



Cal-IPC News

Protecting California's Natural Areas from Wildland Weeds

Quarterly Newsletter of the California Invasive Plant Council



2010 Cal-IPC Symposium in Ventura Weeds and Wildlife: Impacts & Interactions

Cal-IPC members aren't the only ones stalking yellow starthistle. Yellow starthistle infestations displace native plants and animals, threatening natural ecosystems. It also reduces land value and limits recreational access.

Photo: Brian Murphy

Inside:

Is arundo really a water hog?	4
A customized weed worker toolbelt	6
Join us in Ventura!	8
Updates on advocacy	10



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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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Cal-IPC News

Spring 2010 - Volume 18, Number 1

Editors: Doug Johnson, Elizabeth Brusati, Heather Brady

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From the Director's Desk

New faces at Cal-IPC

Thanks to ARRA stimulus funding, Cal-IPC has hired three new staff members. These staff will be heading up initiatives that build on existing programs and promise significant progress in key areas.

Jen Stern works with Heather Brady to manage our training program. Goals include development of a certification program, integration of invasive plant BMPs into training for road and utility workers, job creation, and job training for those with experience in related fields like forestry and landscaping. In her previous position, Jen managed restoration projects for the Santa Cruz County Resource Conservation District. Jen has a Master's degree in Watershed Science & Policy from CSU Monterey Bay.



Dana Morawitz manages our statewide mapping program, working in coordination with Elizabeth Brusati's risk assessment efforts. The program's goal is to create seamless distribution and habitat suitability maps to support detection and response programs. We will be coordinating with regional efforts like the Bay Area Early Detection Network (another recipient of ARRA funding). Dana earned a Master's degree



in Geography from the University of Washington, and has provided GIS support for local government, consulting firms, and nonprofit organizations.

Jennifer Chien is our Business Manager, ensuring sound financial practices and record keeping. The increased size of our organization, coupled with the complexity of invoicing and reporting on the various funding sources, make this position essential to smooth functioning of our programs. Jennifer brings over a decade of experience in nonprofit management for a range of organizations.

We are thrilled to have Jen, Dana and Jennifer on board at Cal-IPC!



Cal-IPC Updates

New Staff

Please welcome our new staff members! See page 2.

Call for nominations

The Cal-IPC Board of Directors is accepting nominations until July 1 for new board members. Know someone that has a lot to offer? Or maybe you want to nominate yourself? Elections will be held in late summer with new board members announced at the Symposium in October. Board terms

are two years, beginning in January 2011. The board meets four times each year at locations around the state, and requires a commitment to fundraising, working on a program committee, and attending the Symposium. Please direct nominations and questions to Board President Jason Giessow, jgiessow@cox.net. Learn about current board members at www.cal-ipc.org/about/staff.php

The California Department of Food and Agriculture has proposed to add 31 species to the noxious weed list in Section 4500 of the state Food and Agriculture Code for plants that cause harmful impacts to agriculture:

Alternanthera sessilis (sessile joyweed), *Atriplex amnicola* (swamp saltbush), *Berteroa incana* (hoary alyssum), *Cambomba caroliniana* (Carolina fanwort), *Carduus crispus* (curly plumeless thistle), *Ceratopteris thalictroides* (watersprite), *Cirsium japonicum* (Japanese thistle), *Diodia virginiana* (Virginia buttonweed), *Drymaria cordata* (whitesnow, tropical chickweed), *Egeria najas* (anacharis), *Euphorbia graminea* (grassleaf spurge), *Euphorbia terracina* (carnation spurge), *Fatoua villosa* (hairy crabweed), *Hygrophila polysperma* (Indian swampweed), *Hypericum canariense* (Canary Island St. Johnswort), *Lagrosiphon major* (oxygen weed, African elodea), *Limnobiium spongia* (American spongeplant, American frog's-bit), *Limnophila sessiliflora* (Asian marshweed), *Ludwigia peruviana* (Peruvian primrose-willow), *Myosoton aquaticum* (giant chickweed), *Ononis alopecuroides* (foxtail restharrow), *Potentilla recta* (sulphur cinquefoil), *Retama monosperma* (bridal veil broom), *Rorippa sylvestris* (creeping yellowcress), *Salsola collina* (spineless Russian thistle), *Senecio linearifolius* (fireweed groundsel), *Sesbania punicea*

(red sesbania, rattlebox), *Spartina alterniflora* and hybrids (smooth cordgrass and hybrids), *Spartina anglica* (common cordgrass), *Spartina patens* (saltmeadow cord grass), and *Zostera japonica* (dwarf eelgrass). CA Dept. of Food & Ag. www.cdffa.ca.gov/phpps/docs/4500ISR.pdf

A biotech firm, ArborGen LLC, is seeking to plant genetically modified eucalyptus in the southern U.S. as a biofuel crop. The USDA has given conditional approval for ArborGen to plant *Eucalyptus grandis* in seven states, replacing native pine trees. The trees are genetically modified to prevent pollen production. Fearing the trees could become invasive, The Nature Conservancy has asked USDA to reduce the number of acres in ArborGen's permit. (New York Times, January 29) www.nytimes.com

A company from Sacramento proposes to plant kiri trees (*Paulonia tomentosa*) to sequester carbon. A fast-growing hardwood tree that is native to China, kiri is considered invasive in the Midwest, South, and Northeastern U.S. The proposed project would grow 3 million trees on irrigated farms in the high desert of northern Nevada. (Yahoo News, April 6) www.news.yahoo.com

Researchers at Northern Arizona University have found a way to scare off the bark beetles that are infesting pine

trees throughout the western U.S.: play sounds that annoy them. When scientists exposed beetles to digitally-altered recordings of aggression calls, the insects stopped chewing, stopped mating, and some even fled or attacked each other. Previous trials with heavy metal music and talk radio failed to produce the same results. Researchers still need to study how and why the sounds work. (Northern Arizona University, February 3) www4.nau.edu/insidenaulbumps/2010/2_3_10/beetle.htm

In February, Mexico's legislature passed a bill that defines an invasive species, prohibits the importation or release of invasive species, and mandates the creation of a list of invasive species that must be reviewed every three years. (We could not find a website with more information on this.)

On March 3, Sen. Harry Reid (NV) introduced S.3063, the Invasive Species Emergency Response Fund Act: "A bill to direct the Secretary of the Interior to provide loans to certain organizations in certain States to address habitats and ecosystems and to address and prevent invasive species." The bill is co-sponsored by Sens. Begich (AK), Bennet (CO), Bennett (UT), Feinstein (CA), Merkley (OR), Murkowski (AK), and Wyden (OR). Additional information can be found at thomas.loc.gov.

Europe is about to release its first non-native biological control species to stop the spread of Japanese knotweed. The UK government has approved the release of an insect to attack knotweed, which is a major problem in the UK, where some reports say mortgage companies refuse to lend money for properties with Japanese knotweed. According to the BBC, the estimate to manage Japanese knotweed in the UK, without successful biological control, would cost farmers, gardeners and local councils at least £13.5 billion (\$20.2 billion). (BBC News, March 9) news.bbc.co.uk

Does arundo use more water than a native willow?

by Tricia Zimmerman and Christiana Conser

Arundo donax, commonly known as giant reed or giant cane, is no stranger to the pages of the Cal-IPC newsletter. This bamboo-like member of the Grass family grows in clumps which can reach 8 meters in height (K. Allred in Hickman 1993) and has formed almost impenetrable thickets on lower elevation river channels throughout California. *Arundo donax* received a High rating in the 2006 Cal-IPC Invasive Plant Inventory due to its severe impacts, wide distribution, and moderate level of invasiveness.

Arundo was introduced into California from the Mediterranean in the 1820s to control erosion in drainage canals in Los Angeles, as a roofing material, and as a source of reeds for woodwind instruments. Since then, arundo has spread and wreaked havoc on riparian ecosystems, canals and levees. Because arundo leaves are not shed regularly, this extremely flammable, standing dry mass increases both the probability of occurrence of wildfire and the intensity of these wildfires (Bell 1997). Equally important, arundo displaces native willows and cottonwoods, provides poorer shading and less leaf litter, and leads to reduced riparian arthropod abundance and diversity compared to the native trees it displaces (Herrera and Dudley 2003).

While many accusations have been leveled at arundo over the years, the one that most intrigued me was the suggestion that arundo could have a huge impact on our water resources. It has been suggested that arundo evaporates water at approximately the same rate as rice, or about a third as much again as the native willows and cottonwoods it displaces. The water theoretically lost to evapotranspiration is water that would otherwise be available

for groundwater recharge and ultimately drinking water supplies (Iverson 1994). However there is no actual data proving the (suspected) comparatively high rate of evapotranspiration of arundo.

In a preliminary assessment of the impact of invading alien plants on surface

composition from natives to invasives including *Tamarix ramosissima* and arundo may result in a substantial increase in transpiration rates from riparian areas (LeMaitre et al. 2007). Lastly, the same author noted that large areas along the floodplain of the Olifants River in South Africa had been invaded by arundo, “a species which probably has very high levels of water-use, but its impacts have not been quantified yet” (LeMaitre et al. 2009).

In 1998 and 1999, as part of a Master’s thesis project for San Francisco State University’s Department of Ecology and Systematics, I measured comparative rates of evapotranspiration of arundo and native red willow, *Salix laevigata*, in a riparian corridor and in a greenhouse, using a steady state LiCor 6200 porometer on fully expanded mid-canopy leaves of both species.

The goal of this project was two-fold: 1) gather a set of data which would allow land managers to accurately estimate arundo transpiration over large areas of pure arundo stands, and 2) quantify the difference in the water consumed by arundo versus that of the native willow it replaces. This research project assumed, as preliminary results suggested, that arundo transpires more water per square meter of land covered than willow.

Transpiration is essentially a passive loss of water that occurs when plants open their pores, or stomata, to let out oxygen and take in carbon dioxide as part of the process of photosynthesis. Transpiration is a form of evaporation that is driven by the difference between the moisture-saturated conditions of the leaf and that of the atmosphere outside the leaf (Anderson 1982).



Giant reed creates erosion along the Russian River in Sonoma County. Photo: Karen Gaffney

water resources in South Africa, arundo was assigned a biomass class based on its growth form and likely water use relative to the pines and eucalypts it replaced (LeMaitre et al. 2000). Similarly, in an article on landscape-scale hydrology of an arid environment in South Africa, it was hypothesized that the change of species

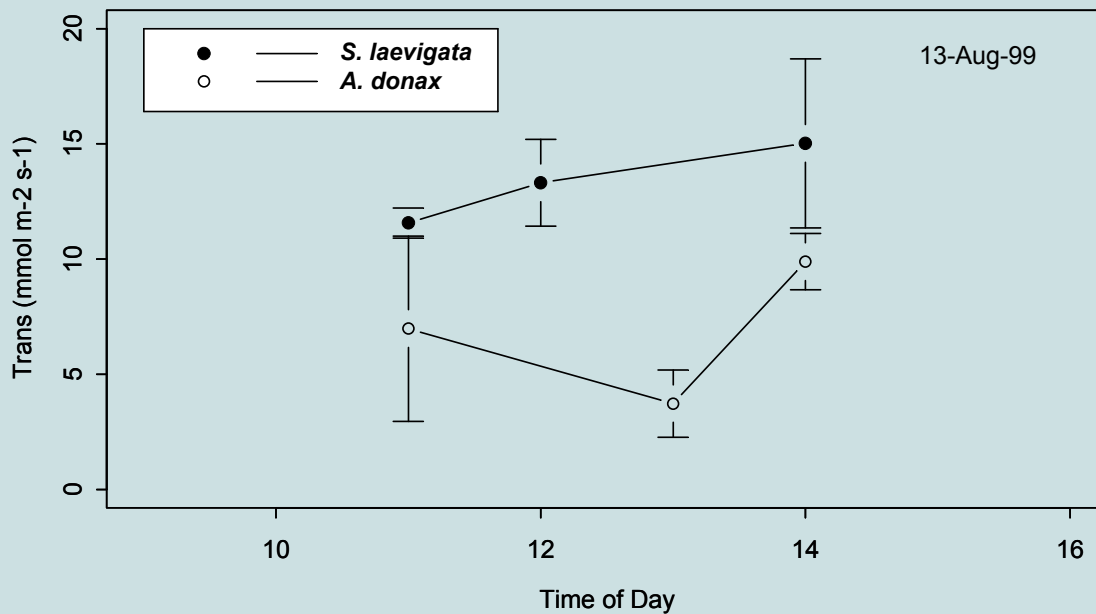


Figure 1. Comparative rates of transpiration of arundo and willow in the field during the hottest hours of the day on days in August 1999. As we were working with only one LiCor and alternating measurements from arundo to willow and back again, measurements were grouped into two-hour blocks in order to compare data from the different species.

How much water the plant loses to transpiration depends on many parameters. These include environmental conditions such as ambient air temperature, humidity, photosynthetically active radiation or PAR (the amount of light hitting the leaf), and specific leaf conditions such as the leaf temperature, stomatal conductance, leaf light saturation and plant water potential.

Evapotranspiration is defined as the amount of water lost to the process of photosynthesis and is measured in millimoles of water per meter squared per second. A mole of water has a weight in grams exactly equal to the water's molecular or atomic weight, or the sum of two atoms of hydrogen and one atom of oxygen. A millimole is one thousandth of a mole.

In addition to taking instantaneous measurements of transpiration, the LiCor porometer measures rates of photosynthesis as well as ambient conditions such as temperature, temperature within the LiCor cuvette, relative humidity and PAR. It also takes leaf measurements including leaf temperature and the stomatal conductance of the leaves.

Methods

I collected field data for this experiment with the landowners' permission, in a riparian corridor of mixed arundo and willow growing side by side at the edge of Larkmead Vineyard on the Napa River in St Helena, CA. I was helped by Christiana Conser, then a graduate student at San Francisco State University. The greenhouse data was collected at the former Gill Tract of UC Berkeley in Albany with the help of Professor Tom Dudley, then of UC Berkeley and now at UC Santa Barbara. Data, soil and leaf samples, and results were compiled and analyzed in the research lab of Carla d'Antonio, then of UC Berkeley and now also at UC Santa Barbara.

In the field, measurements were taken on arundo and willow growing side by side in only one type of substrate: the naturally occurring silt. LiCor measurements were taken from 10 a.m. to about 3 p.m., on the alternating species through the growing season, in the field and in the greenhouse, from March through mid August 1999.

I obtained willow cuttings and arundo rhizomes from the field site and grew them into small plants in 5 gallon containers in the greenhouse in two different types of substrate: sand and silt. To control for similar nutrient inputs, the silty substrate was collected from the field site and transported to the greenhouse, whereas the sand came from bags purchased from a nursery. Arundo and willow received equal, low amounts of fertilizer on a regular basis. Water was controlled by a drip irrigation system, which delivered the same amount of water to each plant. Soil moisture in the field and in the greenhouse was measured by taking soil cores, placing them in Ziploc containers, and doing a gravimetric analysis at the lab.

Results

I compared rates of transpiration of arundo and willow in the field, grouped by ambient air temperatures on different days. At comparable temperature ranges, the willow actually transpired at a greater rate than arundo. These results were correlated by data from the greenhouse, which showed that, with increasing air tempera-

...continued page 12

The Weed Worker's Toolbelt

by Ken Moore, Wildlands Restoration Team

I'm not fond of having to go back to the truck for that one tool I didn't bring. So over the years I've come up with a way to incorporate the smaller items I need in the field into an easily carried system that provides quick access to everything without compromising my mobility, and still leaves both hands free. With this system, I don't forget anything—It's all right there!

Shown here are the items that currently rotate on and off the belt depending on what the species, the site, and the season dictate. This is a constantly evolving system and changes as I get new ideas.

I have modified some of the pouches and holders to work better with the tools I'm using them for. I've also honed a keen edge on the cutting tools to make them more efficient.

This adaptable setup works for dispatching most weedy species I need to deal with. If your weeds are different than mine, I'm hoping this will give you some ideas for making one to suit your needs!



The Swedish Brush Axe is used for clearing brush and is much safer than a machete. Photo: Ken Moore

THE BELT - Any sturdy 2" wide belt will work, but this nylon Peace Officer's Duty Belt with Velcro length adjustment and a Fastex buckle is my favorite. The nylon version is lighter, just as durable as the leather one, washable and costs less.

VELCRO STRIPS - These velcro strips ("keepers") are inserted where needed to keep things from sliding around. Although you can purchase them, I just make them from bulk velcro.

LOPPERS - Anvil loppers are small and light enough to always have with you, and thanks to a clever gear reduction system, it will cut stems over an inch thick. Fiskars makes four sizes; all are functional, long lasting, and inexpensive. A cordless drill holster makes an ideal holder, allowing the handles to face behind you where they are not in your way.

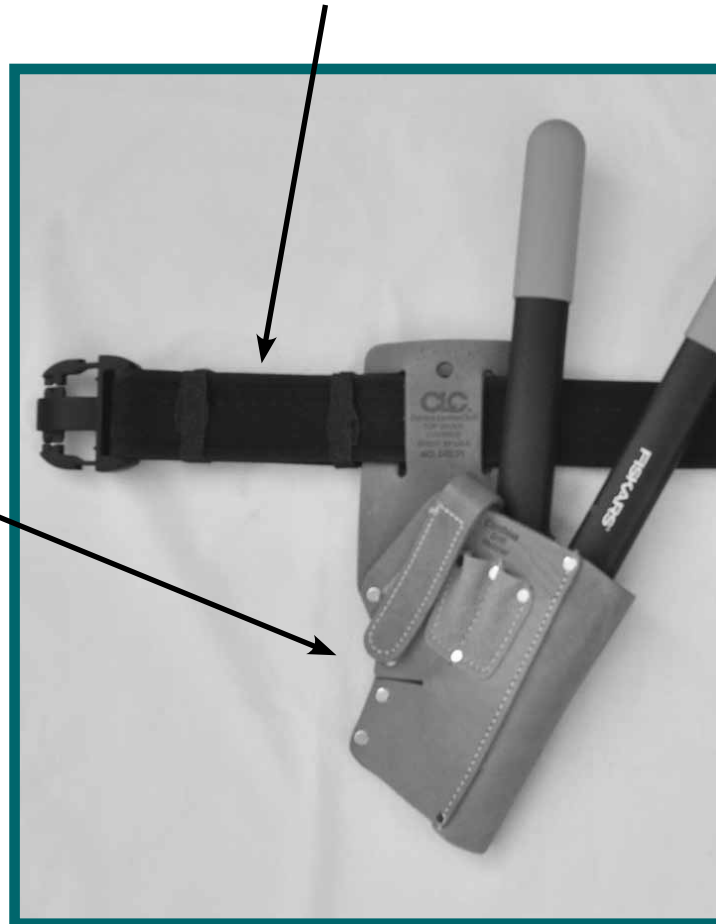
-- OR --

CARPENTER'S HAMMER HOLDER - This is an option that can be mounted on the belt in place of the cordless drill holster listed above. It's perfect for securely holding larger tools and providing quick access. Here are just two tools I currently carry in the carpenter's hammer holder:

SWEDISH BRUSH

AXE - Used for hacking out and clearing dense brush, this is more versatile, easier to use and much less dangerous than a machete. Machetes work well in tropical forests where a one handed swing is all you need to clear vegetation, but woody plants require more powerful swings. The longer handle on this tool allows you to grip with both hands and reduces the possibility of injury.

CAMERA - The camera is not in this picture, but it goes here, in a pouch on the front of the belt. I use a Canon SD780, which is the only quality camera I've found that is small and thin enough to be easily included in the toolbelt without hindering mobility. You get quality images, 3X zoom, ease of use, and it's not much bigger than a credit card. Be careful though, small cameras are expensive and easy to misplace when you're working.



ACCESSORY POUCH - This pouch goes on the back of the belt where it doesn't inhibit bending over, and holds a variety of items not as frequently needed, such as a:

FLASHLIGHT - For light that lasts in a tiny package, LED's! I always carry a small one, but I'll take a larger one if I need serious light.

Essential Tools Kit

This is the heart of the weed worker toolbelt. It holds everything I need to control woody plants up to 20 feet in height, and clips on my harness when I'm working in ropes. It includes:

HERBICIDE BOTTLE

Oval bottles this size are harder to find than round ones, but they fit in the pouch better. Flip-top lotion-type nozzles are OK for light use, but for serious work you'll want a trigger nozzle, which improves speed and efficiency.

HAND PRUNERS

These anvil pruners take twisting abuse and cut old wood much better than bypass pruners. The compound ratchet action gives you greater cutting capacity with less hand strain.

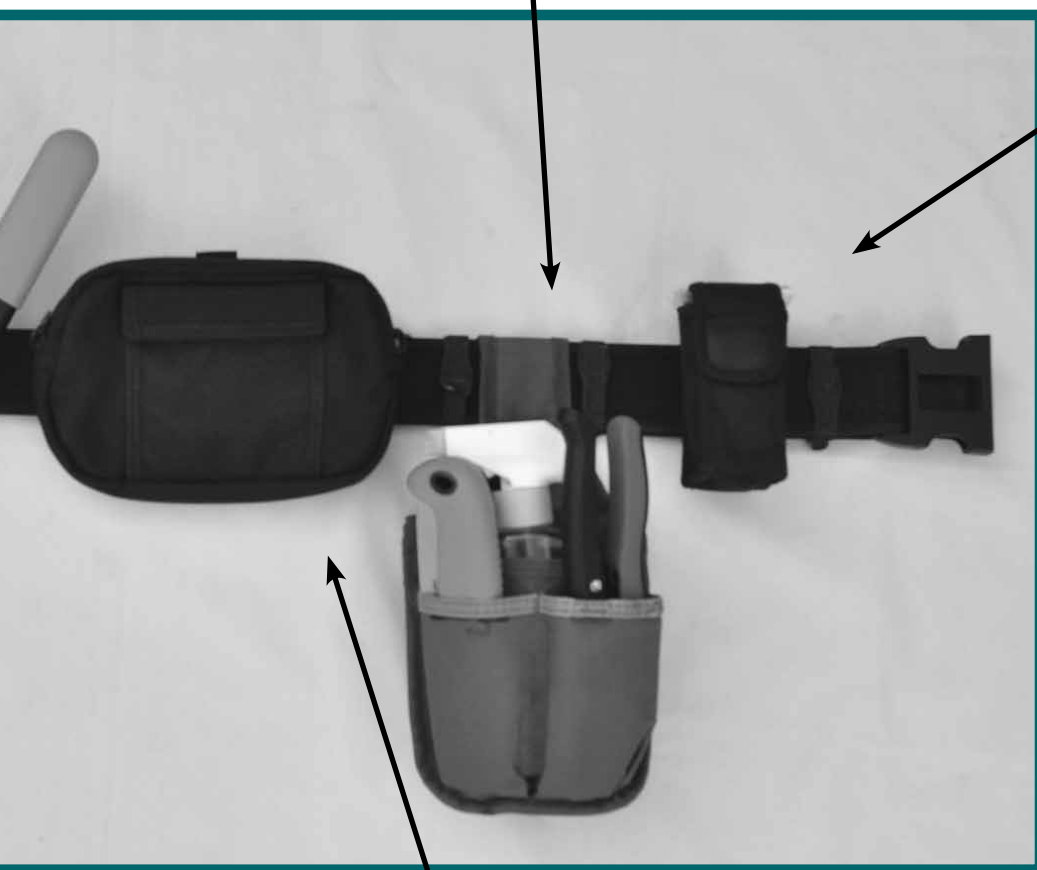
FOLDING SAW

The triple-bevel tooth design on the blade is an immense improvement in hand saw cutting efficiency. Good saws will have impulse-hardened teeth which last a long time. I use a 6" folding saw; there are longer ones, but I've found this

size to be an ideal balance between cutting capacity, blade breakage and convenience.

THE POUCH

Made by Bucket Boss, the Rear Guard Tool Sheath is the best container I've found to house my essential tools. It is designed with one additional seam on the front that I take out using a seam ripper so my pruners fit in that space. I also cut off the lanyard that hangs off the front so it won't catch on brush.



MONOCULAR - Even the smallest binoculars are too large to wear on a toolbelt. But a smaller reasonably priced, monocular can help you identify a distant plant in seconds, saving you lots of time and hiking. It can even double as a loupe by looking through the other end. You might consider investing in higher quality optics though as switching from bino- to monovision reduces your visual acuity by 20%; try the Nikon High Grade 7x15 monocular. It's the same size—\$200—and worth it!

TOOL RESOURCES - Quality tools are a worth while investment, although they may initially cost more they will also last longer. I purchase tools from a variety of sources including common suppliers such as Ben Meadows and Forestry Suppliers, and lesser known suppliers like Lee Valley Tools (Canadian), PalmFlex (gloves), and Galls (peace officer's duty belt).

PONCHO PACKET - This tiny packet will keep you dry and warm in an emergency, and might even save your life.

BASIC FIRST AID KIT - This mini kit is just to patch things until we get back to the truck, where the serious first aid kit is. Contents rotate but usually include self-adherent wrap (Coban), draw-out salve (containing ichthammol), finger

splints, finger tips band-aids, sterile dressing, packets of disinfectants, tweezers with an attached magnifying glass, meat tenderizer and antihistamines for insect bites.

WEBBING - Secure one end to something solid and wrap the rest around one hand, and you've got a way to keep yourself stable on semi-steep slopes. By letting out one loop at a time you can control

the speed of your decent. Also handy for dragging brush.

ARM GUARDS - Kevlar guards save my arms in dense brush and give me peace of mind in snake infested areas.

ANYTHING ELSE you need that fits: flagging, notepad, GPS unit, cell phone, ziplock bags, snacks, etc. And you can still wear a backpack as well!

2010 Cal-IPC Symposium

Sun and sand, eucalyptus and arundo, birds and butterflies... Join us on the central coast for Cal-IPC's 2010 Symposium in Ventura, CA. This year's Symposium will feature our usual exciting line-up of talks, discussion groups, and field trips on a wide variety of topics related to invasive plants. In addition, we will have several invited sessions on Friday organized with the Western Section of The Wildlife Society to address the theme of Weeds and Wildlife.

Contributed & Invited Speakers
Discussion Groups
Field Course



Awards Banquet
Raffle & Auction
Field Trips
Posters & Exhibitors



Wildlife feels the effects of weeds. A bobcat peers through yellow starthistle. *Photo: Brian Murphy*

Weeds and Wildlife: October 14 - 16, 2010

Featured Sessions:

- 🌴 Trends in Mapping for Early Detection
- 🌴 Channel Islands Research and Management
- 🌴 Grazing, Weeds, and Wildlife
- 🌴 Learning from Other Invasive Species
- 🌴 Balancing Invasive Plant and Wildlife Management

Field Course: Wednesday, October 13 Strategic Approaches for Managing Weeds

Developed as the hub to draw on all of Cal-IPC's Wildland Weed Field Courses, Strategic Approaches provides you with the context for all of your weed management skills. Topics will include developing goals and objectives, prioritizing target species, creating treatment plans, permitting requirements, planning for monitoring, and integrating adaptive management. Throughout the day, we will provide applicable examples to enhance your learning.

Register with the Symposium and receive a discount! Cal-IPC field courses provide attendees with reference information and literature, lunch, and a great opportunity to network with expert instructors and as well as attendees. Sign up early—space is limited!



Photo: Bob Case

Ventura... from the rolling hills of the Los Padres National Forest to the sweeping views of the Pacific Ocean protected by the Channel Islands National Marine Sanctuary, Ventura is one of California's oldest communities. Ventura was founded with the creation of the San Buenaventura Mission in 1782 and is home to some of the most spectacular beaches in the world. This year's Symposium venue is the Crowne Plaza Ventura Beach, located right on the beach next to a world-famous surfing spot, only steps from Ventura's Historic Pier, and just two blocks from downtown Ventura.



2009 Student contest winners are congratulated by Doug Johnson.

Impacts and Interactions

Crowne Plaza Ventura Beach, Ventura



Keynote speaker: Scott Morrison, Director of Conservation Science for the California Chapter of The Nature Conservancy. Scott specializes in the ecology of the urban-wildland interface and focuses on the creation and management of nature reserves in the heavily populated landscape of Southern California.

Field Trips to Santa Cruz Island, Santa Barbara restoration sites, and more. . .

Take a Saturday field trip to learn about local projects. We will visit Santa Cruz Island to hear about 30 years of research and management of both invasive plants and wildlife by The Nature Conservancy and the National Park Service. Or, go north to Santa Barbara and visit restoration sites and a monarch butterfly preserve in a eucalyptus grove.

At left, the Santa Cruz Island Fox is heralded as one of the fastest and most successful endangered species recovery program in U.S. history due partially to the removal of non-native feral sheep and pigs.

. . . See next page

More at www.cal-ipc.org

More on the Symposium...

Registration, Transportation, Lodging

Registration will open in June. Register online for faster processing and choose from several payment options. Includes all meals Th., breakfast Fri., and 2011 Cal-IPC membership.

Rates: Regular: \$285 (\$310 after Sept. 21, \$325 on-site)
Student: \$100 (\$125 after Sept. 21, \$150 on-site)
Symposium Volunteer: \$185 (before Sept. 21 only)
Restoration Volunteer NEW: \$185 (before Sept. 21)
Field Course: \$145 with Symposium, \$165 without

Getting There: Ventura is located one hour north of Los Angeles and 30 minutes south of Santa Barbara. The Crowne Plaza hotel is just off Highway 101 at 450 East Harbor Blvd., Ventura. The Ventura Amtrak platform is a short walk away.

Lodging: The conference room rate is \$84 single or double. All rooms have balconies and an ocean view. Attendees receive high-speed internet and free parking in the hotel parking garage. Reserve your room through our website link by Sept. 21 to receive the discounted rate.

Sponsorship Opportunities

Sponsoring the Symposium is a great way for your company, agency or organization to reach California's natural resource managers and 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.

Call for Papers & Posters: due June 25

Submit your abstracts on invasive plant biology, management, or outreach programs by Friday, June 25. We especially encourage presentations that address this year's theme of "Weeds and Wildlife". Speakers have a 20-minute time slot. Undergraduate and graduate students are invited to enter the Student Paper and the Student Poster Contest. Full details and instructions for abstract submission are available at www.cal-ipc.org/symposia/presenters.php.

Student Contest

Students are invited to enter our third 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 9

The Symposium is an opportunity to honor individuals and organizations who have made exceptional contributions to invasive plant research or management. We welcome nominations for: 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, dwjohnson@cal-ipc.org. See past honorees at www.cal-ipc.org/symposia/awards.php.

Photo Contest: due September 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 photos of individual plants, landscape photos, or action photos of 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 learning 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: wine, books, art, and weed killing tools. The banquet later in the evening features a live auction of a few special items. Come mingle with like-minded folks from around the state and recharge your batteries. Contact raffle@cal-ipc.org if you have something to contribute.



Symposium attendees take a break from visiting exhibitors' booths.

Photo: Bob Case

Working to improve advocacy and coordination

Day at the Capitol VII

On March 10, natural resource managers came to Sacramento for the 7th Annual Invasive Weeds Awareness Day at the Capitol. We visited the offices of 120 legislators to urge their support for Weed Management Area (WMA) funding and the efforts of the CISAC and ISCC (see below).

BAEDN Partner Meeting

The Bay Area Early Detection Network (BAEDN, www.baedn.org) held its 2010 partners meeting in Oakland on March 4. The meeting introduced over 150 land managers in the nine Bay Area counties—Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Solano, Santa Clara, and Sonoma—to the new BAEDN/California online system.

John Malpas of Calflora demonstrated the online tool designed to capture new observations of weeds in the Bay Area. He demonstrated how a user can query the database for a location or a plant and several methods for uploading data.

BAEDN is working to develop a method of screening suspected weeds



BAEDN participants contributed information about invasive plant locations using the online tool created by Calflora as well as paper maps. Photo: Bob Case



Day at the Capitol participants prepare for legislator visits. Photo: Heather Brady

to determine which are most likely to become major problems. A working group at the meeting started to develop a list of regional priority weed species. Another working group focused on finding the best way to incorporate existing weed occurrence data into a rapid response program; BAEDN has funding to support WMAs in managing high priority weed populations. A third working group discussed mapping data gaps, potential data sources, facilitation of data collection for early detection species, and Calflora database capabilities. The fourth working group considered detection protocols and coordinated outreach and training strategies.

BAEDN's goal is to serve as a model for regional early detection networks statewide. Stay tuned for more information about developing a network in your area!

CISAC Delivers Species List

On April 21, the California Invasive Species Advisory Committee (CISAC, www.iscc.ca.gov/cisac.html) delivered its first product to the new Invasive Species Council of California (ISCC). The list of over 1,500 invasive species that threaten the state was requested by the six state agencies that comprise the ISCC as part of its efforts to get a strategic foundation in place to strengthen the state's ability to respond to invasives.

The list includes organisms of all taxa, from plants and vertebrates to invertebrates and diseases. It relies on existing lists of organisms in the state (such as the Cal-IPC Inventory) as well as of potentially damaging organisms not yet in the state. CISAC has drafted scorecards that rate damage for 200 of the most important species. Damage includes not only ecological impact (what the Cal-IPC Inventory is based on), but also impact to agriculture, infrastructure, cultural resources, and public health. The list and scorecards can be reviewed at ice.ucdavis.edu/invasives.

...Arundo water use, from page 5

ture, the willow transpired at a greater rate than arundo, both in sandy and silty substrates (Fig. 1).

Field data suggested that while willow was sweating away in order to photosynthesize and fix molecules of carbon so that it could grow more leaves and branches, Arundo was sweating less while also photosynthesizing and fixing carbon. Since the LiCor was measuring rates of photosynthesis in addition to those of transpiration, we incorporated this data to produce comparative rates of Water Use Efficiency, or WUE, for the two species.

WUE is usually defined as the ratio of dry matter produced to water transpired. Instantaneous WUE, as measured by the LiCor, refers to the amount of carbon dioxide taken in by the plant compared to the amount of water vapor lost by the plant to the surrounding air. WUE is therefore defined as the amount of water lost per unit of carbon taken up, or photosynthesis divided by transpiration. Units are photo/trans, so $\text{mmol m}^{-2} \text{s}^{-1} / \text{mmol m}^{-2} \text{s}^{-1}$.

In general, arundo displayed higher rates of WUE than willow (Fig. 2) and these differences in WUE were more distinct before noon. By mid August both arundo and willow exhibited low rates of WUE compared to their WUE earlier in the summer. This can be attributed to higher temperatures, lower humidity and the tendency of both species to become stressed at the end of the growing season and close their stomata, thus limiting both photosynthesis and transpiration.

The greenhouse data correlated arundo's greater WUE over that of willow, and at any given temperature demonstrated a roughly 26% higher WUE. In the greenhouse, arundo's greater WUE compared to that of willow was especially noticeable when grown in silt rather than in sand. This makes sense, considering the decreased availability of water within a sandy substrate rather than in a silty one.

Conclusions

Although I was hoping to be able to point to arundo as a greedy water straw spreading across the landscape, depriving

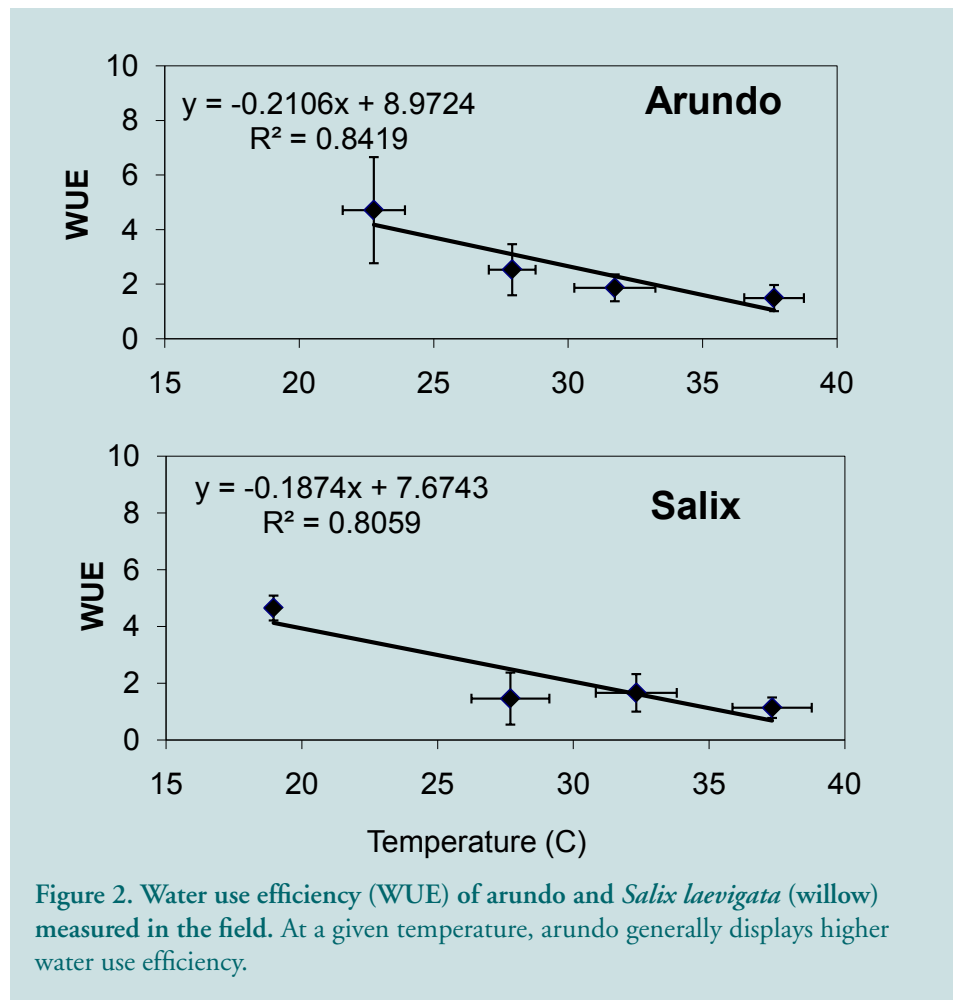


Figure 2. Water use efficiency (WUE) of arundo and *Salix laevigata* (willow) measured in the field. At a given temperature, arundo generally displays higher water use efficiency.

people, their businesses and the riparian ecosystem alike of precious water, I found two things instead: 1) arundo transpires less per square meter of ground covered than the native willow it replaces and 2) arundo's physiology is such that it is more efficient at using and retaining water in the process of photosynthesis than willow. Arundo's greater WUE may represent a species-specific response to the environment that may enhance its competitive ability over native plants.

The first result begs the question: why bother removing arundo if re-vegetation with native willows would result in a net "no gain" of water recovery or conservation?

Researchers at the University of Nebraska Panhandle Research and Extension Center recently used satellite-based energy balance images to map riparian evapotranspiration along the Platte River in Nebraska. Their study measured rates of evapotranspiration of invasive salt cedar

(tamarisk), Russian olive, Canada and musk thistle, and reed canary grass. The results indicated that these invasives transpired approximately the same amount of water as native willows, cottonwood trees and some grasses. As author Gary Stone points out, there is a host of reasons for removing exotics from a riparian project, aside from the goal of water recovery: flood control; domestic, agricultural, industrial, environmental, and recreational uses; preventing native habitat loss; stopping the spread of invasives; and restoring native vegetation (Stone 2010).

In the case of arundo, I would bring attention to the threat of an extreme fire hazard as arundo more than doubles the available fuel for wildfire (Scott 1994). Sonoma State University professor Hall Cushman and Russian River ecologist and champion Karen Gaffney recently documented the significantly lower richness of native perennial plant species on

...continued page 14

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Bake sale fundraiser benefits Cal-IPC

Erica Holland and Georgia Roden, 7th graders from Orinda, recently devoted their "Take Action Project" to California's invasive species. After completing research on the subject, they hosted a bake sale and donated the proceeds to Cal-IPC!

THANKS GIRLS!

New Members

As a Cal-IPC Member, you join a powerful network of land managers, researchers, volunteers, and concerned citizens. Welcome!

Judith Anderson (Angeles Chapter Foundation, Montrose), **James Bazinet** (L.A. County Department of Public Works, Alhambra), **David and Louise Beesley** (Nevada City), **Clare Billett** (City of San Diego), **Janine Bird** (Santa Cruz), **Bill Blanken** (Hanford), **Lee Brockbank** (San Diego), **Rachel Brush** (Redding), **Emily Bynes** (Conservation Corps North Bay, San Rafael), **Kasey Cinciarelli** (Carlsbad), **Jennifer Cogswell** (San Diego), **Jason Cordero** (Cabrillo National Monument, San Diego), **Bené da Silva** (County of Marin Flood Control & Water Conservation District, San Rafael), **James Brentano** (San Francisco), **Margy Day** (San Diego), **Jessica Dowell** (San Francisco), **Leo Dumont** (Santa Clara Valley Water District, San Jose), **Jolie Egert** (Go Wild Consulting, Fairfax), **Michael Ehrenzweig** (Berkeley), **Barbara Eisenstein** (South Pasadena), **Deborah Enos** (Watershed Conservation Authority, Azusa), **Jason Ericson** (San Francisco), **Lynne Frame** (Mill Valley), **Sarah French** (UC Riverside), **Clare Golec** (Arcata), **Fidel Gonzalez** (Santa Clara Valley Water District, San Jose), **David Hardy** (San Francisco), **Jennifer Hogan** (CA Department of Water Resources, Sacramento), **Erica Holland** (Orinda), **Melanie Howe** (San Diego), **Bob Huttar** (Irvine), **Glen Islas** (City of Culver City), **Derrick Johnson** (City of San Diego), **Julia Keley** (San Diego), **Robin Kinmont** (TEC Inc., Solano Beach), **Marilee Kuhlmann** (The Green Gardens Group, Los Angeles), **Marty Lane** (Cabrillo National Monument, San Diego), **Hannah Lee** (Marin County Flood Control &

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New Organizational Members

Organizational Members advance Cal-IPC's mission to protect California's wildlands from invasive plants. Thank you for your support!

Gold Ridge Resource Conservation District
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Pesticide Research Institute
Sonoma Ecology Center

Readings & Resources

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

Aquatic gardening tips

California Master Gardeners have updated their information on how to have a water garden without spreading invasive plants. "Aquatic Gardens, Not Aquatic Pests: How to Practice Responsible Water Gardening" includes three mini-posters, five pages of text, and links to helpful resources (pdf, 8 pp.). Go to www.ucanr.org and click on Publications, then Free Publications to find the report.

New management journal

Management of Biological Invasions is a new open access, peer-reviewed, online journal focusing on real experiences on the management of biological invasions. It admits worldwide contributions on the single or multilevel management of bioinvasions (species, community, habitat and processes), in an effort to contribute to a better diffusion of technical ideas, approaches and results globally. sites.google.com/site/managementbiologicalinvasions/home

Assessing the risk of mussel invasion

The Lake County Fish and Wildlife Committee has produced a risk assessment examining quagga and zebra mussels. The risk assessment proposal addresses the current threat posed by both the quagga mussel (*Dreissena bugensis*) and zebra mussel (*D. polymorpha*). The report attempts to prioritize the various risk factors associated with each Lake County waterbody with public access, and provides organizational and management guidance to direct preventative measures against mussel introduction. www.co.lake.ca.us/Assets/WaterResources/Mussels/Mussel+risk+assessment.pdf?method=1

Forest and range assessment

CAL FIRE's Draft 2010 Forest and Rangeland Assessment is currently available for review and public comment. The draft chapters and a link to the comment form can be found on the FRAP website: frap.fire.ca.gov/assessment2010.html

Cleaning manual

The US Bureau of Reclamation has published a manual that provides recommendations for inspection and cleaning of vehicles and equipment as a prevention tool to limit the spread of invasive species. www.usbr.gov/pps/EquipmentInspectionandCleaningManual_Sept09.pdf

Biocontrol presentations

Proceedings and Presentations from the Interagency Biological Control Meeting, held in Billings, MT, in November 2009, are now available. The Bureau of Land Management (BLM) organizes the annual meeting to improve coordination and collaboration between researchers and managers regarding new information available in biological control research. The site includes an overview, agenda, presentation slides, and publication links. www.weedcenter.org/Interagency_Biocontrol_Meeting/Presentations.html

Biodiversity video

The Convention of Biological Diversity produced an eight-minute YouTube video to publicize the International Year of Biodiversity. It includes a few shots of invasive species. www.youtube.com/watch?v=V1VYmpTikgw

Invasive of the week

Check out the Invasive Species of the Week posted by the IUCN's Invasive Species Specialist Group. Each week ISSG will post photos and a factsheet featuring a new species that is an invader somewhere in the world. See www.issg.org/invasive_species_of_the_week.htm or click on the Species of the Week photo at www.invasivespeciesinfo.gov/news/main.shtml.

...Arundo water use, from page 12

stream banks and floodplains invaded by arundo (Cushman and Hall 2010). Given the many and well-documented deleterious effects of allowing arundo to spread, its removal seems well-justified.

For more information, contact Tricia Zimmerman at desmata@gmail.com.

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THE WILDLAND WEED CALENDAR

May - June

Effective Weed Control: Tools for Public Parks & Landscapes (A partnership between Cal-IPC and the Los Angeles & San Gabriel Rivers Watershed Council)

May 13

Los Angeles

www.cal-ipc.org

SERCAL Annual Conference: "A View of Restoration from the Range of Light"

May 19-22

Mammoth Mountain

www.sercal.org

CNGA - Identifying the Native and Naturalized Grasses of CA

May 22-23

Point Reyes Station

www.cnga.org

Weeds Across Borders 2010

June 1-4

Shepherdstown, West Virginia

www.weedcenter.org

CNGA North Coast Grass Symposium & Grassland ID Workshop

June 3-4 & 5-6

Arcata (limited enrollment, register early)

www.cnga.org

Cal-IPC's Integrated Control Methods Field Courses

June 8 - 9

Lower Lake, Lake County

www.cal-ipc.org

July - August

Aquatic Plant Management Society Annual Meeting

July 11-14

Bonita Springs, FL

www.apms.org

European Weed Research Society Symp

July 12-15

Keszthely, Hungary

www.ewrs.org

Ecological Society of America Annual Mtg

August 1-6

Pittsburgh, PA

www.esa.org/pittsburgh

International Workshop on Invasive Plants in Mediterranean Regions of the World

August 2-6

Trabzon, Turkey

17th Intl. Conf. on Aquatic Invasive Species

August 29-September 2

San Diego

www.icais.org

September - October

Biological Control for Nature Conference

October 3-7

Northampton, MA

biocontrolfornature.ucr.edu

Cal-IPC 2010 Symposium

October 13-16

Ventura

www.cal-ipc.org/symposia

November & beyond

2011 Western Society of Weed Science Mtg

March 7-10, 2011

Spokane, WA

www.wsweedscience.org

Ecological Society of America

August 7-12, 2011

Austin, TX

Society for Ecological Restoration Int.

Congress on Ecological Restoration

August 21-25, 2011

Merida, Yucatan, Mexico

www.ser2011.org

Quotable

"...Conspiracy theories are sprouting like kudzu."

-Richard Corliss, *Time*

(Reviewing the movie *Edge of Darkness*)

"They [invasive species] are the very model of disruptive innovation, sharing certain characteristics that can be used by executives..."

- Henry King, Viewpoint, Bloomberg.com

(Describing how invasive species provide useful lessons for business innovators.)



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