



Cal-IPC News

Protecting California's Natural Areas
from Wildland Weeds

Vol. 17, No. 1 Spring 2009 Quarterly Newsletter of the California Invasive Plant Council

Southern Sierra and Tulare Lake... 2009 Symposium in Visalia!



National Park Service Weed Crew member removes bull thistle (*Cirsium vulgare*) from a steep canyon wall in Bubbs Creek, Kings Canyon National Park Wilderness. Bull thistle is common in wilderness seeps, streambanks, and meadows, where crews have been controlling it by hand removal since 2001. *NPS Photo by Richard Thiel.*

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

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Cal-IPC News

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Editors: Elizabeth Brusati, Doug Johnson, Heather Brady

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From the Director's Desk

Big strides—forward and back

On February 9, California took a big step forward in invasive species coordination by formally creating an interagency Invasive Species Council. Creating the council has been a goal of Cal-IPC's for several years. I count this as a significant accomplishment for our organization and I am excited about the opportunities it presents.

The new council was announced at the World Ag Expo by Secretary of Food & Agriculture A.G. Kawamura and Secretary of Natural Resources Mike Chrisman. They will lead the council, which also includes Cal EPA, Caltrans, Dept. of Health Services, and Cal Emergency Services. Federal agencies, tribal and local governments, universities and private stakeholder groups will serve on an advisory council.

In forming such a council, California follows other states including Oregon, Washington, Hawaii, Idaho and Arizona. Though we will not have the benefit of a \$5 million budget like the New York council, we will be able to build on the experience of other states.

Cal-IPC's advocacy goals include both "strategy and structure". Our risk mapping aims to provide baseline data for designing sound statewide strategy. The new council offers a structure for implementing such broad strategy. Now our job is to help the council be as effective as possible.

At the same time as the state recognizes the importance of invasive species in creating this council, organizations working on the issue are being damaged by the **economic crisis**. In a move that puts the situation in stark relief, The Nature Conservancy disbanded their highly regarded Global Invasive Species Team as part of organization-wide layoffs. John Randall, director of the team, was last year's recipient of Cal-IPC's Jake Sigg Award for Vision and Dedicated Service. Cal-IPC has written to TNC to urge that they maintain focus on invasive species as a core part of their mission.

Many Cal-IPC members, including several on our board of directors, have lost employment recently. Though the promise of federal stimulus dollars may help replace lost state funding in the short term, the long term situation remains troubling. We will continue to work in coalition with others seeking solutions to the state bond freeze's impact on restoration projects. We will also continue working to educate public and private funders about the importance of controlling invasive weeds. Hopefully we will look back on this time as a shake-up that resulted in increased, not decreased, capacity to protect California's wildlands from invasive plants.

Heading to the Capitol, Cal-IPC's Doug Johnson and Ingrid Hogle of the Invasive Spartina Project get set for legislative visits during the 2009 Invasive Weeds Awareness Day at the Capitol, March 11.



Cal-IPC Updates

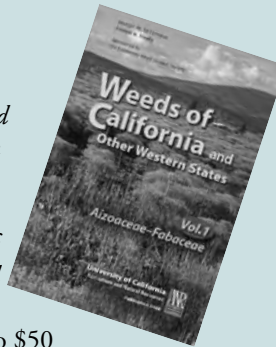
We're on Facebook!

We've joined the social networking universe with a new Cal-IPC Facebook group. Join and keep up on Cal-IPC announcements between newsletter issues. And don't forget that the Cal-IPC Student Chapter has their own Facebook group to help students share ideas.

New Reduced Book Prices

Thanks to a reduction in the publisher's price, we are able to reduce our prices

for *Weeds of California and Other Western States* to \$80 (was \$103) and the set of *Broadleaf and Grass Weeds* CD-ROMs to \$50 (was \$58). Tax and shipping are additional. Take advantage of this Stimulus Package Special! Go to www.cal-ipc.org/shop or call (510) 843-3902.



Smaller, more portable, versions of the Sucker are also being tested. Unfortunately, due to budget cuts, the State of Hawai'i has not delivered the promised funding needed to expand the program. The Nature Conservancy, Hawai'i, www.nature.org

Oregon nurseries can **no longer propagate or sell named cultivars of butterfly bush (*Buddleia davidii*)** due to its invasiveness in the Northwest. In 2004, the Oregon Department of Agriculture banned the sale of the species but excluded all named ornamental cultivars. However, later research showed that all cultivars contribute to butterfly bush's spread. Nurseries have until the end of 2009 to sell existing stock. (Cal-IPC considered butterfly bush for our Inventory but did not add it because most of California would not be suitable habitat.) *The Oregonian*, 11/17/2008.

A new study may help guide efforts to intercept invasive species carried intentionally or accidentally by airline passengers. Researchers at the University of Florida examined travel patterns and weather to predict **when invasive species are most likely to be transported and survive on airlines**, comparing when conditions at origination and destination sites are most similar. June 2010 emerged as one upcoming period with heightened potential for transport of invasives. University of Florida, news.ufl.edu/2009/02/25/travel-bugs

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It is with great regret that we announce that **The Nature Conservancy has cut its Global Invasive Species Team** and the accompanying website tncinvasives.ucdavis.edu (formerly tncweeds.ucdavis.edu). Many of its resources, including the photo gallery, Weed Control Handbook, and Element Stewardship Abstracts, will be moved to other servers such as the University of Georgia's Center for Invasive Species and Ecosystem Health (a.k.a the Bugwood network, www.bugwood.org). One of the casualties is their new Invasipedia. We hope to have more information on where these resources find a home in the next issue.

The fires that burned in Southern California last fall wiped out native vegetation in some areas, **leaving wildlife with no place to go and opening up places for weeds to invade**. At Chino Hills State Park, native shrubs and trees died in the fire and black mustard, milk thistle, and wild radish have moved in. Many California gnatcatchers, a federally-listed threatened bird, died in the fire and the endangered least Bell's vireo will find damaged nesting habitat when they return this spring. *Riverside Press-Enterprise*, 3/23/2009.

Princeton Researchers studying five invasive species in the western U.S. suggest that **while climate change will allow some species to expand their ranges, others may retreat, creating opportunities for restoration**. They studied temperature, rainfall, and other factors where cheatgrass,

spotted knapweed, yellow starthistle, tamarisk, and leafy spurge now grow and compared them to changes predicted in the next 100 years. Yellow starthistle is likely to spread in California while tamarisk will remain approximately the same. This study is published in *Global Change Biology*. www.sciencedaily.com/releases/2009/01/090127112055.htm

Scientists in Hawai'i have a new tool to remove invasive algae that is choking reefs in the islands. The **Super Sucker** is a modified gold dredger that runs on biodiesel and can **remove up to 800 lbs of algae per hour**. Alien algae are a serious threat to Hawai'i's coral reefs because they fill in crevices and flatten the complex reef topography.

2009 Field Course season begins

Our Wildland Weed Field Courses kicked off the 2009 season on April 1 and 2 at San Diego's Sycamore Canyon/Goodan Ranch Open Space. This year's schedule offers courses on control techniques, biology/identification, revegetation, mapping, and new advanced courses on mechanical control and chemical control techniques. Courses are held around the state, and we offer a significant registration discount to volunteer stewards. Get full details online at www.cal-ipc.org.



Thinking less to do more: Ergonomics make weed work more effective

By Ken Moore, Wildlands Restoration Team

Since 1990, Ken Moore has directed the Wildlands Restoration Team, a volunteer program dedicated to protecting and restoring biological diversity on state parklands in the Santa Cruz mountains. They have pioneered non-herbicidal control methods for many invasive plants. Ken is a frequent instructor at Cal-IPC field courses and is well-known for designing and fabricating new tools to make weed work more effective. In this essay, he urges weed workers to consider how ergonomics can make a difference in their work.

We are an interesting species, to say the least. We are increasingly absorbed with using our amazing brain to come up with ways to avoid doing anything even hinting at serious work with our bodies. I won't speculate on where this may lead us, but it has already resulted in our being dramatically less physically capable than other mammals even half our size.

While some things can be accomplished quite well by pushing buttons, I doubt that controlling wildland weeds on the ground is likely to be one of them anytime soon. Herbicides, biocontrol, fire, heavy equipment, flaming: all are valuable components of controlling weeds on a landscape scale. But human-powered control methods will always be necessary. Indeed, most of my field hours are still spent in this way, despite my insatiable fascination with trying every new mechanical contrivance and method I can come up with!

Of course, if we can use that powerhouse brain of ours to keep from doing physical work, we can also use it to devise ways to use our bodies more efficiently. The basic principle here is to understand and utilize what our bodies have become best suited for: repetitive small motions rather than sheer strength. To travel long distances, we learned early on that we could get much

further by taking many small steps rather than big impressive looking leaps.

When I was still a youngster, I received a lesson that I know now to be a universal truth. As I arrived at my very first day on a construction job, an old timer saw my awkwardness, and walked over. "Do you know how to build a house, son?" he asked. "I have no idea," I blurted. "One nail at a time" was his reply.

Look at any hand-held tool, think of how it works, and you will realize that it does so by doing just a little bit at a time. A good tool simply does just a little bit more with each movement. And that's the secret—a little bit more. That's why the design of the tool, coupled with its correct use, is so critical to success. In order to ac-



Ken frilling a tree. Hand tools accomplish tasks taking a series of small bites—we can significantly increase our overall effectiveness by optimizing the ergonomics of each small bite.

complish large tasks, we must maximize our limited strength and energy by increasing—just a little—the work we get done with each small motion.

The tools we use in weed control (indeed, all tools) operate on this same principle: they are designed to maximize the effect of small repeated movements to accomplish a task, rather than fast or strenuous exertion. A hand saw, for instance, works by removing minute particles of wood with each stroke. And a very good one used properly will do so with nearly no effort. Sure, we can use a chainsaw to supply more power and get the job done faster, but the principle is still the same. It still makes sawdust—just more of it, and quicker!

I became intrigued with how much difference efficient design can make in repetitive small movements many years ago

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Want to learn more about mechanical methods for controlling invasive plants? Come to our Advanced Mechanical Methods Control Course in the Santa Cruz Mountains on July 21. Ken Moore will be one of the instructors. For more information about the course, visit www.cal-ipc.org or contact Project Coordinator Heather Brady at hjbrady@cal-ipc.org or (510) 843-3902.

State bond freeze slows weed work

We don't need to tell anyone reading this that the freeze on state bond funding has caused severe impacts to natural resources projects in California. The *Los Angeles Times* (Jan. 21) estimated the bond freeze has affected 1,100 restoration and conservation organizations. The Sierra Nevada Alliance surveyed 68 organizations in the Sierra Nevada in January and found that ten had laid off staff, 26 had laid off contractors, and two had closed completely. Most of those organizations' projects related to restoration and water quality. Cal-IPC itself has two projects stopped.

To make matters worse, state support is often used as required matching funds for other grants, and the loss of state support will cost organizations other funding as well. Due to the seasonality of most restoration work, a short time without funding can translate into a full year lost. The Yolo County Resource Conservation District lost a year's worth of saltcedar removal on Cache Creek without its grant from the Wildlife Conservation Board. The Sierra Nevada Alliance reported that five organizations are unable to host AmeriCorps crews without state funds, losing the work those volunteers were going to accomplish this summer.

The California Council of Land Trusts (CCLT) has been pressing the Dept. of Fi-

nance and the legislature to develop creative solutions to get the money flowing again. Some agencies are willing to issue a "guarantee of payment" to their grantees, stating that if grantees are able to continue work through other funds, the agency will pay for that work as soon as funds are available. However, no date has been set for when such payment might occur. CCLT says they do not expect most bond-funded restoration projects to be restarted in 2009.

One positive note in all of this is the state's action to open up sales of "private placement bonds" to individual investors in the "Buy California Bonds" campaign. And in the first bond sale, the State Treasurer's office sold \$6.5 billion in infrastructure bonds in two days, far exceeding the \$4 billion in three days they had expected.

However, we do not know when projects will be allowed to move forward, or when invoices for last fall's work will be paid. The California Prompt Payment Act requires the state to pay invoices within 45 days of receipt or pay a penalty, but the act exempts nonprofits from receiving these penalties. This means that once bond funding can be distributed again, nonprofits such as Cal-IPC are likely to be at the end of the line as the state pays private companies and other vendors first to avoid penalties. State Senator Patricia Wiggins has introduced SB 553 to close this loophole.

We hope that by the time you receive this newsletter, some of these options have met with success and the future of bond-funded projects looks more optimistic.

Some projects on hold:

Cal-IPC - Two projects halted, one for mapping arundo from the Mexican border to Monterey County and estimating its economic impacts, the other for workshops on invasive species management in the Delta.

Los Angeles and San Gabriel Rivers Watershed Council - \$2 million in work and four jobs lost. Halted projects assisted cities, predominantly low-income minority communities, on restoring and revitalizing parks and streams.

Mission Resource Conservation District (San Diego Co.) - \$700,000 of completed work is unpaid, and \$3.5M is frozen for arundo removal projects addressing flood and fire risk and restoring habitat.

Santa Ynez River Tamarisk and Arundo Project (Santa Barbara Co.) - Delay on this project to eradicate tamarisk and arundo on the 90-mile river risks a significant increase in cost due to an increase in the amount of plants to control.

Invasive Spartina Project (S.F. Bay) - This large eradication project to reverse damage to bayshore habitats and flood channels is nearing completion after five years of work, but skipping control efforts for one season will set the project back several years. Ten jobs are on hold.

Sonoma Ecology Center - The staff of 20+ at the SEC conducts restoration work in northern California watersheds. The organization has laid off several employees, and has cut hours for most staff.

Tahoe Resource Conservation District The RCD is unable to staff educational work on terrestrial invasive weeds. Tahoe relies heavily on educated community volunteers to assist with early detection.

More information:

ReSeed California - updates and a discussion board on efforts to renew funding. <http://stopworkimpact.ning.com>

California Bonds
www.buycaliforniabonds.com



Stopped in their tracks. A crew from Clean Lakes, Inc., cleaning a MarshMog amphibious vehicle after treating hybrid *Spartina* in San Francisco Bay. Coastal Conservancy funding for the Invasive Spartina Project has been halted. *Photo by Drew Kerr, Invasive Spartina Project*

The cost of weeds to California

By Elizabeth Brusati, Cal-IPC Program Manager

At least \$82 million per year. That is Cal-IPC's conservative estimate of annual expenditures on invasive plant control, monitoring, mapping, and outreach efforts in California based on a survey of organizations that work on invasive plants.

The impacts of invasive plants include displacement of native plants and the wildlife that depends on them, increased wildfires, infrastructure damage, reduced recreational opportunities and reduced agricultural or ranching yields. Invasive species are frequently cited as the second-most damaging factor for endangered species after urban development (Wilcove et al. 2000). Many of the impacts of invasive species do not lend themselves to easy economic valuation. After all, how much is an endangered plant worth? Calculations on the cost of invasive plants sometimes use substitutes such as the damage caused by floods on a river infested with giant reed or the reduced agricultural yield in a pasture covered by leafy spurge.

However, it is no simple task to compile impacts for an entire state or to separate out damage that can be attributed to invasive plants. Determining the economic impacts of invasive plants is hindered by three factors: lack of data on the plants; lack of a framework for valuing non-market impacts (i.e. "ecosystem function") and considering uncertainty; and lack of case studies that apply economic analysis to invasive plants. In Cal-IPC's recent Research Needs Assessment (Robison 2009, see article in Winter 2009 issue of *Cal-IPC News*), many participants pointed out the need for better information on the economic impacts of wildland weeds.

We surveyed expenditures on invasive plant control, monitoring, mapping, and

outreach to determine what is spent annually on invasive plants in California as an indirect way of measuring economic impacts. We focused on invasive plants in wildlands, areas outside of human habitation or cultivation, rather than agricultural weeds. Some of the programs we surveyed

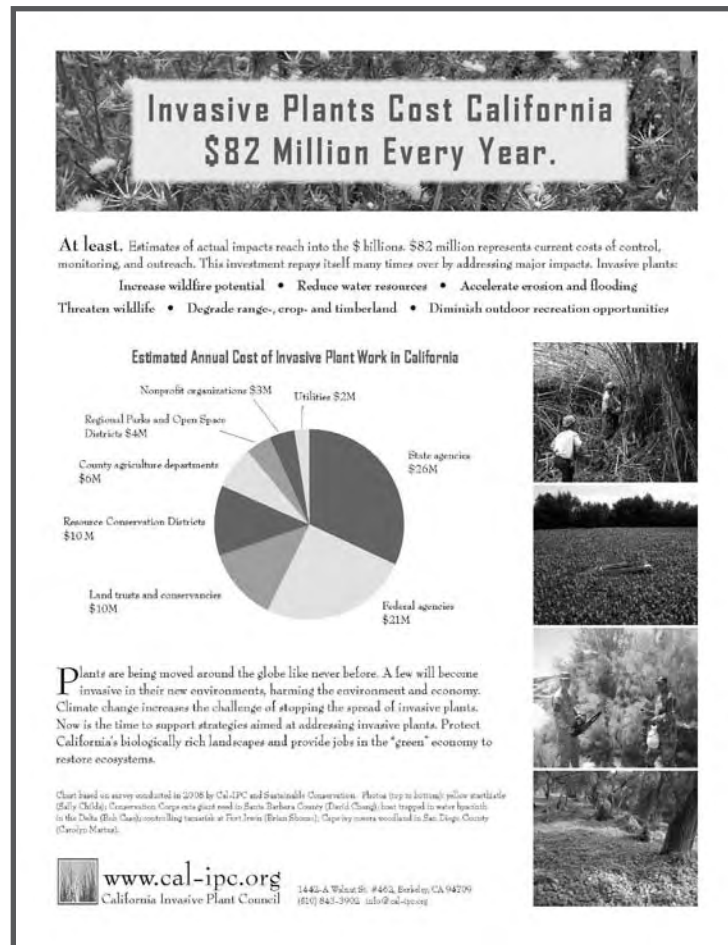
we did not include the many individual private landowners removing invasive species (though some of the grant programs we surveyed do distribute money to landowners). Finally, because we are surveying expenditures as a proxy for impact, the fact that most programs are underfunded tends to make our estimate low.

How data was gathered

We surveyed state and federal agencies, county agricultural departments, land trusts and conservancies, resource conservation districts (RCDs), utility companies, and non-profit organizations. Sustainable Conservation (facilitator of the California Horticultural Invasives Prevention partnership) conducted an initial survey in 2007 and Cal-IPC followed up with a more extensive survey in 2008. We asked each organization to estimate how much they spend annually on work related to invasive plants. To avoid double-counting, we asked them not to include funds received from state or federal grants in the totals they reported. We interviewed state and federal agencies directly to ask how much money they distribute to weed work through their programs.

For several types of organization (e.g. RCDs), we extrapolated from a set of respondents

to estimate expenditures from the whole category of organization. For RCDs and county agriculture departments, we extrapolated based on the number of organizations in that category in California. For land trusts, we extrapolated based on the number of trusts and conservancies (California Council of Land Trusts 2008). We did not have a way to extrapolate for parks and open space districts or utilities, so we only used figures from survey respondents.



Full-color factsheet. Download at www.cal-ipc.org.

also fund research into control methods but we did not focus on research as a category. Because there are hundreds of organizations across the state working on invasive plants, our results rely on some extrapolation (discussed later). Our estimate is conservative for several reasons. First, it was impossible to cover all of the hundreds of organizations across the state working on invasive plants, from federal agencies to local "Friends of the Creek" groups, and our extrapol. Second,

Results

Our results show that state agencies spend the most on invasive plants, at least \$25 million per year. This does not include all bond-funded projects as we were unable to obtain comprehensive information on bond-funded projects. We had limited survey results from parks and open space districts, so the estimate for that category is probably low given the many local and regional districts scattered across California.

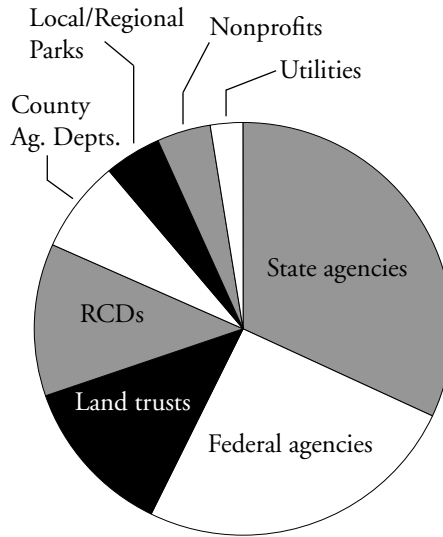
Our estimate would be much higher if agencies and other organizations received the level of funding they believe necessary to make their programs fully effective. The California Noxious and Invasive Weed Action Plan (CDFA 2005) compiled figures on existing and needed budgets for invasive plant control by state and federal agencies (before the current round of budget cuts). For example, the Dept. of Boating and Waterways the \$7 million per year spent to control Brazilian elodea (*Egeria densa*) and water hyacinth (*Eichhornia crassipes*) in the Sacramento-San Joaquin Delta represents only 58% of what they need in order to reach their state-mandated goals. The Dept. of Parks and Recreation receives only 12-15% of the necessary funding to combat weeds on its lands.

Long-term, the cost of removing plants increases when programs that are not adequately funded are forced to choose between species or sites, allowing some infestations to become larger and more expensive problems. If plants grow back due to lack of funds for monitoring or follow-up treatments, money is wasted.

Other estimates

A number of authors have tried to put a dollar value on the damage caused by invasive species. One of the most widely-cited figures is the estimate by David Pimentel and colleagues at Cornell University that invasive species cause \$120 billion in damage in the United States per year (Pimentel et al. 2005). They also found that 42% of species on the federal threatened or endangered species lists are there primarily because of invasive species.

One detailed analysis on the cost-benefit ratio of eradicating a particular invasive plant shows how the values add up on a large scale. Erica Zavaleta of UC Santa Cruz quantified the impact of saltcedar (*Tamarix ramosissima*) by calculating the costs to



What's spent on wildland weeds. Expenditures on weed projects in California by type of organization. This serves as a conservative baseline estimate of statewide impacts.

water supply, flood control, and wildlife. She compared the cost of a program for eradicating saltcedar in the western United States to the benefits that would be gained, and found a net total benefit of between \$3.8 billion and \$11.2 billion over 55 years (Zavaleta 2000).

Even the Marines have to contend with invasive species. Camp Pendleton spent \$200,000 in emergency funds in 2005 to remove arundo debris that had washed downstream onto a beach during winter floods. The base also spent \$1.2 million over five years to remove arundo and tamarisk from training areas. Meanwhile, at Fort Hunter Liggett the Army has a program to remove yellow starthistle because it tears up parachutes that cost \$4000 apiece to replace (Westbrook et al. 2005).

One weed with some estimates of its cost in California is yellow starthistle, which infests 14.3 million acres in the state, an increase of 80% just since 1985 (Pitcairn et al. 2006). Gerlach (2004) compared the water used by yellow starthistle to other species and estimated that the value of water lost ranges from \$16-75 million/year in the Sacramento River watershed alone. On rangeland, yellow starthistle can reduce the capacity of pastures by 50% and cause the overall value of the forage to drop 6-7% per year (DiTomaso et al. 2006). In California, yellow starthistle is managed on 500,000 acres at a cost of \$25/acre, for a total direct control cost of \$12.5 million (DiTomaso

Type of Organization	Annual Weed Expenditures
State agencies	\$26 M
Federal agencies	\$21 M
Land trusts and conservancies	\$10 M
Resource Conservation Districts	\$10 M
County agriculture departments	\$6 M
Regional Parks and Open Space	\$4 M
Nonprofit organizations	\$3 M
Utilities	\$2 M
Total	\$82M

et al. 2006). If the weed is not managed, control costs increase as it spreads onto neighboring properties.

Recreation is another area where invasive plants cause economic impacts. In Nevada, one study estimated that invasive plants cause between \$6 million and \$12 million per year in reduction of wildlife-related recreation (Eiswerth et al. 2005). This included impacts on swimming, boating, fishing, hunting, and wildlife viewing. The authors calculated their estimate based on the total revenue from recreation in Nevada, the level of weed infestation in parts of Nevada, and the subsequent reduction in recreation. In California, expenditures on wildlife-related recreation in 2006 were estimated at \$8 billion compared to \$917 million in Nevada (US Dept. of Interior and US Dept. of Commerce 2006). A reduction similar in percentage to that in Nevada yields a loss of \$52 million to \$104 million a year in wildlife recreation caused by invasive plants in California.

We hope that these survey results will convey the impact of invasive plants to policymakers and members of the public. Attendees at Invasive Weeds Awareness Day at the Capitol in March made sure every state legislator's office received a copy of the factsheet. Cal-IPC will continue to collect data to improve these estimates, and work with researchers to develop robust studies of actual impacts.

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2009 CAL-IPC SYMPOSIUM

The Leading Edge... this year's Symposium brings you theme sessions on halting the leading edge of spreading weed populations, leading edge tools and techniques, and leading edge research on climate change and longterm ecological processes. Join 300 other weed workers in Visalia for the 18th annual Cal-IPC Symposium!

Invited and Contributed Paper Sessions

Poster and Exhibitor Session

Reception & Awards Banquet



Field Trips and Field Course

Discussion Groups

Raffle & Auction

COME SHARE THE LATEST IN WILDLAND WEED BIOLOGY AND MANAGEMENT!

"WILDLAND WEED MANAGEMENT

OCTOBER 8-10, 2009



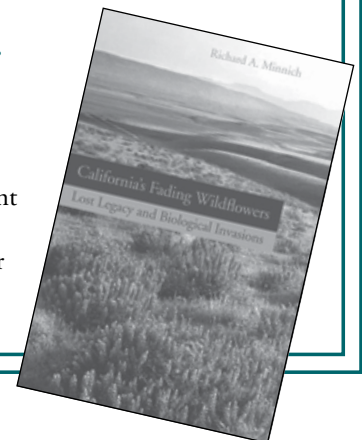
Field Course: Advanced Herbicide Control Methods. October 7, Kaweah Oaks Preserve, Visalia

Want to learn more about how to effectively and appropriately use herbicides to control weeds? This course is designed to provide more detailed information about chemical control than is provided in our basic Control Methods Field Course. Topics will include modes of action, selectivity, application methods, calibration for proper application rate, personal and environmental safety, and specific treatment strategies for different types of weeds. particular methods used for more. Instructors include Dr. Joe DiTomaso of UC Davis and others with extensive experience controlling wildland weeds with herbicides.

DPR Continuing Education units will be available (specific hours will be listed on our website this summer). Register with the Symposium and receive a discount. Cal-IPC field courses provide attendees with reference information, lunch, and a great opportunity to network with instructors and other attendees. Sign up early—space is limited!

Richard A. Minnich, Author of *California's Fading Wildflowers: Lost Legacy and Biological Invasions* (UC Press, 2008)

UC Riverside biogeographer Rich Minnich will be with us to describe the impact of nonnative bromes on California's renowned wildflowers. Forbs, not bunch grasses, may have been the dominant vegetation in much of California's current grassland habitat. Minnich's research calls into question long-held assumptions about historical ecology in California, and offers intriguing opportunities for restoration of this "lost legacy."



Visalia... lies at the foot of the southern Sierra Nevada in Tulare County, Visalia is the gateway to Sequoia and Kings Canyon National Parks. The mountains are home to the world's largest trees, the giant sequoia. The productive valley, which today supports 250 different crops, was once home to Tulare Lake, the largest in the western US. The town itself is the oldest between Los Angeles and Stockton, and boasts over 50 murals in its thriving downtown.

The Symposium will be held at the convention center, a short walk from over forty downtown restaurants and the historic Fox Theatre.



Bavaria? No, Visalia! Photo from *Visalia Convention & Visitors Bureau*.

ON THE LEADING EDGE"

VISALIA CONVENTION CENTER



Field Trips to Sequoia-Kings Canyon National Parks, Kaweah Oaks Preserve, and Atwell Island

Don't miss these opportunities for insiders tours of the region's landscapes and invasive plant management efforts. In the Sierra, we will visit montane meadow restoration projects, and hear about strategies to gain public support for natural resource management. In the valley, we will visit remnant valley oak and alkali meadow habitats, and learn about innovative restoration efforts by the Sequoia Riverlands Trust and the Tulare Basin Wildlife Partners.

At left, California NPS Exotic Plant Management Team Leader Dan Boughter removes reed canarygrass (*Phalaris arundinacea*) from among the native vegetation in a wet meadow in Grant Grove, Kings Canyon National Park. After two years of treatment by herbicide, crews followed up with hand removal. Rein orchid (*Platanthera leucostachys*) is in the foreground. *NPS Photo by Athena Demetry.*

...SEE NEXT PAGE

MORE AT WWW.CAL-IPC.ORG

MORE ON THE SYMPOSIUM...

Registration, Transportation, Lodging

Registration will open in May. Register online for faster processing, and choose from several payment options. Includes all meals Thursday, breakfast Friday, and 2010 Cal-IPC membership. Field trips and field course provide lunch.

Rates: Regular: \$250 (\$275 after Sept. 14)
Student: \$100 (\$125 after Sept. 14)
Symposium Volunteer: \$150 (before Sept. 14 only)
Field Trips: \$25-\$50
Field Course: \$145 with Symposium, \$165 solo

Getting There: Visalia is located in Tulare County, south of Fresno. Three airports are located within 75 miles of Visalia and it is also served by an Amtrak bus shuttle from Hanford via the San Joaquin train.

Lodging: Rooms are available at a special conference rate at the Marriott adjacent to the convention center (\$99 single or double) and the Comfort Suites one block away (\$99 per suite). Reserve your room by Sept. 14 to receive the discounted rates.

Sharing Rides and Rooms: In an effort to help attendees keep costs down, we will be offering online bulletin boards for arranging carpools and shared rooms. Comfort Suites rooms are designed to accommodate multiple people.

Sponsorship Opportunities

Sponsoring the Symposium is a great way for your company, agency or organization to reach California's weed workers while supporting the event. Four levels of sponsorship offer benefits including free registration, exhibit space, and recognition in Symposium materials. Info at www.cal-ipc.org.



Symposium attendees bid on raffle items. *Photo by Bob Case.*

Call for Papers & Posters: due June 19

We invite weed workers and researchers to submit abstracts for oral presentations or posters at the 2009 Symposium on invasive plant biology, management, monitoring, or outreach programs. We especially look for presentations on innovative projects that can be applied to other species or other parts of the state beyond the current project. Presenters will have a 20-minute time slot. Info at www.cal-ipc.org.

Student Contest

Students are invited to enter our second annual Student Paper and Poster Contest. First place in each category receives \$250. First, second, and third places will be recognized at the Symposium and in *Cal-IPC News*. Info at www.cal-ipc.org.

Award Nominations: due July 31

The Symposium is an opportunity to honor individuals and organizations who have made exceptional contributions to invasive plant research or management. Our awards are: the Jake Sigg Award for Vision and Service, the Golden Weed Wrench Award for Land Manager of the Year, the Ryan Jones Catalyst Award, the Invasive Plants Policy Award, and the Organization of the Year award. Send nominations to Cal-IPC Executive Director Doug Johnson, djohnson@cal-ipc.org. See past honorees at www.cal-ipc.org/symposia/awards.php.

Photo Contest: due Sept. 1

Show off your photographic talents in the annual Cal-IPC Photo Contest! Photos will be displayed at the Symposium and attendees will choose Best in Show. Entries can include specimen shots of individual plants, landscape photos, or weed workers. We especially encourage photos that show the impacts of weeds. Info at www.cal-ipc.org.

Auction and Raffle

The Symposium is not just about listening to papers on the newest research results and management techniques; it's also about having fun with fellow weed workers! The Thursday night happy hour includes a raffle with a variety of great prizes, from wine to books, tools to art. The banquet later in the evening features a live auction of a few special items. Come mingle with folks from around the state and recharge your batteries.

Do you have items to contribute as raffle or auction prizes? Contact board member Tanya Meyer, at meyer@yolorcd.org to coordinate your donation. Thank you!

Greetings from the Low Desert WMA!

Text and photos by Ilima Hawkins, Southern Low Desert RC&D Coordinator, Ilima.Hawkins@ca.usda.gov



A pair of endangered peninsular bighorn sheep watch members of the Low Desert WMA hike through the Santa Rosa San Jacinto National Monument during the 2008 WMA review.

The Low Desert Weed Management Area provides a forum for communication between weed managers in the eastern portions of San Diego and Riverside Counties. After the signing of our MOU in 2006, we developed a WMA strategic plan that identifies the Low Desert WMA mission to promote education, research, on-the-ground management, and exchange of information related to the management of invasive plants. We then identified the 12 worst invasive plants in our area, our “dirty dozen”, and created a brochure that we distribute at a variety of events.

Program development through partnerships

One of the items outlined in our strategic plan is to complete an inventory of invasive plants, and in August of 2008 we partnered with Imperial County WMA and initiated a Rapid Watershed Inventory throughout the watershed basin of the southern low desert of California. Professional facilitator Ray Ledgerwood led the kickoff meeting, and active partners include the Imperial county agricultural commissioner’s office, several water districts, federal, state and local government agencies, several tribes and non-profit groups. So far we have identified our most serious invasive species, the extent of mapped data that is available on infestations, and we are

currently developing a list of prioritized projects to tackle over the next five years.

Once this work is complete it will help us better coordinate the weed management efforts of individual partners and the WMAs, ultimately enhancing benefits to wildlife habitat and agricultural areas. Support for the inventory process is provided by the Natural Resources Conservation Service and the Southern Low Desert Resource Conservation and Development Council. We expect to complete the inventory this July.

Tamarisk: It’s everywhere!

The desert areas of Riverside and San Diego counties can be extremely arid and warm, making water a rare and vital resource. Tamarisk (*Tamarix ramosissima*) seems to thrive on the harsh climate and grows with a density and distribution

far exceeding patterns of native species. Tamarisk suppresses native species through a three-pronged approach: competition for space, competition for water, and chemical deterrents (tamarisk dramatically enhances soil salinity).

For the past two years we have continued one of our biggest priorities, managing tamarisk in the Santa Rosa San Jacinto Mountains National Monument. The monument is home to a variety of native plants and animals, including the peninsular bighorn sheep. This winter we successfully coordinated tamarisk removal in the upper reaches of the monument. CDFA awarded \$94,000 to the RC&D in January 2007 but implementation had been stalled due to challenges with environmental documentation and gaining access to the site. Early this year we secured a helicopter contract and crew, and cleared 22.5 acres in the upper reaches of Guadalupe Canyon. We also continue to support smaller volunteer efforts to remove tamarisk from different areas in the Coachella Valley.



During a hike into the Santa Rosa mountains, Sam Cobb, NRCS, and Kate Kramer, US Forest Service, stop to examine a tamarisk specimen.

Tackling invasive plants on California Dept. of Fish & Game lands

Brianne O'Rourke and Julie Horenstein, California Department of Fish and Game

The California Department of Fish and Game (DFG) manages 711 properties statewide totaling over 1 million acres. These properties range from fish hatcheries and marine reserves to wildlife areas and ecological reserves. They are maintained to provide maximum benefits for fish, wildlife and plants as well as recreational opportunities to the public, but how is optimum habitat on DFG lands upheld?

The Invasive Species Program works with partner agencies and organizations to reduce the negative effects of invasive species throughout California, including on DFG lands. This work includes preventing the introduction of these species into the state, detection and response to introductions when they occur, and preventing spread once invasives have become established. Examples include preventing the spread of quagga and zebra mussels throughout California's waterways, the development and implementation of the California Aquatic Invasive Species Management Plan, and administering one-time funding from the legislature for weed control projects on DFG lands.

DFG's Pesticide Investigation Unit (PIU) investigates problems caused by exposure of fish and wildlife to pesticides. It is also an important entity through which invasive species, in particular weeds, are controlled and eradicated on DFG lands. Working with DFG land managers, the PIU provides recommendations on integrated pest management methods to control invasive plants to ensure optimum habitat. This is no easy task when approximately 1,800 exotic plant species compete with native plant species statewide.

The PIU produces an annual report to share information and statistics on which invasive plants are most prevalent, what methods are used to control them and herbicide use on DFG lands. A 2008 survey

of 71 DFG facilities reported 709 invasive weed infestations. Most of these are small incipient infestations of one acre or less (65%) or medium infestations of 1 - 10 acres in size (20%). However, many have established populations between 10 - 100 acres (7%) and infestations exceeding 100 acres (7%).

Nearly 60 invasive plants were identified



Fish & Game crew removing tamarisk. DFG Photo by Randy Botta.

in 2008 as having a significant adverse effect on DFG lands and their restoration efforts. Of these, tamarisk (*Tamarix* spp), Russian thistle (*Salsola tragus*), eucalyptus (*Eucalyptus* spp) and tocalote (*Centaurea melitensis*) are reported as having the most occurrences.

DFG facilities use both chemical and non-chemical to control invasive plants. More than half (63%) reported using non-chemical methods such as mowing (42%), grazing (23%) and disking (18%). Several non-chemical methods are often combined with chemical methods as an integrated pest management strategy. Seventy six percent of facilities used chemical methods, mostly applied herbicide formulations including the active ingredients glyphosate (65%), clopyralid (11%) and triclopyr triethylamine salt and butoxyethyl ester (9%).

In fiscal year 2006-07, 28 DFG wildlife

areas and ecological reserves were provided with one-time funding from the legislature for invasive plant control projects. The objectives of these projects were to eradicate both outlying populations of established invasive plants to limit their spread and new infestations to avoid larger control costs in the future. Twenty species were treated, including tamarisk, several species of thistles and knapweed and Cape ivy (*Delairea odorata*). Removing tamarisk from desert springs and creeks may increase native habitat for such California threatened and endangered species like desert pupfish, peninsular bighorn sheep and least Bell's vireo. Eliminating incipient infestations of Italian thistle (*Carduus pycnocephalus*), spotted knapweed (*Centaurea maculosa*) and yellow starthistle (*Centaurea solstitialis*) at six DFG facilities in the San Joaquin valley may prevent their establishment at these properties and avoid their spread onto neighboring lands. The reduction of Cape ivy at Elkhorn Slough Ecological Reserve will allow restoration and recolonization of native oak trees and their associated native understory species.

Tackling invasive plant species on DFG lands is an ongoing effort that requires the coordination of many programs, people and facilities statewide. One-time funding that lasts for just a few years cannot solve the problem, but we hope with documentation of our work, we stand a better chance of obtaining additional funds in the future. With continual eradication and control projects, public recreational opportunities and optimum habitat for native fish, wildlife and plant species will be ensured.

For more information:

DFG Invasive Species Program:

www.dfg.ca.gov/invasives/

DFG Pesticide Investigation Unit:

www.dfg.ca.gov/ospr/about/science/labs.html

Thank You for Supporting our Work!

Donors

Your tax-deductible donations are extremely valuable in supporting our programs. This list represents donations received through March 31. Thank you!

Patron (\$500-\$999)

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John Randall (Davis)

Wendy West (Placerville)

Hyla Fetler (Santa Barbara)

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New Members

Maureen Abare-Laudy (County of San Diego Parks and Recreation), Leslie Allen (LSA Associates, Inc, Point Richmond), William Allison (Tri Valley Landscape, Westlake Village), Jennifer Allison (Tri Valley Landscape, Westlake Village), Rebecca Alvidrez (Chambers Group, Inc., Redlands), Yidelwo Asbu (County of San Diego Parks & Recreation), Timothy Babalis (National Park Service, Oakland), Domenic Bongio (Caltrans, Eureka), Tamara Camper (McKinleyville), Brian Castelluccio (Dept. of Parks and Recreation, Roseville), Jacqueline Cully (County of San Diego Parks and Recreation), Mary Dellavalle (CA State Parks, Colorado Desert District, Borrego Springs), Andrew Doran (University of California & Jepson Herbaria), Debbie Evans (Tree of Life Nursery, San Juan Capistrano), Anne Fege (San Diego Natural History Museum), Hyla Fetler (Santa Barbara), David Greenwood (BLM, Midpines), David Holt Jr. (County of San Diego Parks & Recreation), Melissa Holton (Woodbridge), Julie Janssen (Native Plant Connection, Descanso), Nicole Jurjovic (Stillwater Sciences, Berkeley), John Kleinfelter (South Lake Tahoe), Tim Koopman (Koopman Ranch, Sunol), Paul Kucharczyk (County of San Diego Parks & Recreation), Betsey Landis (CNPS Los Angeles/Santa Monica Mountains Chapter), Sarah Marino (Natural Resource Conservation Service, Escondido), Brian Mathews (Alameda Co. Waste Management Authority, Oakland), R. Steve Miller (Caltrans, Bishop), Bonnie Muehlner (Batiqitos Lagoon Foundation, Carlsbad), Helen & Fraser Muirhead (Tiburon), Bill Nantt (Caltrans, Stockton), Linda Novy (Fairfax), Everett Papp (County of San Diego Parks & Recreation), Shawn Peterson (SMP Services, Inc, Roseville), Heidi Petty (Contra Costa Resource Conservation District, Concord), Marc Pumpkinthief (County of San Diego Parks & Recreation), Gerry Ramsey (County of San Diego Parks & Recreation), Michael Read (Burlingame), Lee Reeder (Santa Ana Watershed Association, Redlands), Rick Riefner (Rancho Santa Margarita), Catherine Rom (City of San Diego), William Schlegal (San Bernardino National Forest, Idyllwild), Mike Sexton (Tri Valley Landscape, Westlake Village), Christina Smith (California Plant Materials Center-NRCS, Red Bluff), Adam Stackhouse (County of San Diego Parks & Recreation), Melinda Taini (County of San Diego Parks & Recreation), Valerie Van Way (Cal. Dept. of Fish & Game, Sacramento), Justin Wages (Rocklin), Carl Weidert (Shingletown), Susan Wickham (Benicia), Nancy Withrow (Natural Resources Conservation Service, Escondido), Chino Yip (Napa County Regional Park and Open Space District)

Cost of Weeds from page 13

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Readings & Resources

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

State WMA meeting presentations

Powerpoint presentations from the March statewide Weed Management Area meeting are posted online. Topics include mapping programs, prioritizing weeds, new tools, and information on contracts and invoices for WMA partners. www.cdfa.ca.gov/wma

Lake Tahoe website

The Lake Tahoe Basin Weed Coordinating Group has a new website with information on impacts of the weeds in the region and a link for reporting new weeds. www.tahoeinvasiveweeds.org

Weed identification tool

Joe DiTomaso at UC Davis and Mark Renz at U. Wisconsin have developed an online ID tool that can be set up for an agency, state, or organization. The agency provides the plant list and they do the rest. There is a set-up cost but it provides a customized identification tool. See an example at: weedid.wisc.edu/calweedid.php

Wildfire and invasive plants

Powerpoint presentations from the December workshop on Wildfire and Invasive Plants sponsored by the Society for Range Management are posted online. The conference's goal was to discuss practical techniques for managing invasive plants and fire. www.rangelands.org/deserts

Climate change presentations

In January, the US Fish and Wildlife Service and US Geological Survey held a meeting in San Francisco to discuss the challenges of managing natural resources along the west coast under global climate change. Videos of the presentations are available online. www.fws.gov/pacific/Climatechange/meetings/coastal.cfm

Aquatic species newsletter

"Aquatic Species News in a Nutshell" from the Pacific States Marine Fisheries Commission is a quarterly email newsletter that summarizes new announcements and resources on marine and freshwater

aquatic invasive species, with some items on terrestrial invasive species as well. To subscribe, contact editor Joan Cabreza, Joan_cabreza@psmf.org, www.aquaticnuisance.org/newsletters

SeaGrant publications

California SeaGrant has three recent publications related to invasive species (see below). Contact them at pubadmin@seamail.ucsd.edu, phone (858) 534-4446 or see their online bookstore at www.csgc.ucsd.edu:

1) Early detection manual for quagga and zebra mussels

This manual is designed to direct early detection monitoring by citizen volunteer groups at small lakes, reservoirs and streams. 46 pgs, color, \$10.00, discounts available for multiple copies. Order online at anrcatalog.ucdavis.edu/Items/SG027.aspx or see above.

2) Wallet cards

Educate the public about Brazilian elodea and hydrilla with these convenient illustrated cards. Free (listed under Complimentary Publications on the SeaGrant website).

3) Eelgrass brochure

"Stop the Spread of Dwarf Eelgrass" describes how to identify and prevent the spread of an eelgrass that is invading Humboldt Bay. Free (listed under Complimentary Publications)



Resources for citizen science programs

Citizen Science Central, a project of the Cornell Lab of Ornithology, has a website that allows groups to post details about their citizen science projects and to connect with other such collaborative research projects. Soon they hope to add a discussion board and more resources. www.citizenscience.org/projects

Ergonomics, continued from page 14

when I was researching kayak paddle design. I had always felt that a single blade canoe paddle was a more efficient way of propelling a small boat over long distances than the double paddles most kayakers use. But I never saw anyone use a canoe paddle in a kayak, and every kayaker I talked to assured me I was wrong. Turns out I was right. While the increased speed provided with the double blade moves the kayak faster initially, over the long haul the lighter weight of the single blade wins the day. The very slight amount of increased energy used to wield the heavier double paddle higher on each stroke adds up to many tons when multiplied by the thousands of strokes taken in long trips. It's all in the numbers.

Selecting the right tool for a job is a matter of considering the specific task at hand as well as the way your particular body works. I have found that we are all a little different in this regard. And knowing how to use that tool in the most effective way and when to switch to a different tool or a different method of using the same tool is what makes the difference between success and failure out there over the long haul. Simple things like sharpening, or a drop of oil to reduce friction between moving parts, or knowing the range of motion in which the human hand works most efficiently contribute much more than the little time it takes to do or learn them. We simply have too many weeds out there not to be thinking about maximizing our efficiency and output on a daily basis.

Working with thousands of people in weed control over the years has revealed yet another dynamic at work along with employing the best possible tool and technique, having to do with human psychology. It's so simple: if a worker is accomplishing more than they thought they could, they become enthused by their progress. It actually becomes fun, instead of just work! This translates not only to their getting more done in a given day, but in their more positive outlook about weed control work overall. It's a win-win. I believe it is the single most important factor in our completing projects that every observer thought impossible with a little band of weekend warriors. These things are easy to overlook, but I truly believe they make a huge difference in the long run, and I encourage all weed workers to take them into account in your work.

THE WILDLAND WEED CALENDAR

SERCAL-CNGA Joint Conference

Cal. Society for Ecological Restoration and
Cal. Native Grasslands Association

April 29-May 1

Lake Natoma Inn, Folsom, CA

www.sercal.org, www.cnga.org

Cal-IPC Wildland Weed Field Courses:

May 13 - Biology and ID

May 14 - Control Methods

Mountain Home Ranch, Santa Rosa

Discount for registering for both courses.

www.cal-ipc.org/fieldcourses

Cal-IPC Wildland Weed Field Course: Advanced Mechanical Control Methods

July 21

Santa Cruz Mountains, location TBD

www.cal-ipc.org/fieldcourses

National Conference on Ecosystem Restoration

July 20-24

Los Angeles

www.conference.ifas.ufl.edu/NCER2009

Natural Areas Conference

September 11-18

Vancouver, WA

With invasive species session hosted by the
National Association of EPPCs.

www.naturalarea.org/09Conference

North America Weed Management Association Conference

September 21-24

Kearney, NE

www.nawma.org

Cal-IPC Symposium & Advanced Herbicide Techniques Field Course

October 7-10

Visalia

Abstracts due June 19. Registration opens
in May.

www.cal-ipc.org/symposia

Cal-IPC Wildland Weed Field Courses:

November 4 - Control Methods

November 5 - Mapping

Audubon Center at Debs Park, Pasadena

www.cal-ipc.org/fieldcourses

continued from page 3...

Researchers at the University of Utah say they can **monitor the progress of beetles released to control saltcedar** (*Tamarix* spp.). Satellites that take pictures of the earth using red and infrared spectra can distinguish between areas with saltcedar and areas where the beetles have defoliated the trees. They studied areas along the Colorado and Dolores River in Utah. The study is published in *Remote Sensing of Environment*. www.eurekalert.org/pub_releases/2009-03/uou-ss030909.php

L.L. Bean has chosen a creative way to reduce the spread of aquatic invasive species. The company designed their **Riverkeeper boots to minimize aquatic hitchhikers** by reducing the number of seams, using nonporous materials, and using materials that dry quickly. They even include a brush for scrubbing the boots. www.llbean.com

Do you want to be part of the largest ever international effort to study an invasive plant? Join a joint **cross-continental field study on garlic mustard** (*Alliaria petiolata*) sponsored by the National Science Foundation's Global Invasions Research and Coordination Network. Download instructions, sample data sheets, and a policy on co-authorship. invasionsrcn.org/portallactivities/alliaria-sampling/

Quotable

Searching the internet for articles on invasive plants reveals the creativity of newspaper editors—and their love of bad puns. A sample of headlines from around the world...

Pirates of the Caribbean – Invasive species in the Bahamas

- *Nassau Guardian*

Predator vs. Alien: Killer bug to battle knotweed

- *The Scotsman*, Edinburgh, Scotland (the paper's logo is a very patriotic Scotch thistle!)

Invasive plant takes root in bureaucracy

- *Honolulu Star-Bulletin* (editorial on iceplant planted along highways in Hawaii despite a Dept. of Transportation ban)

"Beetlemania" to hit Ausable watershed to fight purple loosestrife

- *Lake Placid News*, New York

Cal-IPC Membership Form

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

Cal-IPC's effectiveness comes from a strong membership of scientists, land managers, policy makers, and concerned citizens. Memberships run on a calendar year; those who join after June 30 will be extended through the following year. Additional donations support our projects. We are a 501(c)(3) nonprofit organization; memberships and donations are tax deductible. **Join or donate online at www.cal-ipc.org.**

Membership

- Regular \$40
 Student/Volunteer \$20
 Organization* \$150

* *Receives member benefits for three individuals.
Attach contact information for add'l individuals.*

Joint Memberships*

- Cal-IPC + SERCAL \$65
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 Cal-IPC, SERCAL, CNGA \$105

*\$5 discount on each organization's normal rate.

- Check here to receive the *Cal-IPC News* as a link to a pdf file online rather than a paper copy.
 Occasionally, we share members' addresses with like-minded organizations. Check if you **do not** want your information shared.

Mail this form with check (payable to "Cal-IPC") or credit card info to:
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