

The Jepson Herbarium Workshops

The 2011 Series on Botanical and Ecological Subjects

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The Jepson Herbarium is a member of the Berkeley Natural History Museums Consortium (<http://bnhm.berkeley.edu/>) located on the University of California, Berkeley campus.

For more information about the University and Jepson Herbaria, please visit <http://ucjeps.berkeley.edu>



Cover image: Type specimen of *Eschscholzia lemmonii*, initially identified as *Eschscholzia hypocoides*. Images of our type specimens are now available online at <http://ucjeps.berkeley.edu/main/types.html>

Photographs by: Heather Driscoll, John Game, Ellen Holmes,
Bruce Kirchoff, and Anna Larsen

Illustrations from *The Jepson Manual* and Nancy Hillyard

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About Our Workshops

The mission of the Jepson Herbarium is to understand and conserve the California flora through systematic, floristic, and conservation biology studies and to communicate knowledge of the flora through publications and instructional programs.

Public programs, supported by the *Friends of the Jepson Herbarium*, provide members of the systematic, ecological, floristic, and conservation communities with access to specialists and current knowledge in a variety of subjects.

Participants in our classes gain a unique perspective on the flora of California as they learn from experts and interact with fellow botanists, while helping to support the mission of the herbarium.

Basic Botany Workshops (1-2 days) are introductory level workshops, designed for participants with little or no botanical background. These workshops provide the foundation for the Weekend Workshops.

Weekend Workshops (1-5 days) are designed for botanists, ecologists, conservationists, consultants, educators, amateurs, and agency employees. Unless specifically stated otherwise, the workshop content is technical and the level of instruction will assume that participants have a general understanding of botanical terminology.

In general, three- and four-day courses begin on Friday or Thursday evening, respectively, and conclude early Sunday afternoon. With some exceptions, courses held on campus start at 8:30 a.m. and end at 5:00 p.m. with a one-hour lunch break.

Course fees include workshop coordination, instruction, facilities, and materials for all courses. Additional items (including but not limited to food, lodging, and transportation) are included for courses held in the field, as listed in the course description. The fees are meant to cover all workshop expenses while keeping the prices reasonable for participants.



Silene veracunda subsp. *veracunda*

Basic Botany Series

These introductory workshops are designed for participants with little or no botanical background and provide the foundation for the Weekend Workshops.

Fifty Plant Families in the Field

March 26–27 and April 2–3, 2011 (two consecutive weekends)

Linda and Richard Beidleman

Location: UC Berkeley and field sites in the greater Bay Area

This course will be an introduction to the flora of the San Francisco Bay region and the techniques used to identify plants of California. It is designed for those unfamiliar with plant identification keys who are ready to jump into botanical detective work. Emphasis will be on the recognition and keying of plant families encountered in the field. With a working knowledge of common plant families, and comfort in using plant keys, identification is an enjoyable challenge. This is also a great way to appreciate plants and take the time to look at them closely. Although this course will involve no collecting of plants, we will discuss the nature, use, and importance of herbarium collections. There will also be an introduction to reference books valuable for the identification of plants in California. An historical perspective on botanical collecting in California will also be presented.

Class will be outdoors except the first morning, which will be held on the UC Berkeley campus. Participants in the class may drive up to 75 miles per day to the field sites and hike up to three miles each day. Students must take day one before days two to four, because the introductory information will lay the foundation for the rest of the course. Enrollment is limited to 14 participants.

Course fee: \$200/\$225



Calochortus pulchellus

51 Families in the Field

April 2–3 and 9–10, 2011 (two consecutive weekends)

Dean Kelch

Location: UC Berkeley and field sites in the greater Bay Area

California is a cornucopia of plants; many of the plants belong to a few groups that have diversified throughout the world. By learning to identify these larger groupings of plants, we will be prepared to recognize plants wherever we go. This course will be an introduction to the flora of the San Francisco Bay region, with an emphasis on identifying plants to the family level. A key component of this workshop will be the use of dichotomous keys to identify unknown plants, largely through the use of the family key in *The Jepson Manual*. We will learn some of the obvious attributes that define the common plant families and larger lineages by looking closely at plants to appreciate their uniqueness and the characters that will lead us toward a correct classification. Although this course will involve no collecting of plants, we will discuss the nature, use, and importance of herbarium collections. There will also be an introduction to reference books and web resources valuable for the identification of plants in California. This course will emphasize some of the recent changes in plant classification and explain why such changes are taking place.

Class will be outdoors except the first morning, which will be held on the UC Berkeley campus. Participants in the class may drive up to 75 miles per day and hike up to three miles each day. Students must take day one before days two to four, because the introductory information will lay the foundation for the rest of the course. Enrollment is limited to 16 participants.

Course Fee: \$200/\$225

A Crash Course in Flowering Plant Families

Two separate workshops: April 7–8 OR April 9–10, 2011

Linda Ann Vorobik

Location: UC Berkeley

You are in the field and want to know what family a plant is in: what information do you need? In this intensive plant identification class we will create a framework for learning plants by comparing traits of more than 50 flowering plant families, and learning how to key using *The Jepson Manual*. Photo-lectures alternate with intensive lab sessions where students learn Vorobik's "divide and conquer" system of understanding groupings of related plant families. Throughout the sessions, botanical terms will be defined and illustrated, and family traits will be outlined, with discussion of revised classification used in *The Jepson Manual*.

Course fee \$150/\$175

Fifty Plant Families in the Field—In Monterey

April 28–May 1, 2011

Linda and Richard Beidleman

Location: Asilomar Conference grounds, Pacific Grove and field sites in the Monterey/Carmel Region

This course will be an introduction to the flora of the Monterey Bay region and the techniques used to identify plants of California. It is designed for those unfamiliar with plant identification keys who are ready to jump into botanical detective work. Emphasis will be on the recognition and keying of plant families encountered in the field. With a working knowledge of common plant families, and comfort in using plant keys, identification is an enjoyable challenge. This is also a great way to appreciate plants and take the time to look at them closely. Although this course will involve no collecting of plants, we will discuss the nature, use, and importance of herbarium collections. There will also be an introduction to reference books valuable for the identification of plants in California. An historical perspective on botanical collecting in California will also be presented.

Class will be outdoors except the first evening, which will be held at the Asilomar Conference Grounds. Participants in the class may drive up to 30 miles per day to the field sites and hike up to three miles each day. Enrollment is limited to 16 participants. *Course fee: \$595/\$620 includes lodging and meals at Asilomar from Thursday dinner through Sunday lunch. Facilities include double-occupancy rooms with private bathrooms and showers.*

Introduction to Plant Morphology

July 30–31, 2011

Anna Larsen and Bianca Knoll Nakayama

Location: UC Berkeley

Would you like to learn more about plant morphology and expand your botanical vocabulary? If so, join us for this workshop where we will explore the morphology of flowers, fruits, and non-reproductive plant structures. Workshop participants will become familiar with the floral characters and terminology frequently used in *The Jepson Manual* and other plant identification guides. This workshop is designed to start at an introductory level and is appropriate for the beginning botanist, nature lover, or avid gardener.

The workshop includes four three-hour sessions over two days. Each session will consist of a short lecture followed by examination of fresh plant material using hand lenses and dissecting microscopes.

Course fee: \$150/\$175

Weekend Workshop Series

These workshops are designed for botanists, ecologists, conservationists, consultants, educators, amateurs, and agency employees. Unless specifically stated otherwise, the workshop content is technical and the level of instruction will assume that participants have a general understanding of botanical terminology.

Phylogeny, Taxonomy, and Name Changes in the California Flora

February 12, 2011

Dan Potter

Location: UC Berkeley

The names of plants have been in flux for centuries, but in recent years, name changes have occurred at an accelerated pace, due largely to advances in our understanding of evolutionary relationships based on analyses of molecular data using modern phylogenetic methods. The results are sometimes striking. For example, in *The Jepson Manual*, some botanists may be surprised to find *Mimulus* listed under Phrymaceae and *Collinsia* and *Penstemon* under Plantaginaceae, rather than the familiar classification of all three genera in Scrophulariaceae. A major goal of this workshop will be to demonstrate that, while such changes may seem inconvenient in the short term, they serve everyone's best interests in the long term. We'll start by reviewing basic concepts and methods of phylogenetic systematics and principles of taxonomy. We'll then explore how new insights into phylogenetic relationships lead to changes in taxonomy.

The second half of the workshop will involve presentation and discussion of specific examples of such changes from the California flora, primarily at the family and genus levels, that are being incorporated in the revised edition of *The Jepson Manual*.

Course fee: \$60/\$80



Dasiphora fruticosa

Plants That Hunt: Carnivorous Plants and the Deeds They Do!

February 26, 2011

Barry Rice

Location: UC Berkeley

How many carnivorous plants can you name? Do you get stumped after Venus flytrap, pitcher plant, and Audrey from *Little Shop of Horrors*? Be prepared to be surprised: there are about 700 described carnivorous plant species. They occur on every continent in the world (except Antarctica) and every state in the U.S. With this huge global distribution, and by thriving in a wide range of habitats, carnivorous plants have evolved an astonishing array of forms and hunting techniques.

Our workshop will review the various genera of carnivorous plants, the methods they use to “forage,” and where they live. It will focus on species in the U.S., and in particular the species in California. We will also discuss some of the new aspects of carnivorous plant research, which are many.

In addition to classroom discussions, we will have carnivorous plants on hand for enlightening dissections, including forensic explorations of their digestive chambers. We will also take advantage of the collections at the UC Berkeley Botanical Garden, and meet more carnivores face to face (or, more correctly, face to leaf).

Course fee: \$115/\$140

Darlingtonia californica



Lichens and Soil Crusts of the Eastern Mojave

March 3–6, 2011

Larry St. Clair

Location: Desert Studies Center, Mojave National Preserve

This short course in biological soil crusts will emphasize the biodiversity as well as the basic structural and functional attributes of arid land soil crust communities. We will also examine components of the desert lichen community that are not part of the soil crust community. Classroom instruction will include information about the biological components of soil crusts, their ecological roles, the nature and dynamics of their interactions with vascular plant communities, the ecological consequences of damaging soil crust communities, and their potential for reclamation. In the laboratory, we will discuss and practice identifying some of the more prominent members of the soil crust community as well as a variety of lichens from other local substrates. Participants will receive handouts and references. During the workshop, we will take field trips to investigate local soil crust communities and saxicolous lichen communities in several locations in the eastern Mojave Desert. Participants in the class may drive up to 30 miles to the field trip sites and may hike several miles. Limited transportation may be available during the workshop. Please contact the herbarium for more information.

Course fee: \$460/\$485 includes lodging and meals from Thursday dinner through Sunday lunch. Lodging will be in double occupancy or dormitory-style rooms. Shared bathrooms have flush toilets and showers.



A Crash Course in Definitions and Methods for Identifying and Delineating California Wetlands

March 11–13, 2011

Terry Huffman

Location: UC Berkeley and field sites in the Bay Area

Wetlands are typically recognized as soggy portions of the landscape that are covered—often intermittently—with shallow water or that have soils saturated with water and plants that are different from the surrounding areas. Scientific studies have shown that wetlands are essential to maintaining the biological, chemical, and physical integrity of the aquatic ecosystem. State and federal programs regulate impacts to wetlands as part of their overall water quality protection strategy. But, these agencies differ in how wetlands are defined and geographically delineated.

This course will emphasize the wetland definitions and delineation methods used by state and federal agencies in California, including the California Coastal Commission (CCC), State Water Quality Control Board and its Regional Water Quality Control Boards (RWQCB), California Department of Fish & Game (CDFG), U.S. Department of Agriculture, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers (Corps), and U.S. Environmental Protection Agency. The course will also provide a comparative overview of the definitions and methods used by these agencies together with the latest changes in methodology and approaches for determining jurisdictional boundaries. The course will offer useful information and practical hands-on experience for private consultants, agency personnel, attorneys, academics, and the general public who are involved with resource protection, impact assessment, environmental restoration, and/or seeking project authorization from the CCC, RWQCB, CDFG, or Corps.

We will meet on the UC Berkeley campus Friday morning and early afternoon for classroom lectures, then spend the rest of Friday afternoon on campus and nearby exploring how and why using the various definitions and associated methodologies produce different results in terms of wetland area delineated. We will spend Saturday and much of Sunday in the field gaining further experience with definitions and associated terminology through hands-on experience using the various wetland delineation methodologies, with analysis of results and field delineation of wetland-upland boundaries. Participants in the class may drive up to 75 miles per day to the field sites and hike up to three miles each day over wet, uneven terrain.

Course fee: \$360/385

From Sea to Summit: Plants and Communities of San Diego County

March 31–April 3, 2011

Michael G. Simpson

Location: Various sites in San Diego County

San Diego County has the greatest known floristic diversity of any county in the continental U.S. A major reason for this is the corresponding high diversity of habitats. Within the South Coast subregion of the California Floristic Province, coastal strand, estuary, inland sage scrub, chaparral, riparian woodland, oak woodland, vernal pool, and grassland habitats are among the major community assemblages. The Peninsular Ranges, including the Palomar, Cuyamaca, and Laguna mountains, contain a number of these communities as well as extensive woodlands and coniferous forests, montane chaparral, and scattered sagebrush scrub. The Colorado Desert, a sub-component of the Sonoran, includes desert succulent scrub, desert wash, alkaline sink, blackbush, and pinyon-juniper communities.

This workshop explores these major habitats and their component plants occurring in our rich county. A slide show orientation Thursday evening will review these habitats, communities, and vegetation regions and introduce many of the common (and a few rare) plant species that comprise them. Friday will be spent traveling to chaparral, inland sage scrub, grassland, and Torrey pine communities of Mission Trails Regional Park and Torrey Pines State Park, to local estuary and coastal strand/dune communities, and (if the rain pattern permits) to vernal pool communities. On Saturday, we will head to the Anza Borrego Desert State Park, making several stops to observe interesting plants of several community types, followed by optional camping in the desert. Sunday morning will take us to higher elevation pinyon-juniper woodland, followed by montane chaparral and woodlands of the Laguna and Cuyamaca Mountains, returning to San Diego by mid-afternoon. Participants should be prepared for up to 100 miles of driving and several miles of easy to moderate hiking over uneven terrain in potentially hot areas each day. Limited transportation may be available during the workshop. Please contact the herbarium for more information.

Course fee: \$300/\$325 includes Thursday night dinner and some communal camp resources. **Participants must pay for their own lodging and meals.** Saturday night camping is in a primitive campground with stored water.



Ferocactus viridescens

Flora of the Santa Cruz Sandhills

May 6–8, 2011

Jodi McGraw and Randy Morgan

Location: Ponderosa Lodge, Mount Hermon and field sites in Santa Cruz County

The Santa Cruz Sandhills represent one of California's most remarkable examples of edaphic (soil-related) endemism. Amidst the coast redwood forests that dominate the Santa Cruz Mountains, islands of droughty, nutrient-poor sand soils formed from uplifted Miocene (15 mya) marine sand deposits of the Santa Margarita formation give rise to unique plant communities found nowhere else in the world. They include maritime chaparral dominated by the local endemic Bonny Doon manzanita (*Arctostaphylos silvicola*), and Sand Parkland, which features sparse stands of ponderosa pine (*Pinus ponderosa*) with a diverse and beautiful herbaceous understory featuring many rare and locally unique plants including three endemic forbs: Ben Lomond buckwheat (*Eriogonum nudum* var. *decurrens*), Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*), and Santa Cruz wallflower (*Erysimum teretifolium*). Floristic jewels, the Sandhills are threatened by sand mining, residential development, incompatible recreation, and the invasion and spread of non-native species.

In this course, participants will learn about the diversity and fascinating ecology of the Sandhills flora. Following an overview lecture Friday evening, participants will hike all day Saturday and half day on Sunday through some of the most outstanding remaining Sandhills communities to experience their uniqueness and diversity first hand. Participants in the class may drive up to 15 miles per day to the field sites and will hike one to three miles per day in sandy soil during potentially warm or rainy weather. Limited transportation may be available during the workshop. Please contact the herbarium for more information.

For more information about the Sandhills, go to www.santacruzsandhills.com. Course fee: \$360/\$385 includes lodging and meals from Friday dinner through Sunday lunch. Lodging is in carpeted, heated cabins with bunk beds, indoor bathrooms, and showers.



Arctostaphylos silvicola

Poaceae

May 14–15, 2011

Travis Columbus

Location: UC Berkeley

Prominent in plant communities throughout California, the grass family (Poaceae) is the state's second most diverse plant family (after Asteraceae). A species-rich assemblage, its members include cool-season and warm-season species, annuals and perennials, natives and exotics, and widespread dominants and rare endemics. A better understanding of this ubiquitous and diverse family can be gained through this workshop. Participants will be instructed in detail on the vegetative and reproductive features of grasses. Aspects of anatomy, physiology, ecology, and ethnobotany will also be addressed. Most time will be spent learning to use the identification keys in *The Jepson Manual*. Special attention will be given to difficult couplets and taxa. In addition, participants will learn how to determine major tribes and common genera by use of diagnostic characteristics.

Course fee \$235/\$260



Tuctoria greenii

Workshop descriptions continue on page 19

Registration Procedures and Policies

To register for a course:

1. Read our registration and cancellation policies. By registering for a workshop, you agree to the terms of these policies. No exceptions to the cancellation policy will be made, even in the case of a personal or professional emergency.
2. Complete the registration form on pages 16 & 17 with your contact details, course selection, and payment information.
3. Mail your registration form and payment to the Jepson Herbarium. Please note that for security reasons, we cannot accept payment information via fax or e-mail.
4. Registrations are processed on a first-come, first-served basis. We will mail you a confirmation letter within 10 days of receiving your registration request. If a course is full we will contact you by email or phone. Detailed course information and an invoice for balance due (if applicable) will be mailed to registered participants approximately 60 days before the course date.

Registration Policy

We require a non-refundable \$75 deposit for each workshop with a registration fee of \$100 or more. Workshops with registration fees less than \$100 require full payment for enrollment.

If full payment is not received at the time of registration, we will send you an invoice for the balance due 60 days prior to the course date. If full payment is not received 30 days before the workshop, your space will be forfeited.

Payment Method

We accept Visa, Mastercard, and checks made payable to UC Regents.

Cancellation Policy

The *Friends* staff will only cancel a workshop at the request of the instructor or due to under enrollment. If we cancel a workshop, all enrolled participants will receive a full refund.

If you have to cancel, please notify the Jepson Herbarium as soon as possible. The date of cancellation is the date that written notice (email or mail) is received by the *Friends* staff.

If your cancellation is received more than 30 days before the start of the course, you will receive a refund, less the \$75 deposit.

Within 30 days of the start of the course, no refunds will be issued.

Questions?

For more information, please contact the Jepson Herbarium at (510) 643-7008 or e-mail jepsonworkshops@berkeley.edu.

Membership and Gifts

Thank you for supporting the Herbarium and its programs! Please complete and return this form, or give online at <http://givetocal.berkeley.edu/browse/?u=71>

Name: _____

Address: _____

City: _____ State & Zip: _____

Preferred Phone: _____

Cell Work Home (please check one)

e-mail address: _____

I would like to contribute to the Annual Fund and:

Join the Friends/ renew my membership with a gift of:

\$35 Individual \$50 Family

\$100 Support taxonomic research at the species level

\$250 Help accession specimens from the Herbarium backlog

\$ _____ other amount

I would like to become a Jepson Benefactor:

\$1,000

My or my spouse's employer will match this gift. (Please enclose company form.)

This gift is in honor of / in memory of _____

Please make your check payable to UC Regents, or pay by Visa or Mastercard:

Account Number: _____

Expiration Date: _____

Signature: _____

Billing address (if different from address above): _____

Please detach and return this form with payment to:

Jepson Herbarium
1001 VLSB #2465
Berkeley, CA 94720-2465

Registration Form

Please detach and return this registration form with payment to:
Jepson Herbarium Workshops
1001 VLSB #2465
Berkeley, CA 94720-2465

You can also download and print the registration form at
http://ucjeps.berkeley.edu/workshops/2011/regform_2011.html

Participant Information

Name: _____

Address: _____

City: _____ State & Zip: _____

Preferred Phone: _____

Cell Work Home (please check one)

Alternate phone: _____

Cell Work Home (please check one)

e-mail address: _____

Emergency contact information

Name: _____

Relationship: _____

Phone number: _____

Please list any dietary restrictions or special needs we should be aware of:

I have read and understand the cancellation policy on page 14.

Registration Form

Course prices are listed as Jepson *Friend*/General Public

Are you a *Friend* of the Jepson Herbarium? Yes No
To become a *Friend*, please complete and return the form on page 15.

Please check the boxes to indicate your registration requests:

Basic Botany Series

- | | |
|---|--|
| <input type="checkbox"/> Fifty Families \$200/\$225 | <input type="checkbox"/> Plant Families April 7–8 \$150/\$175 |
| <input type="checkbox"/> Fifty-one Families \$200/\$225 | <input type="checkbox"/> Plant Families April 9–10 \$150/\$175 |
| <input type="checkbox"/> Fifty Families in Monterey \$595/\$620 | <input type="checkbox"/> Intro. to Morphology \$150/\$175 |

Weekend Workshop Series

- | | |
|---|--|
| <input type="checkbox"/> Name Changes \$60/\$80 | <input type="checkbox"/> Asteraceae \$325/\$350 |
| <input type="checkbox"/> Carnivorous Plants \$115/\$140 | <input type="checkbox"/> Panamint Mountains \$475/\$500 |
| <input type="checkbox"/> Lichens and Soil Crusts \$460/\$485 | <input type="checkbox"/> Klamath Mountains \$490/\$515
(\$430/\$455 without pack support) |
| <input type="checkbox"/> Wetland Delineation \$360/\$385 | <input type="checkbox"/> <i>Potentilla</i> \$360/\$385 |
| <input type="checkbox"/> San Diego County \$300/\$325 | <input type="checkbox"/> Warner Mountains \$475/\$500 |
| <input type="checkbox"/> Santa Cruz Sandhills \$360/\$385 | <input type="checkbox"/> Plant Galls \$115/\$140 |
| <input type="checkbox"/> Poaceae \$235/\$260 | <input type="checkbox"/> Aquatic Plants \$235/\$260 |
| <input type="checkbox"/> <i>Mimulus</i> \$360/\$385 | |
| <input type="checkbox"/> Photography for Plant ID \$200/\$225 | |

Please make your check payable to UC Regents, or pay by Visa or Mastercard:

Account Number: _____

Expiration Date: _____ Amount Enclosed: _____

Signature: _____

Billing address (if different from address on page 16): _____

Payment notes: _____

2010 Year In Review

Some highlights of the 2010 workshop season included (clockwise from top) Kings Canyon vistas, Steens Mountain adventures with Don Mansfield, trekking the Pihea Trail in search of ferns, keying in the field with Dana York, elephant seals on San Nicolas Island, and *Gilia yorkii*.



Mimulus

May 20–22, 2011

Steve Schoenig

Location: Sierra Nevada Research Institute Yosemite Field Station in Wawona

Mimulus is not only an ecologically and evolutionarily interesting genus, it is also showy and beautiful. California is the center of *Mimulus* diversity: 80 of the world's 120 species occur in the state. *Mimulus* diversity is especially rich in the Central and Southern Sierra Nevada, where more than 45 species and forms of monkey flower occur. Members of the genus exhibit specific adaptations, patterns of endemism, and geographic distributions that reflect some of the great themes of California botany such as: response to fire, soil endemism, extreme rarity, occurrence in vernal pools, specialized pollination syndromes, hybridization among taxa, and large morphological variability within species.

This class will focus on the central Sierra Nevada taxa but will also cover *Mimulus* throughout the state. We will discuss *Mimulus* evolution, ecology, and conservation while visiting some beautiful monkey flower hotspots in the Yosemite region. We will use *The Jepson Manual* key and review the relevant morphology needed to use the key.

A draft of the text and pictures from an upcoming book on California *Mimulus* will be distributed to class participants. Participants in the class may drive up to 60 miles to the field trip sites and may hike several miles. Limited transportation may be available during the workshop. Please contact the herbarium for more information.

Course fee: \$360/\$385 includes park entrance fee, lodging and meals from Friday dinner through Sunday lunch. Lodging is in cabins with dormitory-style beds, indoor bathrooms, and showers.



Mimulus brevipes

From All Angles: Standardized Photography for Plant Identification

May 21–22, 2011

Bruce Kirchoff

Location: UC Berkeley

The recent shift to image presentation by electronic means has created a demand for high-quality plant photographs. If collected in an appropriate manner, sets of standardized photographs can supplement herbarium collections by fulfilling some of the same roles. Unlike single images, sets of standardized images can adequately represent the gross morphology of a plant. The set of images allows the species to be identified, serves as a record the plant's occurrence, and facilitates the creation of new types of keys and learning tools.

Workshop participants will learn how to take standardized photographs, and will receive an introduction to some of the amazing things that can be done with standardized images. We will look at three applications of image sets: their use in visual keys, the creation of e-learning programs, and the visual description of characters. The workshop will involve a photography assignment on the Berkeley campus. Participants should have a (free) Google account and know how to upload and share photos through Picasa Web Albums. If time allows, we will cover geotagging, both with and without a GPS photo-tracker.

Course fee: \$200/\$225



Castanea crenata

Asteraceae

May 27–29, 2011

David Keil

Location: UC Berkeley

The Asteraceae (or Compositae) is the largest family of dicots and the largest family in California, comprising almost 13 percent of the state's flora. Members of the family occur from polar regions to the tropics, from sea level to the tops of high mountains, and in an extraordinary diversity of habitats ranging from extremely arid deserts to aquatic environments.

The Asteraceae have a reputation as a “difficult” family. In part, this comes from the size of the family and the superficial resemblance many Asteraceae have for each other. In addition, the beginner must learn a set of unfamiliar terms that describe some unfamiliar features of the flowers, fruits, and inflorescences. The reputation is not deserved. Once you get past the terminology hurdle, you should be able to key members of the Asteraceae with no greater difficulty than any other family.

This weekend workshop will include overviews of characters used in circumscription, classification, and identification of Asteraceae and the terms used in reference to those characters. Fresh plants will be used to illustrate the family's unity and diversity. An overview of Asteraceae classification and some recent advances in Asteraceae systematics will be included. Participants will learn about changes in Asteraceae taxonomy in *The Jepson Manual* and will try out the new key to genera on a variety of native and weedy species. Instruction will include one or more local field trips to develop skills in field identification of genera and species. Participants in the class may drive up to 40 miles to the field trip sites and may hike several miles. Limited transportation may be available during the workshop. Please contact the herbarium for more information.

Course fee: \$325/\$350



Glyptopleura marginata

Rare Flora of the Panamint Mountains

July 7-10, 2011

Dana York

Location: Mahogany Flat Campground, Death Valley National Park

The Panamint Mountains represent a significant north-south trending geologic feature dividing Death Valley from Panamint Valley. At 11,049 feet elevation, Telescope Peak represents the highest point in the Panamint Mountains and Death Valley National Park. Less than 20 miles away from Telescope Peak is Badwater: at 282 feet below sea level, it is the lowest terrestrial point in the Western Hemisphere. With this kind of difference in elevation, the plant communities in the Panamint Mountains are uniquely diverse and range from creosote bush scrub on the lowest slopes to bristlecone pines on the highest peaks.

The trail to the top of Telescope Peak is one of only two constructed backcountry trails in all of Death Valley National Park. This lofty stretch of the Panamint Mountains catches and holds a lot of snow during winter, but the peak can sometimes be climbed without difficulty as early as mid-March with only a mile or so of deep ridgeline snow.

This workshop will introduce participants to the geology and rare flora of the region while exploring the Panamint Mountains. One day will be spent learning about the region's unique flora and landscapes from the Telescope Peak Trail. Emphasis will be given to the Panamint's several endemic and rare taxa. Participants will have an opportunity to explore the following plant communities: desert mountain springs, black brush (*Coleogyne ramosissima*), sagebrush (*Artemisia* spp.), pinyon/juniper (*Pinus monophylla*/*Juniperus osteosperma*), limber pine (*Pinus flexilis*), and bristlecone pine (*Pinus longaeva*). Avid birdwatchers will enjoy the myriad bird species known from the Panamints. Lastly, if we are lucky, the group will have an opportunity to see desert bighorn sheep.

Participants should be in good physical condition for this workshop: hikes will be strenuous, through exposed, uneven terrain at elevations above 8,000 feet, in potentially extreme weather conditions, with distances up to 14 miles and 3,000-foot elevation gain. Participants will need to carry at least one gallon of water on hikes. Limited transportation may be available during the workshop. Please contact the herbarium for more information.

Course fee: \$475/\$500 includes campground fees, transportation, and meals from Thursday dinner through Sunday lunch. Lodging is in a primitive campground with pit toilets and stored water.

Flora and Ecology of the Klamath Mountains Enriched Conifer Forests

July 14–17, 2011

Max Creasy and Marla Knight

Location: Russian Wilderness, Klamath National Forest, Siskiyou County

Since Drs. Sawyer and Thornburgh surveyed the eastern escarpment of the Salmon-Scott Mountains in the 1960s and '70s, this rugged and diverse landscape has received much attention from botanists and ecologists. The uniqueness of the area, which contains 17 conifer species in one square mile, has led to special land designations (Botanical Special Interest Area and Research Natural Area) by the managing agency, Klamath National Forest. This workshop will explore both upland and wetland habitats in search of (some of) the 414 plant species known to occur in this special place.

On Thursday evening, there will be an overview of the area and flora. We'll camp near the town of Etna, and on Friday morning pack animals will carry our gear as we take a moderate four-mile hike at a leisurely pace up to our campsite, stopping along the way to rest and explore the montane mixed conifer and Engelmann spruce forests.

The rest of Friday and Saturday will be devoted to ridge and lake basin explorations. In addition to conifers—including *Juniperus communis* subsp. *saxatilis* and the rare-in-California subalpine fir (*Abies lasiocarpa*)—we can expect to see herbaceous species such as California bog asphodel (*Narthecium californicum*), white marsh marigold (*Caltha leptosepala*), Salmon Mountain wakerobin (*Trillium ovatum* subsp. *oettingeri*), sundew (*Drosera rotundifolia*), and mycotrophic plants such as sugar stick (*Allotropia virgata*) and phantom orchid (*Cephalanthera austiniiae*). The uplands surrounding the lake basin provide opportunities to botanize in montane chaparral and meadows as we discuss the autecological characteristics of the conifer species and factors leading to their distributions across the landscape. We will spend Sunday morning botanizing before hiking out on Sunday afternoon.

Throughout the workshop, we will take selective collections to augment the Klamath National Forest herbarium. Camp support, including pack animals and cooking, will be provided by Trail Blazers, a local company of experienced backcountry packers and cooks. Participants should be prepared for several miles of easy to moderate hiking over uneven terrain in potentially hot areas each day, with an optional strenuous hike to High Lake in search of foxtail pine (*Pinus balfouriana*) and whitebark pine (*Pinus alba-caulis*) for hardy souls who like to traverse steep and rugged ridge systems.

Course fee: \$490/\$515 includes pack animal support, campsite fees, and meals from Thursday dinner through Sunday lunch. Our wilderness campsite will have potable water, solar showers, and temporary pit toilets with seats. Participants who wish to carry their own personal gear into and out of camp may deduct \$60 from the course fee.

Potentilla, Past and Present (Rosaceae: tribe Potentilleae)

July 15–17, 2011

Barbara Ertter

Location: Sagehen Creek Field Station, Truckee

Rydberg was right! If you want the inside scoop behind changes to *Potentilla* (cinquefoils) in the revised edition of *The Jepson Manual*, and how to deal with “species” in a genus notorious for complex hybridization and asexual forms of reproduction, this is the workshop for you. Find out why *fruticosa*, *glandulosa*, and *palustris* have been evicted from *Potentilla*, why *glandulosa* has been fragmented into multiple species of *Drymocallis*, and how to tell them apart. Learn about new species of *Potentilla* in California and how to cope with plants that give only lip service to any rigid species definition. The workshop will also cover *Ivesia*, *Horkeliella*, and *Horkelia*, all restricted to western North America, leading to discussions on island biogeography in a continental setting and the pros and cons of paraphyly. Many of the species covered are rare, threatened, endangered, or presumed extinct, while others may merit conservation attention once we know more about them. One or more field trips will allow direct experience with plants in the field, including complex multi-species populations. Participants in the class may drive up to 25 miles to the field trip sites and may hike several miles. Limited transportation may be available during the workshop. Please contact the herbarium for more information.

Course fee: \$360/\$385 includes lodging and meals from Friday dinner through Sunday lunch. Lodging is at a field station in cabins with bunk beds. Shared bathrooms have flush toilets and showers.



Potentilla anserina

Flora of the Warner Mountains

July 28-31, 2011

Judy Perkins and Gregg Riegel

Location: Soup Springs Campground, Modoc National Forest

The Warner Mountains of northeastern California and southern Oregon are on the westernmost edge of the Great Basin Province, and they contain a unique mix of flora from the Great Basin, Cascade Range, and Rocky Mountains. We will focus on the South Warner area, which contains the highest point in the range, Eagle Peak, at 9,892 feet. From a Forest Service campground base camp at approximately 6,800 feet, we will go on day trips to explore and learn about a variety of plant habitats including sagebrush, mixed conifer forests, gravelly ridgetops, fens, and riparian areas. We will also visit forests of whitebark pine (*Pinus albicaulis*), a species currently under review by U.S. Fish and Wildlife Service for possible Federal listing. Some of the other species we'll look for include Modoc bedstraw (*Galium glabrescens* subsp. *modocense*), Warner Mountain bedstraw (*Galium serpenticum* subsp. *warnerense*), bog birch (*Betula glandulosa*), spiked larkspur (*Delphinium stachydeum*), doublet (*Dimeresia howellii*), blue camas (*Camassia quamash*), Butte candle (*Cryptantha celo-sioides*), blue alpine phacelia (*Phacelia sericea* subsp. *ciliosa*), and kittentails (*Synthyris missurica* subsp. *missurica*). This workshop will involve some moderate day hiking up to five miles, including forays into the South Warner Wilderness Area. Participants in the class may drive up to 40 miles to the field trip sites. Limited transportation may be available during the workshop. Please contact the herbarium for more information. Course fee: \$475/\$500 includes campground fees and meals from Thursday dinner through Sunday lunch. Lodging is in a developed campground with vault toilets and potable water.



Dimeresia howellii

Insect-induced Plant Galls of California

September 18, 2011

Diane M. Erwin, Joyce Gross, and Kathy Schick

Location: UC Berkeley

Co-sponsored by the Essig Museum of Entomology and the University of California Museum of Paleontology

Plant galls provide a fascinating array of color and texture on most of the plants in our California landscape. Galls, growths of plant cells that are not normal plant organs, can be induced by a number of organisms. The most numerous as well as most beautiful and intriguing are those induced by insects. Two insect families are found only in plant galls: Cynipidae (gall wasps) and Cecidomyiidae (gall midges or gnats). Plant galls also host a whole ecology of other insects, including herbivorous inquilines and carnivorous parasitoids like the wasp family Ormyridae, which is found only in plant galls. Most of these organisms are too small for us to see, so that the only thing we notice is the colorful gall growth itself.

In this workshop, we will start by exploring the diversity of extant insect-induced plant galls and some of the community of species to be found within them. We will begin our study indoors, using some of Joyce Gross's excellent photographic images of galls and gall insects. Then, we will take a short campus field trip to learn how to find galls; many do occur on plants common in California gardens. We will then dissect and examine galls under microscopes to tease out the development and origins of the gall tissue layers. We will wrap up with discussion about the evolution of the plant host-plant galler interrelationships with examples from fossil galls.

Course fee: \$115/\$140

Aquatic Plants

Course Date To Be Determined

Don Les

Location: UC Berkeley and field sites in the Bay Area

At summer's end, lowland botanizing is largely long gone . . . at least on dry land. In, on, and around the various lakes, streams, and other wetlands, however, delightfully diverse aquatic plants are still going strong. For those willing to get their feet muddy, a whole new world of botanizing opens up, with a high probability of finding new occurrence records with relative ease. Because of the broad spectrum of plants that will be covered, the workshop will focus more on gaining familiarity with aquatic plant diversity than on keys to species. We will use fresh material and illustrations of diagnostic characteristics of families and genera in the classroom. A field trip to a selection of local wetlands will give us a chance to practice field identification. Participants in the class may drive up to 40 miles to the field trip sites and may hike several miles. Limited transportation may be available during the workshop. Please contact the herbarium for more information.

Course fee: \$235/\$260

About Our Instructors

Linda Beidleman has an M.S. in biology from Rice University. She is co-author of *Plants of the San Francisco Bay Region* and *Plants of Rocky Mountain National Park*. She has worked with the California Native Plant Society, especially as co-supervisor for the CNPS East Bay plant nursery. Linda teaches short flora and ornithology courses for the Rocky Mountain National Park and the Aspen Center for Environmental Studies.

Richard Beidleman has a Ph.D. in biology (ecology) from the University of Colorado and has taught at the University of Colorado, Colorado State University, and Colorado College. He is a Research Associate at the University and Jepson Herbaria and during the summer he teaches short ecology, ornithology, and flora courses in Colorado. He is co-author of *Plants of Rocky Mountain National Park* and his most recent book is *California's Frontier Naturalists* (University of California Press).

Travis Columbus is a Research Scientist at Rancho Santa Ana Botanic Garden and Associate Professor of Botany at the Claremont Graduate University. He has a Ph.D. from UC Berkeley, where he worked on *Bouteloua* and related taxa. His current research focuses on the evolution and classification of the grass subfamily Chloridoideae.

Max Creasy recently retired from the U. S. Forest Service where he was the Province vegetation ecologist for the four National Forests of northwest California. During his career he worked extensively on vegetation community classification and mapping programs. His current interests include restoration ecology of the Klamath Mountains and revisiting botanical wonders of the region.

Diane M. Erwin is Curator and Collections Manager of the Museum of Paleontology, UC Berkeley's paleobotanical collections. She received her Ph.D. from the University of Alberta, Edmonton, Canada. Diane's research spans the Phanerozoic, from studies that include work on early seed plants and their relatives to her current interests looking at the systematics, evolutionary and biogeographical history, and paleoecology of western North American Cenozoic plants.

Barbara Ertter, Curator of Western North American Flora at the University and Jepson Herbaria, is primary author of *Potentilla* and related genera for *Flora of North America North of Mexico* and *The Jepson Manual*. She has described several new species in *Potentilla*, *Ivesia*, *Horkealia*, and other genera, as well as making numerous collections from throughout western North America. She is also author of *Annotated Checklist of the East Bay Flora* and co-author (with Mary Bowerman) of the second edition of the *Flora of Mount Diablo*.

Joyce Gross is a programmer for the UC Berkeley Natural History Museums, supporting CalPhotos, the Essig Museum of Entomology database, and other museum databases. In her free time, she hikes and travels to photograph insects. Her photos have been published in various books and magazines.

Terry Huffman has a Ph.D. in botany with research emphasis in wetland plant ecology and has been working as a wetland scientist for over 35 years. He has worked for the Corps of Engineers and as a private consultant. While with the Corps, he developed the definition of wetlands and criteria for the delineation methodology currently used by the Corps and the U.S. Environmental Protection Agency.

David Keil received his B.S. and M.S. from Arizona State University and Ph.D. from Ohio State University. He is Professor of Biology at Cal Poly, San Luis Obispo, where he teaches courses in plant taxonomy, field botany, and biogeography. He has authored scientific papers, textbooks, and study guides, and is a major contributor to *The Jepson Manual*. His research interests include Asteraceae systematics and floristics of western North America.

Instructors, Continued

Dean Kelch is a plant systematist at the California Department of Food and Agriculture and an Assistant Researcher with the Jepson Herbarium. He received his Ph.D. in botany from UC Davis, studying under the late tropical botanist Grady Webster. His research focuses on the evolutionary relationships of seed plants, and he specializes in the systematics of conifers, particularly Podocarpaceae, and the North American thistles (*Cirsium* spp.). He currently is working on a flora of the Carquinez Strait region.

Bruce Kirchoff is an Associate Professor of Biology at the University of North Carolina at Greensboro, a Visiting Scholar at UC Berkeley, and an educational entrepreneur. He has developed new teaching methods for plant identification and has produced the first all-visual, non-text based keys. His research combines insights from biology and cognitive psychology to improve the reliability of character description.

Marla Knight has been a botanist on the Klamath National Forest for 30 years, and during that time has become very familiar with the local flora. She received a B.S. in Renewable Natural Resources from UC Davis in 1977.

Anna Larsen is a Research Associate with the University and Jepson Herbaria and has a Ph.D. in Integrative Biology from UC Berkeley. Her research interests include ethnobotany and floristics in California and the Pacific Islands. Anna has taught lecture and lab courses in California Plant Life, Medical Ethnobotany, General Biology, and the Biology and Geomorphology of Tropical Islands.

Don Les is a professor of Ecology and Evolutionary Biology at the University of Connecticut and is the director of The George Safford Torrey Herbarium (CONN). His teaching focuses on plant systematics and his research involves the use of molecular data to study the evolution and ecology of aquatic flowering plants.

Jodi McGraw, Ph.D., is an ecologist who works on conservation projects throughout central coastal California. Her dissertation research at UC Berkeley examined the ecology of the endangered plants and rare communities of the Santa Cruz Sandhills. She authored the *Sandhills Conservation and Management Plan*.

Randy Morgan is a California Native Plant Society (CNPS) Fellow, and a founding member and past president of the Santa Cruz County Chapter of CNPS. He has been studying and documenting local plant and animal life since the 1970s and worked for many years to gain scientific and public recognition as well as legal protection for threatened local centers of endemism, including the Sandhills. Randy's main interest is systematics and he has discovered many new California taxa in *Trifolium*, *Piperia*, and other genera. He is the author of *Checklist of Santa Cruz County Plants* and various technical publications.

Bianca Knoll Nakayama received an M.A. in Integrative Biology from UC Berkeley. While a graduate student in Brent Mishler's lab, her research focused on botany and phylogenetics and she served as a Graduate Student Instructor for courses such as Systematics of Vascular Plants and General Biology. She currently teaches upper level Biology and Chemistry at Menlo School in Atherton, California.

Judy Perkins is the Forest Botanist for the Modoc National Forest, where she manages the botany and noxious weed programs. She has a Ph.D. in Organismal Biology and Ecology from The University of Montana, with a research focus on interactions between whitebark pine seedlings and understory plant species. She has worked in a variety of ecosystems, including the eastern Washington sage steppe, the northern Rocky Mountains, the Colorado Plateau, and the South Dakota Badlands.

Dan Potter is a Professor in the Department of Plant Sciences at UC Davis and Director of the UC Davis Center for Plant Diversity, including the herbarium. The primary focus of his research is angiosperm systematics and evolutionary studies of crop plants and their wild relatives. He has studied phylogenetic relationships and character evolution across Rosaceae, and relationships and taxonomy within the genus *Prunus* and the tribe Spiraeae. At UC Davis, he teaches courses on California Floristics and Ethnobotany, and he is the current chair of the Plant Biology Graduate Group. He is the family editor for Rosaceae for *The Jepson Manual*.

Barry Rice earned his bachelor's and Ph.D. degrees in physics and astronomy. He is Assistant Professor of Astronomy at Sierra College, where he focuses on astrobiology, and is also a research associate with the UC Davis herbarium. His current carnivorous plant research focuses on the distribution and taxonomy of U.S. species. A writer and photographer, his publications include *Growing Carnivorous Plants* (Timber Press), *Monster Plants* (Scholastic), and treatments of Lentibulariaceae and Sarraceniaceae for *The Jepson Manual*.

Gregg Riegel became interested in the Warner Mountains as an undergraduate at UC Davis at the encouragement of the late Prof. Jack Major. He studied the forest vegetation in the South Warner Wilderness Area as an MS student at Humboldt State University and received a Ph.D. in Rangeland Ecology from Oregon State University (OSU). Since 1991, he has been an Area Ecologist with the USFS in Pacific Northwest Region. He teaches fire ecology at Central Oregon Community College in Bend, and has a Courtesy Graduate Faculty Appointment at OSU.

Kathy Schick received both her masters and doctorate in entomology from UC Davis. For more than 20 years she has researched the systematics of tiny wasps (Cynipoidea), over half of which are found only in plant galls. She has been a part-time associate specialist at the Essig Museum of Entomology since 1999 and teaches biology as an adjunct faculty member at San Joaquin Delta Community College, near her home in Stockton.

Steve Schoenig is the Supervising Biologist for the California Natural Diversity Database (CNDDB) and the Vegetation Classification and Mapping Program (VegCAMP) at the California Department of Fish and Game. He has been especially interested in *Mimulus* for 28 years and has contributed more than 600 *Mimulus* photos to the CalPhotos website.

Michael G. Simpson is a Professor in the Department of Biology at San Diego State University and Curator of the SDSU Herbarium. He received his Ph.D. in Botany from Duke University. He specializes in the phylogeny of monocots, particularly the Commelinids. At SDSU, he teaches Plant Systematics, Taxonomy of California Plants, and specialty courses. He is an author of *Plant Systematics* (Elsevier-Academic Press, 2nd edition 2010), *Plant Collecting and Documentation Field Notebook*, and co-author of *Checklist of the Vascular Plants of San Diego County* (2006).

Larry St. Clair received his B.S. and M.S. degrees at Brigham Young University and his Ph.D. at the University of Colorado. He is Professor of Biology and Director of the M.L. Bean Life Science Museum at Brigham Young University in Provo, Utah. He also serves as the curator of the Herbarium of Nonvascular Cryptogams, which houses more than 100,000 lichen specimens.

Linda Ann Vorobik is a Research Associate with the Jepson Herbarium and holds a Ph.D. in biology. She currently researches taxonomic relationships within the *Arabis macdonaldiana* group using molecular methods and has taught numerous courses in scientific illustration and botany. An illustrator for over 30 years, her work appears in many scientific books and journals including *The Jepson Manual*, *A Flora of Santa Cruz Island*, *The Jepson Desert Manual*, and *The Flora of North America North of Mexico*.

Dana York received his M.S. from California State University, Fresno, in biology and botany, and his B.S. in forest management from Humboldt State University. He has discovered new plants in the Oregon Cascade and Sierra Nevada ranges and Death Valley National Park, where he was the park botanist for nearly five years. He currently works in Eureka, California, for Caltrans as an Environmental Unit Supervisor.

Get Involved!

Become a *Friend of the Jepson Herbarium*

Friends support research and publication about the California flora, including the publication of *The Jepson Manual*. *Friends* receive discounts on workshop registration fees and receive *The Jepson Globe*, the quarterly newsletter. To become a *Friend*, please complete and return the form on page 15.

Visit the Berkeley Natural History Museums on Cal Day

Cal Day, the University of California, Berkeley's annual open house, will be held on Saturday, April 16, 2011. From 9 am to 4 pm, some of the world's top departments and research museums (including the University and Jepson Herbaria) become open classrooms for children and adults. Admission is free.

Curatorial Volunteers

Learn more about the California flora by working with the botanical collections at the Herbaria. There are many tasks to choose from, including mounting specimens, identifying undetermined specimens, and filing new accessions.

One Saturday each month is Group Volunteer Day in the Herbaria. Upcoming dates are January 22, February 12, March 12, April 16, and May 14, 2011. We also welcome individual volunteers who can come in during our regular business hours (Monday–Friday 8:00 a.m.–5:00 p.m.). For more information, please call (510) 642-2465.

Library and archival collections volunteers

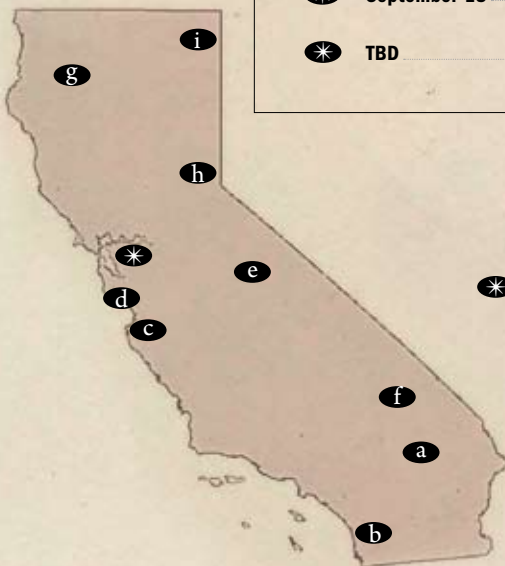
The University and Jepson Herbaria house an impressive collection of rare and unusual books, manuscripts, journals, and field notebooks. If you would like to volunteer in our library or archives, we would be glad to have your help. For information please contact Amy Kasameyer at akasameyer@berkeley.edu or (510) 642-2465.

Attend an East Bay Science Café

This monthly forum for discussing interesting and relevant scientific issues is brought to you by the Berkeley Natural History Museums. For the current schedule, please see <http://bnhm.berkeley.edu/about/sciencecafe.php>

2011 Calendar and Map

✱	February 12	Name Changes
✱	February 26	Carnivorous Plants
a	March 3-6	Lichens and Soil Crusts
✱	March 11-13	Wetland Delineation
✱	March 26-27, April 2-3	Fifty Families in the Field
b	March 31-April 3	San Diego County
✱	April 2-3, 9-10	Fifty-one Families in the Field
✱	April 7-8	Plant Families
✱	April 9-10	Plant Families
c	April 28-May 1	Fifty Families in Monterey
d	May 6-8	Santa Cruz Sandhills
✱	May 14-15	Poaceae
e	May 20-22	<i>Mimulus</i>
✱	May 21-22	Photography for Plant ID
✱	May 27-29	Asteraceae
f	July 7-10	Panamint Mountains
g	July 14-17	Klamath Mountains
h	July 15-17	<i>Potentilla</i>
i	July 28-31	Warner Mountains
✱	July 30-31	Intro. to Morphology
✱	September 18	Plant Galls
✱	TBD	Aquatic Plants



✱ Workshops held on the UC Berkeley campus and/or Bay Area field locations



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