

# UC Santa Barbara

## Newsletters

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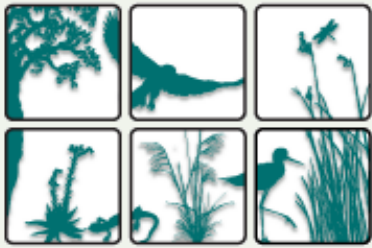
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# THE NATURE PRESS

CHEADLE CENTER FOR BIODIVERSITY AND ECOLOGICAL RESTORATION

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Click [here](#) to visit CCBER's newly launched website.

The Campus Flora Project had its beginnings in 1983 when Sherri Whitmore, a graduate student with Dr. Dale Smith, compiled a comprehensive list of the plants on campus for teaching and research.

## Director's Foreword

**Jennifer Thorsch**

The lifelong dream of former Chancellor Vernon I. Cheadle (1962-1977) of developing UCSB into an outdoor classroom has become a reality through the Campus Flora Project. Dr. Cheadle recognized the special opportunity and favorable circumstances of this botanically rich and unique environment and he took a personal interest in collecting and suggesting plant specimens for the campus.

Under the direction of two very talented and dedicated greenhouse managers in the Biology Department, Will Beittel (1954-1977) and John Bleck (1978-1992), the campus was planted with an incredibly diverse and unusual array of plants, creating an education tool as well as an environment of great beauty.

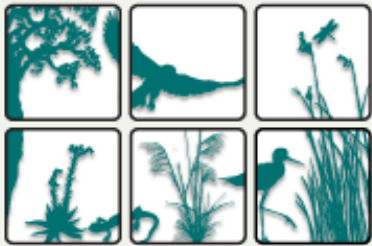
The Campus Flora Project had its beginnings in 1983 when Sherri Whitmore, a graduate student with Dr. Dale Smith, compiled a comprehensive list of the plants on campus for teaching and research. The plants have been a fundamental part of the outdoor classroom for students in a wide range of classes, including Dr. Bob Haller's popular Plants of California field botany class, Dr. Dale Smith's taxonomy course, and currently, Dr. Bruce Tiffney's angiosperm course and the flowers course he co-teaches with Hank Pitcher through the College of Creative Studies.



A botanical illustration of *Erythrina caffra*, a coral tree found on the UCSB campus. Artwork is by Oriana Connolly, a student in the CCS flowers course.

To learn more about the Campus Flora Project, please read the article in the Education section by Bree Belyea, Project Manager and David Norman, undergraduate assistant with the Campus Flora Project.

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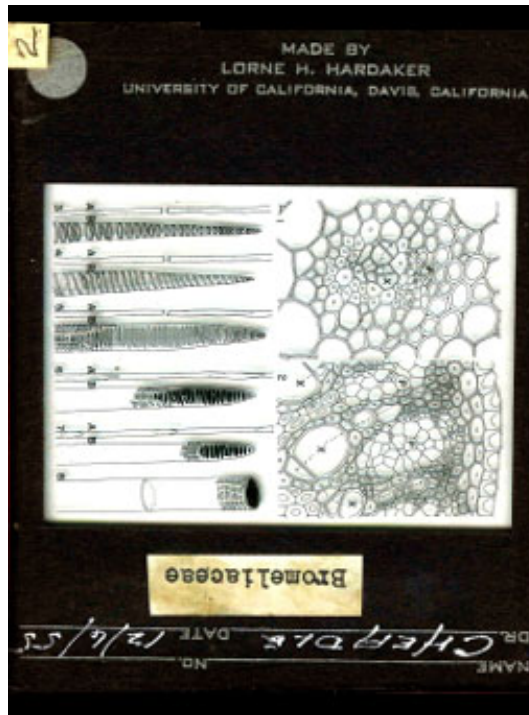
# Director's Foreword

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A lantern slide (precursor to 35 mm slides) from the Cheadle and Esau botanical collection. This slide prepared in 1955 shows line drawings of cells and tissues from the Bromeliaceae family.



A herbarium specimen collected by Vernon I. Cheadle in 1959 in Queensland, Australia. The specimen is *Cordyline stricta* in the Agavaceae family. Cheadle's research focused on the anatomical and phylogenetic specialization of water conducting cells in monocotyledons.

Continuing a tradition of generosity and visionary contributions to UCSB, the Cheadle family recently gave a significant donation for herbarium specimen cases and a compact storage system for our main herbarium. Their donation will provide matching funds for a National Science Foundation grant proposal we will submit this summer. The vascular plant herbarium houses approximately 100,000 sheets with a strong emphasis on local and ecologically sensitive plant communities. The collection includes materials from coastal wetland habitats in central and southern California, including both coasts of Baja California. In addition, the collection contains over 15,000 oak specimens collected by Cornelius H. Muller from western North America and over 2,500 specimens collected by Vernon Cheadle for his studies on water conducting cells in monocotyledons.

We have had a busy year. We recently launched [CCBER's new website](#), installed a Native American garden at the new Student Resources Building, began restoration on six acres associated with the San Clemente housing project, and hosted Kids in Nature, an educational outreach program for underserved elementary students in our local area. In collaboration with Sedgwick Reserve, CCBER worked with over 125 underserved 5th grade students from Santa Maria, Santa Ynez, and Los Alamos school districts. The students visited CCBER to learn about pollination, ethnobotany, plant anatomy, bioswales, birds, seeds, and dispersal. I invite you to read more about these exciting developments and ongoing programs in the News and Events section.

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The SMS will provide on-site natural filtration and treatment of 100% of storm and irrigation water before it enters local wetlands and the ground water system.

In addition to water quality improvement, the SMS will provide important wetland habitat for birds and other wildlife species.

## New Restoration and Enhancement Project

Melanie Powers

CCBER recently began work on the San Clemente Graduate Student Housing Habitat Restoration and Enhancement Project. The 5.6-acre project is located along El Colegio Road between Los Carneros and Stadium Road. It includes a Stormwater Management System (SMS), southern tarplant (*Centromadia parryi* ssp. *australis*) and vernal wetland conservation and enhancement, grassland and oak woodland restoration, and a coastal sage scrub border. All native plants for the project will be propagated from local genotypes at CCBER's greenhouse and nursery.

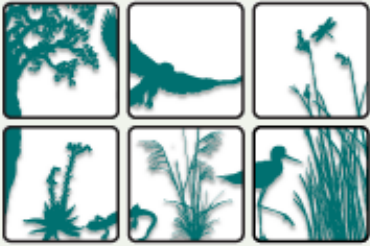
The SMS will provide on-site natural filtration and treatment of 100% of storm and irrigation water before it enters local wetlands and the ground water system. Storm and irrigation water collected from the 11.5 acre housing site will enter the SMS at a single drainpipe. Once the water enters the SMS, it flows through a series of swales and large detention basins. Native wetland species including sedges, rushes, and grasses will be planted in the basins. These plants and microbes in the soil will assist in the uptake of nutrients and help to break down other pollutants. Water monitoring of the inflow and outflow of the system will be conducted to determine the efficacy of the SMS. In addition to water quality improvement, the SMS will provide important wetland habitat for birds and other wildlife species.

During the initial biological survey of the site, a rare annual plant species, southern tarplant (*Centromadia parryi* ssp. *australis*), and three vernal wetlands were discovered. Southern tarplant is listed 1B.1 by the California Native Plant Society, meaning it is rare, threatened, and seriously endangered in California. Several patches of southern tarplant have been conserved, and we will be working to create new habitat for this species throughout the site. Three vernal wetlands, which contain few native species and many exotics, currently exist at the project site. We will be working to enhance the wetlands and wetland buffer areas by removing the exotic species and planting natives. The southern tarplant and vernal wetlands will be monitored over the next five years to determine if these areas meet the performance standards set forth by the California Coastal Commission.



The locally rare California native southern tarplant (*Centromadia parryi* ssp. *australis*) found at the San Clemente project site.

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# Ecological Restoration

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This project, along with CCBER's other management areas on campus, provides educational and research opportunities for UCSB as well as the local community.

## New Restoration and Enhancement Project – continued



CCBER staff installing coconut netting for erosion control in the storm water management system.

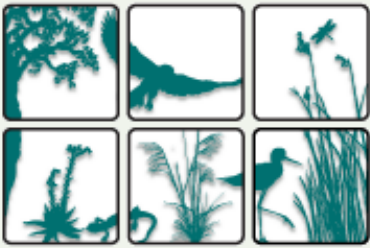
The upland area will be restored to grassland and oak woodland habitats. It is currently dominated by exotic species including annual grasses, mustard, fennel, and bermuda grass. Efforts are under way to remove the exotics using various techniques such as tilling, green flame, and manual methods. We will be conducting multiple grow/kill cycles to reduce the weed seed bank. This area will be planted with native grassland species, primarily purple needle grass (*Nassella pulchra*), and native forbs and shrubs. In addition to the grassland, a small coast live oak woodland will be planted around an existing coast live oak tree (*Quercus agrifolia*). A post and cable fence and coastal sage scrub shrub border will be installed around the project as well as a small trail to allow visitors access to the site. After the plants are established at the project site, there will be no supplemental irrigation required.

This project, along with CCBER's other management areas on campus, provides educational and research opportunities for UCSB as well as the local community. Students from UCSB can receive course credit by interning during project implementation. They will get hands-on experience in the field of restoration ecology by assisting with planting, exotic species removal, seed collection, plant propagation, ecological monitoring, and site maintenance. If you would like more information about this project, please contact [Melanie Powers](#).



Water retention in the storm water management system following the first winter rains.

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# Education

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## Barbareño Chumash Heritage Garden

Wayne Chapman

One of the best things about restoring native ecosystems and planting native plants on campus is the benefits they bring to our local landscape and wildlife. Equally interesting and important however, is the fact that these plants have great meaning to people as well. And no group of people knows the value of these plants better than the Coastal Band of Chumash Indians. For thousands of years, diverse groups and cultures now collectively known as the Chumash have called this region of southern California home. Of all the diverse cultures and places included within the historic Chumash range, it was the Coastal or Barbareño Band who had the grandest historic villages and towns, with permanent settlements of over 1000 people each. These were all centered around Goleta Slough, and one of these, the town of Heli'yuk, sat squarely on campus.



An assortment of plants native to the area, all with special significance to the Coastal Chumash, are on display at the garden.



Mortar bowl, acorn meal, and soap lily fiber brush.

The Cheadle Center for Biodiversity and Ecological Restoration recently had the honor of installing the Barbareño Chumash Heritage Garden, in association with the American Indian Cultural Resource Center, located outside the new Student Resource Building. Organically grown from locally collected seeds, a sample of our wild heirlooms, all with special significance to the Chumash, are now on living display at the garden. Along with the garden, interpretive signage graciously edited by Barbareño Chumash ethnobotanist Julie Cordero-Lamb is soon to follow.

Among the plants installed are what the Chumash call *shtemelel* or giant rye grass (*Leymus condensatus*), *kapshik* or white sage (*Salvia apiana*), *mexme'y* or basket rush (*Juncus textilis*), '*onchochi* or yerba mansa (*Anemopsis californica*), and *tok* or dogbane (*Apocynum cannabinum*). Come in the middle of the day and you still have time to catch spring wildflowers in bloom; redmaids (*Calindrinia cilliata*) are one of these. Called *xutash* in Barbareño Chumash, the seeds of these plants were once a highly prized staple food. When the grave of a Chumash child was excavated on Mescalitan Island (at the current site of the Goleta wastewater treatment plant) a basket full of these seeds was found placed inside.

If you visit in the afternoon or evening, when the shadows hit the garden, you will see the *xutash* and poppies closing their flowers for the night. It is at this time the creamy white flowers of *sto'yoc*, or soap lily (*Chlorogalum pomiderianum*), are just beginning to open. Pollinated by moths, these beautiful native lilies advertise when the day is ending, lending an ever-changing look to the garden as distinct as the seasons. This plant, like the others, has many uses. From the crushed bulb a soapy lather can be derived, which is good for washing. Cooking the edible bulb slowly removes the soap, and the brown liquid that emerges in the cooking process is useful as glue. From the fibrous husk that surrounds the bulb, brushes are made--brushes that swept acorn meal from many mortars, for thousands of years, right here on campus. Our campus now has one more patch of native vegetation to remind and educate students, staff, faculty, and visitors about the heritage of this place.

Of all the diverse cultures and places included within the historic Chumash range, it was the Coastal or Barbareño Band who had the grandest historic villages and towns, with permanent settlements of over 1000 people each.

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# Education



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## Campus Flora Project Update

**Bree Belyea**

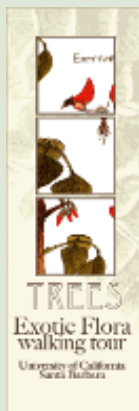
UCSB exhibits a very special collection of trees. The mild Mediterranean climate of Santa Barbara provides the opportunity to grow plant species from many varied habitats. The monkey's hand tree (*Chiranthodendron pentadactylon*) which grows at 7000 to 10,000 feet elevation in its native Mexico, can be found on campus along with *Quercus agrifolia*, a California native oak found along coastal areas.

There is also a wide range of species with different water requirements, from drought-adapted desert plants like mesquite to *Melaleuca linariifolia*, an Australian tree that thrives in swampy soils. Some of UCSB's plant specimens have value because of their rareness within the state. One tree (*Eucalyptus crenulata*) is not known to exist anywhere else in California. Specimens of another eucalypt (*Eucalyptus pruinosus*) are only found here at UCSB and at the Los Angeles County Arboretum and Botanic Garden.

In 2006, the Cheadle Center received funding from the Elvenia Slosson Foundation to initiate the Campus Flora Project. We have just completed the first year of the project, and over 1500 plants have been identified, mapped, and catalogued. A brochure called *Trees: Exotic Flora Walking Tour*, has been produced to help people locate thirteen distinctive trees from six continents, and this summer, guided tours that follow the path will occur once a week for Family Vacation Center guests. Several academic departments have already used the data gathered in the project to augment their class materials.

The project has received full funding for a second year of the project. Goals for year two include: 1) an interactive web map and database that will allow users to customize their own tour of campus plants; 2) an additional 2000 plants mapped and added to the database; and 3) new brochures with walking tours of the palm collection and medicinal plants on campus. The new interactive map and database will launch before the end of the year on CCBER's new web site, and the [walking tour brochure](#) can be downloaded from there as well.

The Campus Flora Project offers unique opportunities for student workers and interns to become involved — providing employment, education, and skills that can be applied to a variety of future endeavors. Our project provides the opportunity for the campus community and visitors to learn about and enjoy our botanical resources. For additional information contact [Bree Belyea](#).



A new brochure, *Trees: Exotic Flora Walking Tour*, has been compiled to allow thirteen distinctive trees from six continents to be located on the UCSB campus.

An interactive web map and database will allow users to customize their own tour of campus plants.



Cork Oak (*Quercus suber*), located directly to the left of Davidson Library.

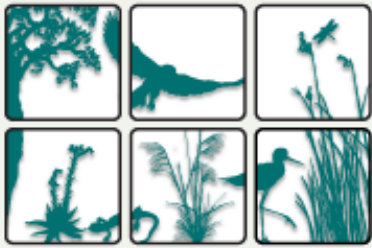


Mediterranean fan palm (*Chamaerops humilis*), located on the western edge of the University Center Courtyard.



Norfolk Island Pine (*Araucaria heterophylla*), located along the bike path, between HSSB and the Arts Building.

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## Restoration Ecology Seminar Series

Weekly seminars are open to the public and occur every Monday from September to May at 6 PM in CCBER's classroom. The topic for fall quarter 2007 is "Fire and Native Plant Communities: History, Ecology and Management."

Contact [Lisa Stratton](#) for more information.

## Native Habitats Garden at Manzanita Village

George Thomson



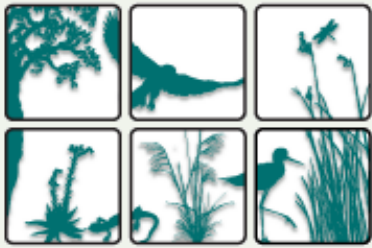
One of the Habitat Garden signs located at Manzanita Village.

... five native plant communities — coastal dune, oak woodland, coastal sage scrub, vernal wetland, and grassland ...

Visitors to CCBER's six-acre restoration site at the Manzanita Village dorms can now enjoy a small educational garden designed and installed by CCBER staff. The garden features five native plant communities — coastal dune, oak woodland, coastal sage scrub, vernal wetland, and grassland — each with a colorful and informative sign describing the habitat and notable species. The interpretive signage is the first in a series CCBER will install throughout the campus to highlight unique natural areas, restoration sites, and natural history at UCSB. In the meantime, please come enjoy the new garden and signs at the northeast corner of the Manzanita Village site!

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## The Algal Collection

David Chapman

The world of seaweeds is dynamic and diverse, and our algal collection is a perfect illustration of that world. The algae collection at CCBER serves as a key support function for those involved in biodiversity, ecology, and biogeography. The algal herbarium consists of nearly 6500 specimens. Approximately 85% come from countries of the Pacific Rim: the western United States, Chile, Pacific Mexico, South Australia, Queensland, New Zealand, and Japan. The remaining 15% come from the eastern United States, Jamaica, Britain, Scandinavia, continental Europe, and South Africa. The collection also includes specimens from the Santa Barbara Museum of Natural History on permanent loan, and duplicates of specimens held in other foreign institutions, e.g. University of Adelaide (Australia), University of British Columbia, Institute of Jamaica, and University of Goteborg (Sweden). The Holmes diatom collection, also housed in the algal herbarium, is an invaluable depository of diatom biodiversity from many lacustrine and oceanic environments from which former UCSB professor Robert Holmes collected.



*Undaria pinnatifida*\*

*Botryocladia pseudodichotoma*

*Plocamium pacificum*

*Callophyllis Plabellulata*\*\*

\* In Japan, this common kelp is known as "Wakame." In the last 25 years it has been accidentally introduced to Australia, New Zealand, France, Great Britain, Argentina and Southern California.

\*\* Sea comb is the preferred diet of the Sea Hare. The red pigment in the seaweed is the source of the purple ink secreted by the Sea Hare.

Besides being wide-ranging geographically, the algal collection is diverse in terms of the time frame over which the collections were made. The Santa Barbara collection of Lorenzo Gordon Yates in the late 1800s is the first collection from this area. The California collection spans the last 80 years, while many other specimens come from collections made predominantly in the middle of last century. The algal collection also boasts three exsiccatae sets from New Zealand, Scandinavia and British Columbia. Such sets are very valuable because they frequently represent baseline collections for early algal floras of a region. Also in our herbarium are collections that formed the basis for published algal floras of such regions as Jamaica, Oregon, Virginia, and California (the earliest published flora).

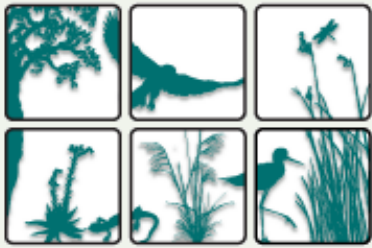
With the vast range of Pacific rim collections, the algal herbarium is a valuable resource for anyone interested in biodiversity changes over time, potential seaweed invasions, and localized areas for which we have specialized voucher collections. While our collections certainly have taxonomic value, mainly for identification purposes, their significance and usefulness will increase as research expands into non-taxonomic realms. The collections are already an integral part of the teaching program, giving students an opportunity to learn about and observe biodiversity, structural variations, and adaptations to various environments.

The collection is continually growing, and is estimated to increase by about 1500 specimens over the next ten years. This would include not only general biogeographic collections, but also special voucher collections, such as the invasive Wakame kelp, *Undaria*, as it continues its expansion throughout the southern California region.

The collection is continually growing, and is estimated to increase by about 1500 specimens in the next ten years.

With the vast range of Pacific rim collections, the algal herbarium is a valuable resource for anyone interested in biodiversity changes over time, potential seaweed invasions, and localized areas for which we have specialized voucher collections.

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# Biodiversity Field Notes

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## Natural Areas Monitoring

**Mark Holmgren**

Does restoration really work across all trophic levels? We are certain that we can enrich the plant community in natural areas, but does restoration work for the animals and for the ecosystem as a whole? These questions are the focus of CCBER's Natural Areas Monitoring Program at western Goleta Slough, the Campus Lagoon, and along the North Bluff bordering Goleta Slough. Monthly surveys focus on two issues. We document the animal activity on the land before we begin a project and secondly, we look for the responses of birds and mammals during and after restoration. While we have not yet gotten the complete answer, some recent observations are intriguing.

Say's Phoebe is a very uncommon breeding species anywhere in Santa Barbara County. Although this species is common here in winter, breeding Say's Phoebes are typically found in sunny arid canyon lands or grasslands. However, this year we found a nest on April 17 west of Los Carneros Road, a wetland remnant of Goleta Slough where CCBER staff have been involved in vegetation enhancement. Once tidal, this area has been closed to tides for more than eighty years. On May 1, the breeding pair was seen carrying food taken from these wetlands to their nestlings.



Say's Phoebe

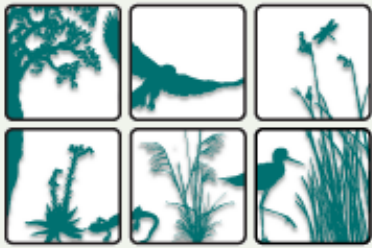
From the same marsh area, a male Tricolored Blackbird flew into the bulrush, sang twice, and then two minutes later, it flew south out of the marsh. In my twenty-three years here, I've never seen a Tricolored Blackbird in a breeding situation on the south coast of Santa Barbara County. Although Tricolored Blackbirds formerly bred on Goleta Slough in the 1970s, they are now listed by the State of California as a species of special concern. We'll continue to look, but we do not expect breeding at this site. Possible breeders here are a Virginia Rail, heard on May 18, and a Sora, seen on May 17. Both are exceedingly rare breeders along the south coast where our wetlands are small and usually dry up by the time the breeding urge hits most wetland species.

**We document the animal activity on the land before we begin a project and secondly, we look for the responses of birds and mammals during and after restoration.**



A nest was found west of Los Carneros Road, a wetland remnant of Goleta Slough.

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## Natural Areas Monitoring ...continued

Campus Point is the best place to see the migration of shorebirds and seabirds, which is by far the most dramatic animal migration available to us in this part of California. From late March to early June, huge numbers of seabirds funnel into our region as they approach Pt. Conception on their northward journey. Some species trickle while others flood past Campus Point. The species seen in largest numbers are Surf Scoter, Brant, Red-throated and Pacific Loon, and California Gull.



A large flock of Brant flying past Campus Point, April 20, 2007.

The shorebirds are more likely than the seabirds to use our restoration areas. For example, shorebirds rely on the three sand dune “depressions” that interrupt the otherwise continuous bluff-backed beaches bordering Campus Lagoon. These depressions offer shelter when the wind is intense or storms rage. CCBER has been working on restoring native plants to these once iceplant-infested areas. On the late afternoon of April 18, Kyle Braunger noted 1000-1500 Western Sandpipers, along with Dunlin and Semipalmated Plovers, hunkering down in the very strong winds on the beach between Campus Point and the Marine Sciences Building. On May 15, several common migrant species were seen during a Campus Lagoon survey: Olive-sided Flycatcher, Yellow Warbler, Western Tanager, and Warbling Vireo.



Western Sandpipers sheltering on the beach between Campus Point and the Marine Sciences Building, April 20, 2007.

Our campus monitoring is greatly enhanced by the observations of our on-campus naturalists in other departments. Thanks go especially to Florence Sanchez, Patrick McNulty, and Dan Fontaine for their contributions to our knowledge of birds and mammals in our restoration zones and elsewhere on campus.

**On the late afternoon of April 18, 2007, Kyle Braunger noted 1000-1500 Western Sandpipers, along with Dunlin and Semipalmated Plovers, hunkering down in the very strong winds on the beach between Campus Point and the Marine Sciences Building.**



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This is the third record ever in Santa Barbara County for this species.

## Rare Species Sighting

Wayne Chapman

You never know when you'll see something out of the ordinary.

This May, CCBER nursery manager Wayne Chapman was out hiking in the Santa Ynez Mountains when he came across a bird he did not recognize. Carefully, he managed to get close enough to the bird to snap a few photographs of it, which he sent to our vertebrate curator and ornithologist, Mark Holmgren.

After some speculation, Mark sent the photographs around to other birders, and it was tentatively identified as a one-year-old Mississippi Kite. If so, this is the third record ever in Santa Barbara County for this species. The first record was a male shot June 18, 1933 near Goleta, and the second was a bird seen June 3, 1970. The same week in late May of this year, another Mississippi Kite was seen in Los Angeles County.



Mississippi Kite

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## Natural Enemies of Giant Reed (*Arundo donax*)

Tom Dudley and Adam Lambert

River systems in California depend on periodic natural disturbance, in the form of seasonal cycles of flood scouring, to encourage the development of native riparian woodlands. These woodlands can provide essential wildlife habitat, filter out pollutants that enter waterways, and ameliorate the impacts of flooding and wildfire. The Santa Clara River represents one of the few remaining major waterways in southern California that retains the capacity to support well-developed riparian forests, but at the same time it is one of the systems most affected by invasion of the non-native weed, *Arundo donax*. Also known as giant reed, this bamboo-like grass has overwhelmed native plants from well upstream of Santa Clarita down to the Santa Clara Estuary. *Arundo* has promoted destructive wildfires, its debris clogs riverbanks and beaches, and it is known to be very poor habitat for birds and other sensitive species. Many control efforts have been undertaken using various combinations of mechanical cutting and herbicide treatments. These can be effective if done right but are extraordinarily expensive, as well as disruptive, to nearby native habitat. The results are generally temporary--the next floods distribute the fibrous rhizomes downstream where they re-grow if moisture is sufficient, and the problem repeats itself.



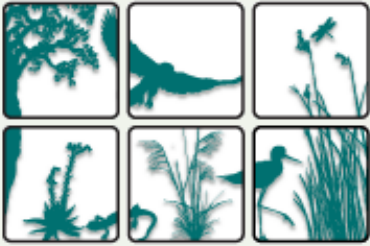
Alan Kirk, Tim Widmer (USDA European Biological Control Lab), and Dudley sampling for natural enemies of *Arundo* in Nepal, and using unusual field vehicle for transportation to study sites.

The Santa Clara River represents one of the few remaining major waterways in southern California that retains the capacity to support well-developed riparian forests, but at the same time it is one of the systems most affected by invasion of the non-native weed, *Arundo donax*.

An alternative approach to weed management is the introduction of natural enemies (or herbivores) that feed on the plant in its region of origin, in this case a broad zone from the Mediterranean across to the Indian sub-continent. A collaborative program involving the USDA Agricultural Research Service and various universities is underway to find and develop such biocontrol agents. Overseas co-operators headed by Dr. Alan Kirk of the USDA European Biological Control Lab in France (photo) have identified a variety of organisms--a stem-boring wasp, several species of stem damaging fly larvae, and a rhizome-feeding scale insect--that inflict substantial damage to plants in Europe and appear to feed only on *Arundo* without undue risks to native grasses or economic plants. Just this year some of these insects were transferred to a quarantine lab in Texas under the direction of Dr. John Goolsby, so that their impacts, specificity to the target weed, and suitability for handling could be further tested.

At the same time, weed biocontrol now involves an exhaustive analysis of the environmental and economic impacts of a weed and the benefits resulting from its control, in order to justify future implementation of the biocontrol program. Part of this includes determining if organisms already in the infested environment can have effects on the weed. These existing "enemies" can be harnessed to do greater damage to the weed, in this case *Arundo*.

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...we have recently discovered at the Santa Clara River a stem-boring wasp that turns out to be the very same species, *Tetramesa romana*...

## Natural Enemies of Giant Reed (*Arundo donax*) - continued

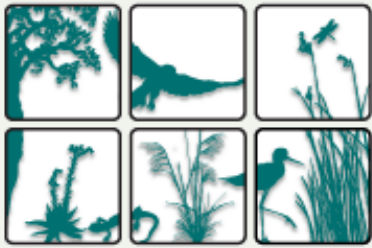
We have been studying these relationships over the past year through a grant from the Santa Clara River Trustee Council, coordinated by Dr. Adam Lambert, a post-doctoral researcher with UCSB's Marine Science Institute and overseen by Denise Steurer of the Ventura field office of the U.S. Fish & Wildlife Service. Besides the ecological and mapping information being developed, we have recently discovered at the Santa Clara River a stem-boring wasp that turns out to be the very same species, *Tetramesa romana*, that USDA is working with in its quarantine programs to see if it is suitable for introduction!

We now have an excellent opportunity to learn more about the biology of this insect and under conditions much more realistic than can be simulated in the quarantine lab. In California, *T. romana* has so far only been found from southern Santa Barbara to San Diego County, and does not appear to be present in many other *Arundo* stands statewide. Field studies will continue to verify its distribution.



Several photos showing the stem-boring wasp, *Tetramesa romana*, and its damage to *Arundo* stems.

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## Natural Enemies of Giant Reed (*Arundo donax*) - continued

Presumably this is not a native species, but perhaps was a hitch-hiker on *Arundo* when it was transported by Spanish settlers, although the wasp's currently limited distribution may suggest that it's a more recent arrival in the New World. Its larvae feed on the smaller diameter stems and shoots of *Arundo* (see photos), sometimes in numbers as high as a dozen or more larvae in a 10 cm section of stem. Mature wasps then vacate the plant, leaving small exit holes, which makes it fairly easy to see if the insect is present in a stand. The 4 mm long adult wasp lives outside the plant, and females insert their eggs into the stem of the plant. This life cycle can be repeated twice or more in one year. The adult population consists almost entirely of females, and since they do not need males for insemination, the potential for population growth can be quite large. In addition, the resulting damage fosters secondary infection by bacteria and other organisms that inflict further damage to the plant, sometimes killing the whole stem.



*Arundo* in France, showing much greater degree of stem death and poorer growth, than in California populations.

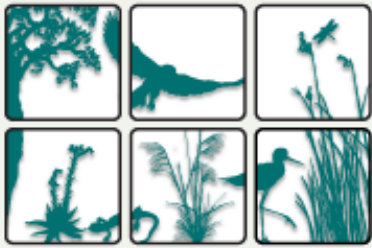
Initially one would suspect that since this herbivore is present, and so is a LOT of *Arundo*, that it must not be able to do a very effective job of controlling the host weed. However, mass rearing could allow us to produce much larger numbers of insects than normally are present in nature. The insects could then be distributed to attack more plants. There also may be means for enhancing the infections by promoting the microbes that cause the secondary damage. However, our best chance for biocontrol success may lie in bringing in additional insects, and hopefully specialized disease organisms as well, to knock out this extremely noxious plant.

Because this is an ongoing and very active research program, we are interested in hearing from any observers whether they have seen evidence of this wasp, or other organisms causing damage to *Arundo* anywhere in the region. Further information on the program is available at our [website](#), including information on a parallel biocontrol program for tamarisk or saltcedar (*Tamarix ramosissima*). Email [Tom Dudley](#) or [Adam Lambert](#).

Because this is an ongoing and very active research program, we are interested in hearing from any observers whether they have seen evidence of this wasp, or other organisms causing damage to *Arundo* anywhere in the region.



Damage caused by a shoot-fly that also feeds inside *Arundo* stems.



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## Announcements

**CCBER Announces New Website:** We are proud to announce our newly developed website, located at <http://ccber.lifesci.ucsb.edu>. Kelly Campbell, our Interpretation Coordinator, and the Center faculty and staff have created an elegant array of all new pages beautifully illustrated with many specimens and images from CCBER's collections of natural history.

You will soon be able to search CCBER's library collection through its online catalog. Approximately 2,200 books and technical reports have been catalogued, and many of our archive collections of papers and photographs will be catalogued in the coming year. We also have been adding our herbarium specimens to the statewide Consortium of California Herbaria database, located at UC Berkeley. These are now directly searchable through the link on the [Vascular Plants](#) page.



## Awards and Grants

**Hutton Foundation** has awarded another year of funding to support the inclusion of Joel Mason's fifth-grade class from Olga Reed School in the Kids in Nature program for 2007-2008. Hutton's grant will provide the participating class with a year-long dynamic combination of hands-on, inquiry-based classroom activities, interactive custom-designed computer simulations, and field trips to UCSB's Cheadle Center for Biodiversity and Ecological Restoration and to Sedgwick Reserve, one of seven natural reserve sites managed by UCSB. The activities focus on environmental science, botany, ecology, and habitat restoration.

The Stormwater Management System (SMS) portion of San Clemente Graduate Housing received the 2007 **Best Practice Award for the Energy Efficiency Partnership Program** in the category of Sustainable Efforts for Water Efficiency/Site Water Quality. The Best Practice Awards are an annual awards program that recognizes outstanding energy-efficiency, green building, and sustainability projects on the UC and CSU campuses. CCBER staff assisted in the design and they are currently working at the site and planting native wetland and upland species.

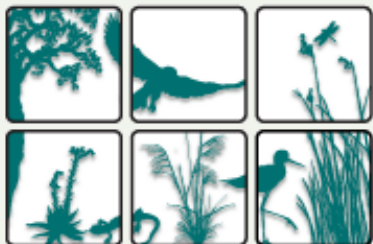
**The Campus Flora Project** has received a second year of funding from the Elvenia Slosson Foundation to continue to identify and georeference the unique and interesting plants on campus, prepare additional exotic flora walking tour brochures, and develop an interactive map.

**Vandenberg Air Force Base Contract:** For the 12th year in a row, the Vertebrate Collections staff, Mark Holmgren and curator Steve Rothstein, have received a contract to conduct bird studies on Vandenberg. The focus this year is to detect breeding by the state and federally endangered Southwestern Willow Flycatcher, *Empidonax traillii extimus*. The range of this subspecies covers parts of Arizona, southern California, and southern Nevada. The small population on the Santa Ynez River between the ocean and Buellton is the western-most in its range. We will also examine the management options that will allow VAFB to best manage its riparian resources.

For CCBER merchandise, please [click here](#).

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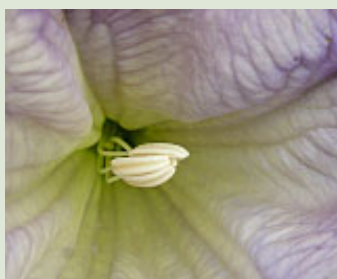
## Awards and Grants – continued

In July 2006 CCBER was awarded a **Wetland Recovery Program Grant** for \$24,000 to enhance the wetland and wetland edges at West Storke Wetland, located between Santa Ynez and Storke Family Housing. This project supported two paid interns, staff oversight, and monthly bird surveys of the site. Additional activities included small scale grading, weed control (ice plant, Harding grass, fennel and Italian thistle), and native planting.

CCBER recently completed the implementation of a \$100,000 **Campus Lagoon Planning grant** funded by the California Coastal Conservancy. This project involved over 20 students in research projects ranging from hydrological assessments with index wells to identification of benthic invertebrates and interpretation of ten years of bird survey data for the lagoon. The results include plans for a staircase up to Campus Point from the east beach, vernal pools on Campus Point, a freshwater wetland below De La Guerra Dining Hall and the restoration of Lagoon Island with native coastal sage scrub and oak woodland plants. The next step is to find funding for this project.

**Shoreline Preservation Fund** has been a big supporter of CCBER this year (over \$15,000). We've received support for five interpretive signs and nine quarters' worth of student interns for three different projects: dune restoration, lagoon water quality, and an evaluation of shorebird habitat parameters, including benthic invertebrates, bathymetry, bird use, and soil type.

CCBER has been awarded a **2007 Museum Assessment Program** grant from the American Association of Museums. The MAP program, which consists of a self study and peer reviewed site visit will help us improve our collections and their management over the next two years. We will incorporate the results into our long-range strategic plan.



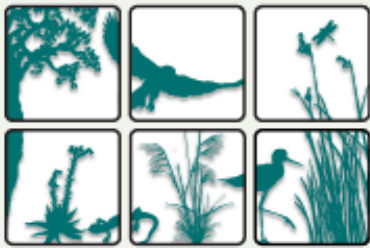
CCBER's nature cards feature photos of local plants and animals.

## CCBER Publications and Products for Sale

The third edition of *Native Plants & Habitats of the UCSB Campus* was released early this year. Produced by the CCBER staff, it features descriptions of seven habitats and 57 plants that can be found on the UCSB campus with full color photographs of each plant. This is a great resource for anyone interested in learning about California native plants both on campus and in the coastal areas of our region. \$14.55 (incl. tax). Please contact [Ben Reder](#) for purchasing information. **Nature cards** featuring photos of local plants and animals are available for sale individually for \$3.23 each or in packaged sets of 6 cards for \$19.40 (incl. tax). A new selection of **CCBER T-shirts** in several colors will soon be available in both men's and women's sizes. Contact [Jennifer Thorsch](#) to place an order! All items are available at the Cheadle Center, and books and cards are also for sale at the UCSB bookstore in the UCEN. Proceeds from all sales benefit the Center's Restoration Ecology Program.



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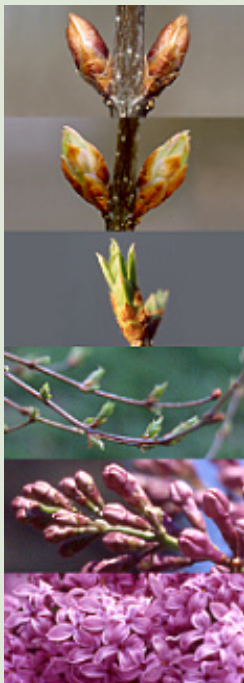
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Download a variety of classroom materials for all grades [here](#).



*Syringa chinensis*,  
'Red Rothomagensis'  
phenological events from  
buds bursting to full bloom.

## Project Budburst

**“Project Budburst” and the National Phenology Network:** Phenology is the timing of seasonal events such as bud break, germination and flowering time: well-known indicators of the arrival of spring. The study of phenology has occurred for centuries and has been practiced by people of all walks of life. For example, phenological clues to the onset of spring have been used by farmers to guide them in the selection of sowing dates that are likely to maximize crop production. Today, phenological patterns are used to track the effect of climate change on plants and animals, to anticipate wildflower displays (and allergies), to make predictions about fuel loads and wildfires, and to plan the best time to plant our gardens.

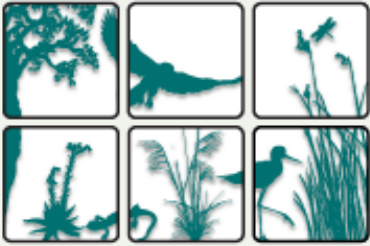
A consortium of scientists and educators throughout the U.S. are initiating the first National Phenology Network (NPN) in the U.S. The NPN is dedicated to fulfilling a range of both educational and scientific objectives. Primary scientific objectives of the NPN include using long term phenological patterns to detect the effects of climate change on the function of plant communities. In addition, scientists aim to detect correlations between the onset of spring, the length of the growing season, availability of water in streams and lakes, and phenomena such as wildfire intensities, plant invasions, weed and pest outbreaks, allergy intensity, and rodent population dynamics (along with the diseases they carry).

Educational objectives include training and involving students, teachers, docents, land stewards, and community members in the collection and contribution of phenological data to a growing national database. Amateur naturalists in Europe and Canada have an impressive history of recording — and making available to the public — the flowering dates of many wild plant species; indeed, the comparison of historical and current flowering dates has been a critical way to demonstrate the direct effects of climate change on plants. To date, the U.S. has remained far behind, and most students (from K-12 through college) remain unaware of how sensitive plants and animals are to climate and to sustained climate change. In response, PhD student Brian Haggerty (Mazer lab, Department of Ecology, Evolution & Marine Biology), with funding from UCSB's Shoreline Preservation Fund, has designed and implemented a training program for UCSB undergraduates to participate in the long term phenological monitoring of fifteen species at the Coal Oil Point Natural Reserve. This spring, Brian trained UCSB students to use CCBER herbarium specimens to track the phenological effects of climate change over the last 100 years in the Santa Barbara region.

UCSB Ecology and Evolution professor Dr. Susan Mazer is co-director of NPN's Education, Citizen Science, and Outreach committee with Dr. Carol Brewer (University of Montana). This past spring, the committee established a web site targeting the participation of students, teachers, native plant societies, botanic gardens, and natural reserves. The effort is called "Project Budburst," and the website <http://www.budburst.org> went live on April 1, 2007. The website presents and solicits phenological data in a way that is user-friendly both to novices and to amateur botanists, and there are a variety of downloadable classroom materials for teachers of all grade levels. Project Budburst and the NPN invites community members of all ages to subscribe to Project Budburst (it's free!), to observe the phenological progression of any plant species (including those that are on our national species list), and to contribute their observations to the Project Budburst website.

Dr. Mazer is also Co-PI with Dr. Mark D. Schwartz of the University of Wisconsin, on a newly awarded NSF "Research Coordination Network" grant (\$500K) to continue to design and to implement the NPN in collaboration with researchers aiming to integrate the fields of community ecology, hydrology, climatology, remote sensing, cyberinfrastructure, and citizen science. Project Budburst is a collaborative effort of: the University of California, Santa Barbara; the University of Wisconsin, Milwaukee; the University of Montana; the Chicago Botanic Garden; the University of Arizona; the University Consortium of Atmospheric Research; and the European Phenology Network. (Photos by Prof. Mark D. Schwartz, Courtesy of University Consortium of Atmospheric Research.)

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# Getting Involved



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## CCBER Provides a Unique Opportunity

**Janet Myers**

The Cheadle Center for Biodiversity and Restoration Ecology provides a unique opportunity for students, interns, volunteers, and researchers of all ages to gain theoretical and hands-on experience in the varied aspects of ecological restoration. Over the past year CCBER staff has worked with over 300 individuals on such projects as the maintenance and upkeep of the natural areas to mounting herbarium specimens and organizing our expanding collection.

With a core staff of twelve, we rely heavily on the support of our student interns, student assistants, and volunteers to complete daily activities and longer term goals for our natural areas. More projects are on the horizon, and we are always looking for willing participants to strengthen our team and the effectiveness of the work we do. For more information on CCBER's volunteer and internship opportunities, visit the Center's [website](#).

**Manzanita Village** - Approximately ten acres of oak woodland, coastal sage scrub, native wetland and grassland habitats were planted in 2002 as mitigation for new student housing. To get involved in maintaining and restoring Manzanita Village, contact [Jan Myers](#).

**San Clemente** - To mitigate the effects of the newly constructed graduate student housing, the seven-acre San Clemente Project site was developed. The intent of the project is tri-fold: to remove non-native plant species, restore large sections of southern tarplant (*Centromadia parryi* ssp. *australis*), and filter run-off from the housing complex through a series of storm water management basins before it makes its way to the ocean. To get involved in this innovative new project contact [Dave Harris](#).

**Campus Lagoon** - A combination of mitigation funding and funding from Housing and Residential Services have contributed to several large restoration projects around the lagoon, including the creation of salt marsh islands and shallow areas for shore birds, coastal sage scrub, coast live oak woodland, freshwater wetland habitats and two acres of sand dune habitat. To get involved in this hands-on restorative effort, contact [Darwin Richardson](#).

**North Bluff** - Established in 1996, the North Bluff area is used for ecological restoration, scientific research, and teaching. It is unique in the fact that it contains the only coast live oak woodland on the UCSB campus – a fragment of a much larger historical oak woodland. To get involved in restoring and maintaining North Bluff, contact [Darwin Richardson](#).

Over the past year CCBER staff has worked with over 100 individuals on such projects as the maintenance and upkeep of the natural areas, the mounting of herbarium specimens, and the organizing of our expanding collection.

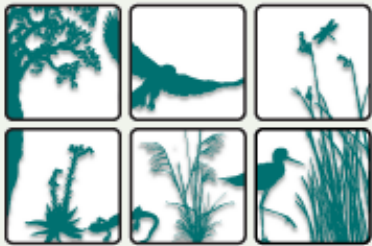
We are always looking for willing participants to strengthen our team and the effectiveness of the work that we do.



Ashlan Alldredge setting up our bird habitat island with two other interns.



CCBER interns planting native dune species within dead iceplant at East Depression.



# Getting Involved



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## Intern Profile

**Casey Peters**

I became involved with the Cheadle Center for Biodiversity and Ecological Restoration in the fall of 2005. It was my first term at UCSB, and I had just recently moved to the area. I came to the Center to attend a seminar on restoration and quickly began volunteering with the CCBER restoration program in the natural areas on campus. I had always been interested in ecology and restoration, but I had no idea how much fun and rewarding it could be working on actual projects. I became familiar with many native plants, and the characteristics of the local plant communities.

The staff and volunteers at the Center are all wonderful people. I have never experienced anything but kindness and generosity. It is a community of people who love what they do to make UCSB a more beautiful and ecologically diverse place. I feel honored to be a part of that.

Through my involvement at the Center, I have had the good fortune of working independently on two projects. The first project was to develop a restoration plan for a potential wetland on the UCSB campus. The proposed area is currently dominated by an invasive grass, but it is evident that there is a strong freshwater influence. The goal of my project was to assess the feasibility of restoring this area to wetland by comparing the depth of its water table to that of an existing restored wetland. If it is determined that this area is an appropriate target for wetland restoration, the knowledge of the water table levels can be used to develop an effective grading plan.

During the summer of 2006, I completed a second project addressing resource use for management of both conventional and restored landscapes on campus. The project examined the environmental impact of resource consumption, such as water, fuel and toxic chemicals, and proposed ideas for lessening the impact. In doing this, it was important to identify the services that the land provides to the University and community, and how these needs are currently met. I recommended that a better monitoring regime for resource use could be devised to set and achieve sustainability goals. I also suggested that by implementing restoration practices in areas with conventional landscaping, and by better integrating conventional and restored landscape types through the use of bioswales and other buffers, the campus could further reduce its impact on the environment.

Working at the Center has been an educational experience that rivals anything I have done in a classroom. The satisfaction of participating in a restoration project as it progresses from conception to completion is immense. The skills and knowledge gained from this experience will serve me for the rest of my life. I am grateful that this amazing program exists here at UCSB.

**Working at the Center has been an educational experience that rivals anything I have done in a classroom.**

**The satisfaction of participating in a restoration project as it progresses from conception to completion is immense.**

**The skills and knowledge gained from this experience will serve me for the rest of my life.**



Casey Peters installing index wells to evaluate the hydrology of a potential native wetland.

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## Hellos and Goodbyes

**Ashlan Alldredge** has been a student intern and worker for the Center all year. This summer, after his graduation, he will be working with CCBER full time, growing wetland plants for the new North Parcel project. We are fortunate to have been able to work with this enthusiastic student and are thrilled that his involvement with the Center will continue.

After two years at UCSB, Restoration Assistant **Barbara Going** has left Santa Barbara to pursue graduate studies at UC Davis. She is preparing to set up experiments that will take place this fall at Sedgwick, McLaughlin, and Big Creek reserves, in which she will look at the effects of water and competition from non-native grasses on the performance of serpentine endemics both on and off serpentine. She was awarded a Mathias grant for this project as well as a prestigious NSF fellowship. Congratulations Barbara!

**Jim Markham**, UCSB Librarian Emeritus, has retired after more than 20 years at Davidson Library as science and German cataloger and biology, marine science, and German librarian. He is now pursuing his original career in marine botany with a specialty in seaweeds. Jim joins Algae Curator David Chapman at CCBER as Assistant Curator of the Algal Herbarium.

**Janet Myers**, Restoration Coordinator, joined the CCBER staff in 2006. She oversees restoration activities and an active intern program at Manzanita Village student housing.

**Chris Walden**, (M.A. Botany, UCSB, 1993), has joined CCBER as a volunteer in the Herbarium, collecting and curating the Arroyo Hondo Preserve and Sedgwick Reserve specimens.



Please welcome our newest junior "staff member", Maximus John Powers, son of Restoration Project Manager Melanie Powers and her husband Mike. Max was born on October 4, 2006 and is an active member at CCBER staff meetings.



Ashlan Alldredge



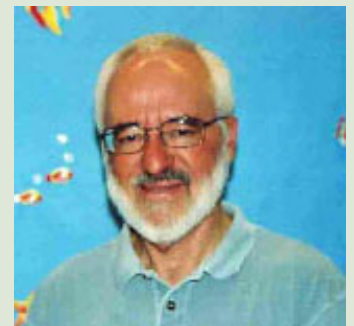
Janet Myers



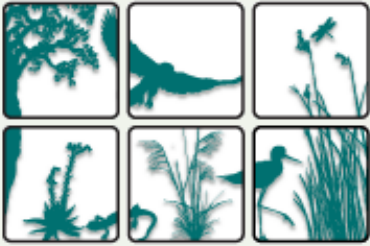
Barbara Going



Chris Walden



Jim Markham



# Contact the Center

Subscription and other information

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Killdeer fledgling hatched at Manzanita Village spring of 2003.

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