Cal-IPC News

Protecting California's Natural Areas from Wildland Weeds

Vol. 12, No. 2, Summer 2004 Quarterly newsletter of the California Invasive Plant Council

Ventura!

Site of the 2004 Cal-IPC Symposium... and just a little *Arundo*

Workers plan their approach for the Ventura River Arundo Removal Demonstration Project, a program of the Ventura County Arundo Task Force (ATF). Story p. 8

Photo courtesy of Ventura County Watershed Protection District

Inside:

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Our Mission

To protect California's natural areas from wildland weeds through research, restoration, and education.

Cal-IPC News

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From the Director's Desk

Environmental grantmakers — Wake up and smell the Vinca!

Many environmental grantmakers have yet to recognize the gravity of the invasive species threat. Recently this situation hit home.

Cal-IPC applied for funding from a foundation whose focus is habitat conservation. Their response? Don't send a proposal because "we rarely fund invasive species initiatives." The logic—or lack thereof—of this response is astounding. How can one separate the goal of habitat conservation from the issue of invasive species?

Other funders tell us that their priority in protecting habitat is to purchase property. This is certainly an important aspect of conservation. After all, development is the one habitat threat as serious as invasive species. But to ignore—or even delay—invasives work is unwise. As a colleague put it, "invasive species are pollution just like an oil spill. Except once you spill invasive organisms, they multiply." The problem gets worse and more costly every day.

This same colleague also said, "I worked for years in nuclear waste cleanup, and I feel that invasive species are an even bigger threat to the environment." This sense of urgency on the part of researchers and land managers needs to be felt by grantmakers whose funds can make a significant difference in the effectiveness of our work.

On the bright side, there are some forward-thinking foundations that have taken the lead in supporting work that protects habitat from invasive plants. In the last six months, Cal-IPC has received grants from:

The True North Foundation
The San Francisco Foundation
The Coastal Conservancy of California

We greatly appreciate the support these funders are providing, and commend their leadership in addressing the issue of invasive species. We will continue to encourage other foundations to follow their lead.

Photo by Brianna Richardson

"Excellent for spring color. Tenaciously invasive where adapted." Scotch broom variety for sale at a nursery in San Mateo County.

Wildland Weed NewsNewsNewsNewsNews

Save the Date! 2004 Cal-IPC Symposium, Ventura, October 7-9. See the program on page 16.

Assemblymember Loni Hancock's bill **AB 2690 passed** both the State Assembly and the State Senate without opposition on May 26. This bill removes the restrictions on volunteer labor being used for public works projects (see *Cal-IPC News*, Spring 2004). *<www.info.sen.ca.gov>*

In May, Federal agents arrested a Glendale, California man on charges of **importing live northern snakehead fish**. The fish were hidden among a larger shipment, and labeled "sea bass" or "bass, freshwater fish." *<www.latimes.com>*

California Assembly Bill 2631 (Wolk, D-Davis) passed the State Assembly, and on June 29th passed in the Senate's Natural Resources committee. The bill, which would establish a California Invasive Species Council, has been re-referred to the Committee on Appropriations. *<www.leginfo.ca.gov>*

Ann Veneman, the U.S. Secretary of Agriculture, transferred $15.5 million from the USDA Commodity Credit Corporation to the Animal and Plant Health Inspection Service (APHIS) to help **halt the spread of *Phytophthora ramorum***, or sudden oak death. APHIS will provide $6.9 million of this emergency funding to California for quarantine activities and identification of infected nurseries. The remaining $8.6 million will be used for surveys, other quarantine and regulatory enforcement, public outreach, and laboratory diagnostics and testing. *<www.usda.gov>*

The Heinz Center has been working with a task group comprising representatives from business organizations, environmental groups, academic institutions, and federal agencies to refine the non-native species indicators contained in the Center's report, **"The State of The Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States."** The Center plans to improve the indicators' consistency and focus across taxa and biomes. Results of this work will be included in the 2007 "State of the Nation's Ecosystems report." *<www.heinzctr.org>*

On March 10, the **Japanese government** passed, without amendments, The Alien Invasive Species Act. Among other provisions, this bill requires new alien speices be investigated for their potential to become invasive before they are imported into Japan. *<www.env.go.jp/en/topic/as.html>*

The U.S. Senate unanimously passed their version of the **Saltcedar and Russian Olive Control and Demonstration Act, S.1516**, last week. The final version of the bill is currently being considered by the House, and passage is expected. After that, S.1516 needs only the President's signature to become law. *<thomas.loc.gov>*

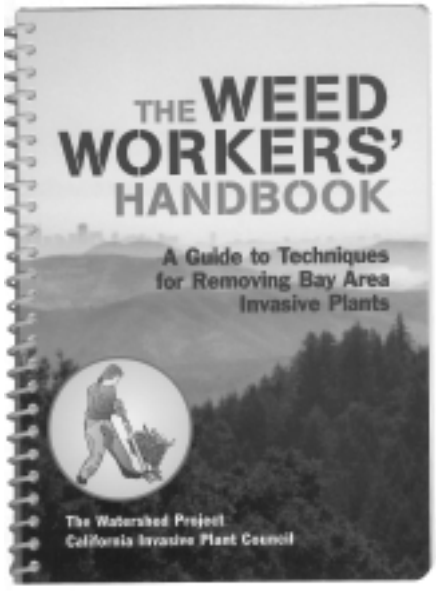
Plant pathologist Stephen M. Griffith of the USDA Agricultural Research Service, Forage Seed and Cereal Research Unit, is working with Audubon California to study how **revegetation with perennial, native grasses** affects soil and water quality and whether they supply quality grazing forage. Early results indicate establishment can be difficult, but once they are established, the deep roots may outcompete annual grasses. Griffith hopes that demonstrating the benefits of perennial grasses will lead to increased demand, encouraging greater seed production and lower prices. *<www.ars.usda.gov/news>*

At a recent meeting in Salt Lake City, the Steering Committee of the **Forest Health Technology Enterprise Team** (part of the US Forest Service) announced they would aggressively establish a national leadership role in the development of technologies for control of invasive species, focusing on coordination of disparate IS databases and development of detection, monitoring, biocontrol and management technologies. *<www.fs.fed.us/foresthealth/technology>*

The **Federal Interagency Committee for the Management of Noxious and Exotic Weeds** (FICMNEW) won the American Planning Association's Excellence in Environmental Planning award for their *National Early Detection and Rapid Response System for Invasive Plants in the United States-Conceptual Design.* *<www.invasivespecies.gov>*

Hawaii's state gemstone, black coral (Family: Antipathidae), is threatened by the **invasive snowflake coral** (*Carijoa riisei*), which is beginning to overrun deep sea reproductive populations of the black coral. Black coral accounts for an estimated $25 million in annual jewelery sales for the islands. *<www.washingtonpost.com>*

Cal-IPC and The Watershed Project announce publication of *The Weed Workers' Handbook*!



The 120-page *Handbook* was designed for volunteers and those who organize volunteer projects. It includes:

- Control methods for 35 Bay Area weeds
- Guidelines for organizing volunteer projects
- Strategies for project success
- Public education and interpretation tips
- Tool descriptions and usage
- Removal and disposal techniques
- Weed biology and reproduction
- More than 50 color illustrations

To order your Handbook, visit www.cal-ipc.org or call 510.843.3902.

Ventura

An Island Called Santa Cruz:
Removing invasives on the Channel Islands

by Ken Owen, Santa Cruz Island, Native Plant Restoration Project

Editor's note: This issue of Cal-IPC News features two articles on the Ventura area, site of the 2004 Symposium. A field trip to Santa Cruz Island will be offered during the Symposium.

Removing invasive plants on Santa Cruz Island is far more than just the dream job my partners and I had hoped for. We have the privilege of helping to restore one of the most unique and stunning nature preserves in California. We have also seen our once informal (and completely volunteer) weed-pulling effort mature into an effective and funded restoration project. Although the job of removing exotic plants on the island is in some ways just beginning, our project presents a framework for sustained funding and volunteer support toward the effort. Together with programs to remove non-native animals, we are part of a coalition of government and private groups who work diligently to preserve a very special place.

Often likened to the Galapagos, the California Channel Islands are known for their unique and diverse assemblage of plants and animals, many found nowhere else in the world. Five of the eight islands comprise the Channel Islands National Park, home to a wide collection of significant natural and cultural resources. Over 2,000 species of plants and animals can be found within the Park and at least 145 species are only known from the islands. Although the breathtaking beauty and unspoiled landscapes of the Channel Islands are within a day's travel to 18 million people, they remain almost untouched by development.

Santa Cruz Island lies between 19 and 25 miles off the coast between Point Conception and Ventura. It is 24 miles long and up to 7 miles wide. At 96 square miles, it is the largest of the Channel Islands. The Nature Conservancy owns 76 percent of the Island, and the National Park Service owns the eastern 24 percent. Santa Cruz Island hosts the greatest number of plant and animal species of all the islands. Sixty species that occur there are either indigenous just to that island or occur on two or more of the Channel Islands and nowhere else in the world. Eight plant species are listed as threatened or endangered and an additional 20 plants are considered rare or species of concern.

Introduced species have had a moderate to severe impact on most of the island's habitats. Past grazing by sheep and cattle has altered many plant communities, increased erosion, prevented species regeneration, and reduced diversity. Feral pigs have been likened to rototillers, because of the damage they cause while rooting for food. This kills many native plants, increases erosion, and spreads invasive plants. Biologists blame non-native species for the decline of the Santa Cruz Island fox (*Urocyon littoralis santacruzae*) from a population of 1,300 individuals in the wild a decade ago, down to about 100 now. At least one plant species (*Mimulus brandegeei*) may have been extirpated from the island due to grazing by non-native animals. Although the last of the sheep were removed in the late 1980s, feral pigs continue to cause damage island-wide.

Many exotic plants have become established on the island. At least 170 of the 650 plants known from Santa Cruz Island are introduced (about 26%). Although sheep and cattle removal led to a dramatic recovery of many native plants, it has also encouraged the growth of certain invasive non-natives like

Photo courtesy Ken Owen

Volunteers on Santa Cruz Island remove *Vinca major* (periwinkle), one of 170 exotics on the island.

Photo courtesy Ken Owen

One hundred seventeen Italian stone pines (*Pinus pinea*) have been removed from Santa Cruz Island since last November.

fennel (*Foeniculum vulgare*). Over the years, eucalyptus and acacia have spread beyond their original plantings and have become established in many areas, mostly in riparian zones. Periwinkle (*Vinca major*) and smilo grass (*Piptatherum miliaceum*) have also spread in many riparian areas. Yellow starthistle (*Centaurea solstitialis*) and hoary cress (*Cardaria draba*) are both apparently spreading. Although other significant invasives (*Cortaderia, Tamarix* and *Arundo* spp.) are present on the island, they have not so far had a chance to become widely established.

The Park Service and the Conservancy have embarked on a multi-faceted restoration program that involves recovery of the island fox and bald eagle populations, while eradicating and/or removing non-native animals. The control of invasive plants is also a key element in the resource management plans for both agencies. Various efforts at large and small-scale invasive plant control have been studied and tried over the years on the island, including burning and aerial spraying of fennel. Volunteer groups often work with the Park Service to remove invasives and to plant natives, particularly on the eastern end of the island. At present an important component of the pig eradication program is to control large sections of fennel, which are utilized by the pigs as cover.

Our project has its roots at UC Santa Barbara where the campus botany and restoration clubs made frequent trips to the island to remove invasive plants. By 1998, regular quarterly weed-pulling trips were organized and student volunteers were recruited at weekly UCSB seminars. In the summer of 2002 we widened our volunteer base and started monthly restoration trips to the island with diverse groups of committed volunteers. Our work was generally unstructured, and we mostly set our own priorities for weed control projects. We removed trees (eucalyptus, acacia etc.) in watersheds and worked on selected herbaceous invasives, particularly outlier populations and infestations along roads. The UC Santa Cruz Island Reserve provided the heavy equipment and many of the tools for our work, plus all of the vehicles and housing. All of this required a large commitment of volunteer time, but progress was made.

Fortuitously, Kate Symonds, a grant coordinator for the US Fish and Wildlife Service (USFWS), volunteered to work on the island. She was so impressed with the work that, in the spring of 2003, she applied for and received funding for the island project on behalf of the Santa Barbara County Weed Management Area (SBCWMA). The Santa Cruz Island Native Plant Restoration Project was born with funding from three grants: the "Private Stewardship Grant Program" and the "Partners for Fish and Wildlife" (both from USFWS) and the "Pulling Together Initiative" (from the National Fish and Wildlife Foundation). A multi-agency Steering Committee consisting of all the island's principle stakeholders (Park Service, Conservancy, UC Reserve, SBCWMA, and more) formed to set priorities and to provide assistance. Duke McPherson, Clark Cowan, and I formed "Channel Islands Restoration" and were hired as the project contractor to carry out the goals of the project. The goals (in brief) are to:

1) Synthesize existing information on exotics into a priority list of control needs,

2) Consolidate several volunteer efforts into a coordinated program to control invasive plants, and

3) Conduct an education campaign to increase awareness about invasive plants and methods to reduce or prevent their introduction to the islands.

Working under the structure of grant funding has provided a boost to the project. With most of our short-term goals met, we continue to focus on removing exotic plants with an emphasis on outlier populations, watersheds, and those spreading from historical plantings. The UC Reserve and the Park Service continue to provide enormous support to the project. They contribute all of the housing, transportation, and heavy equipment, and they have referred many volunteer groups to us. Since the inception of grant funding in November 2003, we have been on 13 trips with over 100 volunteers. We have removed more than 3,000 trees (mostly

continued p.13...

Woody species removed 11/03-5/04

Species	Number
Acacia melanoxylon	226
Albizia lophantha	153
Eucalyptus camaldulensis	2,223
Eucalyptus globulus	112
Pinus pinea	117
Robinia pseudoacacia	35
Schinus molle	8
Total	**2,874**

Herbacious species removed 11/03-5/04

Species	Number
Conium maculatum	718
Centaurea solstitialis	NA*
Centranthus ruber	7,000+
Foeniculum vulgare	423
Marrubium vulgare	9
Pelargonium x *hortorum*	765
Phalaris aquatica	557
Piptantherum miliaceum	1,969
Raphanus sativus	8,217
Silybum marianum	660
Sisymbrium officinale	3,022
Vinca major	NA**
Total	**23,340**

* approximately 1.06 acres treated
** approximately 252 square meters removed

Tools

Development and release of a plant pathogen as a new biological control of yellow starthistle

by Dale M. Woods, California Department of Food and Agriculture

A new biological control agent has received approval for release in California against yellow starthistle, *Centaurea solstitialis*. The introduction and release of the rust, *Puccinia jaceae* var. *solstitalis,* in July of 2003 marks the first plant pathogen approved for release as a biological control of a weed in the continental United States.

The biological effort against yellow starthistle (YST) began decades ago with overseas exploration for potential natural enemies. One plant disease, rust of yellow starthistle, had been noted around the Mediterranean for many years and isolates were collected and brought to the USDA-ARS quarantine greenhouses at Ft. Detrick, Maryland for evaluation in 1978. The evaluation effort on insects as biological controls for YST was, however, far more successful at achieving regulatory approval eventually leading to the release of five species of insect as biological controls. These insects, along with the accidentally introduced false peacock fly, *Chaetorellia succinea*, all widely distributed in California, focus their effort on the seeds and seedheads of YST. This strategy has not yet achieved satisfactory control over YST. A renewed effort by the USDA-ARS is currently seeking approval of additional arthropods attacking other portions of the plant to complement the seedhead insects already in place. The rust, *P. jaceae*, should fit well with this stratagey as it attacks primarily foliage and is not likely to adversely interact with any known YST biocontrol agents.

Puccinia jaceae *var.* solstitialis *is the first plant pathogen approved for release as a biocontrol of a weed in the continental U.S.*

Plant pathogens have not been utilized to the extent of insects as biological controls of weeds. Although several exotic plant pathogens have been released as biological controls in Hawaii, Australia and a few other countries, none have completed the entire review, approval, and release process in the continental United States. One plant pathogen, the skeleton weed rust, *Puccinia chondrillina*, was introduced in the United States, and has had a significant impact, but did not undergo a complete pre-release review and approval.

Photo courtesy Dale Woods, CDFA

Anna Eyler, Napa County Agricultural Commissioner's office biologist, and Dale Woods inoculate a site with the new rust pathogen, *Puccinia jaceae* var. *solstitialis*.

Importation of the yellow starthistle rust in 1978 to a domestic quarantine facility, was the first step in the process of developing this biological agent. With the near absence of endemic North American pathogens on YST, and the history of high degree of host specificity of rusts in general, *P. jaceae* seemed a likely prospect as a biological control agent. Host testing to evaluate the safety of an open field release was undertaken in sealed greenhouses by scientists at the Foreign Disease and Weed Research Facilities in Ft. Detrick. Environmental parameters for successful infection of yellow starthistle, as well as, safety to native plants and crop species were the focus of their research.

Rust fungi are known to be extremely host specific plant pathogens, and most of the early host testing bore this out. Unfortunately, one variety of safflower proved susceptible to the rust under specific conditions. Dr. William Bruckart performed extensive tests to evaluate the limits of the safflower problem, eventually demonstrating that the rust was pathogenic to only one cultivar of safflower which has been abandoned by the industry for over a decade ago, and *P. jaceae* would not infect currently utilized safflower genotypes. Additionally, the infection was extremely minor and not damaging to the cultivar, a finding that was acceptable to industry representatives. No other crop species proved susceptible.

Testing of native plant species, particularly native thistles, was a particular concern to several agencies including the US Fish and Wildlife Service. Over 20 species of thistle were tested as part of the review. The proposal to release the rust received extensive review by several agencies, perhaps greater scrutiny than other proposals as plant pathogens had not been proposed under the current review system so the review was new to everyone. In June of 2003, the California Department of Food and Agriculture Biological Control Program as co-petitioners with Dr. Bruckart, received limited approval to release the rust in

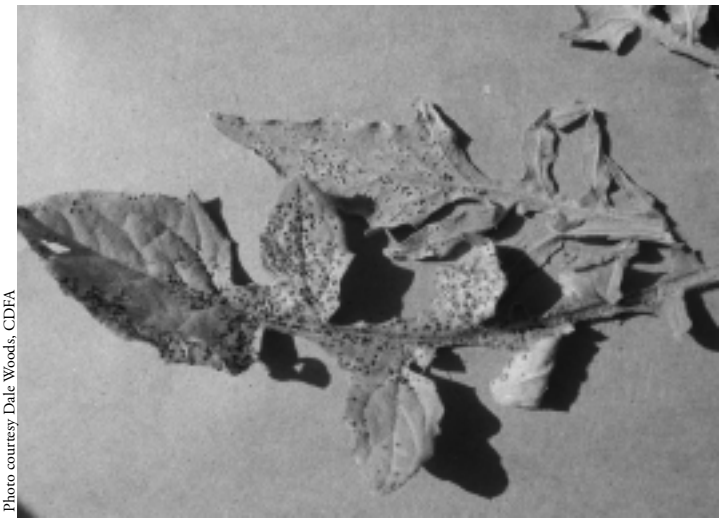


Photo courtesy Dale Woods, CDFA

Yellow starthistle leaves covered in pustules formed by the rust.

California. The approval came roughly 25 years after host testing began.

A single site in an isolated valley in Napa County was selected for the 2003 release. Laboratory research had indicated that a hot, dry, midsummer day was a poor choice to accomplish a successful infection, but it was the first week after permit approval so a single release was made in July of 2003. A one square meter plot was inoculated in early evening and monitored for several weeks. Little more than a dozen pustules developed in the plot, but that alone was heartening to the individuals who had worked so hard to get the rust introduced.

The next step was to prepare for a larger scale biological control project. The CDFA Biological Control Program began propagating the rust in a greenhouse on potted yellow starthistle plants. Rust fungi are obligate parasites, that is, they require a living host in order to develop. Rosettes of yellow starthistle in 4-inch pots were inoculated with the rust and grown in a greenhouse. The rust was essentially farmed on potted starthistle over the next 9 months, with new plants inoculated to replaced aging ones. Spores of the rust were vacuum collected off the leaves and stored frozen in anticipation of a larger field release effort. A modification in the permit was achieved in 2004, allowing a broader release of the rust, and the spring of 2004 was established as the time for widespread release program.

A total of 25 release sites were selected, spread among 20 counties. Releases were scheduled for April based on laboratory test results. Biologists in the county Agriculture Commisioner's offices were trained about the biology of the rust and inoculation procedures and then made the releases. For each release, spores of the rust were suspended in water, and sprayed on a square meter plot of young rosettes. The inoculations were made in early evening and the plot covered with dark plastic tent overnight to simulate dew formation. Rust spores germinate and infected the leaves overnight, then the fungus develops within the leaf eventually producing new spores in 2-3 weeks. These new spore pustules are usually the first indication of a successful inoculation.

Almost all of the inoculations were successful in 2004, producing pustules by three weeks. Sites around the Sacramento to Napa area fared quite well, with 70-100% of the inoculated plants successfully infected. Sites in the northern areas, (Tehema) and Central Coast (Monterey to Santa Barbara County) were unusually hot and dry during 2004 and infections under these conditions were usually less than 30%.

Plans for the rest of 2004 are for the county biologists to continue monitoring their release sites for evidence of natural spread of the disease. Also, the rust will continue to be propagated in Sacramento over the fall 2004 and spring 2005. Releases will be made in counties throughout the state, not previously chosen for release. Additional releases are likely to be made through California and other states as spores are available. Data from the 2004 releases will be analyzed to guide the 2005 releases, determining timing of release in relation to plant growth stage and weather. Efforts are also underway to evaluate any impact that the rust has on its host in the field both for short term plant effects and long term changes in plant populations.

The use of a plant pathogen is not dramatically different than insects as biological control when both are used as 'classical' biological agents. Both are expected to propagate and spread on the intended host without constant human manipulation. It is too early to tell how well the YST rust will spread unaided by humans. The actual inoculations with the rust are governed, unlike insects, by a series of laws and regulations that treat the organism as a pesticide. Thus for the short term, the early releases will continue to be handled by CDFA and county Agriculture Commisioner's offices. With the successful approval of a plant pathogen as a biological control it is likely that other pathogens will be considered in other biological projects.

Contact author Dale Woods at dwoods@cdfa.ca.gov.

S.144 Update

The outcome on United States Senate Bill 144 (S.144, the Noxious Weed Control Act, or "Craig bill") is keeping weed control advocates on the edge of their seats. The bill would allocate $50 million dollars per year to "weed management entities" for cost-share programs to combat invasive weeds. The bill was introduced by Senator Larry Craig (ID) in 2003, passed in the Senate last year, and was refered to the House Resources Committee, where it stalled for some time. CDFA scientist Steve Schoenig was asked to testify at a Resources Committee hearing in Washington, DC in April. He was able to portray the great successes of Weed Management Areas in California, which helped move the bill out of Committee. (This should also help speed funding to California if the bill is successful.) The bill was finally amended and passed to the House Agriculture Committee, where it remains as of this writing. Discussions are taking place in the Agriculture Committee to re-shape the bill in such a way as to avoid further debate once it leaves the Committee and moves to the House calendar under suspension rules. If the bill is passed by the House, the Senate will need to pick up the revised House version. Once that has happened the bill will be ready for the President's signature.

Those following the progress of the bill in Washington say that it may pass this year, and it may not. The final steps in it's passage are likely to happen at the last minute. They don't, however, see any reason why President Bush would not sign the bill, as it is unlikely to be controversial at that point and may help his re-election campaign in some states.

Cal-IPC will continue to report on the progress of this important weed legislation in *Cal-IPC News* and at www.cal-ipc.org.

Ventura

Setting the stage: The Ventura County Arundo Task Force

by Peggy Rose, Ventura County Resource Conservation District

Editor's note: Organizing programatic environmental documentsation on a watershed or even regional scale can streamline future weed control projects. Here's how the Ventura RCD is addressing this need.

The Ventura County Arundo Task Force (ATF) is a consortium of federal, state, and local agencies, property owners, and local special interest groups formed to address issues associated with reducing or eliminating *Arundo donax* (Arundo) from the Ventura County watersheds. The ATF formed in 1997 and meets on a monthly basis to explore opportunities for removal projects, exchange information, and support the ongoing work of eradication of this harmful weed.

The ATF determined that a watershed-based approach is the most effective way to attack the Arundo problem in Ventura County waterways. Many areas where Arundo is established have sensitive plant and wildlife species. The Matilija Canyon alone hosts over 33 special status wildlife species, many of which are classified as threatened and endangered. Because Arundo has established in extremely sensitive riparian corridors, removal projects cannot be classified as exempt under state and federal California Environmental Quality Act/ National Environmental Policy Act (CEQA/NEPA) law. To better look at the cumulative impacts of Arundo removal in these sensitive areas on a watershed-wide level, our Task Force has undertaken programmatic environmental documentation on a watershed by watershed basis. Once complete, these programmatic documents will provide a foundation for other groups to develop Arundo removal projects with limited environmental investigation and documentation.

Using our watershed-based approach, the Arundo Task Force is currently working on three major projects: the Ventura River Arundo Removal Demonstration Project, the Santa Clara Arundo Removal Plan, and Post-fire Arundo spraying in the Santa Clara River.

Ventura River Arundo Removal Demonstration Project

The Ventura County Resource Conservation District (VCRCD) and the Watershed Protection District (VCWPD) are acting jointly to implement the Ventura River Arundo Removal Demonstration Project. The project has multiple purposes. The first is to increase public awareness of the threat caused by Arundo in our river corridors and to build public support for the removal methods. The second is to evaluate four different types of Arundo eradication techniques. Real cost and methodology data generated by the project will allow for effective planning and implementation of future Arundo removal projects within the Ventura River watershed, and, ultimately throughout other watersheds within Ventura County. The third purpose is to assess the effectiveness of six different riparian revegetation treatments using native plant species. ATF partner, USDA Natural Resources Conservation Service (NRCS), is heading up the revegetation treatments and the investigation of their effectiveness.

The demonstration site is a five-acre site located along the east bank of the Ventura River, near the community of Casitas Springs. The site is approximately 50 feet wide and 4500 feet long. The site will be separated into four areas and four different removal methods will be implemented to evaluate their effectiveness. Removal methods include:

Photo courtesy of the Ventura Watershed Protection District

The Ventura River Arundo Removal Demonstration Project

1. Mechanical (hand) removal of the Arundo biomass immediately followed by the painting the remaining stumps with herbicide at appropriate cut-stump concentrations within a designated half-acre area.

2. A foliar spray application of the Arundo biomass at a 2-4% volume-to-volume concentration of herbicide within a quarter-acre area. The biomass will remain on site and dead material will later be removed with handheld equipment.

3. Removal of the above ground biomass within a designated 4-acre site. Biomass would be removed with handheld equipment without applying any herbicide and re-growth will be treated with an herbicide as it emerges.

Photo courtesy Peggy Rose

Post-fire regrowth of Arundo in the Calleguas Creek watershed.

4. Mechanical removal of the Arundo biomass, including excavation of the root mass within a quarter acre area.

A Final Environmental Impact Report (FEIR) was adopted on September 9, 2003. A copy of the FEIR and supporting documents are available at the Ventura County Watershed Protection District.

Removal activities are anticipated to begin in August or September, 2004 and will take approximately six weeks to complete. The demonstration site will be monitored for one year, allowing for treatment of Arundo re-sprouts, then revegetation techniques will be implemented.

The majority of the project was funded by a grant from the California Coastal Conservancy Wetlands Recovery Project. Matching funds and a large amount of staff time will be provided by both the Natural Resource Conservation Service and the Ventura County Watershed Protection District. The California Department of Fish and Game also contributed a large amount of money towards the project.

Santa Clara Arundo Removal Plan (SCARP)

The VCRCD has taken the lead in developing the Santa Clara Arundo Removal Plan (SCARP). This plan will include a programmatic California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) document and related documentation for the implementation, maintenance, and monitoring of Arundo and *Tamarix* species removal projects within the riparian corridors (500-year floodplain) of the Los Angeles County portion of the Santa Clara River watershed. Long-term plans for the ATF and its partners include continuing the SCARP and its accompanying environmental documentation and mapping to the mouth of the river. The California Coastal Conservancy is, as this article is published, moving ahead with vegetative mapping in the Ventura County portion of the Watershed.

The goal is to allow any agency or organization to perform Arundo/*Tamarix* removal projects of any size within the upper Santa Clara Watershed. In general, the VCRCD will be working closely with its partners and an environmental consultant to develop a comprehensive CEQA/NEPA document. SCARP will be a long-term eradication, monitoring, and maintenance plan, which will take into consideration: land ownership; degree of infestation; access; potential eradication methods and procedures; presence of threatened or endangered species; current work being done or planned/pre-existing environmental agency restrictions and permits; and funding mechanisms in place and/or strategy for funding further eradication in the Santa Clara River Watershed that may include Federal and State grants, Federal cost-share programs and in-lieu fee program potential. The programmatic environmental documentation will contain everything necessary to fast-track projects.

The VCRCD will also develop a Memorandum of Understanding for its partners, including the Arundo Task Force (ATF), the City of Santa Clarita, the Friends of the Santa Clara River, and representatives of the U.S. Army Corps of Engineers (ACOE), Los Angeles Regional Water Quality Control Board (LARWQCB), the Los Angeles Department of Public Works (LADPW), California Department of Fish and Game (CDFG), the U.S. Fish and Wildlife Service (USFWS), the U.S. Forest Service (USFS), and the Antelope Valley Resource Conservation District (AVRCD).

The project was initiated in January 2004 and will end in March 2006. The SCARP Working Group is currently being formed. We welcome all interested parties to the planning process.

Funding for this project has been provided in full through an Agreement with the State Water Resources Control Board (SWRCB)

continued on p.17...

ATF Members and Affiliates

The Ventura County Resource Conservation District (VCRCD) and the Watershed Protection District (VCWPD) fill lead roles in the ATF. Other partners include:

- USDA Natural Resource Conservation Service
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- U.S. Navy, Pt. Mugu Naval Air Station
- National Park Service, Santa Monica Mountains
- U.S. Congressman Elton Gallegly
- California Department of Fish and Game
- California Coastal Conservancy
- California State Parks
- California Conservation Corps
- University of California Cooperative Extension
- Ventura County Fire Department
- Ventura County Environmental & Energy Resources Department
- Channel Islands Parks
- City of Ventura
- City of Thousand Oaks
- City of Santa Clarita

Maps

These maps give a sense of the distribution of some of California's worst weeds. They were produced using data collected by Steve Schoenig of the California Department of Food and Agriculture in early 2003. Schoenig asked California Weed Management Areas (WMAs) to list their top invasive weeds. Eighty-five different weeds were cited by the 35 Weed Management Areas (representing 48 counties) that responded. The big winner, of course, was yellow starthistle, listed in 45 counties. Other widely distributed weeds included: perennial pepperweed (30 counties), arudo (29), Scotch broom (27), purple starthistle (20), spotted knapweed (20), Tamarisk (18), and puncturevine (17). The complete lists were published in the Spring 2003 issue of *Noxious Times,* available at www.cdfa.ca.gov.

These maps were generously produced for Cal-IPC by Christen Powell-Essinger, indpendent GIS consultant.
Email: gis-cpe@sbcglobal.net or call 619.239.6648.

Teaching Weeds: California university invasive plant programs

By Kristie Cole and Nicole Molinari, Cal Poly San Luis Obispo, Biology Department

"Prevention is the most cost effective Integrated Pest Management method and education is the most efficient prevention method," according to Scott Steinmaus, professor of the Advanced Weeds class at California Polytechnic State University in San Luis Obispo. "As this has been true for agricultural pests, it will most assuredly be true for invasive species as well." As the invasive plant problem in California grows, it will become increasingly vital that we have the scientific information and expertise we need about the biology, ecology, prevention, and control of these plants. With that in mind, we surveyed each public university in California to determine what these schools are doing to educate their students and the public about invasive plants. The table on the following pages outlines the weed education programs available in the California State University (CSU) system and the University of California (UC) system. This article highlights some of the ongoing research and outreach being conducted in these programs.

Invasion Prediction Research

The goal of Steinmaus' introductory and advanced weed classes is to educate Agriculture and Biology undergraduates about weed ecology, evolution, and invasion. In the laboratory, Steinmaus and his graduate students research mechanisms of weed resistance to herbicides. His lab also employs computer models that couple the physiological constraints of potential invasives with climate parameters. UC Davis' Marcel Rejmanek also employs models as an approach to predicting the optimal parameters for a weed invasion to occur. Ultimately these computer models may help predict state-wide invasions.

Predicting an invasion requires a great deal of knowledge about the physiology and ecology of specific species. UC Santa Cruz, UC Davis, and UC San Diego are just a few of the schools actively pursuing a better understanding of the biology of invasive plants. Ingrid Parker at UCSC has both undergraduate and graduate students working on a wide range of weed-related topics, including studying the effects of pathogens on invasive plants, which may provide a better understanding of the biotic pressures that keep weed populations in check. Her lab is also looking at the impact of invasive *Ammophila arenaria* (European beach grass) on dune ecosystems.

Single Species Research

Several researchers have focused their study on a specific invasive plant. Joe DiTomaso, Weed Specialist for UC Cooperative Extension at UC Davis, has done an incredible amount of work researching the ubiquitous *Centaurea solstitialis* (yellow starthistle). Although DiTomaso's research extends beyond the realm of the yellow starthistle, his work on this plant has become the cornerstone of weed research and education throughout the state.

Often, weed research in California's universities is based upon interests shared between laboratories. Many collaborations, like the Seagrant College Program, a joint venture between UC San Diego and CSU Fullerton, have formed to study the impact of a single invasive species. These schools share resources to prevent the spread of *Caulerpa taxifolia* off the shores of California's coast. Their efforts have eradicated all known populations of this invasive algae from the coast of San Diego. According to Shauna Oh, Research and Education Coordinator for the Seagrant Program, a primary aspect of this eradication effort has been community education. Public awareness is increased by placing samples of this "killer" marine weed in public aquarium displays.

Public Outreach and Community Restoration

CSU Monterey Bay also has a community-oriented approach to weed abatement. Their outreach program, Return of the Natives (RON), not only benefits students but also educates the public. This unique program brings the university and community together under a common cause: to remove invasive vegetation and bring back native plants. Return of the Natives is part of the Watershed Research Institute and is an affiliate of the Department of Science and Environmental Policy at CSU Monterey Bay. RON provides in-class curriculum for all levels of learning, kindergarten through college, and incorporates classroom learning with hands-on field experience at restoration sites. Laura Lee Lienk, director of RON, conveys the program's success, "We have thousands of school children, hundreds of teachers, and hundreds of community members involved in our restoration efforts." RON also has a War on Weeds Program that brings together community members twice a month for weed education and removal.

The Habitat Restoration Club at UC Santa Barbara joins CSU Monterey Bay in coupling education with weed removal. In addition to native restoration around campus, members of the club volunteer three days a quarter to remove exotic plants from Santa Cruz Island. "Weed populations," according to Wayne Chapman, Restoration Club Coordinator, "are devastating the island, and we feel that removal of these populations is critical in restoring the island to its natural state." The club uses mechanical means to remove *Eucalyptus globulus* (blue gum), *Schinus molle* (Peruvian pepper tree), and *Foeniculum vulgare* (fennel) from all parts of the island.

At CSU Northridge several undergraduate and graduate students conduct research on invasive plants, but they don't always work in their immediate community. According to Biology professor Paula Schiffman, most of this work has been done at Carrizo Plain National Monument in San Luis Obispo County. Schiffman and her students are not alone in focusing their research on the larger community. Integrating the larger community with the campus is the direction in which education must head. It is the entire community that must learn about the problem of invasive plants, for it is the entire community that is ultimately at stake. **See the table on the following pages for an outline of who's doing what in California universities...**

For more information, contact Kristie Cole, sid82much@aol.com, or Nicole Molinaria, nmolinar@calpoly.edu

Table Legend

Faculty/Under/Grad: identifies whether the school has faculty devoted to weed research, undergraduate classes or internships, and structured graduate studies in weed science.
Focus: identifies the primary weed topic studied at the school; many schools have additional curricula as well.
Department: identifies the department in which structured weed programs are located.

A Survey of California Public University Weed Science and Outreach Programs

Kristie Cole, Cal Poly San Luis Obispo, Biology Department
Nicole Molinari, Cal Poly San Luis Obispo, Biology Department

SCHOOL	PROGRAM			OUTREACH	WEBSITE
	Faculty/Under/Grad	Focus	Department		
University of California (UC)					
Berkeley	Yes / Yes / Yes	Invasive species control/ Biocontrol/Community dynamics & invasions	Range Science, College of Natural Resources & Biology	UC Botanical Garden	botanicalgarden.berkeley.edu/research.html
Davis	Yes / Yes / Yes	Plant ecology and weed biology (*Centaurea solstitialis* and other specific invasions)	Biology (Evolution & Ecology)	The Nature Conservancy and Weed Research & Information Center	tncweeds.ucdavis.edu wric.ucdavis.edu
Irvine	Yes / Yes / Yes	Invasive species impact on natives in Hawaii	Ecology and Evolutionary Biology	None	
Los Angeles	No / No / No	None	None	various consortium programs	
Merced	No / No / No	None	None		
Riverside	Yes / Yes / Yes	Wildland weeds and herbicide resistance	Botany/Plant Science	None	
San Diego	Yes / Yes / Yes	*Caulerpa taxifolia* invasions	Agriculture and Natural Resources	The Seagrant Program	csgc.ucsd.edu
Santa Barbara	Yes / Yes / Yes	Impacts of exotic species competition between rare plants and invaders	Biology (Ecology, Evolution, and Marine Biology)	Habitat Restoration Club	
Santa Cruz	Yes / Yes / Yes	Ecology of invasives/Weed policy/Physiology of invaders/Endangered plants & invasives	Ecology and Evolutionary Biology	Site Stewardship	ucscplant.ucsc.edu
California State University (CSU)					
Bakersfield	No / No / No	None	None	None	
Channel Islands	No / No / No*	None yet	Planned in Biology	None	
Chico	Yes / Yes / No	Weeds in range and agricultural systems	Agriculture	None	
Dominguez Hills	No / No / No	None	None	None	
Fresno	Yes / No / No	Agriculture and Natural Systems	Plant Science	None	
Fullerton	Yes / Yes / Yes	Coastal marine ecology (*Caulerpa taxifolia* invasions)	Biology	None	
Hayward	No / No / No	None	None	None	
Humboldt	Yes / Yes / Yes	Invasion ecology	Biology	None	
Long Beach	Yes / Yes / Yes	Wetland invasive grasses and eradicaton of *Arundo donax*	Biology	None	
Los Angeles	No / No / No	None	None	None	

SCHOOL	PROGRAM			OUTREACH	WEBSITE
	Faculty/Under/Grad	Focus	Department		
California State University (CSU)					
Maritime	No / No / No	None	None	None	
Monterey	Yes / No / No	None	Earth Systems Science & Policy	Return of the Natives	watershedcsumb.edu
Northridge	Yes / Yes / Yes	Ecology of invasive plants	Environmental Biology	state & federal agency affiliations	
Pomona	Yes / Yes / Yes	Herbicide resistance/ Environmental fate of herbicides	Horticulture/Plant and Soil Science/Agronomy	None	
Sacramento	Yes / No / No	Disturbances and invasion	Biology	state & federal agency affiliations	
San Bernadino	Yes / Yes / Yes	Plant ecology and physiological plant ecology	Biology	USDA Conservation Program	
San Diego	Yes / Yes / Yes	GIS and Remote sensing of invasive plants	Environmental Biology	Affiliated Research Center Program	typhoon.sdsu.edu
San Francisco	No / No / No	None	None	None	
San Jose	No / No / No	None	None	None	
San Luis Obispo	Yes / Yes / Yes	Agriculture & Natural Systems/Weed Modeling and Herbicide Resistance	Crop Science	None	
San Marcos	Yes / Yes / Yes	Impacts of exotic species/ Physiology of non-native species	Biology	Indian Rock Native Garden	csusm.edu/indianrock/ consultants.html
Sonoma	No / No / No				
Stanislaus	Yes / No / No	California weeds	Biology	Endangered Species Recovery Program	esrp.csustan.edu

*Channel Islands does not have graduates yet.
Only public universites were surveyed for this article. Many private universities and community colleges around the state also have weed science programs and classes. It should also be noted that while some schools do not have structured weed research programs, graduate students at these schools often focus their research on invasive plant topics.

...Island, continued from p.5

under 6" diameter) and have devoted much time to removing herbaceous species in creeks and in outlier locations (see table).

Of equal importance to removing exotic plants is the prevention of new weed introductions. Our project is gearing up for an education campaign that will help ensure that those who visit the island understand the dangers of introduced species. We will install signage and make public presentations to various user groups including Park Service and Conservancy staff, concessionaires, and private boaters. Additionally, the Park Service is preparing an "Introduction Prevention Plan" that will recommend (in part) monitoring and controlling potential non-native species at boat and aircraft departure points, implementing guidelines for storage and cleaning of equipment and supplies in transit to the islands, and implementing an ongoing education campaign. The plan also calls for the installation of boot brushes on NPS and concessionaires' docks to help prevent transporting seeds in footwear.

The control of invasive plants on Santa Cruz Island is a daunting task; still there is reason to be optimistic. There is now a permanent, coordinated infrastructure in place that will help insure ongoing work by volunteer groups with the assistance of island stakeholders. There now exists a single, prioritized database of the distribution of exotic plants on the island. An ongoing education campaign will help prevent future introductions of exotic species to the island. With our new structure and focus, together with a track record of success, the prospects look bright for continued support and interest in the project.

Contact Channel Islands Restoration to comment or volunteer at islands@rain.org or 805.448.5726. Or visit www.channelislandsrestoration.com/sci

The Ecology and Impacts of Blue Gum Eucalyptus in Coastal California

Grey Hayes, Ph.D., Elkhorn Slough National Estuarine Research Reserve

On June 3rd 2004, one hundred people came together in Moss Landing, California at a workshop entitled "The Ecology and Impacts of Blue Gum Eucalyptus in Coastal California." The audience included scientists,

Photo courtesy Doug Johnson

Organizer Grey Hayes addresses attendees at the *Eucalyptus globulus* workshop.

county and city planners, land managers, and staff and volunteers from a wide range of environmental organizations. Many were anxious to gather information to justify their blue gum control projects; others were concerned that information might be presented that would condemn groves of what they have come to know is important habitat. There was also a large contingent who knew there would be no easy answers, but nevertheless wanted to hear what could be said about this large, woody invader. And, indeed, there were no easy answers.

The workshop's first speaker, Eric Van Dyke, an ecologist with expertise in GIS, aerial photo interpretation, and ecological history, gave one of the day's most popular presentations. He began with a comprehensive history of the introduction of blue gum in California, beginning in the mid 1800's with widely publicized advertisements of the "miracle tree," which would save the country from the impending "timber famine." Eric then presented analysis of the spread of several groves of blue gum in the Elkhorn Slough watershed, near Moss Landing. While one grove, adjacent to a heavily grazed pasture and a saltwater estuary, did not spread during the study period (1931 – present), most groves (even the grove entirely cut down for firewood!) spread considerably. Although he cautioned that his estimates are preliminary and rough, Eric conservatively put the rate of spread at approximately 4% per year, or nearly a tripling of the size of the stands during the 70-year study period.

Much of the workshop focused on the avian impacts of blue gum. Diana Wakimoto and Anna Kopitov, research interns working with Dr. Kerstin Wasson at the Elkhorn Slough National Estuarine Research Reserve, presented their one-year studies in which they compared bird abundance and species richness in blue gum stands with similarly sized coast live oak groves near the Slough. David Suddjian, a bird biologist/consultant who has extensive experience and records of bird use on California's central coast, compared his long-term data on bird communities in blue gum with riparian, mixed evergreen, coast live oak, and grasslands. The message from these presentations was that blue gum stands are not devoid of native bird species: species nest, forage, and perch within the stands. Suddjian even pointed out that some species prefer blue gum, probably because of their tall stature and the stands' locations, which are sometimes in areas lacking other trees or close to productive aquatic habitats. Wakimoto's study suggested that species richness and abundance was similar in coast live oak and eucalyptus groves, but that individual species may favor one habitat over the other. Both her and Kopitov's data suggested that exotic species may be pairing up: the European starling is much more abundant in blue gum stands than in coast live oak. On the other hand, Kopitov's study found greater species richness and abundance of birds in coast live oak groves, which were favored by titmice, quail, spotted towhee, and dark-eyed juncos.

Another research intern working with Dr. Wasson, Jason Nicholson, presented his comparison between allelopathic compounds from coast live oak and blue gum leaf litter and the impact on native species germination. Nicholson found that compounds leaching from the leaves of both of these species equally suppress the germination of yarrow (*Achillea millefolium*) and sticky monkeyflower (*Mimulus aurantiacus*). This may explain why Kopitov's data suggested similar plant species richness and abundance in the two plant communities. A poster presented by researchers at the National Park Service's Golden Gate National Resource Area suggested that, where blue gum understory vegetation is depauperate, management to reduce litter accumulation can help to restore native species, adding to blue gum groves' habitat quality.

Entomological ecologist Susie Fork presented data on insect communities in coast live oak versus blue gum stands. She found that overall insect order richness and abundance was not different between the two forest types, though specific groups of insects were associated with each type. For instance, beetles were more abundant in coast live oak whereas flies were more abundant in blue gum stands.

Most people have heard about monarch butterflies overwintering in eucalyptus groves in coastal California. Dr. Stuart Weiss gave an excellent presentation on his work at two monarch gathering areas: Pacific Grove (a.k.a. "Butterfly City, U.S.A.") and Andrew Molera State Park, near Big Sur. He illustrated how the monarch requires warmth and protection from wind in these overwintering areas and how scientific analysis of canopy structure and wind patterns can help design management regimes to assure long-term habitat quality of the monarch's winter roosts. Another poster presented at the workshop helped demystify the connection between monarchs and eucalyptus by presenting data on the butterfly's use of pines and cypresses at Andrew Molera State Park.

After the presentations, audience members and presenters engaged in a lively discussion. It was clear that a lot of questions remain unanswered. For instance, do data from Australia bear out here in California where blue gum's water consumption can actually dry up wetlands? Will longer term data show more clear impacts of blue gum on bird communities? With more work, will science demonstrate the widespread anecdotal evidence of low native understory plant diversity and abundance in blue gum compared with native forest communities? And ultimately, will blue gum researchers be able to present to planners and land managers clear guidelines for where, when, and how to control blue gum?

Visit www.elkhornslough.org/CTP/bluegum/bluegum.htm for more information about the workshop and blue gum eucalyptus.

Photo art by Brianna Richardson

2004 Cal-IPC Symposium

"Invasive Plants and the Wildland/Urban Interface"

Ventura, October 7-9

The Cal-IPC Symposium is the ideal place to learn the latest in invasive plant biology, management, and policy issues from researchers and practitioners working around the state. Invited speakers, contributed papers, working groups, field trips, posters, and trade exhibits make the Symposium the most comprehensive overview of wildland weed work in California. **Join us for our 13th annual Symposium!**

The Symposium

The interplay between invasive plants and human development at the wildland/urban interface can both challenge and benefit weed management and restoration. At this year's Symposium, invited speakers will focus on: the migration of ornamental plants across the interface; habitat fragmentation and edge effects; and fire and invasive plants at the interface. We will also host four sessions of contributed papers focusing on volunteer issues, funding for urban weed work, academic research, and cutting-edge field techniques. During it all, the exhibit hall will house trade exhibits and posters highlighting research findings and successful projects.

Photo by Brianna Richardson

The Symposium site

Ventura

The historic city of Ventura is the site of this year's Symposium. Meetings will be held at the Holiday Inn Ventura Beach Resort, overlooking the ocean two short blocks from the downtown shopping district. Antique shops, thrift stores, art galleries, cafes, and restaurants, as well as the historic city hall and Buenaventura Mission are all within easy walking distance of the conference site. Outside the hotel, a beachfront promenade lines the Pacific to Surfer's Point, offering beautiful views of the palm-lined ocean.

Photo by Brianna Richardson

Downtown Ventura

Photo by Brianna Richardson

Buenaventura Mission

Field Trips

Channel Islands (full-day)

Spend the day on Santa Cruz Island, enjoying an unusal opportunity to visit the Nature Conservancy/National Park Service reserve. After boating to Prisoner's Bay, unwind with a guided hike or truck tour from beaches to stunning vistas. Discuss strategies for dealing with infestations of fennel, vinca, eucalyptus, and feral pigs. Birders can add the island scrub jay to their life list.

Santa Monica Mountains (part-day)

Enjoy a half-day in the Santa Monica Mountains, visiting the Mediterranean ecosystem of Solstice Canyon to see the multi-pronged treatment of *Euphorbia terracina* (Geraldton carnation spurge). On the way, visit restoration work at Point Magu salt marsh.

Santa Clara River (part-day)

Visit a riparian forest restoration project organized by Audubon, Coastal Conservancy, and local groups at Valley View Ranch along the Santa Clara River, with a focus on *Arundo donax.*

Photo © Rebecca Wells, The Nature Conservancy

The Santa Clara River

Photo by Brianna Richardson

Island Packers will take us to Santa Cruz Island for the Channel Islands field trip.

For more Symposium information and registration forms visit www.cal-ipc.org or call 510.843.3902

2004 Cal-IPC Symposium

Preliminary Program

Thursday, October 7

Laws & Regulations

Regulations we use as tools to deal with invasive plants. *Courtney Albrecht, California Department of Food and Agriculture*

Encouraging conservation on private lands through permit coordination. *Mike Gerel, Sustainable Conservation*

Why you may need a licensed Pest Control Advisor. *Diana Bartel, California Association of Pest Control Advisors*

Herbicide toxicology and signal words. *Robert Krieger, UC Riverside*

Habitat Fragmentation and Edge Effects

Habitat fragmentation in California: Current extent, rate of edge generation, and a look at our likely future. *TBA*

A comparison of flora in San Francisco's fragmented natural areas. *Christopher Campbell, San Francisco Natural Areas Program*

Corridors: Crossing political boundaries. *Bonnie Harper-Lore, Federal Highway Administration*

Managing remnants of natural habitat in an urban sea. *Suzanne Goode, California State Parks*

Effects of the invasive Argentine ant on northern California grassland community composition. *Lisa DiGirolamo, UC Santa Cruz*

Volunteer Weed Control Efforts (concurrent)

Contributed papers will be selected in August. Visit www.cal-ipc.org for program updates.

Academic Research Papers (concurrent)

Contributed papers will be selected in August. Visit www.cal-ipc.org for program updates.

Working Groups I

Riparian: arundo, perennial pepperweed, Tamarix, Cape ivy...

Aquatic: Eurasian watermilfoil, caulerpa, Spartina, water hyacinth...

Grasses: medusahead, barbed goatgrass, cheat grass, Harding grass...

Forbs: thistles, knapweeds, dalmation toadflax...

Trees & Shrubs: brooms, eucalyptus, tree of heaven, Sesbania...

Dunes: pampas/jubatagrass, iceplant, Ammophila...

Friday, October 8

Migration of Ornamentals Across the WUI

A tale of two invaders: The dynamic history of pampasgrass and jubatagrass in California. *John Lambrinos, UC Davis*

Genetic and reproductive factors contributing to the invasiveness of escaped ornamentals in wildlands. *Marie Jasieniuk, UC Davis*

Water gardening: Pathway to paradise or plant invasion? *Holly Crosson, UC Davis*

Partnering to prevent invasive plant introductions of horticultural origin. *Sarah Connick, Sustainable Conservation*

Invasive Plants and Fire at the WUI

Overview of fire and wildland weeds at the WUI in California. *Chris Ducas, Cal Poly San Luis Obispo*

Fire management practices and alien plant invasions. *Jon E. Keeley, USGS Western Ecological Research Center*

Weeds in WUI fuel breaks: Challenges and opportunities. *Janet Klein, Marin Municipal Water District*

Effects of invasive plants on fire regimes in coastal sage and chapparal. *Richard Minnich, UC Riverside*

Funding Invasive Plant Projects (concurrent)

Wetland recovery projects through the Coastal Conservancy. *Karen Bane, Coastal Conservancy*

Urban stream restoration grants through the Department of Water Resources. *Susan Woolam, DWR*

EQUIP, WHIP, & conservation programs through the Farm Bill. *TBA, NRCS*

Watershed assistance grants and other bond funded grants through Regional Water Quality Control Boards. *TBA, RWQCB*

State and federal legislative funding initiatives supported through CALIWAC. *Wendy West, El Dorado Co. Agriculture Dept.*

Field Techniques (concurrent)

Contributed papers will be selected in August. Visit www.cal-ipc.org for program updates.

Working Groups II

Risk Assessment... Critical Habitat... Nurseries... Fire... Mapping... Environmental/Social Issues... Roadsides...

New and Contributing Members

Thank you for your generous support! *This list reflects donors and new members since the last newsletter.*

Foundation Grants

The Coastal Conservancy of California
The San Francisco Foundation

Generous Donations

Edith & Michael Allen (UC Riverside, Riverside)
Stephen Batchelder (Consulting Arborist, Crockett)
Robert Berman (CNPS, Pacific Grove)
Charles Blair (CNPS, Lompoc)
Daniel Boughter (California Exotic Plant Management Team, Point Reyes Station)
Carroll Brentano (Berkeley)
Eva Butler (Riverside Consulting, Sacramento)
Elizabeth Carlton (Oakland)
Bob Case (Alameda/Contra Costa County WMA, Concord)
Marian Chambers (Central Sierra Partnership Against Weeds, Sonora)
David Chang (Santa Barbara County WMA, Santa Barbara)
John Copeland (CNPS/Mt. Lassen Chapter, Chico)
Pam Dalton (I Care, San Diego)
Kirk Ekelund (Garrapata Creek Watershed Council, Monterey)
Sally Falkenhagen (Menlo Park)
Ron Felzer (Merritt College, Oakland)
Jill Flores (Santa Ana)
William & Wilma Follette (Sausalito)
Paul Grunland (CNPS, Berkeley)
Philip Hoehn (San Francisco)
Kenneth Howard (Sausalito)
Sarah Jayne (Irvine)
Verna Jigour (Verna Jigour Assoc., Santa Clara)
Ralph Kraetsch (Walnut Creek Open Space Foundation, Walnut Creek)
Robert P. Leach (West Sacramento)
Elizabeth Leger (ESA, Davis)
Judith Lowry (Larner Seeds, Bolinas)
Audrey Miller (Novato)
Edward Munyak (Los Altos)
M.P. Murphy (Ornamental Horticulturist, Garden Valley)
Val Page (Mojave Desert RCD, Apple Valley)
Mike Peters (Fallbrook Land Conservancy, Fallbrook)
Ramona Robison (UC Davis, Sacramento)
Susan Sanders (Nevada City)
Lincoln Smith (USDA ARS, Albany)
Jean Starkweather (Marin Conservation League, San Rafael)
Don Stiver (CNPS, El Cerrito)
Allan Thode (Murphys)
Gilbert R. (Ray) Van De Water (CNPS, Gualala)
Clarence Weinmann (Oakland Museum of California, Berkeley)
Anonymous (Petaluma)

Contributing Members

Kirk Ekelund (Garrapata Creek Watershed Council, Monterey)
Elaine & Duncan Walker (Moss Beach)

Institutional Members

DeAngelo Brothers, Inc. (Hazleton, PA)
City of Pittsburg Clean Water Program
Central Contra Costa Sanitary District (Martinez)
Center for Natural Lands Management (Fallbrook)
CNPS/Sierra Foothills Chapter (Groveland)
Peninsula Open Space Trust (Menlo Park)
Center for Invasive Plant Management (Bozeman, MT)
Marin County Stormwater Pollution Prevention Program (San Rafael)
Marin/Sonoma Counties WMA (Novato)
Fairfield/Suisun Sewer District (Fairfield)
San Francisco PUC, Bureau of Environmental Regulation & Management

Individual Members

Elizabeth Bickmore (Southern Nevada Water Authority, Las Vegas, NV), **Maximilliano Busnardo** (H.T. Harvey & Associates, Ben Lomond), **Robert G. Clement** (USDA, Morgan Hill), **Michelle A. Cloud-Hughes** (Soil Ecology & Restoration Group, San Diego), **Geoff Coffey** (San Francisco), **Donna Dormody** (Carmel Garden Club , Carmel), **Rod Dossey** (Dossey & Assoc., Encinitas), **Kristie Ehrhart** (Wildlands, Inc, Rocklin), **Thaddeus Hunt** (University of Florida, Gainesville), **Nancy Jamison** (Woodside), **Jon Keeley** (USGS, Three Rivers), **Cynthia Kondon** (Rancho Palos Verdes), **Caroline Kuizenga** (Carpinteria), **Clare Leger** (Montara), **Walter J. McCall** (The C.R.E.W., Ojai), **Melissa McDowell** (Gold Beach, OR), **Sierra Smith** (Mendocino Coast Botanical Gardens, Ft. Bragg), **Richard Sweet** (Friends of the Santa Clara River, Ventura), **Michael Thometz** (Campo), **Jean Witzman** (CA Dept. of Water Resources, Sacramento)

...Arundo, continued from p.9

pursuant to the Costa-Machado Water Act of 2000 (Proposition 13) and any amendments thereto for the implementation of California's Nonpoint Source Pollution Control Program.

Project partners such as the US Forest Service, City of Santa Clarita, US Army Corps, Friends of the Santa Clara River, Los Angeles County Public Works and many others will be contributing time and energy to make the SCARP document comprehensive and implementable.

Post-fire Arundo spraying in the Santa Clara River

This project is a timely response to a fire occurrence in the Santa Clara River Watershed in October, 2003. Due to the nature of Arundo, it is quickly re-sprouting, well ahead of the native vegetation. One of the primary costs of Arundo removal is the cost of removing and disposing of the biomass generated by cut Arundo. The fire has afforded us a tremendous opportunity to use approved herbicides on the Arundo sprouts without posing any threat to native vegetation and eliminated the need for biomass removal. This project is being funded by a grant from the Santa Clara River Trustee Council and is being administered by the US Fish & Wildlife Service. Spraying is expected to occur in September and October of this year.

Contact the Ventura Arundo Task Force through the Ventura County Resource Conservation District at 805.386.4684.

Readings & Resources

The Nature Conservancy's Wildland Invasive Species Team website is now hosting **"Rob Randall's Big Weed List."** One of the best indicators that a non-native plant is likely to be invasive is if it has a history of being invasive elsewhere. Randall's list will let you know if a plant you have your eye on has caused problems somewhere else. <*tncweeds.ucdavis.edu*>

In addition to information on the effects of fire on specific plants, vegetation types, and wildlife, **The U.S. Forest Service's Fire Effects Information Systems** database and website also contains extensive write-ups on fire effects and fire ecology for a number of invasive plant species, including information on species distribution, potential habitats in which they occur, and management considerations. <*www.fs.fed.us/database/feis/index.html*>

For invasive plant gifts and kitch, visit **Invasive Species, the Store** at cafepress. Don't miss the "It's time to wipe out invasive plants" wall clock. <*www.cafeshops.com*>

Ayres, D.R. and D.R. Strong. 2003. ***Spartina foliosa* (Poaceae) - a common species on the road to rarity?** *Madroño* 50(3): 209-213.
Spartina foliosa, a saltmarsh cordgrass native to the US Pacific coast, is forming hybrid swarms with *S. alterniflora*, a cordgrass from the Atlantic and Gulf coasts. The authors conclude that *S. foliosa* is in immediate danger of extirpation in San Francisco Bay, and perhaps beyond.

Boydston, R.A. and M.M. Williams, II. 2004. **Combined effects of *Aceria malherbae* and herbicides on field bindweed (*Convolvulus arvensis*) growth.** *Weed Science* 52: 297-301.
Combining the biocontrol agent *Aceria malherbae* (a gall mite) and a sublethal dose of the herbicide 2,4-D or glyphosate (active ingredient in Roundup and Rodeo) reduced field bindweed root biomass more than either treatment alone.

A new **invasive alien species event calendar** is available on-line. The site is set-up to allow the addition of events instantly. <*calendar.cleantrade.net*>

Photo courtesy Eric Lane

Tamarisk! Good for something.

Plenary talks from the American Institute of Biological Sciences March meeting, **"Invasive Species: The Search for Solutions,"** are available at <*www.aibs.org/virtual-library/*> Speakers included Ann Bartuska, David Lodge, and Daniel Simberloff.

Last fall the Weed Science Society of America entered a cooperative agreement with USDA-APHIS to examine the weed management implications of the potential deregulation of glyphosate- and glufosinate-resistant bentgrass. The report, **"Determination of the Potential Impact from the Release of Glyphosate-and Glufosinate-Resistant Agrostis stolonifera L. in Various Crop and Non-Crop Ecosystems,"** is now available at <*www.wssa.net/wsinfo/pubs/bentgrass.pdf*>

NatureServe announces the release of **"An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impact on Biodiversity,"** a new scientific methodology evaluating the impacts of non-native plants on native species and conservation areas. The protocol is designed to make the process of assessing and listing invasive plants objective, systematic, and transparent and will help set priorities focusing scarce management resources on the very worst invaders. To date, NatureServe has assessed over 300 of the more than 3,500 non-native plants that have escaped cultivation in the U.S. <*www.natureserve.org*>

Looking for a **weed-removal tool** you're not sure exists? The ergonica website offers links to dozens of manufacturers that produce unusual weeding tools. <*www.ergonica.com*>

The **Baltimore Declaration**, initiated at the Experts Meeting on Implementation of a Global Invasive Species Information Network (GISIN), April 6-8, 2004 has been released for distribution. The Declaration outlines the mission, goals, and guiding principles for the GISIN.<*invasivespecies.nbii.gov/as/BaltimoreDeclaration.pdf*>

A new book, **Harmful Invasive Species: Legal Responses**, edited by Marc L. Miller and Robert N. Fabian, describes the law and policy regarding harmful, non-indiginous species in six countries: New Zealand, South Africa, Argentina, Poland, and the United States. Published in January, 2004 by the Environmental Law Institute <*www.eli.org*>

Can't Get Enough Restoration?

Joint memberships are now available with the **California Society for Ecological Restoration** (SERCAL), and the **California Native Grass Association** (CNGA)

2005 Cal-IPC & SERCAL	$55 ($10 savings!)
2005 Cal-IPC & CNGA	$70 ($10 savings!)
2005 Cal-IPC & SERCAL & CNGA	$95 ($15 savings!)

See the back page of this newsletter to sign up, or call 510.843.3902

The WILDLAND WEED CALENDAR

Flora of Lassen Volcanic National Park
July 22 - 25, 2004
Lassen National Park, California

Participants will hike to explore several areas of botanical interest within the Park. For more details and to register contact Cynthia Perrine at *cperrine@uclink4.berkeley.edu*.

Ecological Society of America 89th Annual Meeting
August1-6, 2004
Portland, Oregon

"Lessons of Lewis & Clark: Ecological Exploration of Inhabited Landscapes."
<*www.esa.org*>

Sierra Nevada Alliance Eleventh Annual Conference
August 6 - 8, 2004
South Lake Tahoe, California

"Local Efforts - Regional Results" Learn about the latest conservation information, tactics and tools. <*www.sierranevadaalliance.org*>

12th International Conference on Weed Biology
August 31, 2004
Dijon, France
<*www.dijon.inra.fr/*>

If you know of an event that you would like to see mentioned here, please contact <brichardson@cal-ipc.org>.

California Vegetation Mapping and Classification Workshop
September 8, 2004
Yosemite National Park, California

Learn the basics of mapping and classification, making use of the park's recently completed vegetation map and classification.
<*ucjeps.berkeley.edu*>

2nd National Conference on Coastal and Esturaine Habitat Restoration
September 12-15, 2004
Seattle, Washington
<*www.estuaries.org*>

North American Weed Management Association Annual Meeting
September 21-24, 2004
Rapid City, South Dakota
<*www.nawma.org*>

3rd International Conference on Biological Invasions, NEOBIOTA - From Ecology to Control
September 30-October 1, 2004
Bern, Switzerland
<*www.neobiota.unibe.ch*>

Quotable:

"I would recommend belts from 100 to 150 feet in width, each quarter of a mile, planted at right angles with the prevailing direction of the winds, and to line all the highways, parallel with or to the general currents, with belts of two or three rows, closely planted. This planting would occupy about one eighth of the land… Contemplate the beauty, the grandeur, the productiveness of the great valleys of the Sacramento, the San Joaquin, the Salinas plain, and of every strip of arable land in the State, with belts of Eucalyptus trees planted as I have recommended. With such shelter California would become the paradise of the world."

Ellwood Cooper, in Forest Culture and Eucalyptus Trees, *1876*

"Just how 'saved' are our national parks if they're overrun with exotic species? In the Grand Canyon alone, over 100 non-native plants, 26 fish, and 4 birds have established themselves in the Colorado River corridor... [I]nvasive species have yet to sink into the public's environmental conciousness the way clearcuts and oil spills have..."

Heather Millar in "When Aliens Attack," cover story in the July/August issue of Sierra, *magazine of the Sierra Club*

Association of Natural Biocontrol Producers Conference
October 1-2, 2004
Colorado Springs, Colorado
<*www.ANBP.org*>

CALFED Science Conference
October 4 - October 6, 2004
Sacramento, California

The Third Biennial California Bay-Delta Program (CALFED) Science Conference is a forum for presenting scientific information and ideas relevant to the Program's goals and objectives in the Bay-Delta, its watershed, and the adjacent coastal ocean.
<*iep.water.ca.gov/calfed/sciconf/2004*>

2004 Natural Areas Conference
October 13-16, 2004
Chicago, Illinois
<*www.conferences.uiuc.edu/NAA2004*>

Third International Conference on Invasive Spartina
November 8-10, 2004
San Francisco, California

A forum for the latest *Spartina* research from around the world, and an opportunity to hear and discuss the experiences of a wide range of marsh managers and technical experts. The conference will include scenic ground and helicopter tours. <*www.spartina.org*>

California Association of Resource Conservation Districts Annual Meeting & Conference
November 17-20, 2004
San Luis Obispo, California

Annual gathering of California's 103 resource conservation district directors and employees and other agency, agricultural, and environmental groups interested in current natural resources conservation issues.
<*www.carcd.org*>

10th Biennial Watershed Management Council Conference
November 15 - November 19, 2004
San Diego, California

"Watershed Management on the Edge: Scarcity, Quality, & Distribution."
<*www.watershed.org*>

Cal-IPC Membership Form

We're working to protect California's wildlands from invasive plants—join us!

Cal-IPC's effectiveness comes from a strong membership, including scientists, land managers, policy makers, and concerned citizens. Please photocopy the form below, complete, and mail with your payment. Additional donations are always welcome to support our projects; we are a 501(c)3 nonprofit organization, and donations beyond regular membership rates are tax deductible.

Individual

❑ **Regular**	**$35**
❑ Family	$60
❑ Contributing	$75
❑ Life	$1,000
❑ Joint Cal-IPC/SERCAL	$55
❑ Joint Cal-IPC/CNGA	$70
❑ Cal-IPC/SERCAL/CNGA	$90
❑ Student/Volunteer	$15

Institutional

❑ Regular	$150
❑ Contributing	$300
❑ Patron	$600
❑ Sustaining	$1,000
❑ Small company or Nonprofit	$100

Ways to join:

Mail: send this form with check (made out to "Cal-IPC") or credit card info to Cal-IPC, 1442-A Walnut Street #462, Berkeley, CA 94709

Fax: fax form with credit card info to 510/217-3500

Email: send contact and credit card info to *dwjohnson@cal-ipc.org*

Phone: call us at 510/843-3902 and provide contact and credit card info

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