



Cal-IPC News

*Protecting California's Natural Areas
from Wildland Weeds*

Vol. 16, No. 3

Fall 2008

Quarterly Newsletter of the California Invasive Plant Council

Weeds have nowhere to hide...



Controlling weeds by helicopter was one of the topics presented at the 2008 Symposium. Here, a helicopter drops off an applicator to treat a remote infestation of invasive Peruvian pepper trees as part of a program to eradicate 14 plant species on Santa Cruz Island.

Photo: John Knapp, courtesy of The Nature Conservancy

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

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Editors: Doug Johnson, Elizabeth Brusati, Heather Brady

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From the Director's Desk

Strategic foresight

Those working on the ground in natural resource management have their hands full with the day-to-day tasks of controlling invasive plants. It can be a victory to simply maintain several years of funding to complete the necessary follow-up on a project.

Yet we know that prevention and early response activities for new weeds can be more cost-effective than managing full-blown infestations. It can be seen as a sign of progress that the natural resource community is beginning to focus more in these areas.

At Cal-IPC, we are working to do our part. We have completed a two-year pilot project to map the potential for spread of wildland weeds already in the state, and to list international weeds that could become future problems here in California. Our efforts to map potential spread drew heavily on distribution data contributed by natural resources managers through local Weed Management Areas. To predict the potential for spread for each plant, we used climate matching software to determine additional suitable areas of the state not yet invaded. These maps show resource managers which weeds are most likely to move into their area. Likewise, the international list helps managers be on the lookout for infestations of new weeds, and provides a basis for screening plants that are proposed as new horticultural imports.

Cal-HIP, the multi-stakeholder partnership behind PlantRight (www.plantright.org), is developing a risk assessment process to help further evaluate potential new horticultural introductions. Such screening also needs to be in place before committing to biofuel crops, many of which have invasive tendencies by virtue of the low-maintenance, fast-growing qualities desired in such plants.

This approach of evaluating pests before they become a problem here is gaining steam through official channels as well. The Governor recently signed into law AB 2763, requiring state agencies to assess which invasive species—plants, animals, and plant and animal diseases—not yet introduced into California are a major threat. The bill was authored by Santa Cruz Assembly Member John Laird in the wake of his constituents' concern about aerial spraying proposed to control light brown apple moth. The bill's intent is for agencies and the public to vet proposed control measures (such as aerial spraying) ahead of time, rather than during a crisis requiring rapid action. The bill includes all invasive species that threaten the state's economy or environment, and it is vital that we use this opportunity to prepare for future wildland pests, not just those that threaten agriculture.

At the same time, local groups are organizing to stop the spread of key invasive plants. The Bay Area Early Detection Network received start-up funding from the National Fish & Wildlife Foundation, and will seek to be a model for reporting and tracking weed populations on a regional basis. Cal-IPC will support this project and others around the state by adding regional detail to our statewide Inventory of invasive plants. It is critical that the Inventory serve local resource managers, and that all plants suspected of being worthy of the "invasive" label be carefully assessed using our science-based criteria system.

All of these efforts reflect a maturation of our field. By beginning to implement strategies focused on prevention and early detection activities will help us work smarter in the future. There is no mystery to what needs to be done—we need to support and expand upon successful programs like those run for a century by our county agricultural commissioners, and to build on new technologies, research, and stakeholders dedicated to this work. With the wild card of climate change shuffled into the deck, our work gets even more challenging. Here at Cal-IPC, we will continue to work with diverse partners on strategic initiatives designed to protect California's wildlands into the future.

Wildland Weed NewsNewsNewsNewsNews

California Department of Fish and Game scientist Susan Ellis and UC Davis professor Joseph DiTomaso have been **appointed to the advisory committee of the National Invasive Species Council (NISC)**. NISC is co-chaired by the Secretaries of the Interior, Agriculture and Commerce. The advisory committee represents a broad range of stakeholders including scientific, conservation, agriculture, state and tribal governments, and industry organizations impacted by invasive species. www.invasivespeciesinfo.gov/council/advisory.shtml

AB 2763 was signed into law by Gov. Schwarzenegger, mandating that the state work on **“advance planning” for invasive animals, plants, and animal and plant diseases**. The bill puts the Cal. Dept. of Food & Agriculture as the lead agency, and instructs them to work with other agencies and stakeholders. The state is unable to fund the work, but plans to seek federal funds through the Farm Bill.

A brown alga, *Ascophyllum nodosum* (pictured below), is **spreading in San Francisco Bay**. While marine biologists are not sure how serious this invader is, this is the first time it has been seen in the bay. It may be spread in packages of bait shipped from the East Coast. The National Oceanic and Atmospheric Administration, US Fish and Wildlife Service, and numerous

volunteers are working to remove the algae. www.noaa.gov/world.noaa.gov/conservation/aug2008_conservation_4.html

A *Los Angeles Times* article entitled “Beige Plague” described how the **conversion of sagebrush habitat to annual grasses**, especially cheatgrass, has increased the intensity and frequency of wildfires in western states. Areas of the high desert that historically burned once a century now burn every few years. In 2005, 1 million acres of the Mojave Desert burned. In Elko, Nevada, courtship grounds for sage grouse, winter habitat for mule deer and food sources for pronghorn have all been burned away. *Los Angeles Times*, August 2, 2008

The **Oklahoma Invasive Plant Council formed this July**, bringing the total number of states represented by Invasive Plant or Exotic Pest Plant Councils to 35. www.naeppc.org

Invasive species are more abundant in manmade impoundments than in natural lakes and those **impoundments act as stepping stones for invaders**. So concluded researchers who examined five invasive species in the Great Lakes region, taking into account water chemistry, recreational use, and geographic distribution of the lakes. (Johnson *et al.*, *Frontiers in Ecology and Environment*, September 2008)



Ascophyllum nodosum, a new alga in San Francisco Bay. Photo: NOAA.

Cal-IPC Updates

Student Chapter

The Cal-IPC Student Chapter formed at UC Riverside in 2007 to facilitate communication between students and professionals in invasive plant management. The chapter is recruiting new members and new schools. To find out more and receive a CD of start-up materials, contact calipcsc@gmail.com.

Online Photo Gallery

See Cal-IPC photos on Flickr! Former Cal-IPC staff and board member Brianna Richardson organized Symposium pictures, photo contest entries, plant photos, and many more into an online database. This is the first step in making our photos more accessible and showing the public the many facets of weed work. Contact us if you would like to use a photo for your outreach materials. www.flickr.com/photos/cal-ipc

Early Detection Online

A new section of our website provides resources for early detection, including maps and county watch lists. www.cal-ipc.org/ip/mapping/early_detection

“Don’t Plant a Pest!” Reprinted

We have reprinted the Central Valley and Sierra Foothills versions of the “Don’t Plant a Pest!” brochure. Request up to 50 free copies by emailing info@cal-ipc.org or calling 510-843-3902. Larger quantities may be ordered through our online store.

Board of Directors Election Results

Jason Casanova, Doug Gibson, Cheryl McCormick, and all officers were re-elected. New directors beginning terms in January are Edith Allen (UC Riverside), Henry Gonzales (Ventura County Agricultural Commissioner), Julie Horenstein (CA Dept. of Fish & Game), and Marc Lea (San Luis Obispo County Dept. of Agriculture).

Predicting where weeds will spread

Elizabeth Brusati, Cal-IPC Project Manager, edbrusati@cal-ipc.org

Those who work to control invasive plants and restore habitats must balance their plans between the present and the future. Most of the work that happens in both research and management addresses the present, or at least the next couple of field seasons. For the past two years, Cal-IPC worked on a project to improve information on where invasive plants currently occur in California while assessing the risk of them spreading in the future. What weeds do your neighbors have? What new weeds are most likely to thrive in your county? What will happen as global climate change progresses?

Weed risk assessment predicts which plants could become problems. “Pre-border” assessments study organisms not yet present in a particular region while “post-border” assessments predict the spread of species already present. The USDA uses risk assessments to judge proposed importation of plants or animals.

Cal-IPC’s risk assessment project addresses invasive plants already here as well as those that could invade, with several specific objectives. First, determine the current range in California of all species on the Cal-IPC Inventory. Second, predict where a subset of those species could spread, using computer models. Third, identify areas in California most vulnerable to expansion of those species and identify potential pathways of introduction. Finally, identify plants that are invasive in other Mediterranean-climate regions and that might become invasive here. The Exotic Pests and Diseases program of the UC Integrated Pest Management program funded the project with Dr. Joe DiTomaso of UC Davis serving as co-Principal Investigator.

Where are invasive plants now?

The first step in predicting spread is to find out where plants already are. The California Department of Food and Agriculture tracks A-rated noxious weeds but there are no statewide maps for most other invasive plants. We surveyed Weed Management

Areas for data on invasive plants in their counties, including rough estimates of total area infested and whether populations are increasing, declining due to control efforts, or stable. We began with 36 species in summer 2007 and added the remaining species from the Cal-IPC Inventory in 2008.

Where can they spread?

The next step is to predict where else known invasive plants could grow. Climate is the main factor that determines where a plant can survive. We predicted the areas of California with suitable habitat for 36 plants. These species were a representative sample from the Inventory, with a range of growth forms, habitat preferences, severity of impacts, and regions currently invaded. Modeled species included a number of ornamental plants, many of which are under consideration by the California Horticultural Invasives Prevention (Cal-HIP) project (See page 11 for the list of modeled species).

Our models compared the climate of the native and invasive range of each species to the climate of California. The software (CLIMEX) uses temperature and soil moisture tolerances of each species to generate an “ecoclimatic index” that rates a plant’s ability to survive. Irrigation can be added to simulate the water needs of riparian or wetland species. CLIMEX includes a database of worldwide meteorological data. Dr. Scott Steinmaus, Cal-Poly San Luis Obispo, provided data from 322 California weather stations to allow for more precise predictions. Online herbaria and flora databases gave us information on where plants grow worldwide.

This method provides only a rough estimate of where plants can grow but its advantage is that it is one of the few types of analysis that can be carried out without detailed experimental data. For most of our wildland weeds, that type of information just does not exist. Including the worldwide invaded range is essential, as many so-called “Mediterranean” species spread into areas far from their native range. For example, castor

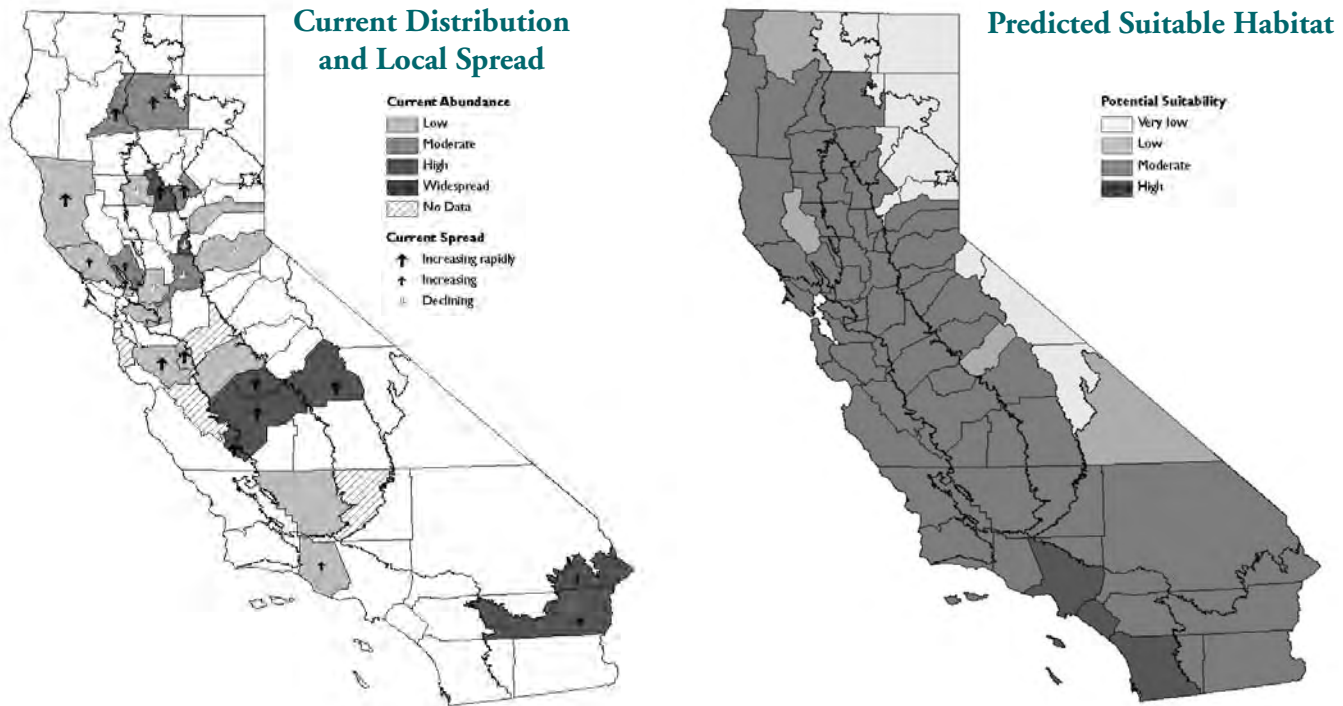
bean (*Ricinus communis*), a native of North Africa and the Middle East, grows into Scandinavia and southern Australia.

The results showed some interesting patterns. Some were not too surprising: for instance, species that grow in a few counties along the coast can survive in areas located between their existing range. Another common pattern was that species that can survive in the San Francisco Bay Area were also predicted to grow in the Sierra Foothills. We also listed the potential pathway for these plants, in most cases either planting as ornamentals or spread by equipment.

No prediction can be complete without considering climate change. CLIMEX includes settings for global climate change with temperature and rainfall adjusted based on predictions from the International Panel on Climate Change. We also consulted the 2006 report from the California Climate Action Team. We compared the sum of ecoclimatic indices for all 36 species to those predicted with a 3°C increase in average annual temperature. When averaged across all species, the results showed only a 2% increase in the total ecoclimatic index, indicating that invasive plants will not automatically gain a large advantage simply due to warming temperatures. However, we found a few clear winners and losers. The ecoclimatic indices for castor bean (*Ricinus communis*) and fountaingrass (*Pennisetum setaceum*) would nearly double, while that of Chinese tallow (*Sapium sebiferum*) is predicted to decrease by 77%.

Other studies in California are using similar methods. Researchers at UC Riverside are using climate modeling combined with greenhouse studies to provide more detailed analysis on several plant species. UC Davis used this method for Chinese tallow tree (*Sapium sebiferum*) (Cal-IPC News, Summer 2008). Another study on Chinese tallow predicted a more restricted range (Pattison and Mack 2008).

Predicting spread for *Sesbania punicea* (scarlet wisteria)



Sesbania punicea is a shrub or small tree spreading through the state's riparian areas (figure at left). Our modeling shows that many parts of California have potential habitat for *S. punicea* (figure at right). With an increase of 3°C, habitat suitability increases in many areas (not shown). Maps such as these can be used as a foundation for early detection in areas not yet invaded by a plant, and also for setting management strategy in areas where the plant is currently found. Color maps and full details on data for the 36 species modeled to date are available on our website at www.cal-ipc.org/lip/mapping/statewide_maps/index.php.

Which areas are most vulnerable?

We combined WMA data on existing populations with predictions showing areas that have suitable habitat for future expansion. One caveat of this method is that the models are based solely on climate and do not consider other factors such as soil type, competition, or means of spread.

Suitable habitat adjacent to existing invaded areas was deemed most vulnerable. This information was used to produce watch lists for each county of the weeds most likely to invade. These results can inform early detection and rapid response programs.

What else could invade?

Several studies have found that the single best predictor of whether a plant will become invasive in a particular place is its being invasive elsewhere. California is one of five Mediterranean climate regions worldwide along with western Australia, central Chile, South Africa, and the Mediterranean

basin. They share relatively mild climates with dry summers and wet winters. Plants have been moved among these regions as ornamentals, for agriculture, and unintentionally as contaminants. As we know all too well, quite a few have become invasive.

Developing a list of plants that could become invasive is important because it might help regulators decide whether to add a plant to the state noxious weed list. Knowing which ornamentals are invasive in other countries also helps our work with Cal-HIP. Some of these species are already present (perhaps planted) in California, while others are not yet recorded here.

We compared lists from other Mediterranean regions to information from California (page 10). Many sources do not distinguish between plants naturalized in small numbers and those that are truly invasive, and some do not distinguish between agricultural weeds and wildland weeds so we used our best judgment of which to include. We then consulted the *Jepson Manual*

(Hickman 1993) and the online Consortia of California Herbaria to determine which species are already naturalized here and their approximate date of introduction. Many weeds experience a lag phase before they begin to spread and cause problems. To narrow the list, we eliminated species that were present in California prior to 1940 and are not considered invasive. Others were eliminated from consideration due to inadequate information.

Ornamentals are a major pathway of introduction and the focus of other Cal-IPC projects. We determined how many of these plants are ornamentals, either already available on the west coast or used in horticulture elsewhere. We assumed that plants listed in the *Sunset Western Garden Book* (Brenzel 2007) or the *Plant Locator* (Hill and Narizny 2004) are available to California gardeners. While these are not exhaustive references, they cover the most widely-available species. In addition, we

Continued page 10...

Weed Workers

Attendees listened to invited and contributed presentations on a variety of topics.



Board member Bob Case models his one-of-a-kind weed warrior t-shirt.



After a short three-year absence, we returned to Chico State University for the 17th Annual Cal-IPC Symposium. Activities began with a Revegetation Field Course on October 1 in 90° heat and ended with rainshowers on the field trips October 4. In between, 320 attendees listened to presentations in the first student paper contest (see pg. 9), heard of new invaders in Weed Alerts (pg. 8) and learned about new management techniques and ongoing research for invasive plants.

This year's program focused on the future of invasive plant management. Invited speakers discussed climate change, developing a list of research needs for invasive plants, and how to handle invasive species we cannot control. A career panel and career discussion group described options for those planning their professional path. Students gathered during Friday's lunch to hear about the new student chapter, organized by graduate students from UC Riverside. Keynote speaker Emilyn Sheffield of CSU Chico reminded us of the need to adapt our work to include the full diversity of Californians if we want to remain viable for generations to come. Find presentations and proceedings online at www.cal-ipc.org/symposia.

Instructor Luis Ojeda of The Nature Conservancy demonstrates planting techniques for optimum establishment. The Revegetation Field Course was held at The Nature Conservancy's Sunset Ranch in Chico.



Field trip attendees at Chico State's Big Chico Creek Ecological Reserve saw a Spanish broom removal site and lots of evidence of the resident black bears.



Return to Chico!



The crew from the California Department of Food and Agriculture's Integrated Pest Management Program, this year's Organization of the Year, in front of their sponsor booth. Pictured are (from left) Steve Schoenig (now with Dept. of Fish & Game), John Connell, Gina Darin, Dan Mitchell, Andreanna Yribe, and Mike Pitcairn. *Photo: Gina Darin, CDFA.*

Joe DiTomaso (at right) auctions Ken Moore's modified "Thistle Thwacker", one of many custom tools Ken has altered in Santa Cruz. *Photo: Bob Case*

Congratulations to This Year's Award Winners!

John Randall of The Nature Conservancy's Global Invasive Species Team won the 2008 Jake Sigg Award for Vision and Service, in honor of 17 years leading the GIST and his role in founding Cal-IPC.

John Anderson of Hedgerow Farms won the 2008 Ryan Jones Catalyst Award for his pioneering work incorporating native grasses into restoration projects.

Abe Doherty of the State Coastal Conservancy won the 2008 Policy Award for his work guiding Ocean Protection Trust funds toward evaluating pathways of introduction for aquatic invasive species.

Janet Klein of the Marin Municipal Water District won the 2008 Golden Weed Wrench Award as Land Manager of the Year for her diligence in testing innovative control methods and for working with decision-makers and the public.

California Dept. of Food & Agriculture's Integrated Pest Management Branch won our 2008 Organization of the Year Award for strengthening the Weed Management Area program while protecting it from budget cuts.

Jay Goldsmith of the National Park Service's Pacific West Region won the 2008 NPS Weedzilla Award for NPS Resource Manager of the Year for fighting to maintain NPS support for weed removal.



Charlie Blair (with umbrella) is undaunted by rain on the Lassen Volcanic National Park Trip. Other trips visited the Sutter Buttes and local restoration projects in Chico. *Photo: Bob Case.*



The raffle and social hour provided a break from talks and a chance to hang out with other attendees (and watch the vice-presidential debate). Funds raised by the raffle help to support our programs. *Photo: Bob Case.*



Join us Oct. 7-10, 2009, in Visalia!

Weed Alerts!

The annual Weed Alerts announce invasive plants that have begun to spread in California as well as new species coming in. John Randall of The Nature Conservancy presented the talk, compiled from observations sent to Dr. Joe DiTomaso of UC Davis during the past year. The complete presentation, with more photos, is available on the symposium website: www.cal-ipc.org/symposia. If you have seen a new plant spreading, report it to us (see box) or to Joe at jmditomaso@ucdavis.edu.

Invasive plants that are increasing

Creeping waterprimrose (*Ludwigia peploides*): Reported by Sharon Wallace, Chico and Vina area. Native to South America, already widely problematic in California and an expanding problem in northern Sacramento River. Taxonomy is not worked out. Has potential to harbor West Nile Virus.

Prickly goldenfleece (*Urospermum picroides*): Reported by Steve Junak and Mary Carroll, Santa Barbara. Closely resembles *Picris echioides* (bristly oxtongue). Expanding in south coast of Santa Barbara County. A low-growing winter annual or biennial that is native to Europe.

Cultivated plants going wild

Spanish heath (heather) (*Erica lusitanica*): Reported by Clare Golec, CalTrans, Eureka. In the *Jepson Manual* but not known to be widespread; *Jepson* lists it only in Humboldt County. Increases in populations are occurring in Del Norte and Mendocino Counties along Hwy 1. It is also expanding in Humboldt County where it forms near-monocultures. Also found in southern Oregon. Perennial shrub native to Europe.

Licorice (*Glycyrrhiza glabra*): Reported by Tanya Meyer, Yolo County Resource Conservation District. Forming large patches near

Two weeds recently seen spreading.

Left: *Limonium ramosissimum*. Photo: Gavin Archbald

Right: *Vitex agnus-cattus* flower. Photo: Adam Clause



Nominate Species for Inventory Update

We are taking nominations for the annual update to the Cal-IPC Inventory. To provide information on a new species you believe should be reviewed, use the link for “Submit information for inventory revision” at www.cal-ipc.org/ip/intentory by December 31. Many plants currently in the “Evaluated But Not Listed” category are there because we had no information on impacts.

Coming soon: A redesigned Invasive Plant Alerts page at www.cal-ipc.org/ip/management/alerts with information from previous Red Alerts.

riparian areas, particularly along Cache Creek. Resembles native, but with spiny fruit and narrower leaves. Herbaceous perennial native to Eurasia.

Sea lavender (*Limonium ramosissimum*): Reported by Gavin Archbald, San Francisco State University. Used as ornamental for some time. A problem in Southern California, but not well established in San Francisco Bay. Native to coastal Mediterranean areas.

New introductions to California

Italian buckthorn (*Rhamnus alaternus*): Reported by Jake Sigg, San Francisco. Frequently used in gardens and as street tree. Recently reported as an escape in Marin County. Seeds transported by birds. Not included in *Jepson Manual* or *Weeds of California*. Native to southern Europe

Chaste tree (*Vitex agnus-castus*): Reported by Jo Kitz and Debbie Bruschaber, Los Angeles County. Recently found along the bank of Las Virgenes Creek as a riparian escape from cultivation. Not included in the *Jepson Manual*, but can be found in the back of *Weeds of California*. A spreading evergreen broom-like species that is native to southern Europe and western Asia

East Coast brown kelp (*Ascophyllum nodosum*): NOAA and the US Fish and Wildlife Service are working to eradicate this alga from the shoreline of San Francisco Bay (see page 3).

Other species reported from Southern California:

Ehrharta longiflora (long-flowered veldtgrass)

Hedypnois cretica (cretanweed)

Cistus cretica (pink rockrose)

Gazania linearis (gazania, treasureflower)

Malcolmia africana (African mustard)

Tetragonia tetragonioides (New Zealand spinach)

Sonchus arvensis ssp. *uliginosus* (moist or perennial sowthistle)

1st Annual Cal-IPC Student Paper & Poster Contest

Congratulations to the participants of the first-ever Cal-IPC Student Paper and Poster Contest, held at the 2008 Symposium! Graduate and undergraduate students were eligible to present their research projects and the winning presenters received \$250. Thanks to all the students for their hard work, to board member John Knapp for overseeing the contest, and to the anonymous judges who provided comments to the students. The Symposium Proceedings will be posted on our website later this year with articles by all student contest presenters. Here are abstracts from the winners!

1st Place Student Paper

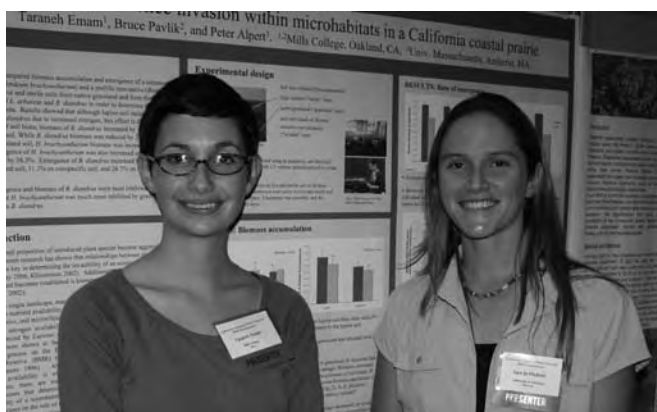
Prescribed fire and exotic plant effects on California grasslands. *Sara Jo M. Dickens, E.B. Allen and L.S. Santiago. Department of Botany and Plant Sciences, UC Riverside.*

California grasslands have been invaded by a suite of Mediterranean, annual grasses for over 200 years. The effects of this conversion from a native bunchgrass and annual forb grassland to exotic, annual grassland has negative impacts on native vegetation and wildlife. It is less understood what the impacts on soils has been and if those impacts can be reversed. We partnered with Nature Conservancy managers at Santa Rosa Plateau Ecological Preserve to test the effectiveness of prescribed fire to control density of exotic grasses. Our objectives were: 1) examine the effectiveness of spring, prescribed burns in controlling exotic grasses, 2) determine an optimal burn regime to reduce exotic grasses and release native plant species, 3) determine if soil characteristics (nutrient pools and fluxes) were responding to exotic grass reduction. Soil total C and N and NO₃ differs between areas burned in different years and having differing levels of exotic grass cover. Phosphorus and NH₄ were not different in soils under differing levels of exotic grass invasion. Prescribed burns reduced exotic grass cover and native forbs increased in the absence of exotic grasses. However, exotic grass cover returned to preburn levels within five years indicating a five year burn frequency may be optimal to initially gain control of the exotic grasses.

1st Place Student Poster

Soil biota facilitate invasion within microhabitats in a California coastal prairie. *Taraneh Emam¹, Bruce Pavlik², Peter Alpert³.* ^{1,2} Mills College, Oakland, CA. ³ Univ. Massachusetts, Amherst, MA.

Relationships between plants and soil biota greatly influence the ability of non-native plants to invade a native soil. Soil biotic communities, and plant-soil interactions,



Student contest winners Taraneh Emam of Mills College (left) and Sara Jo Dickens of UC Riverside. *Photo: Bob Case.*

can vary widely between microhabitats. On the Bodega Marine Reserve (BMR), soil microhabitats influenced by *Lupinus arborescens* have been shown to facilitate growth of non-native grasses through increasing soil nitrogen availability. This experiment compared the effects of soil from differing microhabitats on the emergence and biomass accumulation of *Bromus diandrus*, a prolific non-native annual grass, and *Hordeum brachyantherum*, a native perennial grass. Lupine-influenced soil, *B. diandrus*-influenced soil, and relatively pristine native grassland soil from the BMR were the three microhabitat types tested. *H. brachyantherum* experienced strong negative effects on biomass accumulation from live lupine and grassland soils compared to sterilized soils (relative feedbacks of -1.54 and -0.43, respectively). *B. diandrus* experienced far less severe effects on biomass (-0.049 on lupine soil and -0.070 on grassland soil). The effect of conspecific soil on *B. diandrus* was minimal (-0.00089), which may indicate enemy release. Emergence rates were also affected by soil type. The largest relative difference between *B. diandrus* and *H.*

brachyantherum was seen in native grassland soil, where *H. brachyantherum* emergence fell 58% on live soil and *B. diandrus* only 12%. These findings indicate that the success of both native and invasive plants may vary significantly over small distances due to differing soil communities, and that the native soil community may be promoting the growth of invasive plants while hindering native plants.

Other Student Presenters

Ecological remote sensing of invasion by perennial pepperweed. *Margaret E. Andrew, UC Davis.*

Using airborne remote sensing to map sweet fennel on Santa Cruz Island. *Kyla Dahlin, Stanford University.*

Prioritizing California's A-rated weed populations for eradication. *Gina M. Skurka Darin, UC Davis.*

The role of resource heterogeneity on native plant response to invasive plant removal. *Robert Steers, UC Riverside.*

Removing exotic annual grasses in coastal dunes: Effects on native solitary ground-nesting bees. *Ellen Tatum, Humboldt State.*

Evaluating the potential for spread of an invasive forb, *Limonium ramosissimum*, in San Francisco Bay salt marshes. *Gavin Archbald, San Francisco State University.*

Effects of disturbance of biological soil crusts on the emergence of exotic plants in California sage scrub. *Rebecca R. Buenafe, Cal. State University at Fullerton.*

Interactive effects of population genetic diversity and resident community composition on the success of an annual exotic invasive species. *Heather McGray, UC Irvine.*

Spatial patterns in native and exotic submersed aquatic plant species in the Sacramento-San Joaquin River Delta. *Maria J. Santos, UC Davis.*

An analysis of the seedbank at Joshua Tree National Park in sites invaded by exotic grasses. *Heather Schneider, UC Riverside.*

Patterns of change in water hyacinth distribution in the Sacramento-San Joaquin Delta. *Khanna Shruti, UC Davis.*

... *Weed Risk Assessment*, from page 5

consulted other references to fill out the list of horticultural plants. Forty-five of those plants already naturalized in California are ornamentals, while 143 of those on our list and not yet recorded here are in the horticultural trade. Interestingly, one of the species identified as a possible invader is Italian buckthorn, included in this year's Symposium Weed Alerts (page 8).

Next steps

We hope that these results will prove useful to land managers and policy makers. Data from the first set of 36 plants provided more information on location than we had before and added to the data in the Inventory. My presentation from the Symposium is posted on our website and we plan to publish a scientific article as well.

Our future plans (pending funding) include predicting spread for more species, perhaps focusing on High and Moderate Alert plants from the Inventory as those

have strong impacts but are not yet widespread. We would also like to work with wildlife groups to examine how our predictions for invasive plants relate to identified important areas for wildlife, especially threatened or endangered species.

Thank you to...

All the WMAs that volunteered data and expert opinion! Len Liu and Colleen Murphy-Vierra for GIS expertise. Jeremiach Mann for collecting survey results, Bertha McKinley for looking up hundreds of plants in *Sunset* and *Jepson*. Special thanks to Scott Steinmaus for his meteorological data and Jon Hall, Beth Leger, Rob Klinger, Mike Pitcairn, Steve Schoenig, and Lynn Wihbey for additional information and advice.

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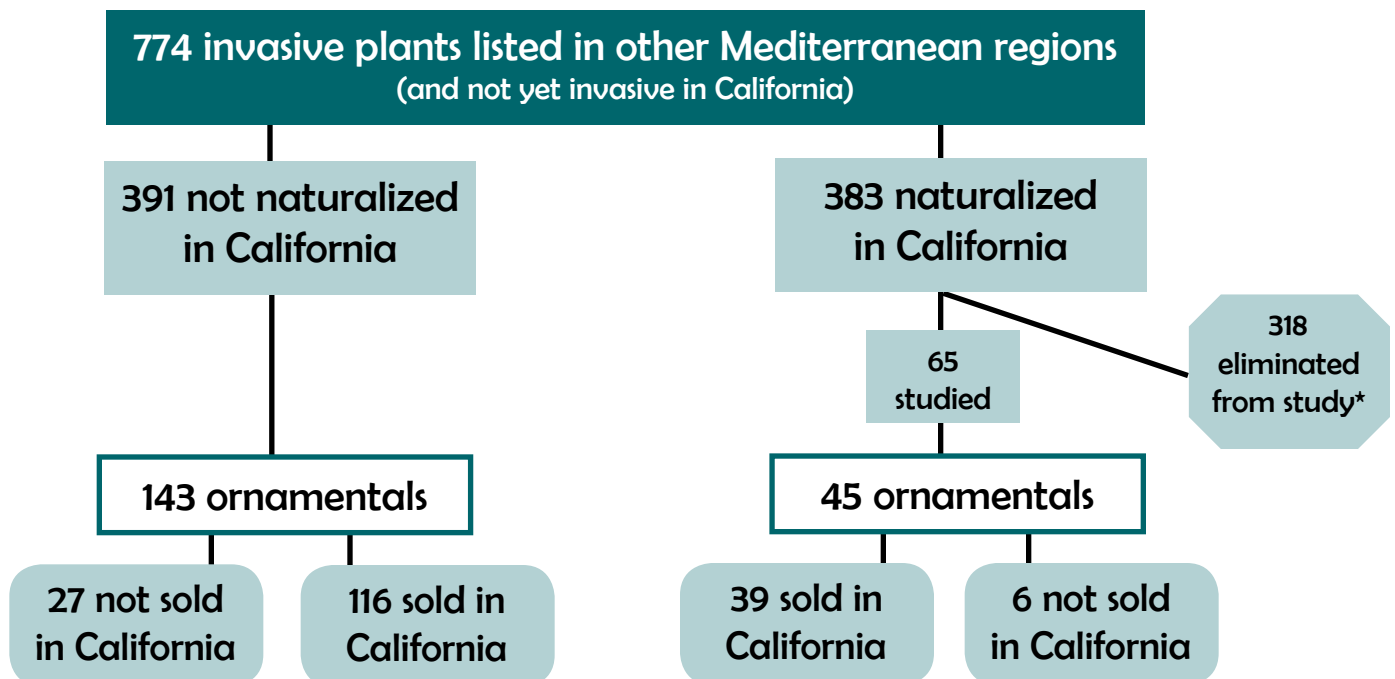


Italian thistle, one of 36 species modeled for risk assessment in this pilot study. *Photo: Brianna Richardson (Cal-IPC Photo Contest)*

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Plants from Other Mediterranean Regions

These plants were listed as invasive in references from the Mediterranean, Western Australia, Central Chile, or the Cape region of South Africa but are not yet invasive in California. Definitions of "invasive" varied among sources. "Naturalized" is based on the *Jepson Manual*. "Ornamentals" were listed as such by the source that listed them as invasive. "Sold in California" indicates that the species is listed in the *Sunset Western Garden Book* (2007) or the *Plant Locator* (2004). Species currently sold in California should be assessed in more detail for their risk of becoming invasive here; those not yet sold here should be cautioned against for importation.



* Most were eliminated because they were present in California prior to 1940 and have not become invasive.

Plants modeled for risk assessment

Aegilops triuncialis (barb goatgrass)
Ailanthus altissima (tree-of-heaven)
Arundo donax (giant reed)
Briza maxima (big quakinggrass)
Carduus pycnocephalus (Italian thistle)
Centaurea calcitrapa (purple starthistle)
Centaurea melitensis (tocalote)
Cortaderia jubata (jubatagrass)
Cortaderia selloana (pampasgrass)
Cynara cardunculus (artichoke thistle)
Cytisus scoparius (Scotch broom)
Delairea odorata (cape ivy)
Dittrichia graveolens (stinkwort)
Echium candicans (pride-of-Madeira)
Euphorbia oblongata (oblong spurge)
Foeniculum vulgare (fennel)
Genista monspessulana (French broom)
Hedera helix, *H. canariensis*
(English and Algerian ivy)
Iris pseudacorus (yellowflag iris)
Lepidium latifolium
(perennial pepperweed)
Myosotis latifolia (forget-me-not)
Parentucellia viscosa (yellow glandweed)
Pennisetum setaceum (fountaingrass)
Phalaris aquatica (hardinggrass)
Picris echioides (bristly ox-tongue)
Piptatherum miliaceum (smilograss)
Ricinus communis (castor bean)
Rubus armeniacus
(Himalayan blackberry)
Sapium sebiferum (Chinese tallow tree)
Sesbania punicea (red sesbania)
Silybum marianum (milk thistle)
Spartium junceum (Spanish broom)
Taeniatherum caput-medusae
(medusahead)
Tamarix parviflora
(smallflower tamarisk)
Tamarix ramosissima (saltcedar)
Vinca major (periwinkle)

Review

The Conservation Professional's Guide to Working with People

Scott A. Bonar. Island Press, Washington, D.C., 198 pp., 2007.
Reviewed by Elizabeth Brusati, Cal-IPC

[Reprinted and excerpted from Natural Areas Journal.]

Many land managers, biologists, and other conservation professionals choose their field because they like being out away from people, with their birds or fish or plants. However, almost none of us get to remain in that idyllic world. Inevitably, our work always comes back to people. We have to explain why it's so important to protect that obscure creature or to deal with an angry member of the public who is sure the government is out to get them. We have to choose good employees, convince supervisors to fund our projects, and dig out from that pile of emails. *The Conservation Professional's Guide to Working with People*, written by fisheries biologist Scott Bonar, combines summaries of basic people-managing tips with anecdotes specific to the conservation field. Topics covered include defusing tense situations, persuading people, providing good customer service, and making a good impression in the field. There are also chapters on managing employees, negotiating, managing your own time to improve your job performance and reduce stress, and even protecting yourself from dirty tricks. Most of us already know that we need to work well with people; this book gives specific steps to use in common situations.

Many of Bonar's suggestions come from books from the business world. However, for those of us who lack the time to read those other books, *The Conservation Professional's Guide to Working with People* is a good summary of tips. It can be read in the space of a couple of evenings. Notes at the end provides citations of books referenced in the text for those who wish to delve further into improving their people skills. As a conservation professional himself, Bonar understands the situations one can get into and shows how basic principles of negotiation,

customer service, and persuasion can apply to natural resources situations. Much of successful dealing with people comes down to understanding their point of view and responding to it in such a way that they feel their concerns have been heard.

I found the chapter on "How to Negotiate Effectively" particularly interesting. Bonar starts by describing how negotiations over cod fishing rights between the fledgling United States and England may have delayed settlement of the terms of independence in 1782. Most of the chapter describes the steps of "interest-based bargaining" and how to resolve underlying issues to provide a successful solution even when the two sides' positions seem incompatible. This technique focuses on obtaining mutual gain rather than winning vs. losing. It can allow resource professionals to maintain good relationships with groups or individuals in their community.

Bonar points out that resource management programs at universities rarely require any kind of training in sociology or communications. I can see this book being used as the basis for a graduate or undergraduate seminar with invited speakers describing their personal people-management dilemmas. It would certainly give students a better understanding of the reality of natural resource work.



Volunteers for the Salmon River Restoration Council working together to find the few remaining spotted knapweed plants in their watershed (Siskiyou Co.). Photo: Katie Reinhard (Cal-IPC Photo Contest)

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Wine is always a popular raffle item. *Photo: Bob Case.*

Thanks to Raffle & Auction Donors

Items for our fundraising raffle and auction held at the Symposium were generously donated by: Bob Case, California Department of Fish & Game, Center for Invasive Plant Management, CHAO Chocolates, Charles Blair, Chris Christofferson, CIMB, Dulcy Schroder, The Eagle Inn/Paul Bullock, Earle Cummings, Elizabeth Brusati, Forester's Co-op, Framer's Workshop, Gina Darin, Hedgerow Farms, Hugh Williamson, Jack Alderson, Jason Casanova, Jason Giessow, Jennifer Erskine Ogden, Jepson Herbarium, Joanna Clines, Joe DiTomaso, John Knapp, Judy Johnson, Julie Horenstein, MacDonald Farm, Hugh Williamson,

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Continued page 15...

Readings & Resources

Know of a resource that should be shared here? Send it to edbrusati@cal-ipc.org by December 15 for inclusion in the next newsletter.

Invasive Plant Alerts

Have you seen a plant expanding its range or a new invader? Consider reporting the information in the new journal *Invasive Plant Science and Management*. For more information, contact Dr. Joseph DiTomaso at UC Davis, jmditomaso@ucdavis.edu.

National WMA Discussion List

The Center for Invasive Plant Management hosts a listserv for discussions and information related to weed management areas around the country. To join, contact cipm-webmaster@montana.edu.

New Book

A Guide for Desert and Dryland Restoration by David A. Bainbridge, addresses the problem of desertification and dryland degradation. The book describes the ecology of desert plants, the causes of desertification,

and procedures needed to evaluate, plan, implement, and monitor desert restoration projects. 416 pages, \$100.00, www.islandpress.org.

Fire and Invasive Plants

“Wildland fire in ecosystems: Fire and nonnative invasive plants” from the USFS Rocky Mountain Research Station is a review of information on relationships between wildland fire and nonnative invasive plants. It is designed to assist fire managers and other land managers concerned with prevention, detection, and eradication or control of nonnative invasive plants. 355 pp. Free download. www.fs.fed.us/rm/pubs/rmrs_gtr042_6.html.

Spatial Invasion Simulator

This model from the Suding lab at UC Irvine shows how invasive plant establishment and spread can be influenced by the ecological mechanisms of plant feedback and seed dispersal; explore alternative management strategies to control invasion and restore native species. sis.bio.uci.edu.

Weed Summit Presentations

Presentations from this June’s Rocky Mountain Weed Summit in Fort Collins, CO, are available online. cmreview.collemyoy.com/review/2008RockyMountainWeedSummit/Presentations/index.html.

Spurge and Knapweed Impact Calculator

This website helps land managers decide which approach is best for their situation when battling leafy spurge or spotted knapweed. It accepts location-specific weed abundance data from land managers and uses these data to estimate weed impacts. The weed impact estimates help managers decide whether or not to use costly weed control measures to battle leafy spurge/spotted knapweed. 199.133.173.229/WeedImpact/

Climate change briefings

Presentations on climate change given by the US Geological Survey to Congressional staff are available online. The September 2008 briefing focused on invasive species and included a presentation on invasive species’ effects on wildlife. www.usgs.gov/solutions

Controlling weeds on horseback



2008 Photo Contest entry: Tamia Marg.

Note: This horseman forgot to wear his personal protective equipment. Gloves and safety glasses should be worn for all pesticide applications.

“We got the idea of using compressed CO₂ to spray herbicide, in this case Telar, from horse or mule back from Hal Pearce of the Blanco Ranger District of the White River National Forest in Colorado. He, with others, developed the non-mechanized “Saddle Light Weed Sprayer” system to enable people to fight weeds in wilderness areas. Besides being quiet and unobtrusive, it gives the operator a good vantage to see the target, a deliberate pace so as not to miss patches (all too easy with an ATV), and an agility traversing areas thick with boulders and brush, not to mention a lot more energy at the end of the day. Of course, good horsemanship is paramount. This operator is working near Long Valley Creek on a private ranch in Lassen County on the east side of the Sierras, doing a late summer spray on perennial pepperweed (*Lepidium latifolium*), or tall whitetop as those in the Great Basin call it.” — Tamia Marg

For more info, search online for “Saddle Light Weed Sprayer” or contact Hal Pearce, White River National Forest, (970) 878-4039, hpearce@fs.fed.us.

THE WILDLAND WEED CALENDAR

Oregon Interagency Noxious Weed Symposium

December 2-4, 2008
Corvallis, OR

www.rangelands.org/deserts

Invasive Wildfire & Invasive Species in American Deserts

December 8-12, 2008
Reno, NV

www.rangelands.org/deserts

California Rangeland Conservation Coalition Summit

January 8-9, 2009
Chico

www.carangeland.org

California Weed Science Society Annual Conference

January 12-14, 2009
Sacramento

www.cwss.org/conference.htm

California Native Plant Society Plant Conservation Conference

January 17-19, 2009
Sacramento
"Strategies and Solutions for Plant Conservation in the 21st Century"
www.cnps.org



Tamarisk & Russian Olive Research Conference

February 18-19, 2009
Reno, NV

www.tamarisk.colostate.edu

National Invasive Weeds Awareness Week

February 22-27, 2009
Washington, D.C.
www.nawma.org

Cal-IPC Invasive Species Workshops

Full-day workshops for watershed groups and other stakeholders. Sponsored by USFWS, with full-day HACCP trainings following workshops. (www.haccp-nrm.org)

San Francisco Bay Area, February

Co-presented with the Bay Area Open Space Council.

Central Valley, February

Information on both workshops will be available in December.
www.cal-ipc.org/fieldcourses

California Weed Awareness Day at the Capitol

March 18, 2009
Sacramento
Tell state legislators why it's important to protect funding for weed work.
www.cal-ipc.org/policy/state/ciwad.php

Amber Manfree wades through water infested with *Ludwigia* while establishing a transect to monitor control activities in the Laguna Wildlife Area (Sonoma Co.), owned by the California Department of Fish and Game. Amber is wearing waders because the water levels are 2-4 ft. deep. *Photo: Julian Meisler, Laguna de Santa Rosa Foundation (Cal-IPC Photo Contest)*



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