

UC Santa Barbara

Newsletters

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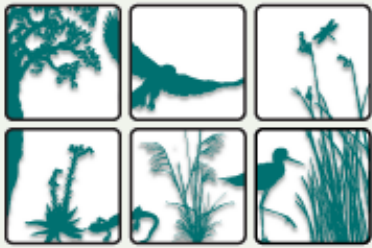
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Authors

Thorsch, Jennifer
Powers, Melanie
Chapman, Wayne
et al.

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THE NATURE PRESS

CHEADLE CENTER FOR BIODIVERSITY AND ECOLOGICAL RESTORATION

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Director's Foreword

Jennifer Thorsch and Carla D'Antonio

We are excited to report on the past year's activities and accomplishments at CCBER. It was a busy year!

In November, Jennifer traveled with Chancellor Henry Yang and several Kids in Nature staff and volunteers to Sacramento to receive the 2007 Governor's Environmental and Economic Leadership Award for Children's Environmental Education, one of the state's highest and most prestigious environmental education honors. For the past seven years, Kids in Nature (KIN) has been teaching local 5th grade underserved students by providing a hands-on, place-based environmental education program.

Also, in the fall we had a small reception to thank John Bleck for the donation of his seed collection to CCBER and to celebrate the dedication of a display case entitled "Mirabilia Naturae Natural Wonders," created from a collaboration with CCBER, Dr. Mark Meadow, and the University Art Museum (UAM).

Based on the Renaissance *Wunderkammer*, this display case is representative of an early natural history collection.



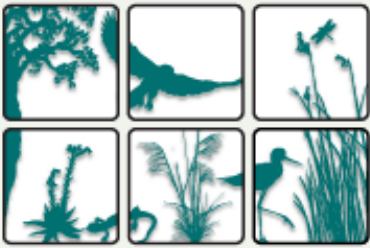
The Mirabilia Naturae case features the four elements—earth, air, fire, and water—to group specimens from the CCBER collections.

In December the Oversight Committee held a retreat to assess CCBER's growth and development over the past two years and evaluate and plan our future goals and direction. The Oversight Committee and staff prepared background materials for the external review which was held in February 2008. The purpose of the review was to provide an independent assessment by a panel of experts on the structure of CCBER, the state of our collections and programs, and the potential to expand our capabilities and services and better serve our missions. Three distinguished academics served on the committee—Dr. Jack Ewel, Professor Emeritus, University of Florida and expert in ecological restoration; Dr. Scott Lanyon, Director Bell Museum, University of Minnesota, with research expertise in bird behavior and systematics; and Dr. Brent Mishler, Plant Systematist and Director, University Herbarium, University of California Berkeley. The committee spent three days meeting with CCBER curators, faculty and staff, campus administrators, and affiliated departments, as well as touring the collections and management areas on campus. The committee's final report was very positive and included several insightful suggestions and recommendations which are being considered and implemented. The committee's report states "CCBER is a jewel of an institution on the UCSB campus, dedicated to education, research, and outreach related to the region's biological diversity and restoration."

"CCBER is a jewel of an institution on the UCSB campus, dedicated to education, research, and outreach related to the region's biological diversity and restoration."

In addition to programmatic growth, the staff has continued to set high standards for environmental stewardship and responsibility.

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Director's Foreword

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Laurie Hannah

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Lynn Watson

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In their report, the committee highlighted several valuable services CCBER provides to the campus and community:

- Serves as a permanent repository of biological specimens and is an outstanding restoration program that reconstructs and maintains natural areas on campus.
- The collections at CCBER are an incredibly rich resource that will only gain in value in the future. The connection with restoration ecology gives CCBER a unique place among university-associated collections in California, and indeed the nation.
- Integrates faculty and student involvement in biodiversity research, engineering, and education into campus planning and regional ecological restoration.
- UCSB can enhance and further develop an outstanding reputation for “celebrating biodiversity.”

One of the committee recommendations was to establish a “Friends of CCBER” group to help support our outreach and public service programs, including the Monday night seminar series, workshops, and special lectures. Learn more about the “Friends of CCBER” in “Getting Involved” and please consider joining!

While we hosted the review team, staff members were busy with other activities. The Campus Flora project recently received a third year of funding from the Elvenia Slosson Foundation and was also awarded the 2008 Goleta Valley Beautiful Award. Project Manager Bree Belyea brought together a team of faculty, staff, and community members who provided expertise and assistance with the project. Congratulations to Bree and her committee — Dr. Bruce Tiffney, Dr. Robert Muller, John Bleck, Randy Baldwin, and current and former students Ben Turner, David Norman and Lindsey Salzman — for continuing to develop this excellent educational resource.

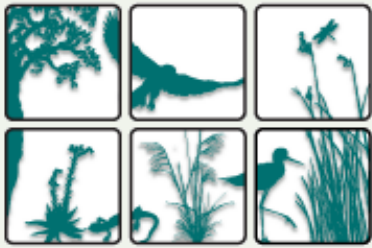


Join Friends of CCBER today by visiting our [website](#).

Activities continued at all of CCBER’s restoration sites. An increased number of classes from many campus departments used CCBER’s indoor and outdoor facilities, the Monday evening seminar continued to be a success particularly in the fall with a focus on Fire Ecology, and the team of student interns has almost doubled in size. Our internship program expanded to cover museum curation and curation of archival materials. Volunteers continue to enhance our success and we thank the many people who have helped CCBER fulfill its mission through their expertise and dedication.

In addition to programmatic growth, the staff has continued to set high standards for environmental stewardship and responsibility. The Green Initiative Fund (TGIF) at UC Santa Barbara awarded CCBER funding to install photovoltaic panels on top of the Cheadle Center classroom. The funding includes money for interpretative signage, an undergraduate student intern, and a computer monitor to assess energy generation and usage. CCBER is also one of the next 25 campus buildings being considered for the Leadership in Energy and Environmental Design for existing buildings (LEED-EB) rating. Congratulations to Lisa for helping CCBER become more energy efficient! We thank you for your interest in CCBER and hope you will enjoy reading about many of the exciting developments that have occurred this past year.

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Under the direction of Ashlan Alldredge and Darwin Richardson, this 700-foot long project has given CCBER the opportunity to implement riparian restoration techniques to restore and stabilize the banks of this newly widened creek.

Devereux and Phelps Creek Projects: First Steps in the North Campus Faculty Housing Project

Lisa Stratton

CCBER's newest restoration projects are in the tributaries to Devereux Slough. The University offset the potential impacts of building North Campus faculty housing in the floodplain by replacing a culvert with a bridge along Venoco Road and laying back the eastern bank of Phelps Creek between Marymount Way and the Ocean Meadows Golf Course. Under the direction of Ashlan Alldredge and Darwin Richardson, this 700-foot long project has given CCBER the opportunity to implement riparian restoration techniques to restore and stabilize the banks of this newly widened creek.

Care was taken to protect threatened species during the project. The rare Santa Barbara honeysuckle (*Lonicera subspicata* var. *subspicata*) was protected and replanted on the site. The project also had the potential to impact the federally endangered tidewater goby, a species of special concern in California, but subcontractors, under permit from the Army Corps of Engineers and the California Department of Fish and Game, moved and protected the fish during the de-watering portions of the project. The North Campus housing project construction is scheduled to start by December 2008.



Soon after the banks of El Encanto Creek (Phelps Ditch) were laid back, willow cuttings and erosion control blanket were installed as part of the restoration and bank stabilization project.



The project handled the first storms of 2008 in fine form, enabling more natural creek processes to occur. This water level reflects a relatively large storm event, likely to occur about once every 5 years



By early spring 2008 the willows were sprouting and becoming established.

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Archives Cataloging Project

Laurie Hannah

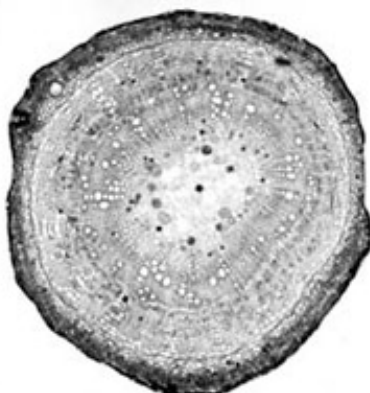
Work began last fall to catalog all of CCBER's biological manuscript collections, funded by a grant from the Institute of Museum and Library Services. With the assistance of Environmental Studies interns Sarah Vitone (see Intern Profile) and Lindsey Hashimoto, we have completed the arrangement, rehousing, and collection-level description of five collections. Researchers can now search our library catalog and find summary descriptions for the papers of C. H. Muller, Robert Holmes, A. L. Brigger, Katherine Esau, and Olivia Converse. Complete finding aids, or inventories, of the boxes and files are available in the library. Later in the year, these finding aids will be uploaded to the Online Archive of California and will be available over the Internet.



Cornelius Muller collecting plants in Mexico, 1939. From the C.H. Muller Papers.

This project is also the starting point for further collection preservation and digitization. We have begun to rehouse all the photographs from the various collections in acid-free sleeves and boxes, given them accession numbers, and begun to scan and database a small collection of plant anatomy images. We have submitted a grant proposal to the California State Library for a pilot digitization project that will focus on the life and achievements of plant anatomist Katherine Esau, aimed at attracting young girls to the field of science.

Researchers can now search our library catalog and find summary descriptions for the papers of C. H. Muller, Robert Holmes, A. L. Brigger, Katherine Esau, and Olivia Converse.

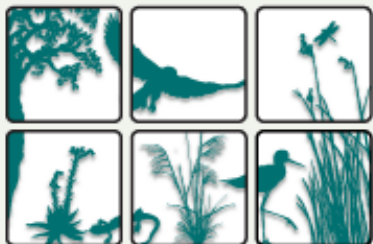


Light microscope image of cotton stem. From the Katherine Esau Papers.



Katherine Esau at Spreckels Sugar Co., 1925. From the Katherine Esau Papers.

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The CCBER team went out of their way to ensure that, above all, this program would educate and engage students curious about the field of restoration ecology.

It was interesting to not only get to work with this material (some of it dating back to the 1920s!) but to also have the satisfaction of knowing that everyone around the world will soon be able to access this information through the web.

Intern Profile

Sarah Vitone

I am a third year Environmental Studies student here at UCSB. I started interning with CCBER beginning fall 2007 after I learned about the Cheadle Center through one of my classes. My first experience with CCBER was working as a Restoration Intern during the fall. This was a wonderful experience because it took me out of the classroom and into real restoration projects for the first time. I was able to learn more about site planning, species identification, and plant material sourcing than any other opportunity I have had here at UCSB. It wasn't all the backbreaking, weed-pulling labor I thought restoration projects were. The CCBER team went out of their way to ensure that, above all, this program would educate and engage students curious about the field of restoration ecology.

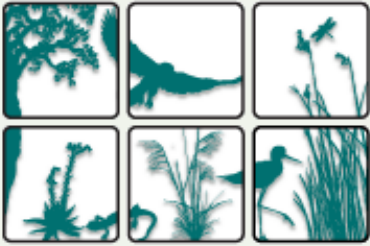
This program has something for everyone. I recommend this internship even if you're just curious about getting to know the plants and animals that inhabit the Santa Barbara area. The exciting breadth of topics and friendly CCBER staff make this an opportunity not to be missed. During the fall quarter I also started interning with CCBER Librarian, Laurie Hannah. Together we worked on several special collections including the works of former UCSB professors Katherine Esau and C.H. Muller. I learned a lot of valuable information about collection preservation and storage. It was interesting to not only get to work with this material (some of it dating back to the 1920s!) but to also have the satisfaction of knowing that everyone around the world will soon be able to access this information through the web. There's still a lot of work to be done on this project so I urge anyone interested in getting involved to contact Laurie.

This quarter CCBER offered me a paid position working on scanning and describing a number of collection photos. These photos will be uploaded to an internet database where people all around the world can access them. I get to build off the skills I learned about archive preservation and apply my knowledge in a fun and practical way. In order to gather and process photo information, I use a number of tools including Microsoft Excel, Photoshop, different scanning programs, and botany databases. Laurie likened the work to that of a detective. I have to use every tool available to me so that I can crack the secrets that lie behind these photos. Interning with CCBER has been a great experience that I will never forget. I am very thankful that CCBER offers these types of opportunities to undergrads looking to apply their knowledge in a fun and useful way!



Student assistant Sarah Vitone scanning plant anatomy images from the Katherine Esau Collection.

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Federal and state conservation agencies would not be aware that the northernmost coastal populations of a high profile endangered species, the Southwestern Willow Flycatcher, and also one of the largest remaining populations, occurs in Santa Barbara County if UCSB did not have expert ornithologists on its staff associated with a museum.

Ornithological Research Collection

Steve Rothstein

The Ornithological Research Collection contains about 8000 specimens, mostly from southern California but with many from other parts of the USA and elsewhere in the world. Most of the specimens were collected by Professors Mary Erickson and Barbara DeWolfe before 1970. When the current Faculty Curator of Ornithology, Professor Stephen Rothstein, arrived at UCSB in 1972 he gave high priority to the maintenance and use of the bird collections. Over time, Professor Rothstein and Vertebrate Collections Manager Mark Holmgren, who joined the staff in 1983 and is now CCBER Associate Director, added small numbers of new specimens to fill in teaching and research needs.

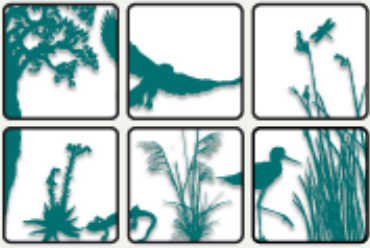
Collections manager Holmgren and Professor Rothstein have used some of the knowledge generated by their activities to collaborate on studies of the avifauna of nearby Vandenberg Air Force Base (VAFB). They found that VAFB is an unrecognized riparian treasure as it contains some of the richest riparian avifaunas left in all of California. Southwestern riparian environments have special significance as roughly 90% of them have been destroyed or seriously degraded by human activities, yet these habitats once had the highest biodiversity in North America. Of special significance at VAFB was the discovery that local Willow Flycatchers are members of the federally endangered Southwestern Willow Flycatcher (*Empidonax traillii extimus*). This gives the local flycatchers and their riparian habitat an extraordinary level of protection. It is interesting to note that specimens are not the only valuable resource that makes up a properly functioning museum. Museums employ people with unusually deep knowledge bases. Federal and state conservation agencies would not be aware that the northernmost coastal populations of a high profile endangered species, the Southwestern Willow Flycatcher, and also one of the largest remaining populations, occurs in Santa Barbara County if UCSB did not have expert ornithologists on its staff associated with a museum.



© Michael J. Hopiak/CLO
Adult Southwestern Willow Flycatcher.
Courtesy of Michael J. Hopiak,
Cornell Lab of Ornithology.

But it is of course the specimens that represent the core value of a museum. A question that often arises about specimens is why there is often emphasis on inclusion of many examples of the same species. In other words, wouldn't one of each suffice? But specimen collections are repositories and generators of ecological and evolutionary knowledge, and variation among individuals is one of the most important issues in biology. Indeed, there would be no evolution without variation among individuals, and the only way we can assess variation is by studying many individuals. This reliance on a series of individuals is amply demonstrated by research on social and dominance behavior in White-crowned Sparrows that Professor Rothstein and his students began in the 1980s. The research focused on the "status signaling enigma," namely, the fact that many animals have badges of status that signal their dominance level, such as large antlers in male deer. This status signaling allows dominant individuals to acquire resources at the expense of subordinate individuals without having to engage in fighting.

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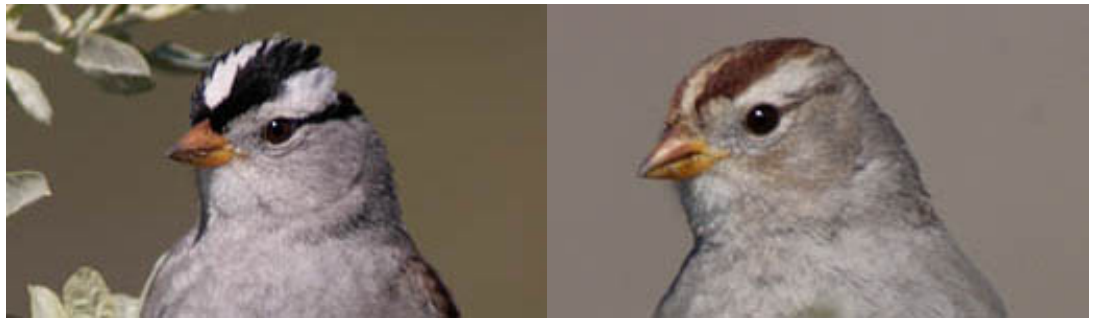
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Specimen collections are repositories and generators of ecological and evolutionary knowledge, and variation among individuals is one of the most important issues in biology. Indeed, there would be no evolution without variation among individuals, and the only way we can assess variation is by studying many individuals.

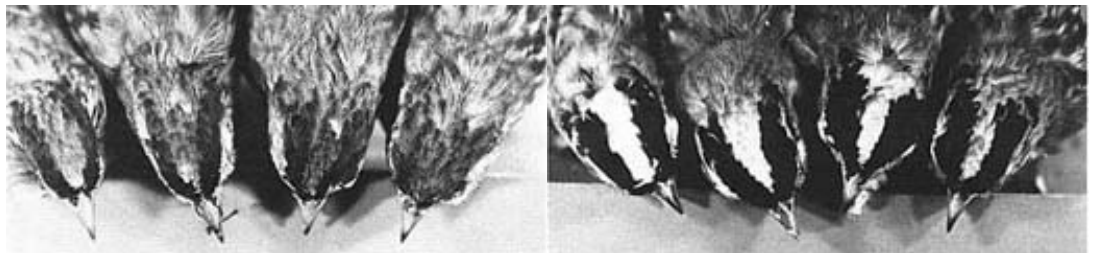
These specimens were due to the pioneering research of Professor DeWolfe, who sadly passed away shortly before this issue of the newsletter was finalized.

Ornithological Research Collection ... continued



The adult is clearly a male based on the brightness of his central white crown strip. Note how the immature has the same basic crown appearance as the adult but the black and white are replaced with dark and light brown stripes. Photos courtesy of Lynn Watson.

The enigma arises because, unlike antlers, some of these signals, like bright colored plumage in birds, are cheap to produce, and if they are easy to produce one has to wonder why the subordinate individuals would develop signals that advertise their lowly status. But they do, so an evolutionary enigma arises because natural selection should favor subordinates that “cheat” on the signaling system and develop dishonestly bright signals. To determine whether adult sparrows two years old or older with black and white striped crowns dominate immatures with brown striped crowns because these older, brighter birds are more experienced or simply because the older birds have brighter colors, Professor Rothstein and his students altered immature sparrows so that their crowns matched the bright ones of adults. Invariably, these “experimentally created cheaters” dominated immatures whose crowns had the usual dull brown colors, and this was the first convincing experimental demonstration of status signaling in birds. They also found that males dominated females within each age class, but this didn’t look like status signaling because the White-crowned Sparrow was believed to lack sexually dimorphic plumage. But a careful analysis of hundreds of our museum specimens showed that this belief was wrong.

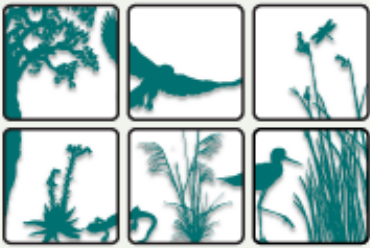


Variation in crown colors of White-crowned Sparrows.

Within both age classes, males have greater contrast between their dark and light crown stripes than do females. The research team was able to make this discovery about a species thought to be one of the most well studied birds in the world only because there were many specimens in the vertebrate museum.

These specimens were due to the pioneering research of Professor DeWolfe, who sadly passed away shortly before this issue of the newsletter was finalized. Professor DeWolfe studied White-crowned Sparrow vocalizations, physiology and life history (and many other things as well) during her long and productive life. A future newsletter will provide an overview of her extraordinary accomplishments. But for now, it’s worth contemplating that science and conservation will continue to benefit from her efforts long into the future, not just because of her own research, but also because of the invaluable specimens of sparrows and other species she placed in the UCSB vertebrate museum and because of her dedication and enduring support for museums such as ours.

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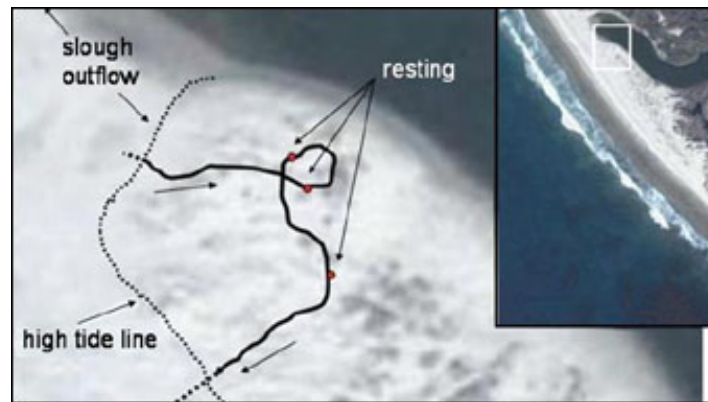
Marine Turtle at Coal Oil Point Reserve

Cristina Sandoval

On each new moon since March 5, 2008, a marine turtle has been coming to the beach and dunes at Coal Oil Point Reserve (COPR), possibly to look for a place to lay eggs. Dr. Sam Sweet and Kristin Carden, from the Department of Ecology, Evolution, and Marine Biology, have been visiting the monthly tracks in an attempt to gather more information about this unusual behavior. Most shore records of sea turtles on the Pacific coast north of the San Diego region involve injured or ill animals that apparently have been transported from the south via a Catalina Eddy current pattern. The COPR turtle is unusual because it seems to be a healthy turtle based on its behavior. In June 2005 the *Santa Barbara News Press* reported an apparent nesting attempt by a turtle presumed to be a Ridley turtle (*Lepidochelys olivacea*) on Santa Cruz Island, but further details have not been released. The photo at right, taken at COPR, shows the extended trackway of a turtle with an angled plastron, or ventral plate, which is consistent with either a green sea turtle (*Chelonia mydas*) or a Ridley turtle. The circumstances of the COPR trackway are consistent with a turtle examining a potential nesting site. COPR is the only significant dune field along the Santa Barbara County coast without extensive light pollution and noise, and the animal came ashore under the right moon and tide conditions. Incubation may not occur, because sand temperatures here (ca. 15 C at depth) are at least 8 C below the thermal minimum needed for success.



Turtle tracks. Photo courtesy of Adrian O'Loghlen.



Turtle Map: Google Earth map of area with turtle tracks superimposed (courtesy of Sam Sweet).

Most shore records of sea turtles on the Pacific coast north of the San Diego region involve injured or ill animals that apparently have been transported from the south via a Catalina Eddy current pattern.

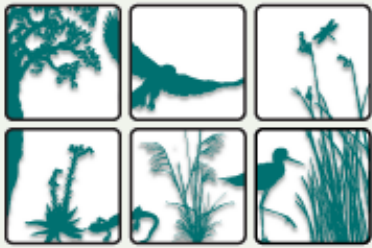
COPR is the only significant dune field along the Santa Barbara County coast without extensive light pollution and noise, and the animal came ashore under the right moon and tide conditions.

Additional Turtle Sightings

The Western Pond Turtle is an aquatic native turtle that inhabits streams and ponds in the western US. It used to be abundant in the back of Devereux slough but was thought to have been extirpated in the 1960s, when the upper half of the slough was filled to create a golf course. We received a call from Stephanie Pappas who is working for a Western Pond Turtles rescue program. Stephanie said she is certain that we have pond turtles in the slough, because people have been picking them up from the reserve and taking them to her rescue facility. Someone brought her a female turtle found in Isla Vista, adjacent to COPR, which was subsequently released in the dune pond at Coal Oil Point Reserve. When the turtles leave the water to lay eggs or mate, they are vulnerable to being taken as pets or because it is believed that they are sick or injured. For more information on the turtle rescue program, please see:

<http://www.nature.org/wherework/northamerica/states/california/newsletter/pondturtles.html>

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Invaders, Restoration and Resistance—CCBER and Beyond

Carla D'Antonio

The overarching goal of restoration activities is to guide the composition, structure and functioning of a degraded site along a trajectory towards a more desirable state. That state is either what was there before or a chosen reference ecosystem that appears reasonable for the site. Ecological restoration challenges our understanding of fundamental ecological processes and what it takes to put a community of organisms and the processes that sustain them back together into a functional landscape.

An activity that has become extremely familiar to restoration practitioners is that of removing or controlling unwanted non-native species. These species are variously referred to as “weeds” or “invasive” species. I prefer to call them invasive non-native species since the term “invasive” really says nothing about where a species came from. Invasive non-native species get here as a result of accidental or purposeful human transport and then spread away from the areas where they were introduced. Many of them are essentially harmless and have become a part of our landscape without raising many eyebrows. Indeed on the scale of the entire state, successfully established, self-replacing populations of introduced plant species have added at least 1200 species to the California flora. About 10% of them, however, interfere with the values we gain from ecological or agricultural systems, including interfering with restoration goals. These are the ones referred to as *harmful*, invasive species (= invaders with an impact we care about). Notorious examples in southern California include saltcedar (*Tamarix*-- two species, mostly from Asia) which can transpire large amounts of water from western streams and reservoirs, the aggressive giant reed grass (*Arundo donax*, from Europe and Asia) which can promote the spread of fire up river channels, clog culverts and create large debris deposits during flood events, a variety of very aggressive streamside vines including English ivy (*Hedera helix*) and Cape ivy (*Delairea odorata*, from South Africa) and fire-promoting annual grasses, such as red brome (*Bromus madretensis* var. *rubens* from the Mediterranean basin), that are contributing to increased fire frequency and the local decline of native species in the Mojave desert. For a complete list of harmful, invasive plant species in California wild lands, see www.cal-ipc.org.

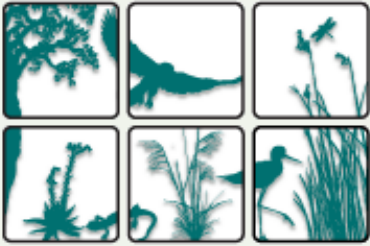


After heavy rains in 2005, *Arundo* debris washed up along miles of shoreline. Some of it rooted, forming new infestations. Photo by C. D'Antonio.

In southern California more and more restoration projects involve control of non-native species, because most mitigation lands are degraded from their original condition, and invaders are good at taking advantage of disturbed habitat.

Control of non-native species as a “restorative activity” can be as simple as removing populations of invaders as they establish in a site that is under long-term management. More often, however, it involves intensive efforts to shift community composition from dominance by unwanted species to dominance by desired target species. Challenges can include both immediate and long-term control and dealing with possible legacies that these species might leave behind after control, such as changes in soil structure or chemistry. In southern California more and more restoration projects involve control of non-native species, because most mitigation lands are degraded from their original condition, and invaders are good at taking advantage of disturbed habitat. Many of our projects at CCBER involve such lands.

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Invaders, Restoration and Resistance - continued

For example, fennel (*Foeniculum vulgare*) is an invasive species that dominated portions of the San Clemente site and the upcoming South Parcel Nature Park. It has deep roots, is very difficult to kill and has an abundant seedbank. A contrasting but still difficult problem is that of ripgut brome (*Bromus diandrus*) which dominates portions of Lagoon Island to the near exclusion of native species. It is an annual species that is easily pulled up by hand but is extremely abundant, making hand removal a laborious process. It also can readily regenerate from the seedbank. While control of species such as these can be achieved with persistent effort via mechanical or chemical treatments, long term control and project sustainability really relies on creating ecological resistance in the invaded site. Ecological resistance can be provided by creating a competitive array of native species that slow down or largely halt re-invasion of the site.



Fennel plant in degraded field. Dead stalks are flowering shoots from previous year. Photo by J. Abraham.



Dense ripgut brome grass (*Bromus diandrus*) with scattered wild radish (also introduced) on Lagoon island in area undergoing restoration. Photo by Alice Levine.

Research into the sources and strength of ecological resistance has been ongoing in my lab for the last two decades and provides support for activities of the restoration practitioner. For example, in my research on highway iceplant (*Carpobrotus edulis*, from South Africa) invasion of coastal habitats in the 1980s, I demonstrated that although resistance is never complete and all the coastal sites I studied have the potential for some iceplant invasion, grazing of iceplant seedlings by native rabbits and competition from existing vegetation could greatly slow down invasion. Thus, restoration of a well established plant community along with its associated animals is the key to keeping this invader under long-term control. More recently I, along with students and postdocs in my lab, have studied sources and strength of ecological resistance in grassland communities in northern California and now here in Santa Barbara County. An important point that emerges from this work is that California native perennial grasses generally are very good at suppressing many non-native grassland species. Getting through the bottleneck of establishment, however, can be difficult for the native perennial grasses because non-native species likely outnumber native grasses in the seedbed by 5,000:1.

In two different northern California grassland sites, we tried using sawdust to promote microbial immobilization of available nitrogen prior to planting native grasses. Our working hypothesis was that non-native annual grass species, because they are much faster-growing than native grasses would be more hurt by the low soil nitrogen in sawdust addition plots than native grasses. While we did find some evidence that sawdust reduced soil nitrogen, and initially it reduced the competitive suppression of native perennial seedlings by exotic annual grasses, overall at the application rates we used, sawdust was not an effective tool for tipping the balance to natives. Other people have tried adding sugar or mixes of sugar and sawdust to the soil at high rates, and found that the growth of fast-growing weeds can be effectively reduced thereby benefiting slower growing, native species.

In southern California more and more restoration projects involve control of non-native species, because most mitigation lands are degraded from their original condition, and invaders are good at taking advantage of disturbed habitat.

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Invaders, Restoration and Resistance - continued

Another way in which we are trying to reduce non-native grassland species and promote native species in California grassland is through winter livestock grazing. With ICES scientist/CCS lecturer Claudia Tyler, we are trying this at UCSB's Sedgwick Reserve. We have found that cows reduce the invasive grass ripgut brome, on one of the two soil types where our experiment is ongoing. But responses by native species are mixed and depend on the rainfall for that year of the study. This year, for example, was a great year for native wildflowers and we saw a strong increase in native forbs in our grazed plots compared to the ungrazed plots on one soil type. This response was much weaker in 2006 and 2007, both years where non-native grasses did extremely well and native wildflowers were sparse. In those years, grazing reduced ripgut but did not lead to a response by native grasses or wildflowers probably due to germination conditions. Thus, grazing may effectively reduce many unwanted non-native species, but without consistently promoting native perennial grasses or forbs, it does not build community resistance to reinvasion. More research is needed on how to promote native perennial grasses that by themselves could reduce the persistence of undesirable exotic species. Such an opportunity could exist on the new South Parcel restoration site where a few remnant patches of native grasses remain within a sea of non-native invaders some of which are very hard to control.



Dead thatch on ground in mid summer.



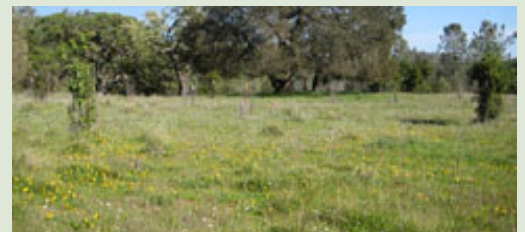
Dense ripgut grass with non-native wild radish in the middle.

A major goal of the restoration practitioner is to create a sustainable ecosystem where, within a range of climate variability and natural disturbance, species composition and ecosystem processes will stay within certain bounds. Invasive non-native species challenge our ability to achieve this goal. However, in many sites, creating plant communities with strong resistance to the establishment of invaders can contribute to this goal. CCBER's restoration sites offer many opportunities to explore and evaluate the enormous challenge of enhancing ecological resistance and creating diverse self-sustaining ecosystems.

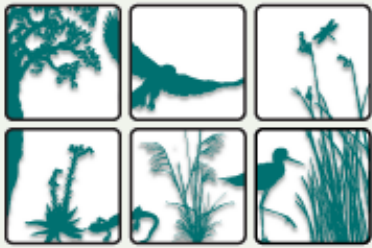
CCBER's restoration sites offer many opportunities to explore and evaluate the enormous challenge of enhancing ecological resistance and creating diverse self-sustaining ecosystems.



Grazing enclosure plot on terrace soil site at Sedgwick. Plot has been ungrazed since 1995 and is dominated by ripgut brome grass and its thatch. Spring 2008 photo by Carla D'Antonio.



Nearby plot that has been grazed annually since 1995 in the winter only. Very little ripgut grass is present. Spring 2008 photo by Carla D'Antonio.



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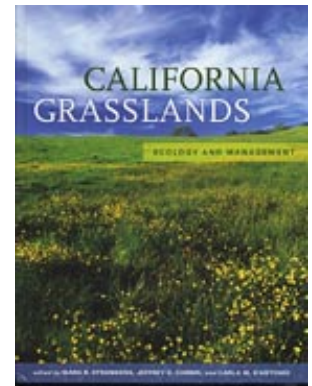
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New Publications

California Grasslands: Ecology and Management

Mark R. Stromberg, Jeffrey D. Corbin, and Carla M. D'Antonio, eds.
University of California Press, 2007.
ISBN 978-0-520-25220-2.
\$55.00.

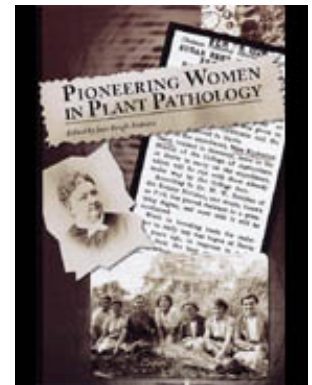
A new handbook on grassland restoration and ecology, covering systematics, historical ecosystems, native American management of grasslands, biological resources, ecological interactions, and policy. Faculty Director Carla D'Antonio wrote several of the chapters.



Pioneering Women in Plant Pathology

Jean Beagle Ristaino, ed.
American Phytopathological Society, 2008.
ISBN 978-0-89054-359-7.
\$89.00.

Includes a chapter by CCBER Director Jennifer Thorsch on Katherine Esau who was a world renowned plant anatomist. In 1963 Katherine Esau joined the biology department at UCSB as professor emeritus. She received the Presidential Medal of Science from former President George Bush in 1989.



New CCBER Interpretive Signs

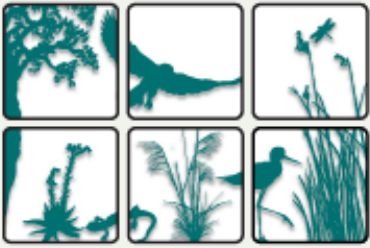
CCBER has just installed five interpretive signs and is in the process of designing more signs to enhance appreciation of our coastal resources. Funded by the Associated Students Coastal Fund, two signs were installed at West Storke Wetland near the bike bridge and three signs were installed at East and West Depression at Lagoon Island.



One of three coastal dune interpretation signs installed at Lagoon Island. Restoration and signs funded by the students of UCSB through the Coastal Fund.

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

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Awards and Grants

The Campus Flora Project has been awarded a third year of funding from the Elvenia Slosson Foundation. Project Manager, Bree Belyea, and Lindsey Salzman, undergraduate assistant, will continue to georeference, identify and photograph plants on campus. The Campus Flora website and interactive web map have been launched and will be continually updated to reflect additional data gathered throughout year three. The web map can be viewed and downloaded via the [Campus Flora website](#). The web map is hosted and supported by Spatial@UCSB, a research center within the Geography department. The Campus Flora project also received a 2008 Goleta Valley Beautiful Award in the open category at a reception on May 3, 2008.

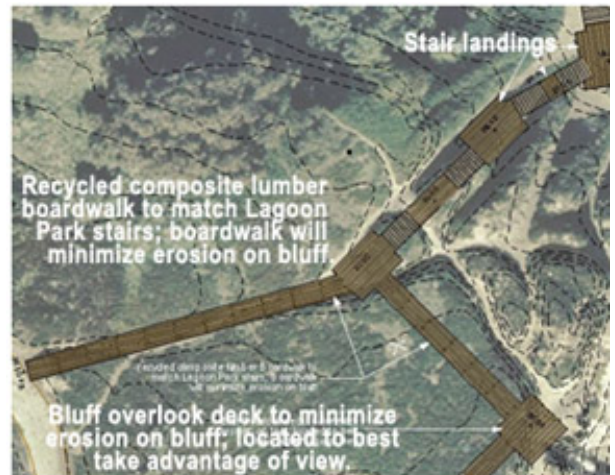
The Green Initiative Fund (TGIF): CCBER brings sustainability to the office! The Green Initiative Fund at UC Santa Barbara awarded CCBER funding to install photovoltaic panels on the roof of the Cheadle Center classroom that will supply 30-40% of our energy needs. TGIF is funded by the students of UCSB through quarterly lock-in fees to promote sustainability on campus. We will be installing a 7.6 Kw system, including real-time, web-based monitoring of energy production, interpretive signage, and we will hire a student intern to oversee the installation, enhance educational aspects of the project, and manage the waste stream. CCBER is also one of the next 25 campus buildings being considered for the Leadership in Energy and Environmental Design for existing buildings (LEED-EB) rating.

Kids in Nature received Faculty Outreach Grant (FOG) funding to include two 5th grade classes from the Cesar Chavez School in the KIN program during 2008-09. In addition, a donation from Bernward and Doris Thorsch will provide support for another local 5th grade class. KIN program provides each classroom with a total of eleven educational activities to CCBER, the Marine Science Institute's REEF program, Coal Oil Point Reserve, and Arroyo Hondo Preserve allowing the students to work closely with the KIN staff for an in-depth and sustained educational experience.

Coastal Fund Grants: The Coastal Fund and CCBER are teaming up again to enhance coastal resources at UCSB. The Coastal Fund, a student run and funded granting foundation, is providing full or partial funding for five CCBER projects including a proposed stairway up the eroded bluff from Campus Beach to Campus Point, to water quality monitoring in our newest storm water management system at the San Clemente Village housing project.

Students will be able to learn more about their environment and how to share their knowledge through a new education program and four new interpretive signs at the Campus Lagoon. Most importantly, the Coastal Fund staff will be continuing work initiated in 2003 by adding another device to divert trash that regularly collects in an Isla Vista storm drain from the protected East Storke Wetland. CCBER greatly appreciates our partnership with Coastal Fund as it enables us to better extend our mandate to the students and community of UCSB.

Proposed stairway up the eroded bluff from Campus Beach to Campus Point.





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Awards and Grants – continued

United States Forest Service Grant: Over the coming year Dr. Sam Sweet, Curator of Herpetology, will be conducting a status review for 75 species of amphibians and reptiles that are candidates for designation as Regionally Sensitive Species on U.S. Forest Service lands throughout California. The goal of this USFS-sponsored project is to revise and expand the current list of sensitive species to better reflect recent research on genetic fragmentation, systematics and population trends in California species, to assess vulnerability of habitats to both natural and anthropogenic disturbances, and to identify land management practices that may place species at risk on National Forest lands. Effects on sensitive species must be considered in many National Forest actions, and the revised list is intended to help guide land management decisions across the 20 million acres of National Forest lands in California.

Vandenberg Air Force Base Grant: Steve Rothstein and Mark Holmgren recently received renewal of their grant to study riparian bird species on Vandenberg Air Force Base. This will allow them to collect quantitative data on the distribution and abundance of riparian bird species and will result in an extensive and uniquely valuable dataset from eight different years since these studies began in 1996. Besides assessing riparian habitat use by birds of special interest, the 12-year time series will allow Steve and Mark to determine ongoing trends in the abundances of numerous bird species.

Conservation Book Gift: This spring the Cheadle Center Library was one of 851 museums, libraries, and archives selected to receive the *IMLS Connecting to Collections Bookshelf*, funded by the Institute for Museum and Library Services and the American Association of State and Local History. We received 15 books and three DVDs on collections care and preservation, ranging in topics from disaster preparedness, housekeeping, legal issues of acquiring objects, to culturally specific conservation issues. This set of books represents a valuable core collection that will assist CCBER curatorial staff in managing collections according to best practices, in communicating the value of CCBER's collections to stakeholders on campus and in our community, and in helping to preserve them for generations to come. They will also be crucial for staff members who will be participating this year in the Museum Assessment Program, a year-long self study of collection care practices and procedures.

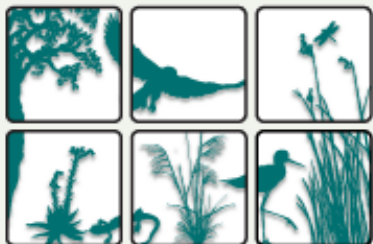
CCBER Publications and Products for Sale

The third edition of *Native Plants & Habitats of the UCSB Campus* was released last 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 [Jan Myers](#) 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 are 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.





Getting Involved



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Friends of CCBER

We have formed a new membership group to support and help expand our outreach and public service programs, including the Monday night seminar series, workshops, and special lectures. Your membership will help us continue these worthwhile programs and you will also receive discounts on CCBER books and T-shirts and invitations to special events. Please make a tax deductible donation of \$35.00 to the Friends of CCBER by clicking [here](#).

CCBER Internship Program Grows

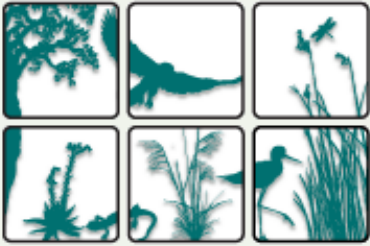
In addition to our well established formal training in restoration ecology, CCBER now offers two additional student internships. Library and archive interns have the opportunity to learn about preservation of historical biological research collections, while assisting in their arrangement, storage, and description. Museum interns help identify, label, and database specimens from the vertebrate and botany collections. To learn more about our internship program, please visit our [website](#).



Library intern Lindsey Hashimoto putting negatives from the Raymond Cowles Papers in protective sleeves.

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

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Faculty and Staff

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Hellos and Goodbyes

We have had many staff changes over the past year. We are sad to see our long-term staff go, but we welcome new young faces!

Rachel Alford has recently joined the San Clemente team as a restoration ecology assistant. She graduated from UC Davis in 2006 with a degree in Environmental Horticulture and Urban Forestry with an emphasis in biodiversity and restoration. She has interned with the National Park Service and US Fish and Wildlife Service in the San Francisco Bay area doing habitat restoration and working with federally listed species.

Bryan Apple was recently hired as a restoration ecology assistant for the San Clemente restoration project. Originally from San Jose, he graduated from UCSB in 2005 with a BA in Environmental Studies. After graduating he worked for eighteen months with Midpeninsula Regional Open Space District and was involved in a variety of restoration and watershed protection projects spanning fifty thousand acres in the Santa Cruz Mountains. In 2007 he returned to the Santa Barbara area and worked with Channel Islands Restoration in Refugio Creek, Carpinteria Creek, and Coal Oil Point Reserve.

Richard Figueroa graduated with a BS in Physics from UCSB in 2007. He served as a student volunteer for one year and is now working full time with the Center on the San Clemente restoration project. Richard is developing a vertebrate monitoring plan for the storm water management basins at San Clemente.

Ryan Lippitt finished his undergraduate degree in Environmental Studies at UCSB in late 2007. He served as a student volunteer during fall and winter quarters, working on the Cheadle and Esau plant anatomy collection as well as doing an internship in the restoration program. He is working full time for the Center with Jan Myers on the Manzanita Village project.

Melanie Powers, Project Manager for Manzanita Village and the San Clemente project, left CCBER and UCSB last fall, after seven years here. She moved to Sacramento with her husband and son to be closer to family.

Ben Reder, Restoration Coordinator, has taken a leave of absence from CCBER this summer to work as an education staff member on cruise ships in French Polynesia for the Ocean Futures Society's Ambassadors of the Environment program.

Sarah Vitone completed a library internship at CCBER during fall and winter quarters and has been working this spring for the Center on a pilot digitization project of Katherine Esau's plant anatomy images. She is a third-year student majoring in Environmental Studies with a minor in Writing.



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Cheadle Center for Biodiversity and Ecological Restoration
 Dept. of Ecology, Evolution and Marine Biology
 University of California
 Santa Barbara, CA 93106-9615
 Phone 805 . 893 . 2401
 Fax 805 . 893 . 4222

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Killdeer fledgling hatched at Manzanita Village spring of 2003.

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