Vol. 19, No. 2 Summer 2011

Cal-IPC News

Protecting California's Natural Areas from Wildland Weeds

Quarterly Newsletter of the California Invasive Plant Council

All roads lead to Lake Tahoe

*Sarah Ford, Tahoe Resource Conservation District, spreads mulch along Hwy 267, one of six main roads leading to Lake Tahoe, to prevent populations of cheatgrass (*Bromus tectorum*) from spreading during the Brockway Erosion Control Project, funded by the Calif. Dept.of Transportation. Photo: Nicole Cartwright, Tahoe RCD.*

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A California 501(c)3 nonprofit organization

Protecting California's lands and waters from ecologically-damaging invasive plants through science, educations, and policy.

Cal-IPC News
Summer 2011 - Volume 19, Number 2

Editors: Doug Johnson, Elizabeth Brusati, and Heather Brady

From the Director's Desk

Prevention is the best cure

It is rare that we have the opportunity to celebrate a prevention victory (in part because it is difficult to know when something unidentified did not happen!) But with the formal adoption of NAPPRA by the USDA, after years of planning and public comment, we have such a victory.

NAPPRA stands for "Not Authorized Pending Pest Risk Assessment". The USDA, through its Q37 regulations, has authority to restrict imports of nursery stock, but historically very few species of so-called "plants for planting" (aka ornamentals) have been disallowed and there has been no pre-screening before a new species is brought into the country. The NAPPRA category has the potential to change that. If there is sufficient concern that a particular plant proposed for import may be harmful, it can be put into the NAPPRA category and be prohibited from entry until a risk assessment has been completed saying that the species is judged to be safe.

This represents a shift from "innocent until proven guilty" to "guilty until proven innocent", which makes a lot more sense when the goal is prevention. USDA has been developing a risk assessment procedure, building on Australia's well-known method. The trick will be to make sure USDA has the resources to process requests for assessment in a timely manner. If the pipeline gets backed up, those wanting to import plants may have a legitimate gripe that this is an unfair restriction on their rights.

Does this address invasive plant species already in the country? Yes, but only those that are not widespread and that are under formal management. It remains to be seen how "widespread" and "formal" will be interpreted. All in all, this is a major step forward. Cal-IPC, other state councils, and partners through the National Environmental Coalition on Invasive Species (*www.necis.net*) have actively supported this move. If you were one of the many individuals who submitted comment to USDA on Q37 revisions during our campaign, you helped make this happen!

We can all enjoy the beauty of new horticultural varieties prospected from around the globe, as long as they have been screened for potential invasiveness before they are brought to our soils. The new commonsense NAPPRA rule makes sure that will now happen.

For more information, see the USDA webpage by searching for "usda nappra" or to *www.aphis.usda.gov/import_export/plants/plant_imports/Q37_nappra.shtml*.

Dyer's woad (*Isatis tinctoria*), shown above in the before photos (left), but controlled in after photo (right), is recognized as an eradication goal throughout the Sierra Nevada region. Read more about project results on pg. 4. Photos: Katie Renhart.

Wildland Weed NewsNewsNewsNewsNews

California's new state budget eliminates virtually all funding for invasive plant programs through the Dept. of Food and Agriculture (CDFA), including Weed Management Area funds. Cal-IPC and other stakeholders will be working to determine the best way to reinvigorate the state's support for invasive plant prevention and management.

Do pesticides get sufficient environmental review? Congress is trying to address this question through H.R.872, passed by the House and being reviewed by the Senate. The bill would confirm that existing environmental review is sufficient to allow for applications that comply with labeled uses. Opponents contend that current review procedures do not adequately address cumulative effects, site-specific factors, and impact to endangered species. *thomas.loc.gov, www.pesticide.org/the-buzz/support-clean-water-oppose-hr-872*

A shape-shifting invasive marine organism in San Francisco Bay changes its body form in different habitats. The bryozoan *Schizoporella errata* normally grows as a crust on hard surfaces such as rocks, docks, and boat hulls. But in 2005 it was also seen growing as free-living balls on the mudflats. This raises concerns that some of the other 37 introduced species that need hard surfaces could do the same thing. Researchers are studying whether this change in growth form is causing impacts to the bay ecosystem. (Smithsonian Marine Invasions Research Lab, feature story Feb. 2011, *www.serc.si.edu/labs/marine_invasions*)

Wider spread of invasive species due to climate change? The capacity of many invasive species for relatively rapid genetic change can enhance their ability to invade new areas in response to human-caused ecosystem disturbance. A new article highlights cases where invasive plants have expanded their latitudinal ranges in response to climatic selection pressures, and lists ten traits that are likely targets for natural selection under climate change. (*Weed Research* 51:227–240, June 2011)

"Our flora is becoming less distinctive". That is the conclusion of the lead researcher on a study examining the impact of increasing urbanization on plants in Indianapolis. The research team compared dried plants specimens collected before 1940 to those collected between 1996 and 2006 and found that as urbanization increased, the number of plant species remained roughly the same, but many of the native species disappeared and were replaced by invasive ones. Native plant species died off at an average rate of 2.4 species per year. (*Science Daily*, March 18, 2011).

A Missouri man was fined $1,000 and given six months probation for introducing zebra mussels into a lake when transporting a private boat lift. The case is the first prosecuted under a provision in Missouri's Wildlife Code designed to stop the spread of invasive species. (*www.ky3.com/news*, May 27, 2011)

Enter a raffle to eradicate the last invasive plant! Brownsea Island, a nature preserve in England, is raffling off the chance to remove its last rhododendron plant. Rhododendrons, introduced there in the 19th century, overran the island and outcompeted native wildflowers and trees, including endangered red squirrels. The Dorset Wildlife Trust has spent 50 years removing the shrubs by hand. Rhody Raffle tickets cost £1. (*BBC News*, June 22, 2011)

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Cal-IPC Updates

Like us!
(Even more than you already do.) Due to new Facebook policy, we had to change our Facebook "group" to a "page". If you're on Facebook, please search for the California Invasive Plant Council page and "Like" us in order to receive Cal-IPC updates and other news.

Statewide mapping
We are almost done! Our mapping team has traveled the state to compile maps by USGS quad on all 206 plants in the Cal-IPC Inventory in 48 of the 58 counties in California. Thank you to all the invasive plant experts who have contributed time, expertise and datasets to this effort! Maps will be available later this year through the online tool at *www.calweedmapper.org*.

20th Anniverary fundraiser
Thank you to all who have helped in our campaign to raise $20,000 for Cal-IPC's 20th Anniversary. As of press time, we are halfway to our goal. It's never too late to donate! *www.crowdrise.com/cal-ipc20th*

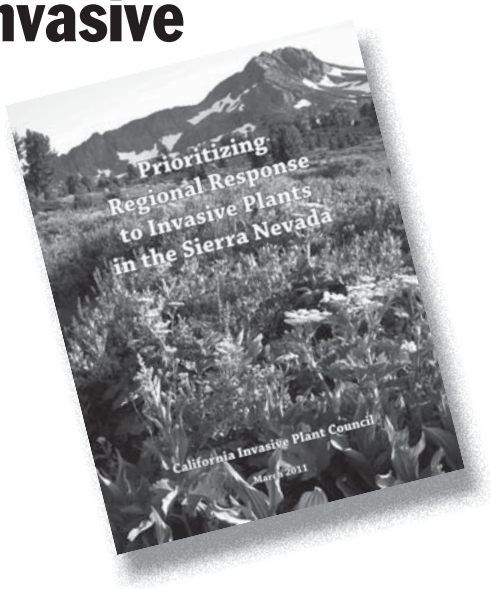
Great interns
Two graduate students are interning with us this summer. Ashley Gilreath, from the Bren School of Environmental Management at UC Santa Barbara, is working on invasive species policy and education. Ginger Jui, from UC Berkeley's Dept. of Integrative Biology, is working on our climate suitability modeling.

New grant
The California Landscape Conservation Cooperative (led by the US Fish & Wildlife Service) has awarded Cal-IPC a grant to couple our invasive plant risk mapping approach with other conservation maps capturing sensitive species and habitats in order to increase the analytical capacity for setting management priorities.

New Release

Prioritizing Regional Response to Invasive Plants in the Sierra Nevada

by Elizabeth Brusati, Dana Morawitz, and Cynthia Powell, Cal-IPC



Cal-IPC's newest report is designed to help resource managers set invasive plant management priorities at a regional level. Maps in the report help determine which species are most important, and what type of management approach—eradication, containment or surveillance—is most appropriate for that species in that region.

Our goal is to support resource managers in setting priorities for effective long-term invasive plant detection and control, including the many projects already in progress in the region and justifying new projects. The approach provides a foundation for regional collaboration, and the work on the Sierra Nevada has helped us refine our methodology for recommendations in the rest of the state.

"This work is needed to better visualize the threat of new invaders, whether to the public or management teams. It is difficult to manage adaptively, and this work holds an important key."

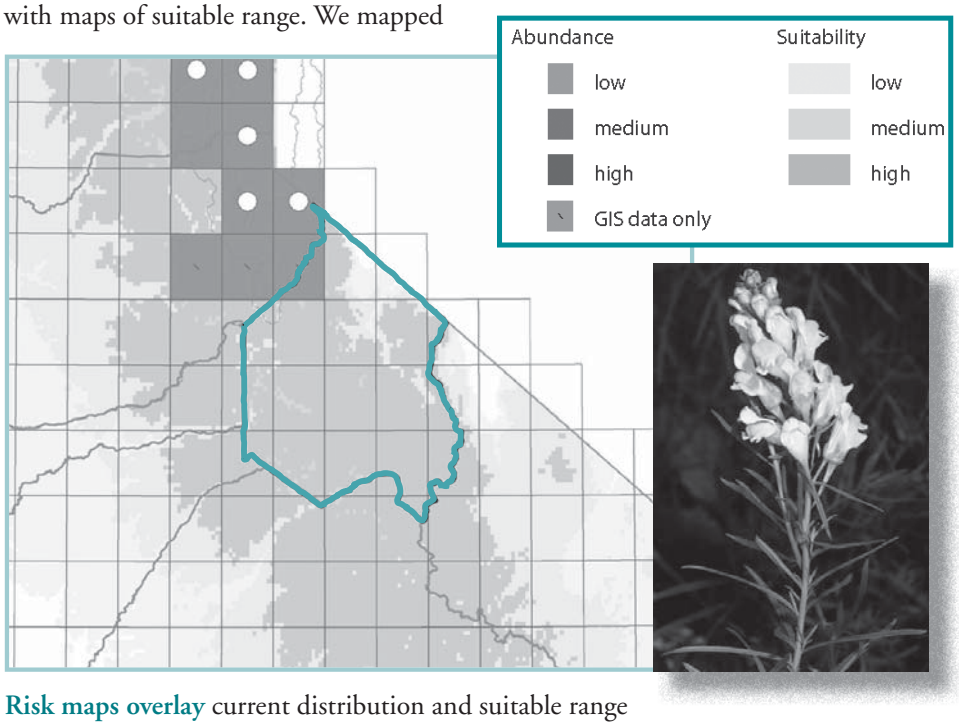
~ Martin Hutten, Yosemite National Park

Approximately 100 plants on the Cal-IPC Inventory occur in the Sierra Nevada. We chose a subset of 43 based on discussions with land managers in the region. Using maps and suitability models, we rated these 43 invasive plants for eradication, containment, or surveillance in the entire Sierra Nevada and for each of the 14 Weed Management Areas (WMAs) in the region.

We chose fifteen of the 43 species as top management opportunities in the Sierra Nevada based on their distribution and Cal-IPC Inventory rating (Table). Many species are listed as both eradication and containment opportunities based on their distribution in different parts of the region.

Each WMA received tailored recommendations including additional species particularly important for management in that area. Species are listed as only one type of opportunity for each WMA.

Our recommendations are based on maps of current distribution coupled with maps of suitable range. We mapped distribution by USGS quadrangles, collecting data by interviewing local experts as well as compiling GIS datasets from online databases, government agencies, and local organizations (see "Mapping the Spread", *Cal-IPC News*, Fall 2010, Vol.



Risk maps overlay current distribution and suitable range to show uninvaded areas that are the most vulnerable to spread. In this yellow toadflax (*Linaria vulgaris*) map, dark gray rectangles indicate abundance in USGS quadrangles, while lighter gray shading indicates climatic suitability. (White dots indicate quads where the species is under management). For Alpine County (green outline) yellow toadflax is a high priority for surveillance because it is present at the northern edge of the county, and much of the county is predicted to be suitable based on modeling. Photo: Joe DiTomaso.

18, No. 3). Expert interviews are a key data source. Over 80% of the quads now known to be infested with a particular species in California have been documented only through expert interviews; no GIS datasets are available to document these populations.

To map suitable range, we used Maxent software to predict where a species can survive. The software makes statistical predictions based on where the species currently exists combined with data on environmental variables. We used climatic variables, since this is the major factor determining suitable range (see pg. 10). We used this approach to map suitable climatic range for 29 of the 43 species studied.

The resulting risk maps overlay current distribution and suitable range to show uninvaded areas that are the most vulnerable to spread. We used the maps to identify three categories of management opportunity: eradication, containment, and surveillance.

Eradication – Complete removal of an infestation, possible where smaller infestations occur isolated from other infestations.

Containment – Limiting spread from larger infested areas. Strategic potential depends on the geography of the infestation, how isolated it is, and the suitability of adjoining areas.

Surveillance – Surveys to detect new infestations of species thought to be absent.

For each species in each WMA, we rated the strategic potential for these management opportunities as high, medium, or low. For each WMA and the region as a whole, we identified species as top priorities for strategic management based on these ratings. Ratings depend on factors such as the impact and invasiveness of the species, whether the particular infestation is spreading, whether the species has a CDFA weed rating, and the evaluation of land managers.

Our recommendations complement management efforts already underway in the region and can help in planning future projects. They can also be used to combine new efforts with those that already exist. For example, efforts to contain invasive plant species climbing the foothills from the Central Valley may be able to coordinate with the existing Leading Edge Project that works to prevent the spread of yellow starthistle to higher elevations. Finally, these recommendations and risk maps can be used by region-wide coordinating bodies to establish goals for eradication, containment, and surveillance in support of early detection.

"Cal-IPC maps have been identified as a major source of information for our planning efforts. We need landscape-scale distribution maps of invasive plants with information on how their range may shift in response to climate change. I have begun using Cal-IPC's mapping tool in beta form to provide information for a systematic species prioritization."

~ Athena Demetry, Sequoia-Kings Canyon National Parks

Species	Opportunities		
	Eradication	Containment	Surveilance
Family Asteraceae			
Acroptilon repens (Russian knapweed)	High	Medium	-
Carduus nutans (musk thistle)	High	High	-
Centaurea maculosa (spotted knapweed)	High	High	-
Centaurea solstitialis (yellow starthistle)	High	High	-
Chondrilla juncea (rush skeletonweed)	Medium	High	-
Dittrichia graveolens (stinkwort)	-	High	-
Onopordum acanthium (Scotch thistle)	High	High	-
Family Brassicaceae			
Isatis tinctoria (dyer's woad)	High	-	-
Family Fabaceae			
Cytisus scoparius (Scotch broom)	High	High	-
Genista monspessulana (French broom)	High	High	-
Spartium junceum (Spanish broom)	High	High	-
Sesbania punicea (red sesbania)	High	High	-
Family Poaceae			
Arundo donax (giant reed)	Low	High	-
Family Schrophulariaceae			
Linaria genistifolia subsp. *dalmatica* (Dalmation toadflax)	High	High	-
Linaria vulgaris (yellow toadflax)	High	High	-

Fifteen of the study species were chosen as high-priority for management in the Sierra Nevada as a region. Many are listed as both eradication and containment opportunities based on their distribution in different parts of the region. In any given WMA, other species may be high priorities, and some of the species above may be surveillance opportunities if not yet present in the WMA. See the full report for recommendations and maps for each WMA in the region.

The report was recently distributed to every Weed Management Area, National Forest, and National Park in California as well as to other organizations working on invasive plants and conservation planning. The report can be downloaded from *www.cal-ipc.org/ip/mapping/sierra* or you can contact us for a free CD.

Next Steps

As we complete our statewide data collection efforts, we are beginning

...continued page 10

From Chinese Cleavers to Remote Sensing

An interview with two generations of weed workers - Greg and Gavin Archbald

by Gina Darin, California Department of Water Resources

As part of Cal-IPC's 20th year celebration, we're tracking down some of the founding board members to ask them what they think of their creation. In May, I spoke with Greg Archbald, who is proud that his son has joined the ranks of invasive species researchers.

Greg Archbald

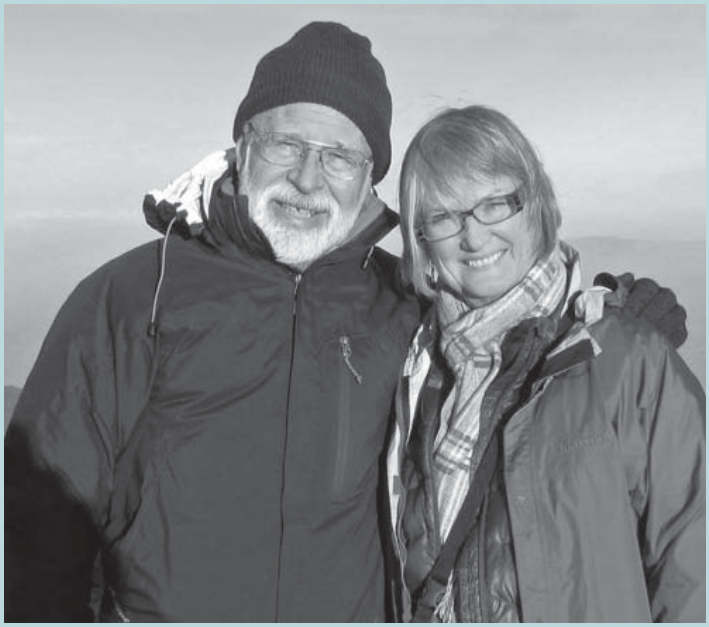
Greg describes his initiation into weed work as a convergence of activities at work and home. With a background in law and land acquisition, Greg co-founded The Trust for Public Land (TPL) in 1972 where he worked for 15 years acquiring parklands, including several tracts in Golden Gate National Recreation Area (GGNRA) and Point Reyes National Seashore.

Over the years, Greg watched as beautiful places he knew in the Marin Headlands disappeared under a sea of broom. "That really bothered me," said Greg. Moving to a ridgetop house surrounded by French broom (*Genista monspessulana*), and being very concerned about the fire danger, Greg started pulling and chopping broom, at one point crawling on hands and knees and using a Chinese cleaver to cut the base of the broom stems. When he first began using a brush cutter, Greg had a little help from a neighbor, almost taking out his neighbor's leg along with the broom. "Learn by doing," Greg explained.

After his years with TPL, Greg focused on involving volunteers in land stewardship. Greg was hired by the Golden Gate National Parks Conservancy (GGNPC), the nonprofit arm of the GGNRA, and in this position, ran into weed issues beyond the familiar broom, like CDFA A-rated fertile capeweed (*Arctotheca calendula*), B-rated gorse (*Ulex europaeus*), and pampas grass (*Cortaderia selloana*).

Idea conceived - birth of Cal-EPPC

In 1990, Greg attended the Yosemite Centennial Symposium and Natural Areas Association conference in Concord, CA. The conference included a lunch where tables were set up by topic so attendees could sit with those with similar interests. Greg sat at the "Weeds" table, and was joined by (among others) Carla Bossard and John Randall (each profiled in recent issues of *Cal-IPC News*); and George Molnar, then chief of the Biological Resources Section of Metropolitan Dade County in Florida. Greg was blown away by George's description of Florida's Exotic Pest Plant Council (FLEPPC) including their ability to raise money and their program of taking legislators and state officials on aerial tours to view *Melaleuca quinquenervia* and other species invading the Everglades. Greg exclaimed to the group, "There ought to be one of those in California!"



Fouding board member, Greg Archbald, and his wife, Connie, are all bundled up for the chill atop the Haleakala volcano, Haleakala National Park, HI, with an elevation of 10,000'.

Greg's hope in pursuing an EPPC for California was to find other wildland weed workers and get them talking, learning, and identifying resources for problems similar to those he and his colleagues were facing in the GGNRA. "Isolation at the time was high, and the subject of wildland weeds was new while lots of information was available on agricultural weeds." Greg helped to host an exploratory meeting in Tiburon in February 1992, and was thrilled when people from San Diego to the North Coast showed up expressing similar concerns and voting to hold the first wildland weed symposium later that year.

Lucky to have GGNPC as a supportive employer, Greg was able to use his office, time, and facilities to help get the Cal-EPPC going. Greg remembers people jumped out of the woodwork for the first Exotic Pest Plant Symposium in Morro Bay in October 1992. After an inspiring talk by FLEPPC's president Bob Doren, the group decided (on a suggestion by Nelroy Jackson) that everyone in attendance would be a member, and just like that Cal-EPPC had its first 150 members.

Twenty years later, Greg is proud to witness Cal-IPC's many accomplishments: evolving from humble beginnings to

influencing policy and invasive plant management practice statewide. He applauds the high quality work by those involved with the California Invasive Plant Inventory and with Cal-IPC's legislative initiatives. Greg also appreciates the field courses and excellent instructors who are training wildland weed workers around the state. Greg feels the key moment for Cal-IPC was the hiring of professional staff. "Doug and the staff are doing a magnificent job."

Greg predicts the future of Cal-IPC

Greg said that one recent moment that stands out for him was the pleasure of seeing his son Gavin present his Master's research at the 2009 Cal-IPC Symposium in Visalia. "Seeing so many young people involved in Cal-IPC is great," said Greg. He believes that having graduate students present research at the symposium and starting student chapters gives Cal-IPC a continual infusion of talent. Greg says that the organization is renewing every year and will continue to be relevant and successful as Cal-IPC keeps young people involved, and keeps up a high level of professionalism in its work.

The next generation

Gavin Archbald completed his Master's in Ecology and Systematics at San Francisco State University in May 2011. He is now working with the San Francisco Bay National Estuary Estuarine Research Reserve, and is helping to plan their mapping program to monitor changes in marsh vegetation associated with sea level rise and surrounding land use changes. As a Graduate Fellow, Gavin worked with the South Bay Salt Pond (SBSP) Restoration Project to develop detection methods for the nascent invader Algerian sea lavender (*Limonium ramosissimum*) using remote sensing and satellite imagery. Gavin continues to help local GIS experts map marsh vegetation, including invasive plants, across the SBSP management area.

Why Gavin decided to study a weed

Gavin readily admits his awareness was heightened by his father's career, but Gavin wasn't initially planning on working with invasive species. Generally interested in using science to repair environmental damage, Gavin chose to do his graduate work in restoration ecology at San Francisco State. After hearing of Algerian sea lavender, Gavin chose to study the weed in the context of wetland restoration.

Gavin Archbald, the next generation of Cal-IPC, working on the South Bay Salt Pond Restoration Project, San Francisco Bay.

Gavin is struggling with the question of whether weeds are misunderstood. [Hold the rotten tomatoes! – Gavin has a point that is part of a growing trend in our field (see John Randall's presentation in the 2008 Symposium Proceedings)]. Gavin points out that often we really don't know how non-native communities function compared to native communities. Gavin asked, "Can we assume that non-native plants won't provide similar functions in a wetland setting, for example?" This is a complicated issue, Gavin. Maybe he'll pursue it in a Ph.D…

Cal-IPC's role for students

By representing a community of managers and scientists interested in research, Cal-IPC gives students and recent grads an audience for weed science research in wildlands. These are systems, like Gavin's marsh, that have no immediate commercial application. Cal-IPC is a place to unite researchers like Gavin with potential users of the research. For example, Gavin's thesis is providing information for reviewing Algerian sea lavender for the Cal-IPC Inventory.

Cal-IPC gives students like Gavin relevant questions to investigate. In Gavin's case, he also met to discuss project ideas and resources. In the future, Gavin is a proponent of Cal-IPC taking this support a step further and offering weed research scholarships. (You wouldn't mind a $5 increase in symposium registration to fund these scholarships, would you?). Gavin would also like to see Cal-IPC facilitate internships between students and organizations and expand opportunities for students at the annual symposium.

Fond Cal-IPC moment

When I asked Gavin to describe a fond Cal-IPC moment, Gavin chose the 2006 Symposium when his father was presented with the Jake Sigg Award for Vision and Dedicated Service. That moment stands out for Gavin because growing up he watched his dad with this seemingly eccentric broom-pulling habit. "My dad helped build this organization, and there's a community of people who get it and appreciate him."

Pulling it all together

Gavin grew up seeing Greg pulling broom and going to town with a brush cutter out of necessity to protect their home and help restore the GGNRA land. While Greg took a practical approach to weed control, Gavin is taking a scientific approach, studying the how and the why. It seems both Greg and Gavin are answering a call in their genes going after a common challenge each in their own way.

Pesticide Risk Mitigation Engine (PRiME)

An Advance Look at a New Tool for Pesticide Risk Comparison

by Susan E. Kegley and Wade Pronschinske, Pesticide Research Institute, Berkeley

Have you ever felt that you lacked the information you needed to make an informed choice of which herbicide would cause the fewest non-target effects? Perhaps you are working in an area with a significant amount of aquatic habitat and potential for runoff, or near a residential area. Short of doing a detailed risk assessment that takes time and resources, it is impossible to determine the comparative risks of different herbicides for a scenario. The label and Material Safety Data Sheets (MSDS) just don't provide sufficient information.

Access a beta version of PRiME online at *www.ipmprime.org*

To address this problem, the Integrated Pest Management Institute of North America based in Madison, Wisconsin, is working with an international team to develop a web-based tool called the Pesticide Risk Mitigation Engine (PRiME). PRiME allows the user to compare site-specific risks to aquatic organisms (fish, invertebrates, algae), small mammals, earthworms, and birds, as well as inhalation risks for bystanders. In the next revision, PRiME will also include algorithms to estimate dermal (skin) exposure risks for reentry into the treated area, risks to pollinators , and dietary risk (for food crops).

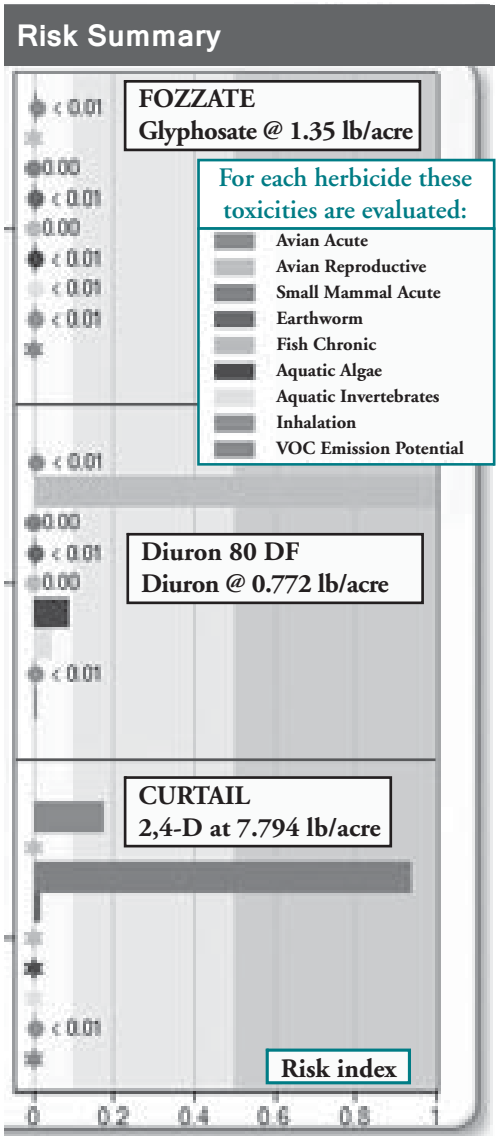
The interface allows the user to map an area using Google Earth and automatically retrieves available soils data from the National Resource Conservation Service database. Using the PRZM-EXAMS model, these data are used to estimate the expected amount of runoff to water bodies based on the soil type and the physical properties of the herbicide. The user can characterize the land around the area by mapping sensitive sites and conservation practices, such as buffer strips, which will then be used to make risk calculations more site-specific.

The user selects one or more pesticide products and defines the application method that will be used to obtain a comparison bar chart that provides a quantitative risk estimate for the different risk indices on a scale of zero to one. For the non-human indices, the risk index is a measure of the probability of an adverse effect occurring, with adverse effects defined for each category of organism. For the human indices (inhalation, dermal, and dietary), the risk index will be based on a hazard quotient (exposure divided by a reference dose). The risk estimates are color-coded, with risks of highest concern in the red zone, moderate risks in the orange zone, and low risks in the yellow zone.

For example, the chart above shows the comparison risk indices for three herbicides containing different active ingredients. This information takes the guesswork out of estimating relative risks for non-target impacts of different products and allows the user to select the least-toxic product for a particular application.

The PRiME tool is now developing modules for agricultural applications; however, the team is currently seeking funding to expand the tool to other applications such as vegetation management programs and environmental impact reports. You can access a beta version of PRiME online at *www.ipmprime.org;* to get started, scroll to the bottom of the page and click "Try our guest resources".

Team members include Tom Green and Wade Pronschinske, IPM Institute; Chuck and Karen Benbrook, BCS-Ecologic; Susan Kegley, Pesticide Research Institute; Paul Jepson and Michael Guzy, Oregon State University; Pierre Mineau, Environment Canada; Martin Williams and Mark Cheplick, Waterborne Environmental.



PRiME allows comparison of risk indices for pesticides, looking at a range of impacts to wildlife and humans. Currently the site focuses on agricultural applications, but a similar approach for wildland applications is on the drawing board.

Contact the author at skegley@pesticideresearch.com.

20th Annual Cal-IPC Symposium

Invasive Plants and Ecological Change

Granlibakken Conference Center, Tahoe City

October 4 - 7, 2011

Featured Speakers

Smog is fertilizer: atmospheric nitrogen deposition drives weed invasions and biodiversity loss, *Stuart Weiss, Creekside Center for Earth Observations*

Effects of changing precipitation patterns on the spread of *Bromus tectorum* L. in the eastern Sierra Nevada and implications for management, *Amy Concilio, UC Santa Cruz*

Nuance, naysayers and twenty years of studying species impacts, *Carla D'Antonio, UC Santa Barbara*

Predicting the spread of invasive plants in the Sierra Nevada with climate change, *Elizabeth Brusati, Cal-IPC*

Fire, climate change, and opportunities for invasion, *Max Moritz, UC Berkeley*

Science, policy, and management interactions: The past is not a template for the future of the national parks, *Dave Graber, Pacific West Region, National Park Service*

Climate change in the Sierra Nevada; Processes, projections, and adaptation options, *Constance Millar, Pacific SW Research Station, USDA Forest Service*

Discussion Groups

- Prioritizing schemes for weed management
- Invasive plant IPM
- Prevention efforts across the state
- Cal-IPC Student Chapter updates
- Licensing and contracting mechanisms for getting work done!
- State-level strategies for rapid response and management of aquatic weeds: New approach needed?

Full program online at www.cal-ipc.org. Dept. of Pesticide CE credits, including 2 hrs. Laws & Regulations will be available pending approval.

Field Techniques for Recording Invasive Plants

On Wednesday, October 4, Cal-IPC will host our annual Pre-Symposium Field Course. Topics include data-recording standards, vouchering techniques, estimating distance and cover, occurence reporting, data management, communicating about your program, field safety, and landscape level planning. Register with the Symposium to receive a discount!

Photo Contest

See information on our website and submit entries by **September 2** to *photos@cal-ipc.org*.

Raffle & Auction

This is a fun event and a fundraiser for Cal-IPC. Books, wine, tools, art, and fabulous trips will be up for grabs. Do you have something to donate? Contact *raffle@cal-ipc.org*.

And More...

§ Sponsor Exhibits § Student Paper & Poster Contest § § Job Board § Social Hour § Awards Banquet § § Student Lunch § Friday Field Trips §

To Register...

Online form at www.cal-ipc.org; you can pay online, over the phone, or by sending a check. **Register and reserve lodging by September 2 for discounts.** Additional discounts for students and volunteers.

Full details at www.cal-ipc.org

...Sierra Nevada from page 5

to work with resource managers on ways to apply our results on the ground. In the Sierra, we are collaborating with existing regional organizations, such as the Southern Sierra Partnership in Fresno, Tulare, and Kern counties, to tie our results into broader conservation planning work.

The maps and recommendation methodology are being incorporated into an online mapping system to be released later in 2011. This tool will allow resource managers to generate maps and recommendations for their area of the state. It will also allow for quad-level data to be updated to keep maps current and to show change over time. The system will tie into occurrence data housed in the Calflora online database to make sure that information only needs to get entered once.

With new funding from the California Landscape Conservation Cooperative (an effort led by the US Fish & Wildlife Service) we will be coupling the invasive plant risk maps with other conservation maps capturing sensitive species and habitats, increasing the analytical capacity for setting priorities. Look for updates in *Cal-IPC News* and on our website.

Suitability modeling

We modeled suitable range for each species in California using current distribution and climate data for the state. We used Maxent software, which predicts where a species can survive based on where it currently lives combined with environmental variables. It requires precise geographic locations that represent the range of conditions in which the species grows. For environmental data, we used a set of 19 climatic variables derived from temperature and precipitation measurements. These variables, available at Bioclim (*www.worldclim.org*), are commonly used in ecological modeling.

We based our assessment of future suitability in the year 2050 on the Intergovernmental Panel on Climate Change's A2 emissions scenario, which is widely used for climate change assessments that inform policy decisions.

Mapping climatic suitability for a given plant species is an inexact science. Like any modeling, the results depend upon the assumptions of the particular model and the data used to generate predictions. The maps are based on existing distribution as evidence of the climatic range of the species. Some species may be able to grow in climates beyond where they currently grow in California, either because they can adapt or because they have not yet been transported to a region with that type of climate. See the full report for additional information and references on our methods.

Acknowledgments

This report would not have been possible without the data and expert knowledge generously provided by hundreds of individuals and organizations involved in Weed Management Areas across the state. Thank you! The authors also thank other members of the mapping team: Suzanne Harmon, Tony Morosco, and Falk Schuetzenmeister.

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...News from page page 3

The first biocontrol agent in the European Union for use against an invasive plant has been approved. The United Kingdom approved widespread release of a plant louse, or psyllid, that is a natural enemy of Japanese knotweed, which is estimated to cost the country $288 million a year in damages and removal. (Science, May 13, 2011)

Should biological invasions be managed as natural disasters? A new article examines how impacts and responses for biological invasions compare to those for natural disasters, pointing out that both are generally unpredictable and uncontrollable, generate enormous environmental damage, and have frequency inversely proportional to magnitude. The authors argue that precautionary systems should be put in place to prevent biological invasions, similar to systems existing for disasters. (*BioScience* 61 (4): 312-317, April 2011)

Citizen scientists in Texas have logged more than 12,000 observations of invasive plants on a publicly accessible online database that governmental agencies and resource managers can use to monitor the plants that compete with native plants. (*www.texasinvasives.org/invaders*)

2011 Field Course Schedule

Los Angeles

Audubon Center at Debs Park

July 20 - Herbicide Control Methods

San Diego

Tijuana River NERR

August 3 - Mapping

August 4 - Control Methods

Tahoe City

Granlibakken Resort

October 4 - Field Techniques for Recording & Reporting Invasive Plants

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New Organizational Members

Organizational Members advance Cal-IPC's mission to protect California's wildlands from invasive plants.

Sonoma Ecology Center
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Sonoma County Agricultural Preservation & Open Space District
Ecological Conservation & Management

Cape-ivy Biocontrols Update

by Angelica M. Reddy and Chris Mehelis, USDA-ARS-WRRC, Exotic and Invasive Weeds Research Unit

*[Cal-IPC and partners have supported the Exotic and Invasive Weeds Research Unit in Albany, CA, in its development of biocontrol agents for Cape-ivy (*Delairea odorata*). The unit operates specialized quarantine greenhouses where host-specificity testing can be conducted to ensure that the agents will not damage any other plant species. This labor-intensive process takes many years to complete, and the permitting process also takes time.]*

It has been some time since we at the USDA's Exotic & Invasive Weed Research Unit have reported on the Cape-ivy biological control project. We are quite pleased to share our progress, as we are getting closer to releasing two promising biocontrol agents: the stem boring moth (*Digitivalva delaireae*),and the gall-forming fly (*Parafreutreta regalis*).

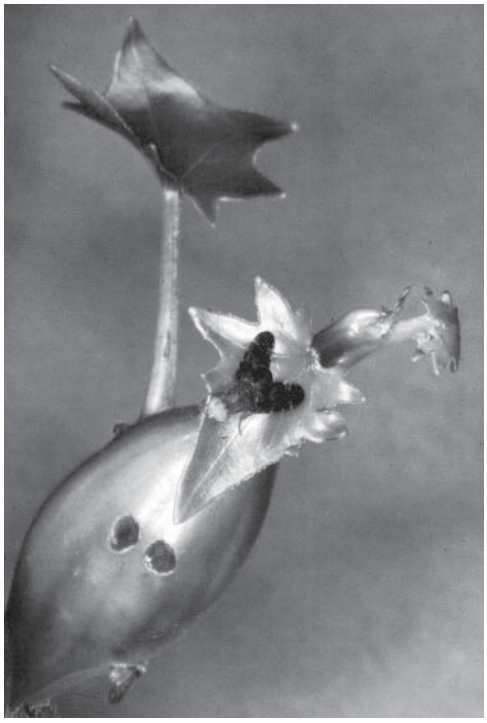
Two Cape-ivy moth larvae (*Digitivalva delaireae*) tunneling through stems. Photo: Elizabeth Grobbelaar.

Cape-ivy (*Delairea odorata*) has been in the cross hairs of coastal land managers and land owners for some time, as it poses a problem by smothering native vegetation. The USDA's biological control project began in 1997 with the support of donations from the California Native Plant Society, the National Park Service, California State Department of Parks and Recreation, and Cal-IPC.

Dr. Joe Balciunas initiated and led the project, which started with a partnership with the South African Plant Protection Research Institute, to locate potential biocontrol agents in Cape-ivy's native region. Once promising insects were located and preliminarily screened for host specificity to Cape-ivy, they were imported to the USDA-ARS quarantine laboratory in Albany, CA, for rigorous host range testing, which began in 2001.

We have spent the past ten years conducting experiments to ensure that when the biocontrol agents are released, they will target Cape-ivy without damaging native plants or agricultural crops. In early 2010, Joe Balciunas retired and was replaced by Dr. Angelica Reddy. Prior to his retirement, Dr. Balciunas submitted a petition for release of the two insects to the Technical Advisory Group (TAG) of the USDA-APHIS-PPQ. We received TAG's official response to the release petition in late 2009 and are currently conducting additional work to address the comments submitted by the petition reviewers.

Initially, more than 100 different species of plants were tested either in our quarantine laboratory in Albany or at our cooperator's facilities at the Plant Protection Institute in South Africa. The two agents were not able to reproduce with any of them. TAG reviewers requested that we test eleven more plant species. Some of these plants have proven difficult to obtain, or are only available during specific seasons.



An adult Cape-ivy gall fly (*Parafretureta regalis*) perched on one of its galls. Photo: Elizabeth Grobbelaar.

Per TAG's request, we have also conducted studies to investigate the preference, as well as the effect of infestation by the moth on the development of both Cape-ivy varieties (stipulate and astipulate) found in California, and whether preference and damage inflicted on Cape-ivy by the month differs between varieties.

When the host range testing is complete, perhaps as soon as the end of next spring, we will resubmit the petition to TAG. From there we anticipate a lag-time of a minimum of six months before any permission to release will be granted.

Contact the author at chris.mehelis@ars.usda.gov

Readings & Resources

Know of a resource that should be shared here? Send it to edbrusati@cal-ipc.org.

Invasive Species Compendium

The Invasive Species Compendium is an online, open access reference work covering identification, biology, distribution, impact and management of more than 1500 invasive species, with more being added. Users can also access articles. Datasheets and bibliographic information are updated weekly. *www.cabi.org/isc*

Species spellchecker

The Taxonomic Names Resolution Service is a utility for correcting and standardizing plant names. It can resolve common misspellings and taxonomic synonyms. Users can upload, validate, and correct a list of plant names against a database of published scientific names and authorities. *ohmsford.iplantc.org/tnrs-standalone/index.html*

Free books

The National Academies Press now offers pdf version of its more than 4000 books for download free-of-charge, including titles in agriculture and biology. *www.nap.edu*

Hawaiian risk assessments

More than 1000 weed risk assessments conducted by the Pacific Island Ecosystems at Risk program in Hawaii are available on their website, with more added each week. A new website under development will include the updated list and links to species assessments. *www.hear.org/pier/wralist.htm*

Decision guide

"A Decision-Making Guide for Invasive Species Program Managers" provides a brief overview of approaches to management, from eradication to mitigation. *www.continentalforestdialogue.org/library*

Book Review

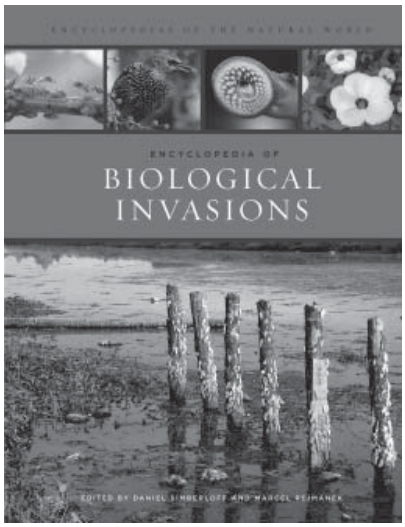
Encyclopedia of Biological Invasions

Edited by Daniel Simberloff and Marcel Rejmánek. University of California Press. 2011.

The Encyclopedia of Biological Invasions is a one-volume compilation of topics related to invasion biology, part of UC Press' Encyclopedia of the Natural World series. The short reviews it contains are intended for either students or others interested in biological invasions. Contributors are a range of international experts in the field. Cal-IPC members will recognize long-time California weed researchers such as Joe DiTomaso, Jodie Holt, Michael Pitcairn, and Marcel Rejmánek.

The book is organized into reviews of about three to five pages long, listed alphabetically. Each review starts with a definition of the topic, continues with a general description and examples of how it relates to biological invasions, and ends with a short list of related publications and cross-references to other entries. A bibliography of further reading is at the end of the encyclopedia, as well a glossary of 600 terms and appendices of the important references and the IUCN (International Union for the Conservation of Nature) list of the top 100 worldwide invasive species.

Topics were chosen to represent



invader attributes, ecosystem features, processes, impacts, notable taxa, pathways to invasion, management and regulation, history, and notable invasions by geographic region. General topics include plant competition, allelopathy, disturbance, restoration, and Charles Darwin. More specific topics include early detection and rapid response, weeds, sudden oak death, the "enemy release hypothesis", and lag time. The broader topics are framed in a way to explain their relevance to biological invasions. For instance, the entry on climate change describes how it affects pathways, establishment, and impacts of invasive species.

The wide range of topics will be of interest to both those who focus on the more academic aspects of invasive species biology and those who are interested in learning the basics of management. For instance, the entry on range modeling describes some of the methods commonly used and the possible benefits and drawbacks of using modeling to predict invasions. The criteria for choosing the topics are not entirely clear, however, and the entries cover both the obvious broad topics and a slightly confusing mix of specific ones. For instance, why does the plant *Lantana camera* have its own entry, but not Fabaceae, a family well-known as a source of invasive plants? I wonder if the choice of topics was dictated partly by the interests of well-known researchers (or those who agreed to write entries).

The Encyclopedia will be a good reference for anyone who needs a quick reference to a lot of topics. It could be helpful to someone preparing a college course that focuses on biological invasions or who needs a starting point for writing a longer paper on one of the topics.

The Wildland Weed Calendar

August - September

Cal-IPC Mapping and Control Courses
August 3 & 4
San Diego
www.cal-ipc.org

Ecological Society of America
August 7-12
Austin, TX
www.esa.org/austin

SER Int'l Congress on Ecological Restoration
August 21-25
Merida, Yucatan, Mexico
www.ser2011.org

Weed Science School
August 30 - September 1
UC Davis
wric.ucdavis.edu

Int'l Conf. on Alien Plant Invasions
August 30-September 3
Szombathely, Hungary
www.emapi2011.org

International Symp. on Biological Control
September 11-16
Waikoloa, HI
isbcw2011.uhhconferencecenter.com

State of the SF Estuary Conference
September 20-21
Oakland
www.sfestuary.org

October - December

Cal-IPC's 20th Annual Symposium
October 4-7
Granlibakken, Tahoe City
www.cal-ipc.org

Cont.Dialogue on Non-Native Insects
October 5-6
Boulder, CO
www.continentalforestdialogue.org

SoCal Botanists Symposium
October 15
Fullerton
www.socalbot.org/symposia.php

Natural Areas Conference
November 1-4
Tallahassee, FL
www.naturalarea.org

CARCD Conference
November 9-11
Stockton
www.carcd.org/conference.php

2012

CNPS Conservation Conference
January 10-14, 2012
San Diego
www.cnps.org/cnps/conservation/conference/2012

CA Weed Science Society Conference
January 23–25, 2012
Santa Barbara
www.cwss.org

N.A. Congress for Conservation Biology
July 15-18, 2012
Oakland
www.scbnacongress.org

Quotable

"Given their persistence and potentially irrevocable damage, biological 'spills' should be treated with more caution and urgency than a chemical spill.."

~ Anthony Ricciardi, Michelle E. Palmer, and Norman D. Yan in "Should biological invasions be managed as natural disasters?", *BioScience*, April 2011

"Every time you hear the term 'invasive species' think 'Monsanto'… "

~ David Theodoropolous, speaking at the Public Interest Environmental Law Conference in Eugene, OR, March 5, 2011. *www.youtube.com/watch?v=AT4Zczx_bik*.

He went on to say, "Invasion biology is a pseudoscience based on discredited ecological concepts. Invasion is entirely natural, and increases biodiversity… Forty years ago we were told that the threats to nature were pollution, pesticides, poisons, bulldozers and chainsaws. Now we are told that the greatest threats to nature are wild plants and animals, and the cure: poison, bulldozers and chainsaws. Now ask yourself—who does this serve? Follow the money. Invasion biology is deeply corrupted by the herbicide and regulatory industries... the Exotic Pest Plant Councils are herbicide industry front groups. Monsanto employee Nelroy Jackson was a founding board member of Cal-EPPC and was on the National Invasive Species Advisory Committee… How can we tolerate this corruption of environmentalism by industry?"

California Invasive Plant Council

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