Eye ON Invasives

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**In This Issue:**



# Invader Crusaders

California has over 1,700 realized and potential invasive species that threaten our richly diverse ecosystems, native fish and wildlife populations, and agriculture industry. With nearly 164,000 $mi^2$ of land and water to monitor for and protect from those species, the limited funds and manpower available to California's resource managers are far from adequate. However, with 38 million citizens, California's volunteer workforce boasts the greatest potential in the nation.

**Save The Bay (San Francisco) volunteers removed a "mustard mountain" from DFW's Eden Landing Ecological Preserve. Photo by Save The Bay.**

California's volunteer labor contribution is valued at tens of millions of dollars annually, but its contribution to protecting California's ecosystems is invaluable. While prevention is paramount in invasive species management, once a species is introduced, the need for observant eyes and feet on the ground is critical. In this issue, we highlight a few of the many volunteer programs providing just that in a variety of forms, including assisting research efforts as 'citizen scientists,' on-the-ground, labor for removal projects, restoration of habitat following invasive species removal, and educating others about invasive species.

The RASCals, or Reptiles and Amphibians of Southern California, citizen science program detected California's first state and county records of two non-native geckos, both of which are potential invaders. Volunteers with the Elkhorn Slough Foundation rapidly respond to eradicable invasive plant populations, while the greenthumbs of the bunch sow, tend, and harvest native grass seed for subsequent restoration projects.

Many volunteer efforts go beyond invasive species removal and habitat restoration. Tuleyome, a non-profit organization, uses a holistic approach to protect wild and agricultural heritages. They acquire lands for conservation, remediate abandoned mines, lead hikes and family outings, and provide youth opportunities for outdoor experience and exploration. The uniqueness of California's state parks, beaches, and recreation areas is reflected in the wide variety of opportunities they offer volunteers. During 2012, the Volunteers in Parks Program contributed a total number of hours equivalent to 531 full time employees, with over 38,000 (3.5%) of those hours dedicated to natural resource management.

Invasive species volunteer opportunities offer something greater than just a project. They provide opportunities to educate the next generation about environmental stewardship and to get outdoors. They offer citizens the chance to be involved in the conservation of our wildlands, native plant and animal communities, and favorite recreational areas. Take a moment to consider your favorite outdoor activities and places, the invaders that threaten them, and how those invasions may impact you. To help mitigate those impacts and protect our resources, consider joining the ranks for the 2014 California Invasive Species Action Week. For details and to find a volunteer opportunity near you, visit the Action Week webpage at www.dfg.ca.gov/invasives/actionweek.

# Research Spotlight:
# 'Citizen Scientists' Helping to Document Non-Native Species

**Greg Pauly, Natural History Museum Los Angeles County**

The first step in studying the impacts of non-native species is finding them. While this statement may seem obvious, the importance of early detection cannot be overstated. Most non-native species introduced to a region never become established, and many of those that do become established have minimal ecological impacts. Some non-native species, however, have huge ecological and economic impacts. Costs for controlling the worst invasive species and the likelihood of eradication are tightly linked with how long those species are established before they are detected. Early detection can greatly reduce ecological impacts and prevent the billions of dollars in economic harm that some invasive species are capable of causing. Thus, a key question is—how can we reduce the time it takes to detect introduced species? This question is especially relevant in California's major metropolitan areas where risk of introductions is high and probability of detection is low because species may first establish on private property (e.g., front and back yards) that biologists can't easily access for surveys.

Consider California's largest metropolitan area, the Greater Los Angeles Area. This region is home to 18.4 million people, the 6th busiest airport in the world, and the busiest container port in the United States. With so many people, goods, and cargo moving through the region, there is an extremely high threat of non-native species being introduced. Southern California's mild Mediterranean climate is especially welcoming, and some of these non-native species successfully establish breeding populations. How can biologists improve early detection of these species when they may be isolated to a single house or neighborhood?

At the Natural History Museum of Los Angeles County, we think that citizen science is the best solution, especially in heavily urbanized areas. Citizen science crowdsources data collection by asking the public to photograph the species they encounter and submit those photos to our online citizen science projects.


**Reese Bernstein at the Natural History Museum of Los Angles County. Photo by NHM Staff.**

This approach has resulted in some really interesting discoveries.

**Original photo submitted documenting the first Mediterranean house gecko (*Hemidactylus turcicus)* population in Los Angeles. Photo by Reese Bernstein.**

In August 2010, father and son team, Will and Reese Bernstein submitted a photo of a lizard they had never seen before to the Museum's Lost Lizards of Los Angeles (LLOLA) project. The photo was taken in a friend's backyard after the lizard scurried by during an evening barbeque. Museum staff identified the lizard as a Mediterranean House Gecko (*Hemidactylus turcicus)*, and through further work with the Bernsteins, determined that there was an established population in the western San Fernando Valley. This was the first time the species had been documented in Los Angeles County, and Will and Reese worked with museum scientists to publish the new finding (Bernstein and Bernstein, 2013. *Herpetological Review* 44:474). Reese, now 12 and in the 7th grade, is published in the peer-reviewed scientific literature demonstrating how citizen scientists can actively participate in the scientific process. This is not a standalone event, and two additional new county or state records of lizards have been identified in the past year through citizen science.

As a result of the gecko find and other interesting observations, the LLOLA project was greatly expanded to focus on all reptiles and amphibians throughout southern California. The new project, called Reptiles and Amphibians of Southern California (RASCals) has been active since June 2013 and already has over 1900 submissions (www.inaturalist.org/projects/rascals). These submissions allow researchers and land managers to learn about current distributions of native and non-native species. This information can be used for various research projects, including comparing modern distribution records to historical museum records to understand how species are responding to urbanization. Only with the help of thousands of interested and observant Californians is data collection at this scale possible. For more information on this project please visit www.nhm.org/rascals.

# Volunteers and Weed Control: Elkhorn Slough National Estuarine Research Reserve

**Andrea Woolfolk and Bree Candiloro, National Estuarine Research Reserve**

The fog is just starting to lift along the Monterey Bay shore's Elkhorn Slough on a Monday morning and what looks like a troop of hobbyist gardeners has gathered around a small plot not far from the Visitor Center.

Two others are already busy yanking hemlock, thistle and other broadleaf weeds from the tenth-acre plot.

**Volunteers Sharon Burkett, Mark Levine, and Rich Tuemmler expand the grass farm by planting 2000 blue wild-rye plants. Photo by Bree Candiloro.**

It is a native grass farm, producing seeds of blue wild-rye, California brome and California oat grass as part of an ongoing effort to maintain the original flora at Elkhorn Slough Reserve that existed when European explorers arrived.

“For me, this environment has been depleted and transformed by human beings," said Jon Deikman, one of the regular volunteers who keep the effort going. "Me weeding is a way to help turn back the clock and restore habitat that was here before human beings came to this place.”

The seed from these grasses will be harvested in the summer and used for restoration projects throughout the Elkhorn Slough watershed.

About 150 species of non-native plants now call Elkhorn Slough home, crowding out native vegetation and the animals that feed on it. The most successful non-natives, uninhibited by the natural predators in their native land, can also increase wildfire and flood danger and consume scarce water, among other concerns.

For practical reasons, the slough's stewardship crew -- the Stew Crew -- focuses on just a dozen or so of the most invasive plant species. Among them: jubata grass (closely related to pampas grass), iceplant, Cape ivy, fennel, French broom, and Himalayan blackberry.

The crew targets infestations that are small and isolated, and situated along roadsides, trails, parking areas, and waterways. Large, well established infestations of high-priority weeds, or species that are more difficult to control, are a lower priority, unless they are growing in areas slated for restoration.

“It’s an activity where you can actually see progress,” said volunteer Alex Darocy.

Or, as volunteer Su Chesterman put it: “Pulling weeds is like painting a room, it’s always so different and so beautiful and so great to see that so much can be accomplished in a short amount of time. You have a new room; you have a new garden. That’s why I come back.”

The crew, which meets every Monday from 10 a.m. to noon, rotates through several sites throughout the year. The volunteers typically wrap up work after a couple of hours and then walk back to the greenhouse. Some people grab a snack and a drink and stick around to chat with each other on a picnic table.

**Volunteers Alex Darocy, Carolyn Mitchell, Juana Work, and Sharon McGuire add California oat grass to the grass farm. Photo by Bree Candiloro.**

“I just like being outside in the outdoors in the sun and smelling fresh air," explained volunteer Kathy Baird. "And if I can help doing something for nature at the same time it’s a win-win.”

For more information about the Elkhorn Slough National Estuarine Research Reserve please visit www.elkhornslough.org. For information on volunteering with the Stew Crew or on other projects, please see www.elkhornslough.org/calendar.

# ‘Weedyaking’ on Cache Creek: Tuleyome Volunteers Make Invasives Removal Possible

**Andrew Fulks, Director, UC Davis Putah Creek Riparian Reserve and President, Tuleyome, Inc.**

Flowing from Clear Lake, through the inner Coast Range and the Capay Valley, into the Central Valley before ending at the Cache Creek Settling Basin adjacent to the Yolo Bypass, Cache Creek and its adjacent watersheds have a variety of groups working collaboratively on invasive weeds throughout their lengths and tributaries. Tuleyome, an environmental non-profit group, has adopted the 19-mile ‘Wilderness Run’ of upper Cache Creek as an *Arundo donax* and tamarisk (*Tamarix spp.*) eradication project.

As a land manager and environmental advocate with Tuleyome, my desire to complete weed control projects always exceeds available funding. Through numerous projects, I’ve found that contractors average $5,000/acre for hand labor to remove arundo and tamarisk. Based on the average density of plants on these projects, removal has cost approximately $195 per plant, not including herbicide costs. For public land managers and private non-profit groups, these costs can present a hurdle to beginning or completing much needed weed control projects without outside grants or other funding.

I’ve found that relatively small infestations, where tamarisk and arundo have yet to form dense monocultures, can be eradicated by finding ways to stretch what dollars are available. Such methods can include substitution of mechanical equipment for hand labor, temporarily borrowing equipment from partner agencies, relying on proven herbicide mixes that are potent enough to reduce retreatment needs, and using volunteer labor on small infestations. Using these methods on the Cache Creek eradication project reduced our overall eradication costs.

**Tuleyome volunteers remove giant reed (*Arundo donax*) along Cache Creek. Photo by Andrew Fulks.**

Completing the project as cheaply as possible was a primary consideration. This meant looking at all phases of the project to find ways to reduce or eliminate expenses. The Cache Creek watershed has an array of citizens groups that can be drawn upon for labor and expertise. We enlisted volunteers to assist, starting with initial data collection for mapping and development of a treatment plan. Reconnaissance work determined Cache Creek had 100 plants along 19 miles, supporting our initial expectation that we could achieve eradication without an expensive contract.

The plants were scattered along 19 miles of steep canyons along the river. This section of Cache Creek is within a Federal Wilderness Area, as well as designated a State Wild and Scenic River. Access to the Cache Creek project area was very difficult, as vehicle use is prohibited, and accessing some plants by foot was near-impossible.

**Innovative Tuleyome members and volunteers used kayaks to access remote infestations of giant reed (*Arundo donax)* and tamarisk (*Tamarix spp.)* along Cache Creek. Photo by Andrew Fulks.**

However, by accessing the site via kayak, we could stop at each plant as we progressed downstream. For a contractor, boating in supplies, equipment, and laborers would be costly and a high liability risk, but Tuleyome had a volunteer team of experienced kayakers and insurance coverage for our outings program. The use of volunteer labor reduced costs and also doubled as part of our outreach program; giving the public a stake in the stewardship of the public lands. Thanks to the enthusiasm of the volunteers, we were able to eliminate up to $195 of labor cost per plant and treat all but one of the plants during 2006 - 2007. With labor costs removed from the total cost of eradication, the cost per plant was confined to the herbicide used, which was donated by the California Department of Fish and Wildlife.

As land managers and environmental advocates, we have a responsibility to steward the land regardless of the money at our disposal. If infestations are small enough, cost-effective removal can be accomplished using a combination of citizen’s groups, Conservation Corps, borrowed equipment from partner agencies, and judicious use of herbicides. Through creative, collaborative, and citizen-based approaches, we have the ability to cut costs and still have great success in our eradication efforts, and hopefully inspire others to do the same. For more information about Tuleyome and how to get involved, visit www.tuleyome.org.

# Partner Spotlight: Volunteering in California's State Parks

**CDFW Staff**

Do you enjoying being in the outdoors? Do you enjoy hiking, biking, or bird watching? No matter where you are located in the State of California, chances are that you are within a short drive to a state park. California's state parks offer visitors a unique opportunity to experience the great outdoors. The California Department of Parks and Recreation (State Parks) is responsible for 280 parks, beaches, trails, wildlife areas, open spaces, off-highway vehicle areas, and historic sites statewide, which allow their 70 million annual visitors to experience all that California has to offer.


**In 1900, volunteer group Sempervirens rallied for preservation of old-growth redwood trees of Big Basin Redwoods State Park. Photo by Andrew P. Hill, Sempervirens Fund Collection.**

The mission of State Parks is "to provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation." But State Parks staff cannot accomplish that mission alone, so they enlist the help of volunteers, young and old, to help maintain trail access, conduct beach clean-ups, restore natural habitats, fundraise, and much, much more.

State Parks developed its Volunteer in Parks Program (VIPP) as a result of the 1978 California State Government Volunteer Act, which recognized the value of volunteerism to state government. Volunteers have been used to enhance existing programs and begin new projects at a reduced cost to taxpayers. In 2012, 35,659 volunteers contributed 1,107,782 service hours, which is the equivalent of nearly $24.5 million in labor costs. The VIPP offers opportunities for individuals or groups who are interested in one-time or on-going volunteer opportunities.

For the last 20 years, State Parks has utilized their VIPP to help control and manage invasive plants and restore areas to their natural state. Invasive plants can spread quickly and crowd out native species by taking up space to grow, soil nutrients, and water, posing a threat to native species that rely on these habitats. Across the state, State Parks is actively managing a number of invasive plants including yellow starthistle *(Centaurea solstitialis)*, tamarisk (*Tamarix spp.*), Cape ivy (*Delairea odorata*), English ivy (*Hedera helix*), eucalyptus (*Eucalyptus spp.),* pampas grass (*Cortaderia selloana),* French broom (*Genista monspessulana*), and iceplant (*Carpobrotus edulis*).

An example of VIPP volunteers' success resulting from many hours of ongoing hard work is the English ivy removal at the Forest of Nisene Marks in Santa Cruz County. Volunteers have successfully cleared over one acre of English ivy, an aggressively spreading plant that threatens native plants by covering and eventually killing native shrubs and trees, and native animals by displacing plants the local wildlife depend on.

Primarily using hand-removal techniques, VIPP volunteers played an integral part in this invasive plant removal, which has allowed for the restoration of old-growth redwood forest habitat. The Forest of Nisene Marks State Park was a logging operation site until the 1920s, but now offers over 30 miles of trails through rugged semi-wilderness, rising from sea level to steep, coastal mountains.

**Volunteer removal project of English ivy (*Hedera helix*) at nearby Henry Cowell Redwoods State Park. Top: Before removal efforts, Bottom: After removal efforts. Photo by Ken Moore, State Parks Volunteer.**

Volunteers are essential to the successful operation of California's State Parks. Enabling citizens to be actively involved with maintaining our State Parks increases public support for state parks, their understanding of management decisions, and ultimately helps to enrich all visitor's experiences. If you are interested in participating in State Park's VIPP, please contact your local State Park District Office or visit www.parks.ca.gov/volunteer to learn how you can help.

# Did You Know This Is Invasive?
# Mediterranean house gecko—*Hemidactylus turcicus*

The Mediterranean house gecko, native to Southern Europe and Northern Africa, was first reported in Key West Florida in 1915. The species likely arrived in the United States as stowaways on cargo ships and once here dispersed by overland transportation. Due to their ability to reproduce rapidly and thrive in urban settings, this species has been able to establish stable populations across the southern United States.

The Mediterranean house gecko is almost always associated with human habitation. As its name suggests, this species is commonly found in manmade structures including houses and buildings. These geckos are often found hiding under shingles and shutters near outdoor lights. Because they are nocturnal, Mediterranean house geckos seek refuge in cracks and crevices during the day and emerge at night to feed on insects and other invertebrates. These relatively small (4-5 inch) geckos have yellow to white body coloration, often with brown blotches on their back and white and brown alternating rings on their tail. They also have sticky toe pads, vertical pupils, and large, lidless eyes. Throughout the summer females can lay multiple clutches of two eggs. Males emit a series of clicking sounds to announce territory ownership and advertise their presence to females during the breeding season. The Mediterranean house gecko's bumpy or warty skin makes it easy to distinguish from the Indo-pacific gecko, a similar non-native species recently found in California.

**Mediterranean house gecko in Chatsworth, CA. Photo by Sigfrido A. Zimmermann, CSU Northridge.**

Mediterranean house geckos have been reported in California from San Diego to as far north as Chico. Most of these sightings were reported by local residents. To report Mediterranean house gecko sightings, please contact the California Department of Fish and Wildlife at 1-866-440-9530 or email invasives@wildlife.ca.gov.

Remember, the best way to manage invasive species is to prevent their introduction in the first place. Don't release your geckos or other pets into the wild. For information regarding options other than release, visit the Habitattitude website.

## 2014 California Invasive Species Action Week

**Saturday, August 2 – Sunday, August 10**

Help protect our resources by joining a volunteer effort, learning about prevention practices, attending an educational presentation or field outing, or learning to identify your local invasive species.

Find nearby volunteer efforts, a schedule of events, and educational information at www.dfg.ca.gov/invasives/actionweek.

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**Youth Poster Contest**

**"Race to Protect Your Favorite Place"**

Youths (grades 2 – 12) are invited to enter by creating a poster showing which invasive species threaten their favorite outdoor place and how to take action to help protect it. Entries due by June 20, 2014.

Find more information and entry forms at www.dfg.ca.gov/invasives/actionweek/postercontest.

## A Sneak Peek into the next issue of Eye On Invasives:

## California Invasive Species Action Week Schedule of Events

## Boating season is here!

## Remember to always

## CLEAN, DRAIN AND DRY

- ☑ **Inspect all watercraft and equipment**
- ☑ **Clean any visible mud, plants, fish or animals from watercraft and equipment**
- ☑ **Drain all water, including from lower outboard unit, ballast, live-well, buckets, etc.**
- ☑ **Dry all areas**
- ☑ **Dispose of debris and live bait in the trash**

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