Cal-IPC News

Protecting California's Natural Areas from Wildland Weeds

Vol. 14, No. 3 Fall 2006 Quarterly Newsletter of the California Invasive Plant Council

Buffelgrass at the border

*Deladier Lopez and Raul Romo, Mexican graduate students at Northern Arizona University, look at new growth of buffelgrass (*Pennisetum ciliare*) outside of Hermosillo in Sonora, Mexico. Lopez studies how buffelgrass affects soil fertility and Romo has studied the dynamics of buffelgrass invasion and the social drivers for its introduction. Photo: George Koch, Northern Arizona University*

Inside:

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A California 501(c)3 nonprofit organization

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

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Editors: Doug Johnson, Elizabeth Brusati, Melissa Dozier

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Evolution of the Symposium

Putting on an annual Symposium was one of the first things Cal-IPC ever did, and fifteen years later we're still doing it. A lot has stayed the same—it's the best place to find out what research is being done, see what techniques are being tried in the field, and meet all sorts of weed workers from around the state. It's an amazing confluence of people and information, and it provides a lot of fun and renewal. Especially notable this year (besides the rain) were: an excellent keynote address from State Parks Director Ruth Coleman; an all-star panel session addressing the integration of research and management; and a 15th anniversary tribute to founding member Greg Archbald.

Over the years, some things have changed, too. Attendance has grown from 100 attendees to 400, and the program has expanded. Finding ideal venues for a conference of this size is a challenge. Comfortable atmosphere, access to field trips, easy travel logistics, reduced cost, fun neighborhood, minimal environmental impact... it's difficult to have it all. We continue to get excellent suggestions from you on your feedback forms, and will be working on them for next year's Symposium in San Diego. The conference will be held September 19-22 at the Bahia Hotel near Mission Beach.

We'll aim to include plenty of presentations on topics like economic impacts, public perceptions, outreach programs, horticultural partnerships, climate change, and policy efforts, while maintaining our primary focus on management techniques and strategies. In addition, we'll be looking at ways to improve the focus and structure in working and discussion groups, setting aside more unstructured time for interaction, verifying hotel recycling and waste reduction practices, making sure meal options work for everybody, and developing a price structure that encourages students and volunteers to attend.

So mark your calendars for next year's event, and thank you for being there to make it what it is!

Founders of Cal-IPC in early 1990s: (back, from left) Sally Davis, Jake Sigg, Ann Howald, Nelroy Jackson, Greg Archbald, Steve Harris, Mike Pitcairn, Jo Kitz, (front, from left) John Randall, George Molnar, Mike Kelly, and Carla Bossard.

Wildland Weed NewsNewsNewsNewsNews

Cal-IPC Updates

Contribute info for the annual Inventory update: Now's your chance to additional information on plants in the California Invasive Plant Inventory or to nominate a new plant for review. Send your information to edbrusati@cal-ipc.org, and the review committee will update the list based on your input. Deadline: January 2, 2007.

Renew your membership early: Check the mailing label on this newsletter to see if your membership expires Dec. 31. We count on your membership dues for so much of what we do, and the less effort we spend reminding you the more weed work we can do.) Use our convenient online system at www.cal-ipc.org (the Quicklink for "Join Cal-IPC"). Thanks!

Check out the 2007 Field Course schedule: Our projected schedule for field courses throughout the state can be found with the calendar on page 19.

Help distribute new brochures in the Central Valley and Lake Tahoe Basin: Thanks to dedicated local efforts, new *Don't Plant a Pest!* brochures are now available for two more regions. Contact Melissa Dozier at mdozier@cal-ipc.org if you can help. The brochure content is also on the Cal-IPC website.

No Plante Una Plaga! The Mission Resource Conservation District has translated the Southern California *Don't Plant a Pest!* brochure into Spanish. Contact Melissa Dozier at mdozier@cal-ipc.org for more info.

Missed the Symposium? Presentations and working group notes are available as pdf files at *www.cal-ipc.org.*

Thank You to: Dale Smith, for donating her professional design expertise in producing a new tabletop display for Cal-IPC. Photo of the exhibit debuting at the statewide WMA meeting page 9.

A draft **California Aquatic Invasive Species Management Plan** has been produced by the San Francisco Estuary Project. Cal-IPC submitted comments on the draft. The final plan should be available Spring 2007. *fep.abag.ca.gov/projects/invasive_species.html*

Permanent pest ratings have been assigned to the following plants by the California Dept. of Food and Agriculture:

- ***A*** - Slender false brome (*Brachypodium sylvaticum*)
- ***A*** - Non-native dodder (*Cuscuta* spp.)
- ***B*** - Arundo (*Arundo donax*)
- ***B*** - Jubatagrass (*Cortaderia jubata*)
- ***B*** - Tamarisk (*Tamarisk chinensis, T. gallica, T. parviflora, T. ramosissima)*
- ***C*** - Tree of heaven (*Ailanthus altissima*)
- ***C*** - Bull thistle (*Cirsium vulgare*)

A rating for Spanish broom (*Spartium junceum)* is pending further review. *www.cdfa.ca.gov/phpps/ipc/encycloweedia/winfo_weedratings.htm*

In some cases, **invasive plants modify habitat to their benefit** according to researchers at the U. of Michigan. Experimenting on cattail populations, they found that study plots with dead cattail litter accumulated nitrogen in the soil at a higher rate, and also had a higher turnover of nitrogen than those without the litter. This change in habitat favored cattails over native species, indicating that the invasion begins a feedback loop that continues to benefit the invaders. *www.eurekaalert.org or www.eeb.lsa.umich.edu/eeb/*

On Sept. 29, Gov. Schwarzenegger signed into law Assembly Bill 984 directing California state agencies to work with other Colorado River basin states to develop a comprehensive plan for **tamarisk control and revegetation for the entire Colorado River system**. Once a plan is completed, California will help implement it if funds are appropriated. *www.leginfo.ca.gov*

At the federal level, President Bush signed the **Salt Cedar and Russian Olive Control Demonstration Act** (Public Law 109-320), authorizing Congress to appropriate $80 million over five years for large-scale demonstration projects and research, as well as development of a long-term strategy for control. The Dept. of the Interior will be the lead agency for implementing the project when/if funding is appropriated. *thomas.loc.gov*

A specimen of **tropical soda apple** (*Solanum viarum*), one of the worst weeds in the Southeastern US, was brought to the Los Angeles County Arboretum earlier this month. Native to Brazil and Argentina, soda apple infests pastures and wooded areas in the US. In a dramatic turn of events, the man who brought the specimen to the arboretum refused to disclose the location of his find, although he assures us that the plant has been killed. Luckily, California lacks the hot, humid and wet climate in which the soda apple thrives. As with any potential newly introducted weed, report sightings to CDFA and your county agricultural commissioner.

Exhibiting behavior akin to college students on spring break, the federally listed **arroyo toad** (*Bufo microscaphus californicus*) spends much of the breeding season vocalizing on sandy beaches. Unlike their human counterparts, the arroyo toads living in the Angeles National Forest are losing high quality breeding habitat to **yellow sweetclover** (*Melilotus alba*). To combat the problem, the Los Angeles River Ranger District has proposed removing *Melilotus* and other invasive plant species from area beaches. If you have experience removing *Melilotus,* the district welcomes your input. Contact Leslie Welch, District Wildlife Biologist, lrwelch@fs.fed.us.

In other wildlife news, the California Dept. of Fish and Game wants to control **invasive northern pike** in Lake Davis by drawing the 70,000-acre-foot reservoir down to a 15,000-acre-foot pool. This follows a similar control program several years ago. The project, set for next fall, includes treatment with liquid rotenone in the lake, tributary streams, ponds and springs within the watershed. Four public hearings on the proposal are scheduled. *www.bakersfield.com/119/story/71361.html*

Correction: The link for Japanese dodder information at CDFA should have been listed as *www.cdfa.ca.gov/phpps/ipc/noxweed-info/noxweedinfo_jdodder.htm* in the last issue.

Buffelgrass: A threat to Southern California deserts

By Gina Darin, California Department of Food & Agriculture, Integrated Pest Control Branch and University of California-Davis, Weed Science

In May, I represented the California Dept. of Food and Agriculture at the 2006 Biennial Weeds Across Borders (WAB) Conference in Hermosillo, Sonora, Mexico, with officials from Mexico, Canada, and the USA. Participants heard presentations on Saharan mustard, tamarisk, Russian olive, camelthorn, and national and state weed programs to combat them, but of all the noxious weeds in North America, no weed commanded attention like buffelgrass (*Pennisetum ciliare)*.

Photo courtesy Arizona-Sonora Desert Museum

Pennisetum ciliare

Common name: buffelgrass, anjangrass, African foxtail grass

Scientific name: *Pennisetum ciliare* (synonym: *Cenchrus ciliaris*)

Native range: East Africa, Arabian Peninsula, Madagascar, Pakistan, and northern India

Introduced to: Australia, West Indies, South America, Mexico, and USA

Distribution in California: Orange, Riverside, and Imperial Counties

Preferred habitat: agricultural areas, desert, disturbed areas, range/grasslands, riparian zones, scrub/shrublands, roadsides and vacant lots in urban areas

Pathways of spread: wind, animal fur, roadsides, used as forage

Worst weedy characteristics: spreads fire, displaces native species

Listed: Arizona Noxious Weed List, 2005

Following the WAB conference, and being intrigued by the focus on buffelgrass, I engaged in many informative discussions regarding the suspect plant. Californians don't seem to know much about it, or do know about it and don't mind that it's here. I believe Californians are at a crossroad as an invader lurks nearby.

Buffelgrass – What, Where, and How

There is an invasion afoot. Buffelgrass is a non-native grass widely planted in arid regions of the world for cattle forage and was introduced to the United States and Mexico to improve pastures. It is established in many parts of the southwestern USA, and the plant's range is expanding northward, possibly into California. The first records for it from the 1980s in Orange and Riverside counties were published in 1996.

Buffelgrass modifies the ecosystems it invades. In Sonora and Arizona, buffelgrass carries wildfire through habitats not naturally fire-adapted. In Texas, Hawai'i and Australia it is displacing native species. California's proximity to the problem areas in Arizona and Mexico and the value of our treasured desert habitat put California arid lands at a high risk to buffelgrass invasion.

Biology and Ecology

Buffelgrass is a ragged-looking perennial bunchgrass with erect culms on average 1.5 feet tall and bunches 3 feet wide. It can form thick mats or tussocks with dense, usually stoloniferous root systems. The leaf blades are bluish-green in color with soft hairs on the upper surface. The inflorescence is generally cylindrical in outline and can be purple, gray, brown or straw-colored. The spikelets are surrounded by bristles. According to Todd Esque, ecologist for the US Geological Survey (USGS), the most distinctive feature of buffelgrass for identification is its color when it is green and when it cures. It's most evident in big patches.

Buffelgrass is adaptable. It grows well in heavy limestone and sand soils, can withstand low pH, and is drought tolerant. It can withstand heavy grazing, and its root system is extremely fire resistant. Buffelgrass produces seed both sexually and asexually. It can also reproduce vegetatively, via rhizome or stolon sprouts.

The seeds can spread with wind and by sticking to animal fur, but mainly humans disperse seeds. George Koch, professor at Northern Arizona University, Flagstaff, recently returned from a buffelgrass research trip to Hermosillo where he "saw many *campesinos* collecting seeds from the vigorous stands of buffel that develop along roadsides. Apparently they sell the seed to ranchers." Also, Todd Esque described many situations where buffelgrass spreads along roadsides.

Buffelgrass does have some redeeming qualities and is not invasive everywhere. It's reported to increase productivity of livestock and could stabilize tailings at mines. Buffelgrass is an important pasture grass in Texas and many parts of the tropics, mainly

because of its low cost to establish, high yields and high level of nutrients, tolerance to drought conditions and crop pests, and its ability to withstand heavy grazing and trampling by livestock. It is often touted for its ability to increase the flow of milk in cattle and give a sleek and glossy appearance to their coats. Buffelgrass has also been used as a folk remedy for kidney pain, tumors, sores and wounds.

Native Range and Exotic Distribution

Buffelgrass is native to East Africa, Arabia, Canary Islands, Madagascar, Indonesia, northern India, and Pakistan. Buffelgrass has been introduced into many tropical and subtropical areas, where it can be found from sea level to 2000 meters. It usually requires summer moisture and is not naturally cold-tolerant. It is believed that buffelgrass was first introduced to Australia via the harnesses of Afgan camels, and is also found in South America and the West Indies.

The U.S. Department of Agriculture (USDA) first brought the plant to the US in 1948 as a forage species. It has been detected in California, Arizona, New Mexico, Texas, Louisiana, Mississippi, Florida, Missouri, New York, Hawai'i (the islands of O'ahu, Maui, and Hawai'i), Puerto Rico and the US Virgin Islands. It is also a valued pasture grass in Texas and has been until recently a minor pasture crop in California's Imperial County.

Buffelgrass was introduced to Sonora in 1958. The Mexican government has promoted buffelgrass as forage, and its cultivation often involves bulldozing the native vegetation before seeding. This practice severely degrades the native plant communities. Tom van Devender of the Arizona-Sonora Desert Museum estimates it covers more than one million hectares in the state of Sonora, Mexico.

Buffelgrass is increasing rapidly in the borderlands between the United States and Mexico. Yuma County, Arizona, is taking buffelgrass infestation very seriously because the extra fuel load creates a fire hazard. Todd Esque finds that once buffelgrass leaves the roadside, it moves up on south-facing slopes in rocky terrain. He has seen the grass ascending hillsides in southern Arizona and Mexico. Buffelgrass thrives particularly well in converted grasslands in the plains of Sonora, but also advances into intact desert, and has the potential to become a serious wildland weed in California.

Buffelgrass spreads rapidly along roadsides in the Southwest. *Photo courtesy Arizona-Sonora Desert Museum.*

Widespread use of buffelgrass for pasture increases opportunities to spread from cultivation. Cultivars have been developed with increased growth rates, ranges of tolerance to different environmental conditions, and disease resistance. The USDA-ARS is even breeding a cold-tolerant strain, 'Frio.' If these cultivars are successful and escape, which seems inevitable, then buffelgrass could spread much farther north.

Worst Weedy Characteristics

Buffelgrass displaces native species. According to research presented at WAB, buffelgrass removal resulted in increases in nitrate, ammonia and net nitrogen mineralization rates in both converted grassland and intact desert. The mechanism driving the decline of native herbaceous species in the presence of buffelgrass appears to be competition for limiting resources, slowing nutrient cycling and occupation of space. Therefore, buffelgrass threatens native diversity by competitively acquiring nutrients, increasing its own biomass and leaving fewer nutrients for native plant growth. For example, buffelgrass is replacing native herbs and shrubs in the xerophytic scrub of the Chihuahuan Desert. Also, in Hawai'i, buffelgrass was planted for erosion control but is now replacing native pili grass, *Heteropogon contortus*.

Buffelgrass carries fire. Mexican ranchers are planting buffelgrass as a forage species, but it, along with other exotic perennial grasses such as red brome (*Bromus rubens*) and fountain grass (*Pennisetum setaceum*), has the dramatic ability to carry fires in non-fire-adapted communities, destroying palo verde and saguaro habitats. By introducing fire on a landscape scale in habitats long considered fireproof, buffelgrass not only threatens human life and property, but also compromises the value of the surrounding deserts for biological conservation, ecological research, and ecotourism. Tom van Devender explains that by changing the fire regime in this way, buffelgrass can transform Sonoran Desert cactus woodlands into grasslands within several years after its introduction. Many native species, such as saguaro, are not fire-adapted and their numbers are greatly reduced by the more frequent and more severe fires associated with the unnatural accumulation of fuel left aboveground by dried buffelgrass.

Response to the Invasion

Although initially thought to be an important practice to boost rangeland productivity, buffelgrass planting is now controversial. Some ranchers are starting to experience the ecosystem impacts of buffelgrass on the land. One WAB presentation stated that the practice of removing native desert vegetation before seeding with buffelgrass leads to a loss in net primary production from land conversion. George Koch works with one Mexican rancher near Hermosillo who planted buffelgrass on his ranch for cattle and also manages his ranch for high value game species (deer and big horn sheep). The rancher is concerned that buffelgrass may displace the native vegetation that these native game species prefer. Alejandro Castellanos of the University of Sonora, Hermosillo, underscored this point. He

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2006 Symposium: Sonoma County

Panelists for the research and management forum were (from right) Catherine Parks (USFS), Erika Zavaleta (UC Santa Cruz), Pete Holloran (UC Santa Cruz), Jodie Holt (UC Riverside), Joe DiTomaso (UC Davis), John Randall (The Nature Conservany, partially hidden), Carla Bossard (St. Mary's College of California), Jaymee Martee (The Nature Conservancy), Mike Kelly (Los Penasquitos Canyon Preserve), and Christy Brigham (National Park Service). Dan Gluesenkamp of Audubon Canyon Ranch moderated.

Top right: Director Ruth Coleman of California State Parks gave a rousing keynote address.

Joanna Clines (USFS), Dave Bakke (USFS), and Joel Trumbo (CDFG) leada Discussion Group on the use of herbicides in restoration work.

...and the Field Course

A field course on"Tools for Early Detection" was attended by 80 people the day before the Symposium. At top, an exercise to measure patch density; at bottom, GPS tools used for early detection.

Awards

Top left: Cal-IPC Executive Director Doug Johnson presents the 2006 Policy Award to Assemblyman Dave Cogdill (R-Modesto), as well as his Legislative Director Erin Cogdill and Andrea Fox of the California Farm Bureau Federation (not pictured) for their work renewing funding to the state's Weed Management Area program. **Top right:** Sharon Farrell (left) of the Golden Gate National Parks Conservancy and Maria Alvarez of the Golden Gate National Recreation Area were honored with Catalyst Awards for their exceptional contributions over the last 15 years to some of the state's most highly regarded programs in invasive plant control and outreach. Sharon and Maria helped fete Cal-IPC founder Greg Archbald, winner of the Jake Sig Award for Vision and Service. John Watson of the Cache Creek Conservancy was the recipient of this year's Golden Weed Wrench Award for Land Manager of the Year. **Bottom right:** Bobbi Simpson (left) presented Stassia Samuels of Redwood National and State Parks with the Weedzilla Award for National Park Service Land Manager of the Year.

Above, top: Cal-IPC Board member Marla Knight with a luxury birdhouse, one of the raffle prizes. **Above:** Doug Gibson, San Elijo Lagoon Conservancy and Cal-IPC board member-elect, and Cindy Burrascano, San Diego Chapter of CNPS. **Left:** Marc Lea knows what he wants in the raffle. **Below:** Learning about brooms and restoration at Lake Lagunitas on the field trip to the Marin Municipal Water District.

2006 Photo Contest

This year's categories were condensed into Weed Workers and Weeds. Winners received framed 8"x10" photos of their winning entry and a stylish Cal-IPC t-shirt.

Weed Workers, 1st Place: **Cape Ivy Re-Moo-Val along Hwy 1.** *Bruce Delgado*

Weeds, 1st Place: **"Fennel glacier" on Santa Cruz Island.** *Peter Schuyler.*

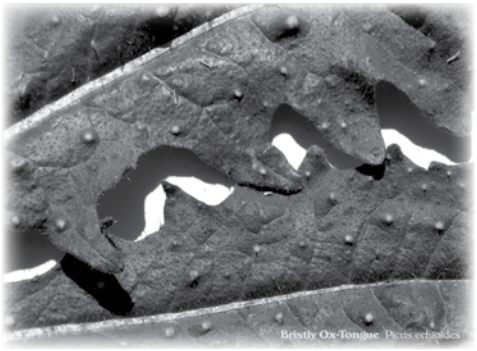
Weed Workers, 2nd Place: **10-year-old lost in fennel.** *Peter Schuyler.*

Weeds, 2nd Place: **Jeep lost in fennel.** *Peter Schuyler.*

Weeds, 3rd Place: **Arundo pushing through a car seat on the Santa Clara River.** *Anna Huber.*

Weed Workers, 3rd Place: **Rolling back the cape ivy carpet, Golden Gate Nat'l Recreation Area.** *Libby VanWyhe, submitted by Tanya Baxter*

Weeds, Honorable Mention: **Bristly Ox-Tongue.** *Doug Burgess.*



Annual meeting in Woodland

Weed Management Areas (WMAs) bring together local landowners and managers (private and public) to combat locally problematic invasive weeds. WMAs are organized according to county, multi-county, or other notable geographical area, and together cover every inch of California. This September, the Heidrick Agricultural History Center in Woodland hosted the 8th annual statewide WMA meeting. The meeting featured panel discussions on permitting and on maximizing WMA success; a presentation on promoting weed awareness modeled on Montana's successful program; a debut of new treatment and control techniques; and regional breakout-sessions to establish local weed-control priorities.

But the section of the meeting that inspired a wave of better posture and frantic note taking covered a familiar subject: funding! In June, the California state budget passed with $1.5 million in general funds for the California Dept. of Food and Agriculture to support the WMA program. CDFA is charged with distributing the money to the WMAs, and Steve Schoenig of CDFA outlined the request for proposals that will determine the allocation of funds. Rather than distribute the money evenly to all WMAs regardless of size, funds will be allocated according to specific project needs. Even though most attendees were deep in thought on the topic of proposals, most were able to relax for a few hours Thursday night during a barbecue at the Yolo Land and Cattle Company.

Outreach Associate Melissa Dozier displays the new Cal-IPC exhibit at the State WMA meeting. *Photo: Bob Case.*

Thanks for supporting renewed WMA funding

Funding for the WMA program was renewed in large part because so many organizations sent letters of support. In our summer issue we acknowledged over 100 organizations that provided letters, but we inadvertantly missed some organizations. A big thanks for their invaluable support of this important program.

Statewide Organizations:

- California Association of Pest Control Advisers
- California Council of Land Trusts

Regional and Local Organizations:

- CA Native Plant Society, El Dorado Chapter
- Contra Costa Resource Conservation District
- Fresno County Board of Supervisors
- Glenn County Board of Supervisors
- Honey Lake Valley Resource Conservation District
- Kern County Board of Supervisors
- Kern County Department of Agriculture & Measurement
- Lake County Weed Management Area Partnership
- Mariposa County Board of Supervisors
- Merced County Board of Supervisors
- Napa County Board of Supervisors
- San Diego County Department of Agriculture, Weights & Measures
- San Joaquin County Board of Supervisors
- San Luis Obispo Department of Agriculture and Measurement
- Santa Barbara County Agricultural Commissioner's Office
- Shasta County Department of Agriculture/ Weights & Measures
- Shasta County WMA
- Sierra-Cascade Land Trust Council
- Solano County Weed Management Area
- Tulare County Board of Supervisors

Buffelgrass continued from page 5...

says, "There is apparently no replacement for buffel in the near future. Ranchers are probably decreasing hectareage by themselves as they realize that buffel may be displacing other species that may be more profitable for wildlife as they change from cattle ranching to hunting grounds on their ranches."

Tucson, Arizona, has an extensive buffelgrass problem. Buffelgrass fires in urban and suburban Tucson are growing more frequent, suggesting that immediate action is required before buffelgrass fires become the dominant driver in local ecosystems. In the past decade, buffelgrass has expanded rapidly across southern Arizona, especially along roadways, and in 2005, Arizona listed buffelgrass as a prohibited noxious weed.

Taking a census of buffelgrass near Magdalena, Sonora. Most of the herbaceous plants have disappeared. *Photo courtesy Arizona-Sonora Desert Museum.*

Kika de la Garza of the USDA-NRCS Plant Materials Center in Texas is evaluating native grasses to replace buffelgrass on rangelands and wildlife areas. So far, studies show that only shortspike windmillgrass (*Chloris subdolichostachya*) establishes in a buffelgrass plot. The NRCS and the USGS are seeking research on buffelgrass impacts to native ecosystems and control methods. Alejandro Castellanos explains, "Some alternative native grasses have been studied under experimental conditions at CIPES (Centro de Investigaciones Pecuarias del Estado de Sonora), a research branch sponsored by the Sonora state government and the state cattle growers association in Sonora, but no real promotion has been made for them since they are apparently no match for buffel's high biomass productivity."

Eradication and Control Efforts

The key to the successful control of buffelgrass is preventing new infestations or beginning control efforts while the infestation is still small and manageable. Todd Esque described an experience when he was driving to Hoover Dam and saw buffelgrass on the roadside. He stopped and collected samples for the herbaria and later went back to remove it. "We don't want it to get down to Lake Mead," Esque affirmed. Buffelgrass has a high degree of reproductive vigor, wide adaptability, and few pests and predators. It is difficult to manage once firmly established. Esque believes windblown seeds are the biggest obstacle to effective control. Seeds also travel on vehicles. He recommends prioritizing small, outlying populations of buffelgrass for eradication. Eradication is possible if the infestation is caught early, but it takes a much more extensive community effort once the population moves away from roadsides. Then it's no longer just a Department of Transportation problem, but a regional problem. The best control of buffelgrass will likely occur with the use of an integrated management approach. Manual and mechanical methods, followed by another control treatment (such as an herbicide spray to control for new seedlings) for several years, must be followed by active restoration efforts to obtain desired results.

Manual: The long, dense root mass makes manual removal difficult. All pieces of the root must be removed or resprouting may occur. The Sonoran Weed Whackers have much experience in this area. The Southern Chapter of the Arizona Native Plant Society coordinates the weed whackers program, through which over 500 volunteers have cleared an estimated 8,000 acres of buffelgrass and fountain grass infestations in the Tucson Mountains.

Mechanical/Cultural: Buffelgrass withstands cutting and grazing. Cutting or grazing the grass 5-10 cm from the ground actually increases plant growth.

Biological: It has no serious pest problems except a fungal blight caused by *Magnaporthe grisea*.

Chemical: Cost-benefit trials by Todd Esque showed that the most effective treatment is Roundup application. Todd recommends: "Just spraying gives the same results as all the other techniques, but it is much cheaper unless you have an army of volunteers."

Where do we stand?

In conclusion, buffelgrass is a threat to California due to proximity to Arizonan and Mexican infestations and the value of the desert ecosystems at risk. Since buffelgrass is opportunistic, Todd Esque warns that it seems like Tucson's problem could occur in any municipality in southern California. Buffelgrass likes summer monsoon rains, which the California portion of the Sonoran Desert has less of than Tuscon, giving us a slight advantage. Any vacant lot with excess runoff throughout the year would make good habitat for buffelgrass. There are herbarium records for buffelgrass in California. It is also present in Yuma County, Arizona, along Interstate-8 at the doorstep of California. Judging by what buffelgrass is capable of in our neighboring states, and due to the severe fire hazard that buffelgrass presents, it seems wise to remove plants from California. After removing buffelgrass, consider planting native species or non-invasive alternatives in the area so new buffelgrass seedlings will be less likely to establish.

Information Sources

Arizona Dept. of Agriculture, List of Prohibited, Regulated, and Restricted Noxious Weeds: *www.azda.gov/PSD/quarantine5.htm*

Arizona Native Plant Society, Sonoran Desert Weedwackers: *aznps.org/html/exotics_weedwackers.html*

Buffelgrass in Australia: *www.ento.csiro.au/weeds/buffelgrass*

Buffelgrass in Arizona and Sonora: *www.desertmuseum.org/invaders/invaders_buffelgrass.htm*

USGS study on buffelgrass and fire: *www.werc.usgs.gov/invasivespecies/sonorangrassfire.html*

The Nature Conservany Weed Alert: *tncweeds.ucdavis.edu/alert/alrtcenc.html*

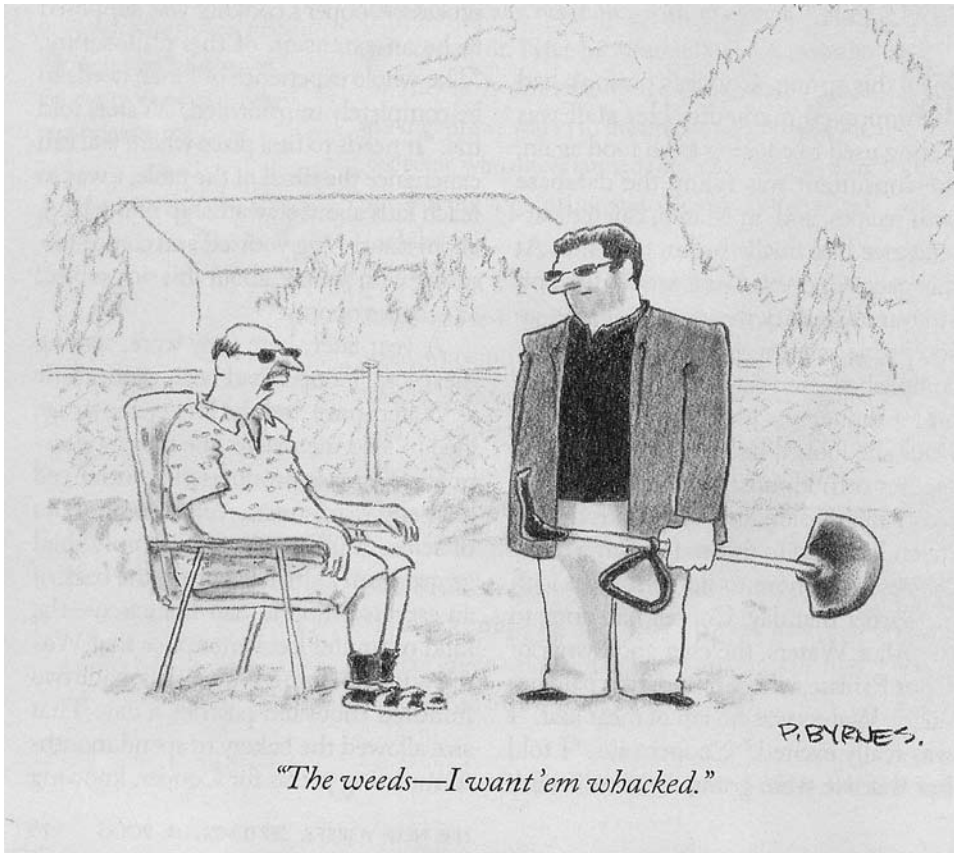
Mandy Tu, The Nature Conservany Stewardship Abstract: *tncweeds.ucdavis.edu/esadocs/documnts/cenccil.html*

USDA-NRCS Plant Materials Program: *PlantMaterials.nrcs.usda.gov*

Weeds Across Borders 2006 Proceedings (in press): *www.desertmuseum.org/borderweeds*

Tutorial for Identification and Removal of Buffelgrass: *wwwpaztcn.wr.usgs.gov/buffelgrass/buffelgrass.wmv.*

Contact the author at gdarin@cdfa.ca.gov. *The author thanks Todd Esque, U.S. Geological Survey, Henderson, NV (todd_esque@usgs.gov); George Koch, Northern Arizona University, Flagstaff; Alejandro Castellanos, University of Sonora, Hermosillo; Jim Weigand, Bureau of Land Management, Sacramento; and Tom Van Devender, Arizona-Sonora Desert Museum, for providing information for this article.*



Cartoon from *The New Yorker*, September 4, 2006.

Invasive Ornamental Plant Guide Wins Award

Carolyn Martus, San Diego Chapter of the California Native Plant Society

The San Diego County Invasive Ornamental Plant Guide published by the San Diego Chapters of the American Society of Landscape Architects (ASLA) and California Native Plant Society (CNPS) was awarded "Outstanding Environmental Resource Document" at the Association of Environmental Planners annual awards banquet on September 21, 2006.

The guide was produced and distributed by ASLA-SD and CNPS-SD for the primary purpose of educating landscape professionals and the general public regarding the cultivation, selection, use, and management of non-native and/or invasive flora in San Diego regional landscapes. The guide is of special importance in "urban interface" areas where natural vegetation and man-made landscapes come into close contact. The guide provides a list of plants in two categories: most invasive and moderately invasive. The complete guide is available online at *www.asla-sandiego.org/content/plantguide.html.*

Pictured accepting the award at right are Carolyn Martus (President, San Diego Chapter of CNPS), Scott Sandel (member of both ASLA-SD and CNPS-SD) and Melanie Johnson-Rocks (volunteer, CNPS-SD).

Seed production in *Arundo donax?*

Maile Johnson[1], Tom Dudley[1] and Casey Burns[2]. [1]Marine Science Institute, University of California, Santa Barbara, CA 93106-6150; [2]USDA

The invasion of California riparian areas by *Arundo donax* (arundo, or giant reed) continues despite efforts to control its spread, and there remains some uncertainty as to how it is able to do so. Arundo can establish monocultural stands from fragmented rhizomes distributed by flooding with many well-known impacts to ecosystems and biodiversity (Else 1996, Decruyeneare & Holt 2005), but the question of whether seed production plays any role in this invasion is frequently cited, yet not adequately answered. No viable seed production has been observed and no seedling has ever been reported here (Bell 1997, Dudley 2000, Boose and Holt 1998, Else 1996, Spencer 2005), but no study has definitively confirmed this statement nor addressed the issue of sexual reproduction in arundo. For this reason, we conducted a study of reproductive structures from arundo found in California and other infested regions, to determine whether seed production and viability could be documented.

Arundo donax along the Santa Clara River. *Photo: Tom Dudley*

Arundo produces flowering cymes (plumes) toward the end of the growing season, from approximately mid-autumn through late winter. Their presence and abundance vary widely among regions and stands, and the specific environmental or biological cue to promote flower growth has yet to be identified, but there does seem to be a general pattern in North America of increased flowering as one moves from north to south. The plume is typically borne on mature stalks, its size ranging from about 20 to 45 cm or more in length. Plumes contain many hundreds of spikelets, each containing two to six florets. In each floret and enclosed within the lemma and palea we observed all the essential reproductive structures: one ovule, two stigmata and three anthers, all distinct characteristics of the Poaceae family.

Approach and Findings

To provide comprehensive coverage across the region, we requested that co-operators collect plumes at the appropriate time in their areas. Co-operators provided a total of 244 plumes from late September to early February, from 31 collection sites representing California, Nevada, Colorado, New Mexico, Texas, Nuevo Leon (northern Mexico), Georgia and Washington D.C.; 22 of these were from northern and southern California. At some sites plumes were collected periodically throughout the flowering season to increase the chance of finding seed in a mature state, while other sites yielded only one collection date. Immature flowers were still suitable for identifying developing ovules.

From each plume approximately 200 florets were scanned under a dissecting microscope to establish presence of any developing structures. We gently peeled back the lemma and the palea with forceps to expose the ovule, and if there was any evidence of seed or ovule development the samples were placed into a Petri dish and stored at 4°C. The criteria we used to distinguish an inactive ovule from a developing one were the following: if it showed an obvious increase in size, if it looked swollen, if it appeared to have a hard, or hardening, seed coat, or if an embryo was visible. We observed a total of roughly 36,666 florets, from which 43 ovules were suspected as possibly being developing ovules. These originated from only three sites within the Los Angeles River watershed (Los Angeles River near Griffith Park, and nearby from the San Gabriel River), collected between 17 November and 18 December, 2005.

Laboratory Testing

The putative developing ovules were tested with tetrazolium to determine whether actively metabolizing embryo tissue was present. The tetrazolium test (TZ test) is a standardized procedure for evaluating seed viability for a wide range of plant types, including grasses. The TZ test detects live tissue by staining a red/pink color on contact with hydrogen derived from enzymatic activity associated with embryo respiration (Garay 2002). Ovules were exposed to a 0.5% tetrazolium salt solution for 24 hours, and evidence of staining was monitored at one hour, five, 12 and 24 hour intervals (Peters 2000).

Five ovules displayed distinctive staining patterns suggesting the presence of dehydrogenase activity. These may have been viable embryos with the potential to develop into seed, although no true seed

was ever found. Generally, the TZ test is used on mature seeds to determine percent viability of the samples, but given the extremely limited ovule sample size we only report absolute numbers. Remaining chaff that potentially held additional developing 'seed' was placed onto moist sand in nursery flats (covered with clear plastic to retain moisture) to test whether any germination would occur, but no germination was observed.

Conclusion and Interpretation

If the TZ staining correctly indicated developing tissue, a total of five developing ovules were derived from a single general location. In the previous year there was suggestion of possible seed production from a single location in Ventura County (D. Kanthack and D. Dyer, pers. comm.), although that site showed no evidence of viable reproductive tissue during this study. This may indicate that the environmental conditions necessary to stimulate reproduction, if reproduction is occurring at all, may be highly specific and not frequently encountered. The 2005 season was unusually wet in California, which may have reduced the tendency to produce flowering structures by arundo because there is anecdotal evidence that low soil moisture plays a role in stimulating flower production.

This study indicates that arundo may be capable of producing seed, albeit in very low numbers and the results cannot be considered definitive. Whether hypothetical 'seeds' could germinate and survive in a natural habitat also remains an open question, but this and other ecological questions can only be addressed if viable seed production can be documented in the future. Therefore, targeted studies will continue in 2006 to better establish whether fertilization and seed development are possible. Of equal interest will be to identify the physiological mechanisms that cause plants to be sterile in most, if not all, cases (we did not have sufficient material to evaluate whether fertilization preceded ovule production). Pollen production appeared to be low, so it is possible that male sterility is a factor limiting fertilization.

The extreme rarity of ovule development in *Arundo donax* can be interpreted to mean it is unlikely to be of ecological significance. Other invasive plants are known to maintain and expand populations based largely on asexual reproductive tactics, such as water hyacinth and other aquatic species which form daughter plants that disperse and form large masses, but these generally produce seed as well. The capacity for multiple reproductive tactics is a common trait for successful invaders (Reichard and Hamilton 1997), so it is unusual for a weed as successful as arundo to effectively have no sexual reproduction.

The essential lack of sexual reproduction also means that genetic diversity, or variation available for natural selection of invasive traits, should be low, as Khudamrongsawa et al. (2004) verified in arundo at the Santa Ana River. Apomixis (diploid seed produced without fertilization) is a means of asexual reproduction that allows rapid production of propagules by some invasive plants (e.g. dandelions), but the lack of genetic variability may limit invasive potential, as indicated by the greater success of out-crossing *Cortaderia selloana* compared with asexual *Cortaderia jubata* (Lambrinos 2001).

Thus, arundo remains one of the few cases in which a serious invader may not depend on sexual reproduction nor seed production at all. Its continuing invasion relies on exceptionally robust rhizomes for population re-distribution and expansion. Despite the fact that no seedlings have yet been found in the field, there is now a slight suggestion that new populations could be established from seed dispersal. The case for seed production may not be fully closed, but the remarkable success of this plant certainly depends on other factors (e.g. nutrient augmentation, altered hydrology, lack of natural controls) that warrant further investigation.

Acknowledgements

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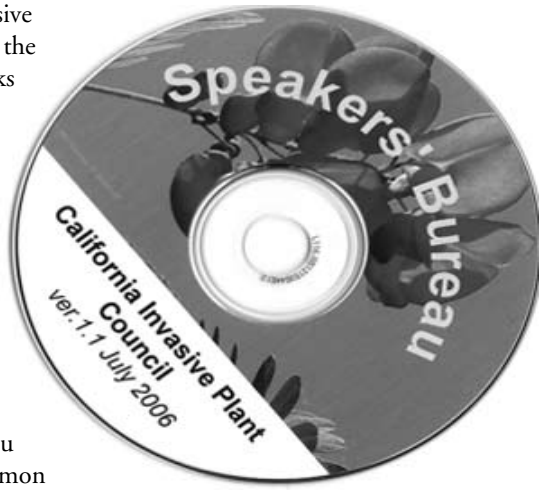
Raising local awareness with the Cal-IPC Speakers' Bureau

Melissa Dozier, Cal-IPC Outreach Associate

I may be biased – after all, I am the outreach associate - but I believe that combating invasive wildland weeds requires increased public awareness about the issue. To spread the word at the local level, Cal-IPC developed the Speakers' Bureau, a network of people ready to give talks on weeds to local organizations. Speakers are equipped with two complete PowerPoint presentations, targeted to general and gardening audiences (just imagine--reaching your local garden club!).



The Speakers' Bureau provides a network of Cal-IPC speakers for local groups, while providing speakers with ready-to-go materials and information to make it easy. Here's how it works. The Speaker's Bureau divides California into nine sections, each with a regional coordinator. When Cal-IPC receives a request for a talk, the regional coordinator in that area finds an available speaker from the network. We're always looking for more speakers, and we still need regional coordinators in Southern California. Don't be shy--remember that Cal-IPC will send you written outlines for each PowerPoint presentation, as well as answers to frequently asked questions and fact sheets to prepare you for common questions. That way you don't need to worry about being blindsided by common conundrums such as: "Doesn't the introduction of invasive plants increase biodiversity (and isn't that a good thing)?" Even though Cal-IPC provides the presentations and outlines, speakers are free to alter them to fit their own personal style and strengths.

With the Speakers' Bureau, you can reach:

- Watershed/restoration/trail work volunteers
- Garden clubs
- Book clubs, neighborhood groups, homeowners' associations
- Environmental education centers - staff and students
- Outdoor Clubs: hiking, kayaking, fishing, ATV, etc.
- Birding clubs
- High school or college environmental clubs

Make contact...

The sidebar (at left) lists just a few examples of Speakers' Bureau audiences. Many groups are interested in invasives--one of our Bay Area speakers recently gave a talk to a woodworker's club! If you know a group in your area that might be interested in a talk, or if you'd like to join the Speakers' Bureau, contact Melissa at 510-843-3902 or mdozier@cal-ipc.org. The CD above could be yours!

New and Contributing Members

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

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Wildlife and Invasive Plants:
Finding Common Ground to Protect Ecological Diversity

January 30-31, 2007
Portola Plaza Hotel, Monterey, CA
A joint symposium by Cal-IPC and the Western Section of The Wildlife Society (TWS)

Registration and other information at www.tws-west.org on the Annual Conference page, or contact Elizabeth Brusati, edbrusati@cal-ipc.org, 510-843-3902.

Bringing together weed workers and wildlife biologists to discuss interactions between invasive plants and wildlife, this symposium will be held in conjunction with the TWS-Western Section's annual meeting. Invited speakers, contributed papers, and posters.

Speakers include:

- **Clare Aslan, UC Davis** - Bird spread of invasive trees in California
- **Dave Bakke, US Forest Service, Vallejo** – USDA Forest Service pesticide risk assessments: Methods, utility and limitations
- **Cameron Barrows UC Riverside, Center for Natural Lands Management** - Population, community, and ecosystem consequences of an invasive plant in a desert sand dune landscape
- **Shawna Bautista, US Forest Service, Oregon** - Summary of herbicide effects on wildlife
- **Christy Brigham, Santa Monica Mountains National Recreation Area and Cal-IPC Board of Directors** – Considerations for wildlife biologists when working in areas with invasive plants to prevent spreading weeds
- **Sarah Chaney, Channel Islands National Park** - Role of endemic island scrub jay in dispersal and establishment of invasive Italian stone pine and Russian olive
- **Todd Esque, US Geological Survey, Las Vegas** – Impacts of invasive grasses on desert tortoise
- **Erik Grijalva, San Francisco Estuary Invasive Spartina Project** – San Francisco Estuary *Spartina* control within California clapper rail habitat
- **Rob Klinger, The Nature Conservancy, USGS, UC Davis** – Impacts, effects, and food webs: the importance of distinguishing conservation and ecological perspectives in animal-invasive plant interactions
- **J. Cully Nordby, UC Los Angeles** – Impact of *Spartina alterniflora* invasion on resident bird species in San Francisco Bay tidal salt marshes
- **Peter Schuyler** – Controlling invasive plants and animals: Observations and lessons from island restoration projects
- **Rick Sweitzer, University of North Dakota** – Dispersal of invasive plants by bison and feral pigs
- **Joel Trumbo, California Department of Fish & Game** - Potential wildlife impacts of herbicides used in restoration: Background and current status

A poster session on the evening of January 30 will present current research on interactions among wildlife and invasive plants in California, while a panel discussion on the morning of January 31 will allow speakers and the audience to exchange information and ideas on balancing the plant and wildlife perspectives.

Photos: Santa Catalina island fox by Joe DiTomaso, yellow starthistle by Bob Case, nest in artichoke thistle by Janet Garcia.

Readings & Resources

WMA Summary Report. The California Department of Agriculture has released the **Noxious Weed Management Area Support Program report,** detailing the highlights of the Weed Management Area projects funded in 2000-04. Download the report at *www.cdfa.ca.gov/phpps/ipc/.*

Book. *Math in the Garden*, by the UC Berkeley Botanic Garden and Lawrence Hall of Science includes **garden-related class exercises** suitable for grades K-8. $29.95 (on sale for $19.95 as of 11/1/06). View sample pages at *botanicalgarden.berkeley.edu.*

Aquatic Nuisance Species Identification Cards. California Sea Grant produces 3"x 4" cards featuring photos of **hydrilla, giant salvinia, parrotfeather, and zebra mussels** on water-repellent stock with a grommet for attaching to a key chain. $3.50/set for agencies, $4.50 for the general public, 10% discount on multiple orders. *Call 858-534-4446 or go to www-csgc.ucsd.edu/PUBLICATIONS/ANScards.html*

New Book. ***Invasive Species of the Pacific Northwest***, edited by P. D. Boersma, S. H. Reichard, and A. N. VanBuren, features accounts of a wide variety of organisms that are invasive in the Pacific Northwestern States. Includes freshwater, marine, and terrestrial plants; invertebrates; vertebrates; and diseases. Each species account contains maps, photos, and an overview of impacts. Published by University of Washington Press, 285 pp., $29.95.

Hotline. The USFWS and USGS sponsor an **Aquatic Nuisance Species hotline**, 1-877-STOP-ANS (1-877-786-7267), where the public can report sightings of aquatic nuisance species or request information on solutions. *www.anstaskforce.gov*

More Aquatic Species Materials. Sea Grant also has a **free bilingual (English/Spanish) poster** designed to educate boaters, fishers, and others about reducing the spread of aquatic nuisance species, especially fouling organisms on boats. *Contact Jamie Gonzalez, 858-694-3414 or jagonzalez@ucdavis.edu.*

Downloadable PSA. The Nature Conservancy's Invasive Species Initiative is at it again, producing a **Public Service Announcement on rush skeletonweed** (*Chondrilla juncea*) **to** follow the previous cinematic success of "KNOTWEED!" and "Gill Man". All three videos may be viewed at *http://tncweeds.ucdavis.edu.*

Knotweed Resources. TNC also recently added several **resources on knotweed** (*Polygonum cuspidatum*), including information on field practices and a brochure produced in Oregon. *http://tncweeds.ucdavis.edu*

Database. The Global Invasive Species Database has a **new interface with improved content and functions**. The database covers all taxonomic groups from micro-organisms to animals and plants in ecosystems across the world. New entries include iceplant (*Carpobrotus edulis*) and castor bean (*Ricinis communis*). *www.issg.org/database.*

TOOL REVIEW: Starhill JAWZ

A California firm, Star Hill JAWZ, has developed a hydraulic tool to uproot large woody plants. The tool mounts onto a skid steer loader, tractor, or mini-excavator, and can be used to grab onto a woody stem at ground level, lift the plant out of the ground, shake off loose soil, and carry to the desired location. To date, the tool has been used chiefly in landscaping applications, but its designers believe it will prove equally useful for invasives removal projects. The units (regular and mini) use a universal quick attach mechanism for mounting. Full specifications and a DVD of the tool in action are available.

For more information, see www.StarhillJAWZ.com or call 415-285-2707.

Have you tried a new tool for weed work? Share the information by submitting a review to *Cal-IPC News*. Photos always encouraged.

Cal-IPC T-shirts for the spirited weed worker! "Stop the invasion of wildland weeds" on the back. We ran out of sage shirts, but there are lots of white and navy ones left over from the Symposium. Just give us a call. Help spread the word and look good doing it!

Publications Available from Cal-IPC

Order at www.cal-ipc.org or call (510) 843-3902.

CA tax and shipping costs will be added.

Weeds of California and Other Western States (two volumes)

Joseph DiTomaso and Evelyn Healy
UC Agriculture & Natural Resources, 2006
Identification guide to 750 weed species, with 3000 color photos. Detailed descriptions of morphology and biology. Includes a CD-ROM with all photos.
Available December 2006. Price TBA.

Aquatic and Riparian Weeds of the West

Joseph DiTomaso and Evelyn Healy
UC Agriculture & Natural Resources, 2003
Comprehensive identification guide to the West's riparian weeds. Photos, identification keys. 440 pp.
$40.00

Grass and Grass-like Weeds of California

Joseph M. DiTomaso. California Weeds, 2004
Menu-driven CD-ROM identification guide to more than 200 invasive grasses and native perennials used in restoration. Requires Windows 95 or higher, 650 MB free hard-drive space.
$32.00

Broadleaf Weeds of California

Joseph M. DiTomaso. California Weeds, 2006
Expert computer-based identification guide to 722 broadleaf weeds of California. Requires Windows 95 or higher. **$40.00**
BUY BOTH CD-ROMS FOR $60.00

Don't Plant a Pest! brochures

Wildland-safe alternatives to invasive plants sold at nurseries. 14 panels. Choose: San Francisco Bay Area, Southern California, Central Coast, Central Valley, Sierra Foothills, Tahoe Basin, or Trees in California. **$30.00**/100 brochures [up to 10 free]

Biological Pollution brochure

Describes ecological and economic impacts of invasive plants in California for a general audience. Tri-fold.
$12.00/100 brochures; **$110.00** /1000 brochures [up to 10 free]

Invasive Plants of California's Wildlands

Carla C. Bossard, John M. Randall and Marc C. Hoshovsky, Eds. University of California Press, 2000
Biology and control information on 70 of the state's worst wildand weeds. Maps, photos, illustrations. 360 pp. **$25.00**

The Weed Workers' Handbook

Cal-IPC and The Watershed Project, 2004
Biology and control information on 25 SF Bay Area wildland weeds, plus background on organizing local projects. Illustrations. 120 pp. **$9.20**

California Invasive Plant Inventory

Cal-IPC, 2006
Summarizes the impacts, potential for spread, and distribution of more than 200 non-native plants that invade wildlands in California. 39 pp. ***Currently out of print. Online pdf at www.cal-ipc.org.***

The Use of Fire as a Tool for Controlling Invasive Plants

Joseph M. DiTomaso and Douglas W. Johnson, Eds., 2006
Captures current state of knowledge on the use of fire to manage invasive plants in wildlands. 49 pp. **$5.00**

Yellow Starthistle Management Guide

Joseph M. DiTomaso, Guy B. Kyser, and Michael J. Pitcairn, 2006.
Comprehensive overview of treatment methods for yellow starthistle. Approx. 78 pp.
Available December 2006. Free to 2007 Cal-IPC members.

The WILDLAND WEED CALENDAR

2007 Cal-IPC Field Courses

We are finalizing the list of field courses for next year. The cost for each one-day course will be approximately $125 for Cal-IPC members. The complete schedule will be posted on the Cal-IPC website (*www.cal-ipc.org*). For more information on field courses, contact Melissa Dozier, mdozier@cal-ipc.org or 510-843-3902.

Tools & Techniques Courses:

March *Los Angeles/Santa Monica area*

April *Redding area*

May *South San Francisco Bay Area*

...plus, a new **Mapping Course** the day before the Symposium (Sept. 19) in San Diego.

3rd International Fire Ecology and Management Congress

November 13-17
San Diego, CA
http://emmps.wsu.edu/firecongress

Northern California Botanists

January 18-19, 2007
CSU Chico

Northern California Botanists is an organization with the purpose of increasing communication about botanical issues in Northern California among agency, consulting, and academic botanists.
csuchico.edu/biol/Herb/norcalbot/index.htm

Bay-Friendly Landscape Maintenance Training & Qualification program

January 23-February 27
Oakland, CA

Landscape professionals in Alameda County can learn sustainable practices and become certified as a "Bay Friendly Business." Class meets Tuesdays. *www.stopwaste.org*

Weed Science Society of America

February 5-8, 2007
San Antonio Texas
www.wssa.net

Evolutionary Change in Human-altered Environments: An International Summit

February 8-10
UC Los Angeles

An international summit of evolutionary biologists, conservation practitioners, and policy makers to synthesize current knowledge and to begin to develop plans to mitigate the effects.
www.ioe.ucla.edu/CTR/ioesymposium.html

National Invasive Weeds Awareness Week

February 25-March 2, 2007

Washington, D.C.
Weed workers from across the U.S. descend on the Capitol to bring invasive plants to the attention of Congress.
www.nawma.org/niwaw/niwaw_index.htm

Invasive Weeds Day at the Capitol

March 14, 2007
Sacramento, CA

Join weed workers from around the state to visit legislators.
www.cal-ipc.org/policy/state/ciwad.php

Knotweed Symposium

March 14-15, 2007
Portland, OR

In conjunction with the Western Society of Weed Science annual conference.
www.wsweedscience.org

Society of Wetland Scientists

June 10-15, 2007
Sacramento, CA

Join an expected 750 wetlands biologists from around the world. This year's theme is "Water Wetlands and Wildlife: Resolving Conflict and Restoring Habitat."
www.sws.org/sacramento2007/index.html

Ecological Society of America and Society for Ecological Restoration, Joint Annual Meeting

August 5-7, 2007
San Jose, CA

More than 3000 ecologists will gather to discuss "Ecological Restoration in a Changing World". Abstracts due March 2007. *www.esa.org*

Quotable

"When a place once full of ivy and eucalyptus starts to look and smell like California, people get interested."

Kitty Whitman, Presidio Park Stewards volunteer at Mountain Lake in San Francisco, Bay Nature Magazine, Oct-Dec 2006

"Regulating the movement of plant and animal species based on whether or not the fringe of the environmental movement considers them 'native' or 'non-native' has very little to do with sound science and very much to do with controlling private property."

Peyton Knight, The National Center for Public Policy Research , regarding a letter signed by numerous property rights groups and delivered to Senate Environmental and Public Works Committee Chairman James Inhofe (R-OK) warning about the invasive species legislation. www.nationalcenter.org

Cal-IPC Membership Form

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

Cal-IPC's effectiveness comes from a strong membership that includes scientists, land managers, policy makers, and concerned citizens. Please complete this form and mail with check or credit card number. Additional donations support our projects. We are a 501(c)(3) non-profit organization, and donations beyond regular membership rates are tax deductible. **Join or donate online at www.cal-ipc.org.**

2006 Individual Membership

- ☐ **Regular** **$35**
- ☐ Family $60
- ☐ Contributing $75
- ☐ Life $1,000
- ☐ Joint Cal-IPC/SERCAL $60
- ☐ Joint Cal-IPC/CNGA $70
- ☐ Cal-IPC/SERCAL/CNGA $100
- ☐ Student/Volunteer $15

2006 Institutional Membership

- ☐ Regular $150
- ☐ Small company or nonprofit $100

Donations

for Cal-IPC programs: $____

for Cape Ivy Biocontrol: $____

(info online at cal-ipc.org)

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

Fax form with credit card info to 510/217-3500, or...

Phone us at 510/843-3902 with contact and credit card info.

☐ Check here if you would prefer to receive the *Cal-IPC News* as a link to a pdf file online rather than a paper copy.

☐ Occasionally, we share our members' addresses with like-minded organizations. Check here if you ***do not*** want your information shared.

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