. We are now in the process of comparing all of these findings with those from more extensive analyses of the California flora that incorporate a phylogenetic perspective, and look forward to sharing those results with our *Friends* in the near future. 

## JEPSON HERBARIUM RESOURCES & PROJECTS RELATED TO THE CALIFORNIA FLORA

Approximately 400,000 plant specimens from California

**Director:** Brent D. Mishler  
California Phylodiversity Project  
Systematics and ecology of *Syntrichia*

**Jepson Curator:** Bruce G. Baldwin  
*Jepson eFlora*  
Systematics and evolution of Calif. tarweeds and relatives (tribe Madieae, Compositae), *Chaenactis* (Chaenactidiaceae, Compositae), and *Collinsia* (Plantaginaceae).

**Curator of Ecology:** David Ackerly  
Ecology and evolution of California flora  
Climate change impacts and conservation strategies

**Curator of Ferns and Lycophytes:** Carl Rothfels  
Divergence and hybridization in Californian ferns and lycophytes (especially *Notholaena*, *Cystopteris*, *Isoetes*).

**Curator of Monocots:** Chelsea D. Specht  
Evolution and biogeography of Calif. monocots (including *Allium*, *Nolina*)  
Population structure and floral color pattern diversity in the *Calochortus venustus* complex

**Curator of W. N. Am. Botany:** Barbara Ertter, *Flora of Mount Diablo* and flora of the East Bay,  
North American Potentilleae

**Asst. Director for Collections and Curator of Cultivated plants:** Andrew Doran

**Asst. Director for Development & Outreach:** Staci Markos, *Jepson eFlora*, CCH & *Globe* editor

**Biodiversity Informatics Manager:** Jason Alexander

**Collections Staff & Plant Identification:** Kim Kersh, Ana Penny, and Margriet Wetherwax

**Archivist and Librarian:** Amy Kasameyer

**Public Programs:** Allyson Ayalon

**Membership, workshop enrollment, and *Globe* design:** Edith Summers

**Staff Research Associate:** Bridget Wessa  
**Trustees:**

Vice Chancellor Emeritus Beth Burnside; Professor Emeritus Russell Jones; Professor Emeritus Paul Licht; Professors John Taylor and Brent D. Mishler (ex officio)

**Constancea:** UC Publications in Botany (online)



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## SPACES AVAILABLE IN JEPSON WORKSHOPS!

There are spaces available in the following Jepson Workshops.  
Complete descriptions are online at [ucjeps.berkeley.edu/workshops](http://ucjeps.berkeley.edu/workshops)

### **Wetland Delineation**

*May 11-13*

### **Butterflies: Biology, Behavior, and Identification**

*May 20-21*

### **How to Learn the Plant Families of California**

*June 3-4 and 10-11*

### **Climate Change in California: Past, Present and Future**

*September 23*

### **GIS for Botanists**

*October 20-22*

### **Mushrooms of the Bay Area**

*December 8-10:*

*Photo left: Eriogonum crocatum, a rare plant endemic to the Santa Monica Mountains, from the workshop there April, 2017. Photo by Allyson Ayalon.*



Advanced Registration is required for all workshops.

Please call the Herbarium at (510) 643-7008 if you have additional questions.