

Friends of the Herbarium

Biological Sciences Herbarium

California State University, Chico

Newsletter

Vol. 7 No. 1

October 2001

The Biological Sciences Herbarium at California State University

*** announces ***

the database of specimen label information
is now queryable via the internet!

Go to

www.csuchico.edu/biol/Herb/database.html

to query the database and for more information
about the status of the databasing effort

.....

Friends of the Herbarium

Workshops

*** see insert ***

or visit

www.csuchico.edu/biol/Herb/Events.html

.....

Articles:

page 2 — A New *Eriogonum* from the Lassen National Forest.

page 5 — Diversity and Characterization of Arbuscular Mycorrhizal Fungi in the soils of Vernal Pools in Northern California.

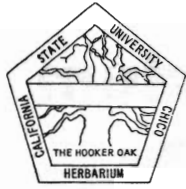
MESSAGE FROM THE BOARD

October 27 marked the seventh Annual Meeting by the Friends of the Biological Sciences Herbarium. This well attended meeting included a special presentation by renowned plant ecologist Dr. Michael Barbour of UC Davis titled "Progress and promise in our understanding of vernal pool ecology and conservation." Excellent presentations were also given by this years Jim Jokerst Field Botany Award recipients Gavin Blosser and Colby Boggs, updating the group on the status of their projects "Diversity and Characterization of Arbuscular Mycorrhizal Fungi in the soils of Vernal Pools in Northern California" and "Reproductive Biology of *Dudleya cymosa* subsp. *cymosa*," respectively.

Those who came to the re-

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Friends of the Herbarium

The Friends of the Biological Sciences Herbarium, California State University, Chico, was formed to help maintain the high quality of work that has been known to be associated with the herbarium. The primary purpose of the group is to provide community support for the herbarium. This includes raising funds for items that are not covered under the University budget. Scientific and academic pursuits are the focus of the group. The Friends also offers low cost workshops and classes on various botanical topics.

The Friends of the Biological Sciences Herbarium operates under the auspices of the California State University, Chico, and enjoys non-profit status and has access to the use of University classrooms and equipment.

Memberships are renewed on May 1 of each year.

BOARD OF DIRECTORS

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Newsletter

Volume 7 Number 1

The Newsletter is published three times per year (June, October, and February) by the **Friends of the Biological Sciences Herbarium**, California State University, Chico. Subscription is free with membership. Submissions on herbarium related topics are welcome.

News From The Herbarium

You saw the announcement on the front page! Yes, the Biological Sciences Herbarium database of specimen label information is now queryable via the internet! Thanks to the web site design efforts of volunteer Bill Carlson, and the willingness of the UC Davis Herbarium to host the database query part of the Biological Sciences Herbarium web site, you can now query the database via the internet. Presently queries can be based on genus, species, or subspecies/variety. We are also working to make queries based on county and/or collector also available via the internet. This may already be possible by the time you receive this newsletter.

We still have a long way to go to get the whole herbarium collection databased, but the efforts of Herbarium Assistants Morgan LoRomer and Marcella Shuey, and the herbarium curator, are making rapid progress towards that goal. During the summer months great progress was also made by Herbarium Assistants Jeannie Trizzino, Michelle Cedeborg, John Rowden, and Stephanie Lopez, and volunteer Susan Bazell. An updated status of this databasing effort, including the number of specimens databased so far, can be found on the database page of the Herbarium web site (see the front page for the URL). This page also links to a list of plant families that have been completely databased and the families that have databasing in progress.

If you would like to help with databasing the herbarium collection, please give the Curator a call at (530) 898-5381 or via e-mail at LJaneway@csuchico.edu. Volunteers (and Herbarium Assistants) receive valuable training in the herbarium practices, nomenclature, and numerous other topics related to the

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Jim Jokerst Field Botany Award

In this issue of the Friends of the Biological Sciences Herbarium *Newsletter* we present a summary of the project for the second of the two award recipients for 2001, Gavin Blosser — see page 5. The two award winners were announced in the last issue of this *Newsletter*, and the summary of Colby Boggs' project was presented in that issue. Both award recipients gave excellent updates on their research to the Friends' annual meeting on October 27.

Two awards are offered each spring, and each winner receives a cash award of \$250. The request for applications for the 2002 awards will appear shortly on the Friends of the Herbarium web page (www.csuchico.edu/biol/Herb/Friends.html). This announcement will include details about what information to include by each applicant for the Jim Jokerst Field Botany Award. This year is the second year that the University is coordinating applications for all scholarships into one basic application form and with one due date of February 1 to the Scholarship Office at CSU Chico. Information about this part of the process can be obtained at www.csuchico.edu/fa/home/types/appinfo.html. The additional information specifically required for the Jokerst Award is then included with this application.

LJ

Continued from page 1
Message from the Board

ception preceding the annual meeting enjoyed excellent treats and drinks organized by board members Caroline Warren and Gail Kuenster, and also had an opportunity to query the herbarium database via the recently established internet accessible web search pages.

LJ

A New *Eriogonum* from the Lassen National Forest

by Beth Corbin

Lawrence asked me to tell a little about how this new species was discovered, identified, and named. For technical information, see the *Madroño* article cited below, but following is a little more on the behind-the-scenes.

The story starts in July 1997. I was Forest Botanist on the Lassen National Forest, and Robin Barron and Pete Figura were temporary botanists. On 30 July 1997, Robin and Pete were conducting surveys in the Bailey Management Area. It was fairly late in the flowering season, and projects were beginning to wind down. I didn't consider the Bailey M. A. a high priority area for survey, since no rare plants or habitats were known or expected there. It was not an area that I considered particularly interesting. However, on the Lassen N.F., we attempt to survey (to some degree) all the habitats present, and botany surveys are done floristically, meaning all vascular plants species are identified and recorded (to the best of our abilities given phenological and practical limitations). So, that day Robin came upon a buckwheat (*Eriogonum*) that she did not immediately recognize. As we usually do, she picked a small sprig with flowers and leaves, and put it in a Ziploc bag to key later.

It wasn't until about a week and a half later that the crew had an office day to key plants, and started looking at the *Eriogonum* and other plants collected. Pete first tried to key it in Vern Oswald's books: *A Flora of Lassen Volcanic National Park*, *Manual of the Vascular Plants of Butte County*, and *Selected Plants of Northern California*. It keyed most closely to *Eriogonum pyrolifolium*, which it clearly was not. Pete then tried keying it in *The Jepson*

Manual, and probably Abrams *Illustrated Flora of the Pacific Coast States*. In his words, on all leads "it blew up." I had recently attended a Jepson Herbarium weekend workshop on *Eriogonum*, taught by James Reveal, the worldwide expert on this genus. I tried to key the plant, using (in addition to Oswald and *Jepson*) Reveal's key to the California *Eriogonum* from the weekend workshop. It didn't fit. I showed it to Gary Schoolcraft, and we keyed it in another reference he had, an earlier (1989) *Eriogonoid Flora of California* by Reveal. Again, nothing fit.

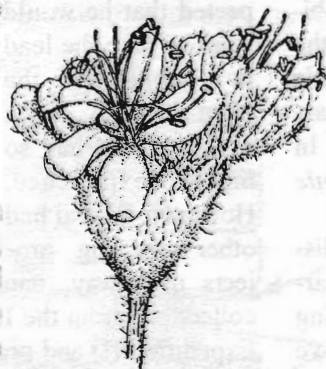
At this point we suspected that we had something new. I sent Robin back to the site make a better collection, since all we had so far was the single sprig. She brought back pressed specimens to make about four sheets of herbarium material, and took some slide photographs of the plants and their habitat. I sent one collection to Vern Oswald at Chico, and another (and some slides) to James Reveal in Maryland. Vern quickly e-mailed me that he had no idea what the pretty shrub was, but would be glad to add the collection of "Barron's buckwheat" to the Chico herbarium. Reveal responded quickly too, first with an exuberant phone message, then an even more excited e-mail, along the lines of "One glance at the slide, even without looking at the specimen, said NEW!! This is the most wondrous new buckwheat I have seen in years. The epithet "spectabile" has not been

used in *Eriogonum*, with good reason, but this one qualifies. Then there is *habrotatum* (Greek for prettiest) or *composum* (Greek for elegant) or any number of other names that can hardly express the impressive nature of this plant." Within hours of that first e-mail, he had also written and sent me a preliminary technical description of the plant. Needless to say, we all were quite excited.

At this point, all we knew about was the one occurrence that Robin had found. The next working day (8 September 1997), we had a botanist field day to the site. Robin led Vern Oswald, Gary Schoolcraft, Kim Earll, Mike Dolan, and I to the occurrence for the first time. Using pin flags, we counted every individual present (194 plants), GPS'ed the area (just under 1/10 acre), and took numerous measurements of flower length, plant height, peduncle length, leaf length and width, etc. I also collected a sprig of fresh flowering material (unpressed) to send to Reveal, as requested. We then hiked around some in the general vicinity, but found no more new *Eriogonum* plants. I sent the measurements and fresh material (overnight express) to Reveal, anxious to get the name publication underway. However, Reveal felt that it was too late in the season to get adequate flowering collection material for the type specimen, and he wanted more information on the species' range and variability, so I was resigned to putting the publication off for a year.

For the rest of that summer and early fall, Robin and I did lots of surveying in the general vicinity, particularly on other areas mapped with

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Continued from page 3
Eriogonum

the same soil type. Within about two weeks, I had found a second occurrence (of 54 plants), and Robin found a third (of only 3 plants!). All three occurrences are fairly close together, about 1/4 to 1/3 mile apart and within one quarter-section.

The common name was a natural, since Robin had first found the plant, and "Barron's buckwheat" has a nice ring to it. The specific epithet was less obvious. Reveal had suggested "spectabile" from the beginning, and although it's a spectacular name (bad pun), I was inclined to have a name that reflected more of the plant's character or had a sense of place. Robin and I considered several other names from a list that Reveal suggested, especially "oligistum" meaning rare (although we hoped it wasn't as rare as it appeared), "nivarium" white, referring to the whitish leaves and flowers, and "glaciale" for its glaciated habitat. I also liked "lassenensis", for the Lassen National Forest, but since it's neither in Lassen County nor on Lassen Peak, that might be confusing. In the end, we decided that *spectabile* was fine.

Barron's buckwheat is quite distinctive. It's a low shrub with narrow, silvery-hairy leaves. Flowering stems are about a decimeter above the leaves, and loosely branched. The flowers have an interesting color progression: buds are pink, in full flower the perianth is white, then after pollination it turns pink again. It's a very pretty plant, and quite unlike other buckwheats on the Lassen National Forest. The combination of hairs on the outside of the flowers, white/pink color, shrub form, and short stipe makes it easy to separate from other *Eriogonum*.

The habitat is fairly easily defined, but hardly unique. *Eriogonum*

spectabile grows on minor ridges of glacial deposits, in open, coarse andesitic soil and rock. It grows with pinemat manzanita, lodgepole pine, and red fir, but only in the sunny, open areas within this habitat. Competition with other plants may be a factor -- at the third occurrence, the three lonely plants look like they are being swallowed up by the manzanita.

In 1998, Lassen NF botanists continued surveying in the Bailey MA and vicinity for more of the new *Eriogonum*, without success. On 18 August 1998, Kim and I collected about eight sheets worth of material from Occurrence #1, for the type specimen, which I sent to Reveal. I expected that he would want to take the lead in publishing the plant's name, since of course he has so much experience. However, Reveal had other pressing projects underway, namely examining collections from the Lewis and Clark Expedition (!) and preparing to retire from the University of Maryland and move to Colorado, so he was unable to work on our plant.

Time passed. We did more surveys in 1999, but found no additional Barron's buckwheat. I decided that we really needed to name this rare plant, so drafted up an article using *Madroño's* format, and found someone to translate the Latin description. Reveal had reservations about publishing a species of the genus *Eriogonum* at this time, since researchers at Rancho Santa Ana Bo-

tanic Gardens are doing some work that may result in splitting *Eriogonum* into several genera. If that happened, the generic name of the newly named species might have to change, causing some confusion. But I didn't want to wait any longer, especially given the uncertainty of when the research would be completed and what the result would be.

So Reveal edited my article draft, I found someone to do the botanical illustration (after several false starts and delays), and the article was on its way.

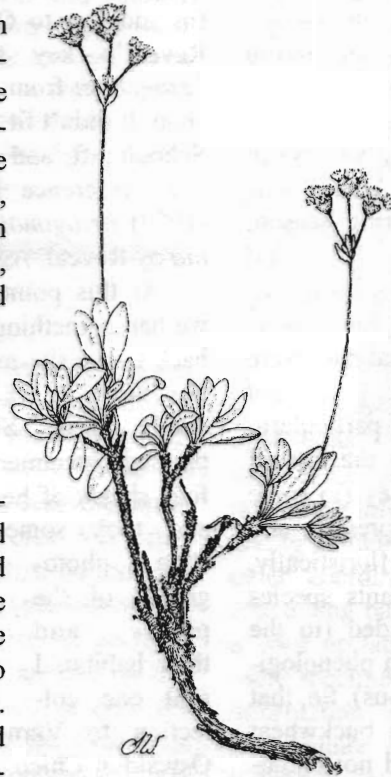
In February 2000, I sent the manuscript to Kristina Schierenbeck, editor of *Madroño*. She sent it out for peer review. Some months later, I got the comments back, made some edits, and sent it back. Finally, on 15 March, 2001 it was published: "*Eriogonum spectabile* (Polygonaceae): A New Species from Northeastern California," by Beth Lowe Corbin, James

L. Reveal, and Robin Barron, in *Madroño* Vol. 47, No. 2, pp 134-137, 2000. Barron's buckwheat finally had a name!

In February 2001, I left the Lassen National Forest and transferred to BLM. Kim and the Lassen NF temporary botanists have continued with surveys, but still no more than the original three occurrences are known, totaling only about 250 plants, making this a very rare species indeed.

This plant would make a great research project for a graduate study.

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Diversity and Characterization of Arbuscular Mycorrhizal Fungi in the soils of Vernal Pools in Northern California

A project by 2001 Jim Jokerst Field Botany Award winner Gavin Blosser

Vernal pools represent unique ecosystems within California. Many of the natural vernal pool ecosystems within California have been destroyed or damaged by agriculture and development. Restoration and creation efforts have yielded artificial habitats with depauperate floras (Ferren and Gevirtz, 1990; Zedler, et al., 1993). The importance of soil microbial and mycorrhizal associations to the floristic composition of a given plant community has been well documented in the last two decades. Recent studies reveal extensive arbuscular mycorrhizal associations in harsh, diverse habitats such as deserts in southern California (Bethlenfalvay, et al., 1984), tidal salt marshes (Brown and Bledsoe, 1996), calcareous dune sand (Olsson, et al., 1998), California serpentine grassland (Hopkins, 1987), marine sand dunes (Rose, 1988; Siguenza, et al., 1996), wetlands (Rickerl, et al., 1994; Turner, et al., 2000), California annual grassland (Rillig, et al., 1998), California chaparral (Acsai and Largent, 1983) and alkaline desert playas (Ho, 1987). The flora of vernal pools may also depend largely on

the soil microbial community, however there is virtually no literature on the soil ecology of vernal pools. Effective preservation and restoration efforts will undoubtedly be facilitated by characterization of the arbuscular mycorrhizal fungi in natural vernal pool ecosystems.

We have planned a study to establish a foundation of information

pertinent to the soil ecology of vernal pool ecosystems. Three study sites (vernal pools) will be chosen near Chico. Methods to be employed in the study are microscopic examination of roots to determine percent colonization, spore extraction from soil samples and identification, phospholipid fatty acid analysis (PLFA) of soil samples to detect arbuscular mycorrhizal fungi signature fatty acids, DNA extraction from soil samples followed by nested polymerase chain reaction techniques (PCR) with family specific primers, and DNA extraction from colonized roots followed by PCR with family specific primers and sequencing. Based on the results obtained with these methods we believe we can answer the following questions. 1) Are arbuscular mycorrhizal fungi associated with the flora of vernal pools? 2) Will the

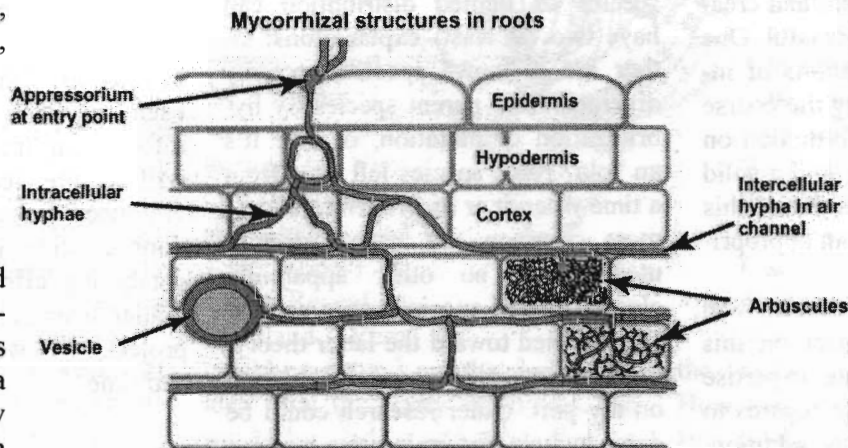
Mediterranean climate of California (Allen, et al., 1995). AM fungi are extremely important in recruitment with colonization of plant roots often occurring within two to three days of radicle emergence, especially in harsh environments dominated by annual plants (Francis and Read, 1994; Hopkins, 1987). In addition, 95% of extant plant families have members known to form arbuscular mycorrhizal associations despite the fact that only approximately 5-6% of plant species have been surveyed (Smith and Read, 1997). Reliant on the above findings and the many studies describing AM associations in the diverse habitats addressed earlier, we are confident that AM fungi are associated with at least some of the plant taxa in vernal pools.

Mycorrhizal associations are of great importance in determining plant community structure (Francis and Read, 1994; Dodd, 2000). Temporal and spatial changes in mycorrhizae and plant taxa are well documented both independently and jointly within the same community (Allen, et al., 1995; Brown and Bledsoe, 1996; Siguenza, et al.,

1996; Allen, et al., 1998). Spatial and temporal changes in plant taxa are inherent characteristics of vernal pool ecosystems (Sanders, 1981). We expect to find spatial and temporal changes in arbuscular mycorrhizal fungal taxa within vernal pool soils as well.

We feel this will be an important

Continued on page 6



presence and diversity of arbuscular mycorrhizal fungal families vary significantly throughout a year?

Arbuscular mycorrhizal (AM) associations are the prevalent mycorrhizal fungi in arid to semi-arid regions, soils with low phosphorous, soils with low organic matter, soils high in heavy metals, and areas with seasonal precipitation such as the

Continued from page 5
Mycorrhizal Fungi

study with practical implications. It will provide a foundation for understanding the soil ecology of the unique and endangered vernal pool ecosystem. The information obtained may facilitate more effective restoration and creation of vernal pools through inoculation with specific arbuscular mycorrhizal fungal taxa. It will provide a contribution to the rapidly growing fields of microbial and soil ecology. Finally, the study will add to the growing data confirming widespread mycorrhizal associations and the dynamics of these mutualistic relationships.

After an exhaustive literature search spanning over five months, I have been unable to locate a single study addressing the soil ecology of vernal pools. Since vernal pools are often an ecological concern associated with agriculture and development, we strongly feel our study will not only be beneficial, but necessary if restoration, preservation, and creation efforts are to be successful. Due to the important implications of information gathered during the course of our study, lack of information on vernal pool soil ecology, and a solid design we expect the results of this study to be published in an appropriate journal.

Dr. Kristina Schierenbeck will serve as my major adviser on this project. She will provide expertise and advice, particularly in regards to molecular techniques. In addition, she will be of great help in interpreting, analyzing, and presenting the results of this study. We expect to complete the project during the Fall 2002 semester. 🐾

The illustration used in this article is from the book *Working with Mycorrhizas in Forestry and Agriculture* by Mark Brundrett, Neale Bougher, Bernie Dell, Tim Grove, and Nick Malajczuk, pub-

lished by the Australian Centre for International Agriculture, 1996 (www.aciar.gov.au). The image was actually obtained from the web site supported by Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO): www.ffp.csiro.au/research/mycorrhiza. This web site is itself like an introductory textbook on mycorrhizal associations. Another good site with extensive information about mycorrhizal associations is the Mycorrhiza Information Exchange site at <http://mycorrhiza.ag.utk.edu>. This site also contains a copy of the diagram used in this article, and is where by favorite web search engine first took me when searching for diagrams about vesicular arbuscular mycorrhizae. Ed.

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Eriogonum

Additional surveys could be done, particularly in Lassen Volcanic National Park, to try to locate more occurrences. Genetic work could be done to determine its relationship to other *Eriogonum* species. Very rare species of limited distribution can have two (at least) explanations: either it's a "new" species, recently diverged from parent species by hybridization or mutation, or else it's an "old" relict species left over from a time when it or its progenitors were more common and widely distributed. Since no other apparently closely related species occur nearby, I'm inclined toward the latter theory, but of course that's pure speculation on my part. Other research could be done to help determine the limiting factors for this species, such as pollinators, seed viability, habitat parameters, or fire history. There are many possibilities! 🐾

The illustrations used in this article are from the Madroño article cited above, as drawn by Shannon Workman. Madroño, *A West American Journal of Botany* is published quarterly by the California Botanical Society. For more information

about the California Botanical Society, visit their web site at www.calbotsoc.org. Ed.

Continued from page 2
News From The Herbarium

collecting and processing of plant specimens, partly to help with their databasing efforts and partly to make their volunteer (or work) experience as educational and rewarding as possible. Data enterers are encouraged to pick plant families of interest to them and database all of the specimens within those families. Please call or e-mail if you're interested or for more information.

We are starting to work on a next phase of computerizing the herbarium collection. That is to have the results of a web-based query of the database be accompanied by a map of the locations represented by the collections. The main problem at this stage is that only a few of the collections have information on their labels giving latitude and longitude or some other coordinates. Thus, the time-consuming part of this phase will be to look up latitude and longitude for each specimen and then enter this information into the database. This will require additional funding and volunteer resources, but could be done concurrently with the present databasing effort. If you have particular interest in this aspect of the project, we welcome input, ideas, and time. LJ



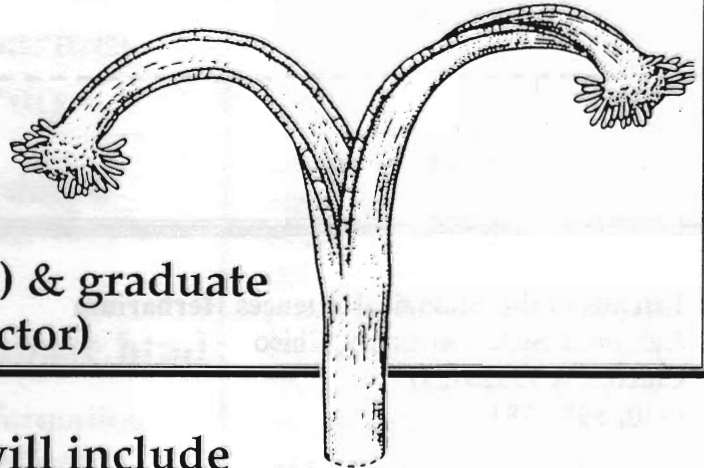
Plant Ecology

Biological Sciences 352
(TRACS 14345), for
Spring 2002
Tues/Thurs afternoons

Rob Schlising, Instructor
Rschlising@csuchico.edu

Emphasis on
Behavioral,
Reproductive,
& Evolutionary
Ecology of
Vascular plants

Pre-requisites: course in
Ecology, some botany
background (plant taxonomy
or field botany recommended) & graduate
standing (or consent of instructor)



Topics will include

Lectures focusing on variations in ecological life cycles of plants

Fieldtrips to perturbed habitats, rock outcrops, knobcone pine and yellow pine forests, chaparral, vernal pool landscapes

Seminar-Discussions on

Ecology of exotic plants in California—the invasive & the innocuous
Mate choice & other contemporary topics in sexual behavior of plants
Lepidopteran larvae & plant structures, chemicals and behaviors
Birds & plant propagules
The serpentine plant phenomenon

Group field research project on ecology of a native grassland annual

Yes! I would like to join!

____ Student \$5.00
____ Individual \$10.00
____ Contributing \$25.00
____ Sustaining \$100.00
____ Lifetime \$1,000.00

____ Donation \$ _____

Name _____
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State _____ Zip Code _____
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E-mail _____

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California State University, Chico
Chico, CA 95929-0515
(530) 898-5381

ADDRESS SERVICE REQUESTED

UPCOMING WORKSHOPS
SPONSORED BY THE
FRIENDS OF THE BIOLOGICAL SCIENCES HERBARIUM
CALIFORNIA STATE UNIVERSITY, CHICO

INTRODUCTION TO KEYING CYPERACEAE. Lawrence Janeway.
December 8, 2001, Saturday.

INTRODUCTION TO KEYING CAREX. Lawrence Janeway.
February 9, 2002, Saturday.

IDENTIFICATION OF MOSSES. Dan Norris.
March 9, 2002, Saturday.

IDENTIFICATION OF SPHAGNUM. Dan Norris.
March 10, 2002, Sunday.

*** This list is also available at www.csuchico.edu/biol/Herb/Events.html ***
Check there for updates and additions to the workshop list.

TO REGISTER FOR WORKSHOPS:

Please make checks payable to:
"Friends of the Biological Sciences Herbarium"

include your name, address, and phone number and mail to:

Friends of the Biological Sciences Herbarium
California State University, Chico
Chico, CA 95929-0515

INTRODUCTION TO KEYING CYPERACEAE.
December 8, 2001, Saturday.

Although Cyperaceae has far fewer species in California than the largest plant families in the state, Asteraceae with about 750 species and Poaceae with about 430 species, it still has about 205 species in California and more than 3,600 species worldwide. Because of the genus *Carex*, the most speciose genus in California with about 135 species, the Cyperaceae tends to be avoided by many botanists. This workshop, led by Lawrence Janeway, curator of the Herbarium at CSU, Chico, is an introduction to keying the Cyperaceae, using *The Jepson Manual*. Dry, pressed material representing the major genera of Cyperaceae in California, and some of the smaller genera, mostly collected in northern California, will be provided for use by all members of the class keying together, each person with their own specimen and dissecting scope. Herbarium labels will be provided for those participants who would like to take home their sample material for later reference. Terminology for this notoriously difficult group will be explained and illustrated as it is encountered during the keying process.

Please bring forceps (tweezers – the sharper, the better), dissecting needle, 6" millimeter ruler, and a copy of *The Jepson Manual*.

The workshop will meet on Saturday, December 8, 2001, from 9:00 a.m. to 5:00 p.m. in Holt Hall room 129 at CSU, Chico. The registration fee is \$45.00 regular, \$80.00 corporate (\$35.00 for members). Please register in advance; class size is limited to 16 participants (class cancelled without a minimum of 5 participants). For more information about workshop content please contact Lawrence Janeway at <LJaneway@csuchico.edu> or (530) 898-5381. For information about registration or directions please call the Herbarium at (530) 898-5381.

INTRODUCTION TO KEYING CAREX.
February 9, 2002, Saturday.

The genus *Carex* (Cyperaceae) is by far the largest genus in California, with about 135 species in California and more than 1,000 species worldwide! This workshop, led by Lawrence Janeway, is an introduction to keying *Carex* using *The Jepson Manual*. Material of several species of *Carex*, mostly from northern California, will be provided for use by all members of the class keying together, each person with their own specimen; herbarium labels will be provided for those

participants who would like to take home their sample material for later reference. Terminology for this notoriously difficult group will be explained and illustrated as it is encountered during the keying process.

Please bring forceps (tweezers – the sharper, the better), dissecting needle, 6" millimeter ruler, and a copy of *The Jepson Manual*.

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IDENTIFICATION OF MOSSES.

March 9, 2002, Saturday.

Dan Norris returns to Chico with this one-day workshop on identifying the mosses of the three west coast states. In this workshop Dan will guide the participants through his keys to the mosses of California, Oregon, and Washington. These keys are unique among moss keys from almost any place in the world. They emphasize gametophytic characters to such an extent that every local moss can be identified to genus without the presence of sporophytes. Fewer than ten species require examination of sporophytes for determination. The reason for such emphasis is obvious: sporophytes are not always present. The handicap is that rather obscure microscopic features must sometimes be used. Introduction to the Norris keys may best be done in a classroom setting. This Chico workshop is one of several that Dan has been presenting over the past year and a half throughout northern California and Oregon.

Participants should bring fine-point forceps, dissection needles, microscope slides and cover slips, and single-edged razor blades.

The workshop will meet on Saturday, March 9, 2002, from 9:00 a.m. to 5:00 p.m. in Holt Hall room 129 at CSU, Chico. The registration fee is \$45.00 regular, \$80.00 corporate (\$35.00 for members). Please register in advance; class size is limited to 16 participants (class cancelled without a minimum of 5 participants). For information about registration or directions please call the Herbarium at (530) 898-5381.

IDENTIFICATION OF SPHAGNUM.

March 10, 2002, Sunday.

Dan Norris will guide participants in this workshop concentrating on the important and unusual moss genus *Sphagnum*. *Sphagnum* is the most ecologically important plant in many parts of the earth. It is the plant that blocks drainages and lowers the pH allowing the development of bog vegetation, including vascular, in many parts of the arctic. *Sphagnum* includes perhaps 300 species throughout the world, and the genus is variously divided into numerous sections. The course will emphasize the recognition of these various sections on a world wide basis, and it will emphasize the identification of those species of the genus native to the three West Coast states. Materials will be studied primarily on a compound microscope basis but hints will be given to the field recognition of the 17 species native to California. Lectures will cover the role of *Sphagnum* in the ecology of California wetlands.

Participants should bring fine-point forceps, dissection needles, microscope slides and cover slips, and single-edged razor blades.

The workshop will meet on Saturday, March 10, 2002, from 9:00 a.m. to 5:00 p.m. in Holt Hall room 129 at CSU, Chico. The registration fee is \$45.00 regular, \$80.00 corporate (\$35.00 for members). Please register in advance; class size is limited to 16 participants (class cancelled without a minimum of 5 participants). For information about registration or directions please call the Herbarium at (530) 898-5381.

FRIENDS OF THE BIOLOGICAL SCIENCES HERBARIUM

CALIFORNIA STATE UNIVERSITY, CHICO

Chico, CA 95929-0515

(530) 898-5381

The Friends of the Biological Sciences Herbarium, California State University, Chico, was formed to help maintain the high quality of work that has been known to be associated with the herbarium. The primary purpose of the group is to provide community support for the herbarium. This includes raising funds for items that are not covered under the University budget. Scientific and academic pursuits are the focus of the group. The Friends also offers low cost workshops and classes on various botanical topics.

At least half of workshop registration fees go to help support the Friends activities on behalf of the Herbarium. The corporate rate provides the opportunity for companies and agencies to demonstrate an added commitment to the Herbarium and its place as a valuable resource to the botanical community.

The Friends of the Biological Sciences Herbarium operates under auspices of the California State University, Chico, and enjoys non-profit status and has access to the use of University classrooms and equipment.