



THE JEPSON GLOBE

A Newsletter from the *Friends of The Jepson Herbarium*

VOLUME 19 NUMBER 2, October 2008

California's Changing Climate

By David Ackerly, Curator of Ecology

Earlier this year, I and fellow Jepson Herbarium staff and students were part of a team that published a ground breaking study of the effects that global climate change may have on California's endemic flora over the next 100 years. We assessed changes in plant ranges under several scenarios. We used two climate models — one predicting a moderate emissions increase that levels off and one predicting greater emissions that continue to grow.

We also considered two plant scenarios: one where the plants do not change their current range and must deal with the new environmental conditions and second scenario where the plants can migrate to more suitable habitats.

Possibly the most staggering finding is that, under the worst-case scenario, where emissions are highest and where plants do not disperse, two-thirds of the species studied would experience an 80 percent reduction in range size.

Our team addressed some specific questions such as where future refugia might be found. Across all scenarios, the general trend is that diversity shifts towards the coast and northwards. Coastal areas, especially Northwestern California and Central Western California, are rich in species at present. Even under significant climate change, they will continue to be so. In contrast, the foothills of the

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The 2008 Moorea Class at the Belvedere.

*Photographer Albert Park, far left;
author Brent Mishler, 5th from the right.*

Director's Column: Teaching and Research on Moorea (French Polynesia) at the Gump Research Station

By Brent D. Mishler

Photographs by Albert Park

The University of California, Berkeley, has a broad institutional emphasis on the Pacific Rim, and the University and Jepson Herbaria are no exception. Reaching out from our quintessentially Pacific Rim location in California, we have many staff and students with research interests around and across the Pacific. Research and teaching in this area is facilitated by UC's Richard B. Gump South Pacific Research Station on Moorea in French Polynesia (<http://moorea.berkeley.edu/>). The station is located centrally in the middle of the Pacific Ocean, with a fascinating paleotropical flora and fauna at the tail end of a biodiversity gradient that extends eastward from continental source areas in Southeast Asia and Australia, step-

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The Horticultural Herbarium, More Than Just Garden Collections

By Andrew Doran, Administrative Curator






A meeting at the end of last year attended by Administrative Curator, Andrew Doran, and hosted by President of the Missouri Botanical Garden, Peter Raven, brought increased focus on cultivated plants in North America and highlighted the need for an all encompassing account of plants cultivated in North America. The following article highlights some of our important holdings and their potential use and contribution to this effort.

Cultivated plants are a relatively unknown resource of the herbaria. Many of our visitors use the herbaria to work on native plants from California and beyond and are sometimes unaware our horticultural collections even exist. In fact, the collections are of around 15,000 specimens and are housed both in the main University Herbarium and separately for the exclusively cultivated specimens with no wild locality data.

The oldest plants in the collec-

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ALSO IN THIS ISSUE

-  New TJM2 treatments online
-  Graduate Student Research
-  Weekend Workshops in Review
-  Anna Larsen, Farewell
-  New Bryophyte Database



A composite photo taken looking north from the spine of the island. Mt. Mouaroa (an emblem of Moorea) is at far left, Opunahu Bay is on the left, Cook's Bay (where Gump Station is located) is on the right. Mt. Rotui is prominent in the center.

wise through the island groups of the South Pacific to French Polynesia (east of which is a large expanse of ocean). The biota is thus much less diverse than the source areas and shows “taxonomic disharmony” — i.e., with some groups like ferns and bryophytes forming a disproportionately large fraction of the flora and other groups like orchids a disproportionately small fraction. Interesting ecological questions arise, given this small and biased subsample of the southeast Asian biota, such as how are niches filled in a low-diversity region versus a high-diversity region?

The interesting flora and fauna, which is representative of tropical ecology yet of manageable size to learn, is ideal for teaching students whose backgrounds are in temperate California. Of course, the beauty of the island, reputed to be the among the most beautiful in the world, helps keep their interest high also! The premier undergraduate class taught at the Gump Station is UCB's *Biology and Geomorphology of Tropical Islands*, for which I am one of several professors each fall (and Albert Park is a current undergraduate). This is a rare

class in undergraduate education, an interdisciplinary course open only by application and interview, that occupies one whole semester (13 units), with a student to teacher ratio of nearly 2:1, featuring all-inclusive research experience and full immersion in the life of science and a foreign culture. The 21 students spend a month in Berkeley for lectures and labs five days a week, then go to the Gump Station on Moorea for nine weeks to carry out an intensive research project as well as participate in general educational field trips and group projects, finally returning to Berkeley for two weeks of non-stop data analysis, library research, and writing. Following a round of peer reviews, the students prepare camera-ready copies of their papers for publication in the annual class book (with some submitted to the professional literature as well!) and give an oral presentation in a professional-style symposium. Class members form bonds with each other and the teaching staff that will last a lifetime. About five professors (who each spend two to four weeks on Moorea) and three Graduate Student Instructors (who spend the

whole nine weeks!) have a unique opportunity to help each student design their project and assist them in the analysis and write-up phase. This close living and working situation allows the transfer of fundamental methods, theories, and even attitudes about science, in addition to the expected transfer of basic information about islands and their biology. It is extremely rewarding for us to see students transform into research scientists in front of our eyes! The class began in 1991, and many participants have gone on to graduate school and are now becoming professors themselves!

Research is another area of emphasis at Gump Station. The major current project is the Moorea Biocode Project, which involves many teachers and graduates of the class. The goal of this project (http://www.berkeley.edu/news/media/releases/2007/12/06_moorea.shtml), funded by the Moore Foundation for \$5.2 million, is to inventory every single species of multicellular organism on the island, or in the lagoon. We called it “biocoding” to indicate that our approach is an

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Students on a hike in the jungle.




Gump Station from the waters of Cooks Bay.



On a field trip to the motu — small reef islands that form on the barrier reef.


improvement over “DNA barcoding” — initial approaches to which were too limited and controversial, given the potential non-evolutionary connotations of a “barcode.” Campbell’s Soup cans of a particular type can bear a barcode because they are identical to each other, but organisms in a species are not. [I will lead a discussion of this topic at the December 3rd Science Cafe — see advertisement elsewhere in this issue.] The Moorea Biocode Project is looking at multiple populations for each species, getting museum or herbarium vouchers and pictures of everything, and making keys and morphological descriptions as well as sequencing lineage-specific genes for every specimen. It is really just an old-fashioned biotic survey, with the addition of advanced computer infrastructure and high-throughput DNA sequencing.

There are teams working on various groups of plants, animals, fungi, and algae. My lab is taking primary responsibility for ferns and bryophytes, as well as assisting with the flowering plants. A former undergraduate student (Joel Nitta — concentrating on ferns) and a current undergraduate student (Elaine Fok — concentrating on liverworts) from my lab are working with me (concentrating on mosses) this semester in Moorea. We have made several hundred collections so far and have added many taxa to the known flora of the island. Current Bryolab graduate student Ben Carter will begin working on the project in spring, first coordinating the lab work on bryophyte DNA sequencing, then traveling himself to Moorea to continue the collecting. This ambitious and novel attempt to inventory, biocode, and database a complete ecosystem will have many applications to research, conservation, sustainable use, and teaching in the future. 

northern Sierra Nevada are extremely vulnerable to species loss. Under scenarios that allow dispersal, the areas that straddle the California-Oregon border also become rich in species — as expected from northward dispersal. There is one important caveat — the potential for areas to act as refugia depends greatly on whether species are able to disperse into them.

We also addressed where species will move. As one might expect, species tend to move to higher elevations and often northward. Interestingly, these trends result in divergent projections for elements of the flora. Given California’s geography, movement to higher elevations often means taking a *southward* path. Within the six major regions, substantial numbers of species move in diametrically opposite directions — typically north of northwest, and south of southeast. In the Cascade Ranges and the Sierra Nevada, species at high elevations tend to move south to higher elevations. Those at lower elevations, like those in other regions, are a mix of species, some of which move south and others that move north. In short, even relatively moderate projections suggest that climate change has the potential to break up local floras, resulting in new species mixes, with consequent novel patterns of competition and other biotic interactions.

It seems certain that the temperature and rainfall patterns in California will change considerably during the next century. Projecting future change is a crucial step towards planning for and mitigating the impacts of climate change on biodiversity and this study has provided important insight. We are now planning additional projects, including a study of local adaptation to determine if populations of widespread species are climatically specialized, and applied projects to address how our results can be used by land managers in the management of protected areas.

The work was supported by data from The Jepson Manual and the participants of the Consortium of California Herbaria. The full article is available here: <http://www.plosone.org/article/info:doi/10.1371/journal.pone.0002502> and range projections for specific taxa are available here: http://ucjeps.berkeley.edu/jepsonflora/CAFP_climate_change/index.html 

TJM2 treatments posted since May 2008

<http://ucjeps.berkeley.edu/jepsonmanual/review/>

Apocynaceae: *Amsonia*, *Apocynum*, *Araujia*, *Asclepias*, *Catharanthus*, *Cycladenia*, *Funastrium*, *Matelea*, *Nerium*, *Vinca*

Apodanthaceae: *Pilostyles*

Aponogetonaceae: *Aponogeton*

Campanulaceae: *Downingia*, *Lobelia*

Commelinaceae: *Commelina*, *Tradescantia*

Crossosomataceae: *Crossosoma*, *Glossopetalon*

Droseraceae: *Drosera*

Fagaceae: *Chrysopsis*, *Lithocarpus*, *Quercus*

Martyniaceae: *Proboscidea*

Oxalidaceae: *Oxalis*

Paeoneaceae: *Paeonia*

Platanaceae: *Platanus*

Rosaceae: *Fragaria*, *Peraphyllum*

Simaroubaceae: *Ailanthus*, *Castela*

Simmondsiaceae: *Simmondsia*

Staphyleaceae: *Staphylea*

Urticaceae: *Boehmeria*, *Hesperocnide*, *Parietaria*, *Soleirolia*, *Urtica*

Graduate Students Affiliated With The University and Jespon Herbaria



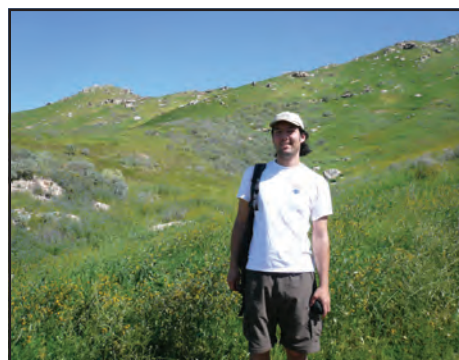
Ben Carter My dissertation research focuses on the ecology and systematics of *Scleropodium*, a small genus of mosses from North America and Europe. I am interested in using molecular phylogenetics to uncover the diversity within the genus that has previously been unrecognized, as well as elucidat-

ing the evolutionary relationships and biogeographic patterns that emerge with revised circumscriptions of taxa within the genus. In addition, I am doing fieldwork in northern California to explore the ways that water availability, both too much and too little, affects the relationships among moss life history strategies, local distributions, and ecophysiological constraints.



Matt Guillems My research includes studies of *Calyptridium* and closely related *Cistanthe*, systematics of *Plagiobothrys* sect. *Allocarya*, evolution in California vernal pools ecosystems, niche modeling, conservation of the endemic manzanita, *Arctostaphylos rainbo-wensis*, from southern California, and general patterns of niche evolution in southern Cali-

fornia manzanita species. I am also deeply interested in plant conservation biology and intend to focus on projects that will result in increased awareness and/or protection of California's rare plants.



Christopher DiVittorio I am interested in species ranges and adaptation in the genus *Encelia*, a group of about 20 perennial sunflowers that appear to have radiated recently throughout the Mojave, Sono-

ran, and Baja California deserts. These sunflowers exhibit a wide range of leaf traits that seem to correlate with the different climatic and edaphic habitats they occupy. Interestingly, although species readily hybridize in the greenhouse, hybrids are conspicuously absent in nature even where different species grow in sympatry. The geologic history of the North American deserts provides some insight into this phenomenon: species ranges match up with the locations of putative late Miocene habitat islands in the Baja California Peninsula. Thus, the rifting of the peninsula from mainland Sonora ~6 mya, and the trend towards increasing aridity over the past 10 mya suggests that *Encelia* diversified in response to the onset of desert climates and regional changes in habitat availability and connectivity.



Christopher Hobbs My research centers on the human uses of plants—ethnobotany and ethno-pharmacology. I am investigating the evolutionary significance of the complex and diverse chemistry of plants, and their pharmacological actions using phylogenetic meth-

ods and phytochemical analyses. How is the production of the secondary compounds related to animal interactions through millions of years of evolution, including human interactions? These chemicals may be analogous to the nervous system of animals in that plants use them to perceive and respond to the environment, as well as for protection and communication. I'm focusing on the medicinal genus *Artemisia* and related lineages, and, using phylogenetic methods, I would like to clarify their ancestry and migrations in and out of North America and Hawaii. I am also analyzing the volatile terpenes from *Artemisia* species and from the Asteraceae in general, to determine whether they might have phylogenetic significance using small polymer microextraction and gas chromatography/mass spectroscopy. It is possible to characterize up to 150 different compounds or more from a typical plant in this group—offering tremendous variation and complexity for study.



Ekaphan (Bier) Kraichak My research interests center around community ecology and biogeography of cryptogams, particularly mosses and lichens. How do communities form? What environmental factors influence formation of cryptogam communities? I am also interested in relationships between mosses and lichens. Why do they co-exist? What types of

relationship do they have (mutualistic or antagonistic)? What are evolutionary explanations for such relationships? With collaboration with several universities in Thailand, I also plan to work on biogeography and community structure of mosses and lichens in various parts of Thailand. I hope to develop some comparative studies that will reveal some underlying differences in ecology of these groups in tropical and temperate systems.



Nathan Kraft While tropical forests have inspired more theories of species coexistence than perhaps any other habitat, a synthetic understanding of the forces that shape patterns of species distribution and abundance within these communities has remained elusive. My research focuses on understanding how different ecological processes, such as competition, habitat association, and dispersal limitation, change in importance across spatial scales from meters to kilometers within an upland rainforest in Amazonian Ecuador. I use a set of methods that considers the distribution of ecophysiological traits and phylogenetic relatedness within a community and a variety of statistical null models to make inferences about ecological processes.



Susan Tremblay My research is focused on the evolution of liverworts, living representatives of the earliest diverging land plant lineage. Morphologically, liverworts are a diverse group; and, while some taxa do appear to be isolated 'relicts,' others have undergone extensive recent adaptive radiations. I am particularly interested in the unique, membrane-bound organelles called oil bodies found in the cells of 90% of liverwort species but in no other plant groups. These conspicuous, often colorful structures are distinctive and have long been used for taxonomic purposes; yet,

little is known about them beyond their appearance. I am currently looking at their diversity within and between clades for evidence of trends that could lead to testable hypotheses regarding oil body function. I am also interested in the special adaptations of the complex thalloid liverworts that thrive in California's Mediterranean climate and for the last three years have been conducting a phenological study of local populations of *Cryptomitrium tenerum*. Photo: gametophyte of *Cryptomitrium tenerum* supporting five sporophytes with mature sporangia.

THE JEPSON HERBARIUM PROJECTS & RESOURCES

The Jepson Flora Project

Second Edition of *The Jepson Manual*
Online Interchange for California Florisites
Jepson Desert Manual

Online Horticultural Database
Electronic Publication of Jepson's
A Flora of California

Ecological Flora of California
Publications & Research Projects

Constancea: University of California
electronic publications in botany

Flora of Mount Diablo

Building the Tree of Life — A National Resource for Phyloinformatics and Computational Phylogenetics

Deep Green Plant Phylogenetics: Novel Analytical Methods for Scaling Data from Genomics to Morphology

Systematics and Evolution of California tarweeds and relatives (tribe Madieae, Compositae)

Unravelling the dynamics of mating-system evolution in tribe Collinsieae

Niche conservatism, functional trait evolution, and the diversification of the California vernal pool flora

Flora of the East Bay

North American Potentilleae

Evolution and origin of Calif. alliums

Educational Services & Resources

Botanical Workshops & Courses

Plant Identification

2,200,000+ Worldwide Plant Specimens

Botanical Library & Archives

Administration

Trustees: Vice Chancellor Emeritus Rod-
eric Park, Chairman; Vice Chancellor Beth
Burnside (on leave); UC Botanical Garden
Director, Paul Licht; Professors John Taylor
and Brent Mishler (ex officio)

Director: Professor Brent Mishler

Curator: Professor Bruce Baldwin

Research Associate: Bridget Wessa

Jepson Flora Project Staff:

Project Research Specialists:

Jeff Greenhouse, Scott Simino

Project Manager: Staci Markos

Manag. of Collections Data: Richard Moe

Scientific Editor: Tom Rosatti

Admin. Assistant: Edith Summers

Managing Editor: Margriet Wetherwax

Administrative Curator: Andrew Doran

Collections Management Staff: Kelly Ag-
new, Heather Driscoll, Rebecca Guenther,
Kim Kersh, and Ana Penny

Research Botanist: Barbara Ertter

Public Programs: Anna Larsen

Development & Globe Editor: Staci Markos

tions come from the recently acquired Charterhouse School Herbarium or GOD (from the town of GODalming, Surrey, U.K.), if being referred to by its standardized Index Herbariorum designation. Many of these specimens were acquired by the Reverend Tullie Cornthwaite (1807-1878), a local vicar and philanthropist, closely associated with Forest School in northeast London. Cornthwaite, in addition to his own volumes, acquired vouchers from famous estates and gardens, many of which have been destroyed or built over. These include (amongst others) specimens from the famous Loddiges nursery in Hackney, many historic London gardens (see below), and from the Whiteknights estate of George Spencer-Churchill (1766-1840), the Marquis of Blanford, which eventually became the main campus of Reading University, well renowned for its botanical and horticultural programs.

Naturally, there are vouchers from Kew Gardens, but also in GOD are specimens from another less known London garden, Isaac Swainson's now demolished botanical garden in Twickenham. A short distance from Kew, this garden was observed by garden designer, botanist, and horticultural journalist, John Claudius Loudon (1783-1843), who wrote that it "contained every tree and shrub that could be procured at the time in the British nurseries..." Such specimens are a record of plants in cultivation during a period when novelties from around the world were highly sought after. These remaining vouchers are the records of some of the first introductions into cultivation, the dates and times being vital clues to retracing the steps of botanists and the development of collections.

Another garden, sadly no longer extant, is represented by a fascinating lot of several thousand vouchers of renowned landscape architect and Berkeley alumna, Beatrix Farrand, the only woman of the original founders of the American Society of Landscape Architects. The vouchers are all from



Label data from the back of this specimen reveals, 'Hort. Chelsea Fairbairn,' a specimen of *Aristolochia sipho* L'Hér., now *Aristolochia macrophylla* Lam., collected in London's 'Chelsea Physic Garden,' under the curation of John Fairbairn, who was employed there from 1784 till his death in 1814. Most of our vouchers from this garden were collected in the 1790's. The plant is annotated as "...reported to cure bite of venomous serpents" in the hand of the Rev. Tullie Cornthwaite, however today plant roots are often seen for sale in homeopathic pharmacies. The high resolution scan enabled us to send a digital image to an *Aristolochia* expert in Brooklyn Botanical Garden who confirmed the identity of this specimen as *A. macrophylla* Lam. As well as verifying existing accession data for the garden, more recent ethnobotanical vouchers are frequently used for classes on the Berkeley campus.

one of her last projects to create a landscape study center at Reef Point, Maine. These specimens precisely document the planting design (see image below), and her use of native plants (and cultivars of native plants) is central to the

current objectives and horticultural data contained in *The Jepson Manual* and subsequent horticultural database, to document and promote the use of native Californian plants including those with

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Above. Typical specimen label from Farrand's Reef Point Garden, using a hybrid of the native *Vaccinium corymbosum* L. Communication with former Herbaria Director, Herbert Mason indicates very precise plans to house her collections within the University Herbarium. This collection was made by Miss Marion Spaulding, a graduate of the Rhode Island School of Design. Note that the labels contain individual maps of the garden beds and locations of plants (e.g., Sec. No. 57), information vital to garden conservationists for recreating bed designs and identification of native plants. It is vouchers themselves that confirm the identity of what was planted; what is desired on a landscape drawing is often not what is available in a nursery.

localized genotypes.

Farrand's projects aside from Reef Point included Dumbarton Oaks, the Santa Barbara Botanic Garden, and The Huntington Botanical Gardens. Her association with a renowned English garden designer is another British connection and the reason why landscape plans, correspondence, and photograph albums of Gertrude Jekyll are housed in the College of Environmental Design archives. When Farrand was unable to raise funding for the secure future of Reef Point, she had the house and garden dismantled but the specimens continue to tell its story and now may prove invaluable for restoration projects. The Garden Conservancy is currently engaged in restoring her final home garden at Garland Farm on Mt Desert Island, Maine, and also, more locally, the prison gardens of Alcatraz Island (see below).

Because invasive plants were



Jepson Flora Project researcher, Jeff Greenhouse standing next to a Giant Chilean Rhubarb, *Gunnera tinctoria* (Molina) Mirb., over eight feet high, now naturalized in Point Reyes National Seashore and Tomales Bay State Park. What started as a fascinating ornamental has now found heavily grazed, moist, sloping, seeps an attractive alternative to its native Chile. Growing on tussocks and out of the prevailing winds it is a truly bizarre sight in the California landscape. Collecting escaped ornamentals also documents the early detection of, and hopefully rapid response to, new invasions.

not always the targeted collections of California botanists they were often overlooked and under collected. The cultivated collection has some of the first records of ornamentals such as *Cortaderia selloana* (Schult. & Schult. f.) Asch. & Graebn. that eventually became invasive, and these collections assist our knowledge of the spread of invasives and lead to a greater understanding of invasive plant ecology and support informed conservation management.

Some of our specimens are the cultivated equivalent of a type specimen known as 'standards' and are the specimen to which the name of a new cultivar is permanently attached. A recent accession of the waterlily, *Nymphaea* 'Stan Skinger' is one such example. Like many cultivars, preservation and documentation of attributes (such as color, scent, flowering times, and parentage) that make them unique from closely

related cultivars pose many curatorial and observational challenges. In addition, there is a separate code of nomenclature for cultivated plants dealing with the inevitable complexities of assigning non-latinized names for cultivars that have been developed for hundreds of years.

Specimens closer to home are vouchers from the UC Botanical Garden that document the collections, complement living accession records, and can be collected at our leisure, thus documenting different morphology at different times of the year. The garden maintains excellent accession records and, unlike a number of ornamental collections, data associated with the living plants is so detailed that despite being cultivated the resulting vouchers are filed with the main wild collections in the University Herbarium.

Alcatraz is potentially the



Botanist Andrew Doran (right) collecting on Alcatraz Island in April 2008. Some of the long neglected prison gardens are being restored by the Garden Conservancy. Unsurprisingly, few collections have been made on the island (just 3 out ~1,000,000 consortium records), but past inventories and historic photographs show that a surprising diverse range of plants grown by inmates (left) and current garden staff, which will complement a cultivated flora project for the Bay Area. Photo of inmate taken by prison guard Joseph H. Simpson, a guard on the island from 1934-1946 (courtesy of Joan Simpson Moore).



Anna in Venice, Italy, summer 2007

Farewell to Friends from Anna Larsen

Once again, planning for the upcoming year of Jepson Herbarium Public Programs is in full swing! We have a suite of exciting botanical forays, special programs, and taxonomic adventures planned for 2009. Sadly, after seven years at the University and Jepson Herbaria as both a graduate student and the Coordinator of Public Programs, the time has come for me to leave the nest! I accepted the position as the program coordinator last summer, during the final months of writing my dissertation. Having been involved with the program since 2003 as both a volunteer and a guest coordinator, I was thrilled at the opportunity to take the helm and have enjoyed the experience.

In reflecting on the past year, I certainly have many personal highlights. First, I learned an important life lesson: manzanitas and rushes can be identified and are not to be feared! I also made my first trip to the Channel Islands to meet many endemics I'd seen only in the UC Botanical Garden. The workshop was memorable not only for the plants and the spectacular views, but also for the adventurous driving, the marine life, and the feeling that I had traveled backward in time to see California the way it was two hundred years ago.

The Jepson Herbarium Public Programs is a vivacious component of our botanical community and it takes contributions large and small from many people to be a success. I'm glad to have been a part of the legacy of the program and I'm grateful to the many people who helped to make this season a reality and enriched my experiences as the program coordinator. Upon my departure from the Herbarium, I will continue to be involved with the botanical community in the Bay Area, and I certainly hope to run into many of you while botanizing around California! ☺

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Horticultural Herbarium, cont. from page 7.

start of a new program to voucher cultivated plants. California has a rich history of growing more plants in cultivation than almost anywhere in North America. Like the native and naturalized plants that have preceded them electronically, there is no doubt that a consortium/database approach to the mammoth task of producing a cultivated flora, coupled with our experience with managing on-line data, would greatly assist this project. A great start to such a project would be to capture the historic cultivated flora for California by digitizing the approximately 110,000+ cultivated plants in herbaria throughout California.

Duplicates of California collections will also be sent to participating herbaria such as the US National Arboretum herbarium and possibly a set in a European herbarium such as the Royal Horticultural Society's herbarium in Wisley, Surrey, where specimens could be used for comparative purposes. The RHS conduct plant

trials that plan and assess groups of plants for garden decoration or other horticultural use. These trials can often resolve taxonomic and nomenclatural problems occurring in cultivated plants. Curator of the Herbarium at Wisley, Dr. Christopher Whitehouse, communicated that cultivated plants of known wild provenance of genera such as *Ceanothus* and other Californian plants grown in the U.K. as ornamentals would greatly assist RHS research projects. In addition, specimens would greatly assist members identification queries to RHS botanists when returning home from trips to California.

To find out more about our cultivated plants at the herbaria, to arrange a tour of the collections, or to become involved with documenting the collections please contact Andrew Doran at andrewdoran@berkeley.edu. ☺



The East Bay Science Café is a forum for discussing scientific issues in a casual evening of conversation. Sponsored

by the Berkeley Natural History Museums (bnhm.berkeley.edu).

FREE at La Peña Cultural Center
3105 Shattuck Ave., Berkeley,
94705 (www.lapena.org).

7 PM to 9 PM

Nov. 5, Jerry Powell. *Long-term effects of a wildfire on butterfly and moth diversity in coastal California*

Dec. 3, Brent Mishler. *DNA barcoding: benefits and potential pitfalls*



2008 YEAR IN REVIEW

This has been a great year for the Public Programs. We botanized new locations like the Sierra Valley and the Shasta-Trinity NRA, and returned to some old favorites like Anza-Borrego and the Mojave Desert. Most of our workshops filled to capacity and we welcomed many new workshop participants this year! We expanded the program to offer a training course for the California Department of Transportation and will continue to expand in this direction by offering training opportunities for the Forest Service in 2009. Each year, we strive to recruit the best possible instructors and in 2008 thirteen new instructors joined our host of popular veterans.

A special thanks to Edith Summers for the administrative assistance that has been an incredible asset to the Public Programs this year!

Photos (clockwise from upper left): 1) Bill Harnach and company enjoy the sweeping views from the floor of Sierra Valley. 2) Dinner is served against a backdrop of Mojave Desert mountains. 3) Kathy Kellison curates her insect collections at the Bee Pollination workshop. 4) Under the tutelage of John Sawyer, workshop participants get up close and personal with *Neviusia cliftonii* on the Shasta-Trinity workshop. 5) Steve Junak deftly navigates the backroads of Santa Cruz Island in a military surplus vehicle.

Photos courtesy of Heather Driscoll, Anna Larsen, Tom Rosatti, and Scott Simono



VOLUNTEERS NEEDED TO HELP WITH UC/JEPS BACKLOG


One Saturday of each month (from 10 AM to 4 PM) is a Group Volunteer Day in the Herbaria at the University of California at Berkeley.

Our focus will be chipping away at the unmounted backlog of pressed plant collections, from California and around the world, some brand new, some decades old. Volunteers are greatly needed to mount, sort, and file these collections and to assist with related projects. No previous herbarium experience is necessary.


To be added to the Group Volunteer reminder list, please call Ana Penny (510) 642-2465. Opportunities are also available during the week (9-5, M-F).

Group Volunteer Saturdays for 2008-2009: Nov 15, Dec 13, Jan 10, Feb 14, Mar 14, Apr 18, and May 9

CALIFORNIA BOTANICAL SOCIETY FREE LECTURES

 **Nov 20** *Bart O'Brien* California Native Plants in Restoration and Landscape Projects Along the Los Angeles and San Gabriel Rivers

 **March 19** *Tom Daniel* A Botanical Tour of the "Chocolate Islands." São Tomé and Príncipe

 **April 16** *Bruce Baldwin* Diversification and Diversity of *Collinsia* (Plantaginaceae)

Lectures start at 7:00 p.m. Refreshments will be served before (starting at 6:45 p.m.) and after.

2063 Valley Life Sciences Building, UC Berkeley
www.calbotsoc.org


Bryophyte data going online!

Label data from 95,000 specimens is now available.

http://ucjeps.berkeley.edu/bryolab/UC_bryophytes.html

The database currently presents data from nearly 70,000 of Dan Norris's 110,000 bryophyte specimens, 25,000 of Jim Shevock's specimens, and specimens databased by Paul Wilson at California State University at Northridge. These specimens, mostly georeferenced, are primarily from California, but also worldwide. We are actively curating the UC bryophyte collection (currently about 200,000 specimens total) and we intend to add to this database regularly. We anticipate adding data from other current collectors, including Brent Mishler and the Bryolab graduate students. Eventually we will include the entire UC bryological collection.

Bryophytes in UC



These pages currently present data from nearly 70,000 of Dan Norris's 110,000 bryophyte specimens, and 25,000 of Jim Shevock's specimens (Shevock's first set is at CAS but most are duplicated at UC), as well as specimens databased by Paul Wilson at California State University at Northridge. These specimens, mostly georeferenced, are primarily from California, but also worldwide. We are actively curating the UC bryophyte collection (currently about 200,000 specimens total) and we intend to add to this database regularly. We anticipate adding data from other current collectors, including Brent Mishler and the Bryolab graduate students. Eventually we will include the entire UC bryological collection.

For other information about UC bryophytes see:

- [A list of genera in the UC bryophyte herbarium](#)
- [A list of specimen folders in the UC bryophyte herbarium \(large file\)](#)
- [A list of type specimens in the UC bryophyte herbarium](#)

Scientific Name

Source (1 or more; default is all sources)

All sources
Norris collections, University Herbarium, UC Berkeley
Shevock collections, CAS and UC
Cal State Northridge Collections

County (CA counties first; choose 1 or more; default is all counties)

All
UNKNOWN
ALAMEDA
ALPINE
AMADOR

Collector (2+ collectors also; last name only; e.g.: Bratt, Toren)

Geographic Locality (e.g.: Eucalyptus; Tilden Park)

Collection Number (numerical part only)

Lower elevation (meters)

Collection Date(s)

Month

Day

Year

Upper elevation (meters)

☐ **Name List:** One record per name.

2000 records is default maximum: Contact us for larger searches.

Please cite data retrieved from this page: Data provided by the University Herbarium, University of California, Berkeley

Accession Number

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Introduction to Plant Morphology and Identification,
Anna Larsen

Fifty Plant Families in the Field, Linda & Dick Beidleman

April 2009

Flora of the Saline Valley, Dana York

May 2009

Poaceae, Travis Columbus

Wetland Restoration, John Callaway

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Flora of Humboldt Co., Michael Mesler & John Sawyer

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