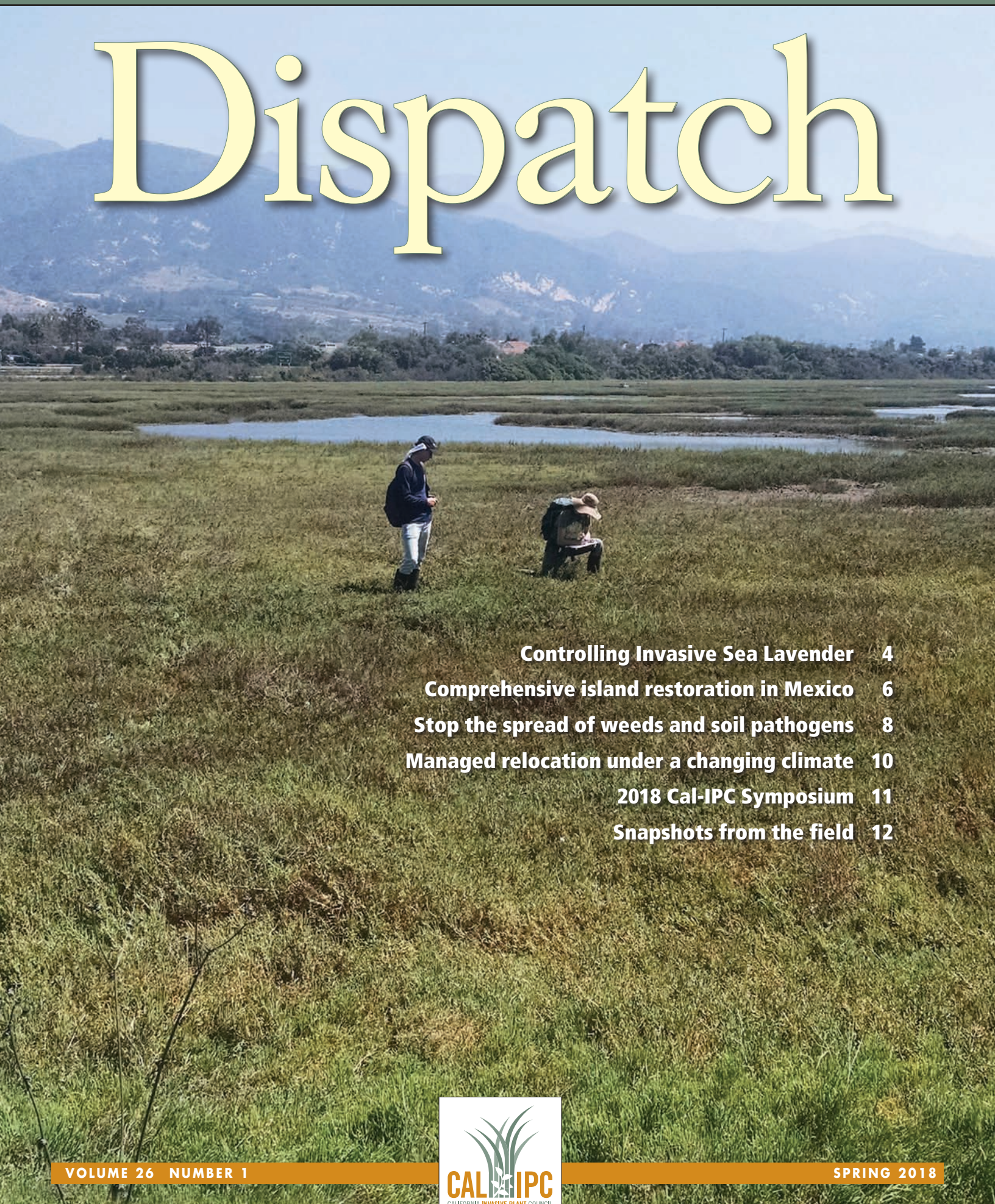
NEWSLETTER OF THE CALIFORNIA INVASIVE PLANT COUNCIL

Dispatch



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1442-A Walnut Street, #462
Berkeley, CA 94709
ph (510) 843-3902 fax (510) 217-3500
cal-ipc.org info@cal-ipc.org

Protecting California's environment and economy from invasive plants

Cal-IPC Dispatch
Spring 2018 - Vol. 26, No. 1
Editor: Doug Johnson
Associate Editor: Claire F. Meyler
Designed by Melanie Haage
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Follow us:

On the cover:
Teams record data points during a survey of the Carpentaria salt marsh to map endangered plants and proximity to invasive plants. Photo courtesy of Channel Islands Restoration

FROM THE DIRECTOR'S DESK

Working the halls in Sacramento

By Executive Director Doug Johnson

Each spring, Cal-IPC visits Sacramento with the goal of renewing funding for Weed Management Areas (WMAs), local efforts where land management partners work collaboratively to stop the spread of invasive plants. In 2014, we worked with Assembly Member Joan Buchanan to get AB 2402 passed. Though the bill succeeded in updating the program design, it failed to secure funding. Last year, we worked with Assembly Member Jim Wood on a budget request for the program, but were again unsuccessful in securing funding. The program has been supported through General Fund dollars in the past, and that funding is in high demand.

This year, we are trying again with fresh opportunities. One significant shift is that Cal-IPC, with the financial support of members and special donors, has hired an environmental lobbying firm to guide our efforts, strengthening our ability to navigate Sacramento's political ecosystem.

Elections this November will also choose a new governor, whose appointees will direct the state's environmental protection efforts. Though the current administration cares about the goals of increasing climate resiliency and protecting biodiversity, that has not yet resulted in renewed funding for WMAs, one of the best investments the state can make in meeting these goals. As Governor Brown and his administration, including Secretary of Food and Agriculture Karen Ross and Secretary of Natural Resources John Laird, work to secure their legacy, they may finally act on this pressing need.

Another element is the visible impact of invasive species in California. Nutria, the South American rodent that has caused so much damage in wetlands in Gulf Coast states, has been found near the Sacramento/San Joaquin River Delta and made headlines. As street trees die in Southern California, the shot hole borer infestation has made it onto the radar screen of elected officials.

An Invasive Species Summit was held in the capitol in January, bringing together experts from government, industry, academia, and conservation groups to discuss ways to speed implementation of the state's framework on invasive species. The framework was created by the state's Invasive Species Advisory Committee (CISAC) and interagency Invasive Species Council (ISCC) in 2012.

Hundreds of implementation actions were identified at the summit, with several critical needs rising to the top. Among them were (1) formalizing the interagency council and advisory committee in statute, and (2) renewing funding for Weed Management Areas. Cal-IPC is co-sponsoring a bill that addresses these two needs, AB 2470 from Assembly Member Tim Grayson.

We have seen in the past how difficult it is to secure WMA funding. Though most legislators are convinced that invasive plant management is a wise, cost-effective investment in protecting the state's resources, political reality makes it difficult to carve out room in the budget with so many competing needs. Allocations from the two potential funding sources — the state's General Fund and the Greenhouse Gas Reduction Fund from cap-and-trade proceeds — will be made by the legislature through extensive discussions weighing the myriad requests.

The advocacy road is long, and we do not know what turns it will take, but we are working from multiple angles toward a solution. Part of that will be building a coalition. We already have fifty organizations supporting AB 2470, and we will keep working to make sure their voice is heard on this issue. Please join us in trying to renew funding for WMAs by sending a letter of support for AB 2470! Go to cal-ipc.org/AB2470 for a sample letter and instructions.

CAL-IPC UPDATES

2018 Cal-IPC Symposium. Join us Nov. 7-10 in Monterey. Registration opens May 1. Abstracts for presenters due June 1. Discounted room block first come/first served through Oct. 7. See page 11 for more information.

Support AB2470 – We need organizations across the state to support WMA funding. The bill will be heard in multiple committees over the legislative session, and each needs to hear our support. See cal-ipc.org/AB2470.

Invasive sea lavender – We are beginning year 3 of removal efforts across San Francisco Bay, with funding from the National Fish & Wildlife Foundation (NFWF).

Desert knapweed – Minimal rains in the desert made this a year for mapping distribution around Borrego Spring. We are organizing partners to fully scope the infestation in Newport Bay. Funded by NFWF.

North Coast – Humboldt and Del Norte county partners are gearing up for year 4 of removing knotweeds, *Arundo*, rush skeletonweed, and shiny geranium. Funding from the California Wildlife Conservation Board (WCB).

South Central Coast – San Luis Obispo and Santa Barbara county partners are in year 2 of removal efforts on Japanese dodder, Canada thistle, *elyumus farctus*, and invasive sea lavender, while tracking spiny emex and stinkwort. Funding from WCB.

Arundo mapping – Using aerial imagery, maps have been completed for the Great Valley, covering more than 10% of the state. Next up, we will calculate Impacts of Arundo on waterways and design removal projects with local partners.

OTHER NEWS

State bills – Besides co-sponsoring AB2470, we are supporting two other bills: SB1015 (Allen) to create a Climate Resiliency Fund at WCB, and AB2054 (Gonzalez Fletcher) to address invasive tree-damaging shot hole borers.

CDFA lawsuit – Anti-pesticide groups have successfully sued CDFA over the Programmatic Environmental Impact Report for its pest management programs. A court has ordered CDFA to stop all pest management using pesticides until deficiencies in the PEIR are fixed. CDFA has appealed, asking for a timeline over which to fix the PEIR while pest management programs continue.

Glyphosate – A federal court has found that the California cannot compel Monsanto to place warning labels on products containing glyphosate, such as Roundup. California's Prop. 65 mandates labels for all products found to be potentially carcinogenic by an international cancer panel. However, many entities, including the US EPA, disagree with the findings of the international panel.

50 worst invasives – The Western Governor's Association published a list of the 50 worst invasive species in the Western US. Top three: tamarisk, cheatgrass and Canada thistle. Feral cats made the list at #13. For aquatics, the top three are Eurasian watermilfoil, quagga/zebra mussels, and New Zealand mudsnails.

Forest Service regulatory streamlining – The agency has launched an effort to improve efficiency of their environmental analysis and decision making. Lack of NEPA documentation has been a significant limiting factor in conducting weed management on the national forests in California.

Global register of invasive species – An international database has been initiated using agreed-upon standards by the International Union for the Conservation of Nature. (Scientific Data, Jan. 2018, at Nature.com.

California plants at risk – A recent study estimates that 45-56% of California vegetation is at risk from climate change. (*Ecosphere*, Dec. 2017)

YOUR MEMBERSHIP

Thank you for keeping your membership current. Note that your expiration date is shown on the mailing label of this newsletter.

Wildland Weed News

Illustration by Ryan Jones

The Nature of Americans

Profound changes are occurring in the American public's connections to nature, the outdoors, and wildlife. To better understand and foster Americans' relationship with nature, Dr. Stephen Kellert and DJ Case & Associates conducted an unprecedented study of nearly 12,000 adults, children and parents across the United States in 2015-16.

The study's findings can be distilled down to eight major points: (1) Americans face a significant gap between their interests in nature and their efforts, abilities, and opportunities to pursue those interests in their lives; (2) Experiences in nature are deeply social; (3) adults and children differ in where they locate unforgettable, authentic nature; (4) access to nature is as much about the quality of places as their quantity; (5) Americans value nature in remarkably broad, diverse ways; (6) Americans support nature-related programming, funding, and conservation; (7) Americans' relationship with nature is complex and nuanced; and (8) Americans perceive tremendous benefit from experiences in nature. The report includes 22 recommendations based on these findings.

(Full study: natureofamericans.org)

Rene Sforza

Steve Novak and Dorothy Maguire jumping in the air after collecting the rare African wire-grass.

Controlling invasive sea lavender in Carpenteria Salt Marsh

Doug Johnson, Cal-IPC, and Andrew J. Brooks, UC Santa Barbara Marine Science Institute

[Note: This work is part of a project funded by the California Wildlife Conservation Board, in which Cal-IPC is partnering with local groups to eradicate several invasive plant species in the region. All photos courtesy Channel Islands Restoration.]

The Carpinteria Salt Marsh is a special spot along California's south-central coast. Migratory waterfowl stop at the marsh, and the estuary includes extensive wetland, sub-tidal channel and emergent upland habitats that support many sensitive plant and animal species.

Several species, such as the Belding's savannah sparrow, are listed as endangered, threatened, or of special concern; and there are plans in the works to re-introduce Light-footed clapper rails. Located next to a sandy beach, subtidal rocky reef, and kelp beds, the 230-acre marsh is also an important regional nursery for California halibut, diamond turbot, and other species of marine and estuarine fish.

Approximately half of the 120-acre salt marsh is a reserve run by University of California's Natural Reserve System as an outdoor classroom and laboratory. The other half is divided into parcels, with owners including the City of Carpinteria, the Land Trust for Santa Barbara County, and numerous private individuals. Publicly accessible portions of the marsh include interpretative trails and a small amphitheater. The estuary itself comprises a series of natural and artificial channels at the base of the watersheds of Franklin and Santa Monica creeks draining from the southern slope of the Santa Ynez Mountains, which reach nearly 4,000 feet and are the westernmost portion of the Transverse Ranges.

Large population of endangered salt marsh bird's beak (Chloropyron maritimum) *growing in the Carpinteria salt marsh.*

The predominant vegetation in the marsh is estuarine emergent wetland dominated by pickleweed (*Salicornia virginica*). The flora of Carpinteria Salt Marsh has been of interest to scientists for at least 90 years. Eleven species growing presently at the estuary are regionally rare plants, and two species — salt marsh bird's-beak *(Chloropyron maritimum)* and Coutler's goldfields *(Lasthenia glabrata)* are endangered.

INVASIVE LIMONIUM

One of the top invasive plant threats to the marsh is European sea lavender *(Limonium duriusculum)*, which is one of the few plants that can displace native plant species in salt marsh habitat. (Cal-IPC is on its third year of funded work to remove invasive sea lavender from salt marshes around San Francisco Bay, where it has become a significant problem.)

In August 2017, a grant from the UCSB Coastal Fund enabled staff and volunteers from Channel Islands Restoration

Eleven species growing presently at the estuary are regionally rare plants, and two species are endangered.

and students from UC Santa Barbara to perform a survey of the endangered salt marsh bird's-beak and Coulter's goldfields in the marsh. Teams of two or three individuals walked parallel lines in a

systematic grid, circumventing meandering channels and deep mud as needed. The teams also mapped the distribution of European sea lavender.

Not only did they find more sea lavender than had been previously mapped, they also found extensive co-occurrence of European sea lavender and salt marsh bird's-beak, which is a parasitic plant. They recommend that tarping and herbicide application, though effective, not be used in areas where the two species co-occur because the methods are likely to cause too much collateral damage. In these areas, hand-pulling is recommended as the best method for removing invasive sea lavender.

Teams record data points during a survey of the salt marsh.

PERMITTING CHALLENGES

Conducting any type of activity in a delineated wetland, even those that are aimed at protecting the wetland from a highly invasive species such as the European sea lavender, requires several state and federal permits. Permit applications must contain extensive and detailed information on the proposed project including: an exhaustive list of all methods and materials that will be used; any potential impacts to other species (particularly species that are listed as endangered, threatened or of special concern) along with methods to eliminate or mitigate those impacts; a project time-line; and a follow-up monitoring plan. Consultation with agency biologists prior to submitting any application is done to ensure that all information required by the various permit-issuing agencies is included in the permit applications.

To date, the UC Natural Reserve System, with assistance from staff associated with the Upper Salinas-Las Tablas Resource Conservation District, the California Invasive Plant Council, and Sustainable Conservation, has obtained its Section 401 permit under the Clean Water Act from the Central Coast Water Quality Control Board and is in the final stages of obtaining a California Department of Fish and Wildlife Section 1653 permit under the California Habitat Restoration and Enhancement Act. (The Habitat Restoration and Enhancement Act allows permit applicants to simultaneously apply for a Section 1600 streambed alteration permit as well as a California Endangered Species Act permit.) Because both the US Army Corps of Engineers and the US Fish and Wildlife Service have declined to exercise jurisdiction over the project, approval of the California Endangered Species Act permit as part of the California Department of Fish and Wildlife Section 1653 permit also will satisfy permitting requirements under the US Endangered Species Act. The UC Natural Reserve System has obtained an exemption under the California Environmental Quality Act, due to the small size of the proposed project.

Mud flows brought wood and debris into the marsh following the Thomas Fire in January.

RECENT UPDATES

Recently, the Carpinteria Salt Marsh was impacted by a large debris flow which occurred following the Thomas Fire. Tens of thousands of cubic yards of mud and large woody debris, including large trees, entered the marsh via Franklin and Santa Monica Creeks early in the morning of January 9, completely filling several of the intertidal channels that wind their way through the marsh and out into the Pacific Ocean. This event has altered the natural pattern of water flow through the marsh and may eventually alter vegetation patterns for many species, including the invasive European sea lavender.

LIST OF PERMITS NEEDED:

Clean Water Act Section 401 from Regional Water Quality Control Board

Cal. Dept. of Fish & Wildlife Section 1653

Comprehensive island restoration in Mexico

Luciana Luna-Mendoza, Yuliana Bedolla-Guzmán, Mariam Latofski-Robles,
Antonio Ortiz-Alcaraz, Federico Méndez-Sánchez, Conservación de Islas Project Managers

[Editor's Note: All photos by J. A. Soriano, courtesy Conservación de Islas, submitted by Cynthia Jauregui to the 2017 Cal-IPC photo contest.]

For the past twenty years, *Conservación de Islas* has worked to conserve biodiversity in Mexico's islands. The more than 4,000 Mexican islands support 8.3% of the country's vascular plants and terrestrial vertebrates, concentrating 14 times more endemics than the mainland. Islands are key sites for the reproduction and refuge of seabirds, sea turtles, and pinnipeds. During the last several centuries, the presence of invasive mammals and human disturbance on Mexico's islands has caused the extinction of 17 vertebrates and extirpation of many seabird colonies.

Conservación de Islas works in collaboration with government agencies, private foundations, universities, research institutes and fishing cooperatives to remove invasive mammals, install social attraction techniques, enhance habitat through the removal of introduced vegetation and reforestation of native and endemic species; share environmental education and promote island biosecurity with local communities; and create management policies. To date, we have removed 60 populations of invasive mammals on 39 priority islands, which protects at least 147 endemic taxa of mammals, reptiles, birds and plants and aids recovery of more than 200 seabird colonies recovering. We have also achieved the inclusion of all Mexican islands on protected areas and identified management and conservation priorities published on a National Island Strategy.

Invasive ice plant (Mesembryanthemum crystallinum) *is present on many of the Mexican islands*

RECOVERY OF NATIVE VEGETATION FOLLOWING ERADICATION OF INVASIVE HERBIVORES

We have removed herbivores from 12 islands in the Mexican Pacific, including sheep *(Ovis aries)*, goats *(Capra hircus)*, donkeys *(Equus asinus)*, and rabbits *(Oryctolagus cuniculus)*. Currently, we are working on two additional islands: Espíritu Santo and María Cleofas. The removal of goats allowed the recovery of Malva occidentalis on Coronado Sur Island — an endemic species to Guadalupe and Coronado Sur islands — which is also nesting habitat for brown pelican *(Pelecanus occidentalis)* and double-crested cormorant *(Phalacrocorax auritus)*. On San Benito Oeste Island, the endemic *Dudleya linearis* (chalk lettuce) was threatened by the European rabbit; after eradication of the invasive rabbit, the plant population is thriving. On Guadalupe Island, goats caused the extinction of several species. After their eradication, vegetation has remarkably recovered. A new record *(Island Ceanothus Ceanothus arboreus)* and plants thought to be extinct (e.g., Guadalupe mint *Satureja palmeri*) were found after the goats were removed. The endemic Monterey pine *(Pinus radiata var. binata)*, once down to only 220 trees, has recovered to several thousand individuals, together with other endemic trees. On Socorro Island, after sheep eradication started, the vegetation cover increased 11%. Before the eradication, the understory was practically absent from some vegetation communities. Now, this coverage has increased with native species such as the fern *Pteridium caudatum*. Forests of Common Fig *(Ficus cotinifolia)*, once heavily degraded by soil erosion, are now recovering. As plant cover increases, animals such as the endemic blue lizard *(Urosaurus auriculatus)* and landbirds are more common. The eradication of herbi-

Ice plant forms thick mats over the breeding sites of nocturnal seabirds, preventing them from nesting. As an immediate solution, staff and volunteers installed protected burrows.

vores allows not only the recovery of the vegetation communities, but the recovery of the whole insular ecosystem.

THE RETURN OF SEABIRDS

On the Baja California Pacific Islands, introduced species have contributed to the extirpation of at least 30 seabird colonies, and the decline of several more bird populations. In 2008, we began the implementation of active seabird restoration techniques on nine islands and archipelagos: Coronado, Todos Santos, San Martín, San Jerónimo, Guadalupe, San Benito, Natividad, San Roque, and Asunción. For the first time in Latin America, we used social attraction techniques on all these islands and built a feral cat exclusion fence on Guadalupe Island to protect seabird colonies from predation. Social attraction consists of using decoys for surface nesting species such as cormorants, gulls and terns; artificial burrows for burrow nesting species such as auklets, murrelets and storm-petrels; and playing reproductive calls to recreate breeding colonies to attract back seabirds. At the same time, we have restored nesting habitat by manually removing crystalline iceplant *(Mesembryanthemum crystallinum)*, widely spread on all these islands. We carried out monitoring and applied research on breeding biology, genetics, population dynamics, and ecology of seabirds.

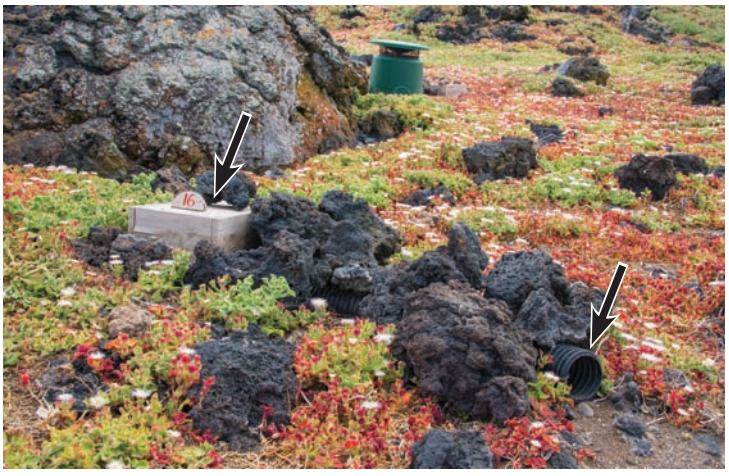
Our outcomes to date are very encouraging. Cassin's auklet *(Ptychoramphus aleuticus)* returned to nest on Coronado, Todos Santos, and Natividad Islands; and royal tern *(Thalasseus maximus)* and elegant tern *(Thalasseus elegans)* to San Roque Island, thanks to social attractions techniques. After all these restoration actions, 22 colonies have returned to breed, which indicates we have successfully restored about 70% of the extirpated seabird colonies in this important region for seabirds. Furthermore, more than 10 new colonies have established, and several colonies have increased their productivity. Also, we have generated scientific and baseline information — non-existent until now — essential for appropriate decision making for species management: population size, nesting colonies distribution, productivity, genetic relationship between nesting colonies, diet, and at-sea distribution. This comprehensive program is successfully restoring seabirds in Mexico, reducing the biodiversity loss and improving their resilience to climate change.

Staff removes ice plant from around nesting sites.

ISLAND BIOSECURITY TO MAINTAIN CONSERVATION GAINS

Over time, as our island restoration projects have developed, we have documented awe-inspiring results. Thus, to ensure that those results will last, biosecurity — the measures to protect island environments from invasive alien species — has become a transversal theme on all projects. We work closely with fishing cooperatives to raise awareness on the threats invasive species pose, both on ecological processes as well as on human health and economy. We strive to build capacities on preventing and detecting accidental introductions of such harmful species. Simple biosecurity measures, such as making sure our clothing and equipment are clean and free from mud, seeds, propagules or insects, whenever we visit an island, are crucial to keep them free from invasive species. Thus, we believe that "island conservation is in our hands." Everyone has a part to play in safekeeping our islands, strongholds of biodiversity. As vulnerable species begin to make a comeback, it is up to all of us to ensure that they continue to thrive in the future.

After their hard work, staff were rewarded by seeing native birds benefit from the removal of invasive ice plant. Here, a Cassin's Auklet chick (Ptychoramphus aleuticus)*, is monitored in a constructed burrow on Todos Santos Island.*



This image gives a sense of the scale of the ice plant infestation on San Martin Island. In the foreground, you can see a protected burrow (left) and entrance tunnel (right) to help native birds nest and breed.

Stop the spread of weeds and soil pathogens

Pamela Beitz, East Bay Regional Park District

All photos courtesy Pamela Beitz

An ounce of prevention is worth a pound of cure, as the saying goes. And I presume, if you're reading this article, you have contributed tons of cure to the weed problem over the years. It's the prevention portion of the equation that is so elusive. Instituting a program of weed seed prevention has been a cultural shift that is difficult to achieve, on the personal as well as organizational level. We've all tried to incorporate better hygiene into our work day-knocking the weed seeds off, picking the dirt clods out of our boots, cleaning the mower deck after rough cutting-but as usual, doing more with less has meant that "park hygiene" is often the first task to fall off the list.

Hoof Pick, aka, Boot Pick

I use this handy little tool for cleaning boots, chain saws, line trimmers, hand saws, etc. It hangs on my field bag and man does it come in handy! Also, the interior of my truck stays clean!

The consequences of poor "park hygiene" is also not readily apparent, often taking a year or longer before that new noxious plant population is evident and established. By that time, we've forgotten our role in its introduction. And our poor habits become reinforced.

"Park hygiene" is often looked at with suspicion, or even, pessimism. How can my small actions have that much of an impact? The "Tragedy of the Commons" plays out again on multiple levels when you manage, volunteer in, or recreate on public lands. Or, worse, resignation: how can we turn the tide of infestation?

The introduction of *phytophthora* species has amplified the impact of poor "park hygiene" and now threatens the existence of some imperiled plant species, notably the pallid manzanita. Sadly, this extreme consequence may provide traction to this shift in work, volunteer, and play practices. If we reframe this challenge as a cultural one, we may learn new habits that will slow or stop the spread of soil pathogens such as phytophthora as well as weed seeds.

After all, it wasn't until 1847 that hand washing was shown by Dr. Ignaz Semmelweiss to reduce infection spread, though he was ridiculed by fellow doctors. Florence Nightingale championed this cause during the Crimean war, but her success in limiting infection did not result in changing many practices. It wasn't until 1980, after a string of foodborne outbreaks and healthcare-associated outbreaks, that the United States Centers for Disease Control and Prevention launched a nationally endorsed hand hygiene campaign. Now, we all consider hand washing the most important tool in maintaining health.

This cultural shift in personal hygiene took over a century. Unfortunately, pallid manzanitas and other imperiled species or plant communities don't have that much time to wait. Neither do fritillaries or endangered tarplants that are being overrun by "bad grasses."

40-volt Battery powered blower

The 40-volt version really packs a punch and is more portable than a gas blower. If you're using and hauling big equipment, get a gas blower. But for quick trips, small jobs during the dry season, this blower really does the trick. It does not, sadly, work on mud. The batteries also work on other handy tools like a small chainsaw, hedger and line trimmer.

Change happens both on a personal level and social level. After all, I wash my hands before each meal and after each visit to the restroom without even thinking about it! I'll readily admit that I sometimes forget to clean off my line trimmer or scrub my boots when I leave my work area, but I endeavor to try to incorporate strategic points of hygiene in my work day. Working in groups, everyone takes on the responsibility of reminding the group to "start clean and keep it clean." Within some groups, we are beginning to incorporate "park hygiene" at the beginning and ends of work days, and sometimes at appropriate times in between. We've written down guidelines, performed tailgate safety meetings, incorporated principles in all trainings, workshopped solutions and plan on doing it repeatedly until it becomes institutional.

Each work day, project or site has its own constraints and challenges, but focusing on principles, we hope that education and practice will provide the tools to reason through most situations. After all, I can't always wash my hands in clean water with soap before I eat. But I do have other options when I'm in the field-hand: sanitizer, hand wipes, etc.

PRINCIPLES

- Recognizing that absolute sanitation is difficult to attain, remember that making every effort to follow basic sanitation principles will limit infection and spread.
- The risk of spreading pathogens or weeds increases with the amount of mud, soil and organic debris that adheres to you, your shoes, your tools, vehicles, pets, etc.
- Avoid if possible, wet weather work (when water ponds and persists on the trail).
- Work sites can be different parks, or different areas within the same park. Consider a change in vegetation type, watershed divide or recreational focus a good indicator that you have changed work sites.

STEPS

1. Build time into your schedule for hygiene.
2. Work smart and avoid off-trail travel whenever possible. Establish routes and areas of entry/exit.
3. Arrive on site with clean equipment, vehicles, tools and gear: no soil, vegetation, or debris on any surface.
4. When working in botanically-rich areas or around sensitive species, after removing dirt and vegetation, incorporate sanitation with Isopropyl alcohol or 10% bleach solution.
5. Minimize the movement of soil and leaf litter. Keep generated debris in the work site. When large piles are produced, reduce fire hazard by lopping and scattering loosely on site.
6. Prior to leaving the work site, remove any soil, vegetation or other debris. Scrub, brush, and pick off soil and debris from shoes, saws, vehicles, and other equipment. This is 99% effective at removing infectious propagules and weed seeds.
7. When water is used, ensure that no erosion occurs or waterways are contaminated. When working in sensitive sites, disinfect at a designated decontamination site.
8. When working with contractors, require that they follow the same basic hygiene principles.
9. Reward yourself and your crew for a job well done!

Stiff Bristled broom

This is my work horse cleaner. It takes up very little room, has stiff bristles to knock mud clods off and does not run out of juice! It cleans truck beds, wheel wells, tires, etc. It also helps move rattlesnakes off the trail.

Isopropyl Alcohol bottle and Sprayer

To avoid having to mix bleach every day, I carry around a bottle of 70% isopropyl. When I need to sanitize my tools between pruning, or my shoes when I change parks or work around sensitive species, I pour some in my squirt bottle and spray after removing debris! Store the alcohol in its original bottle to avoid evaporation. If you are using big equipment, get a back pack or 2-gallon sprayer and mix with bleach. Don't forget to get the muck and mud off first.

Managed relocation under a changing climate: an interdisciplinary perspective

Gina Darin, California Department of Water Resources

One possible management approach to climate change is translocating individuals of a species whose current range is expected to become too hot or dry, to areas outside of its current range that are projected to be more suitable under future conditions. The Managed Relocation symposium on December 4, 2017 at UC Davis was hosted by the Coastal & Marine Sciences Institute and the Delta Science Program to explore this possibility. Scientists and managers came together who are considering managed relocation in a variety of systems to inform decision making. Cal-IPC Board members, Heather Schneider (Santa Barbara Botanic Garden) and Gina Darin (CA Dept. of Water Resources), along with Cal-IPC Board alum John Randall (TNC California) were in attendance. To fully consider this intervention, scientists and managers need to understand the ecological, economic, ethical, and legal ramifications. Risks to the individuals being translocated and risks to the recipient ecosystems need to be carefully weighed.

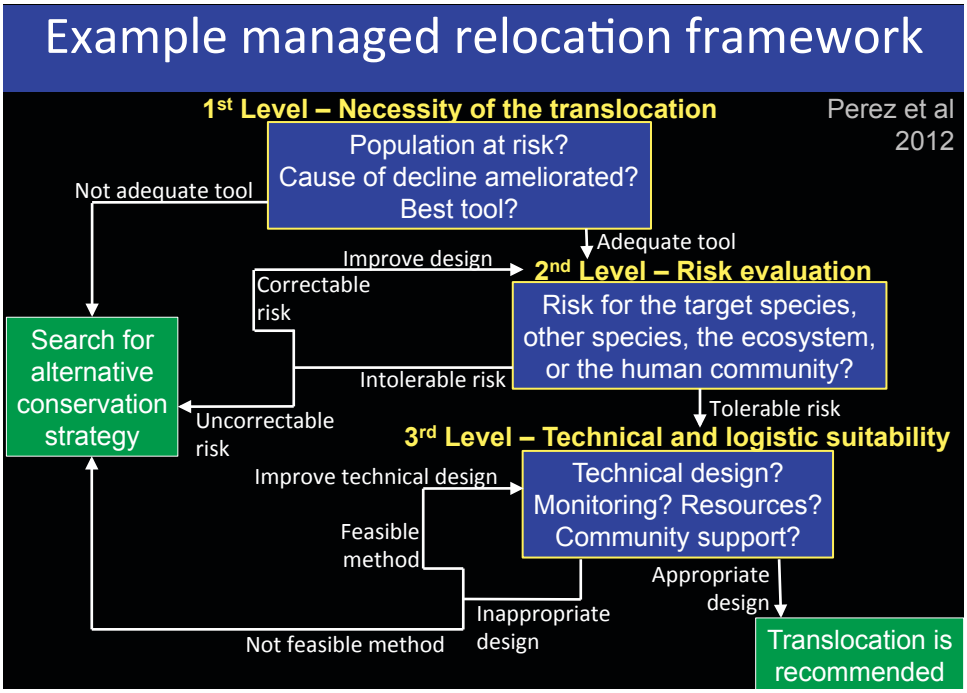
The symposium began by defining the scientific, legal, economic, social, and ethical issues, which highlighted the uncertainty and limited information available regarding managed relocation. Agencies presented perspectives from the Great Barrier Reef to the Rocky Mountains to the Sacramento-San Joaquin Delta. The latest scientific advancements concerning managed relocation were presented, especially emerging experimental approaches to test expectations, hypotheses, and approaches. Attendees then participated in breakout discussions by system: terrestrial, estuarine, freshwater, and marine. The theme that emerged is that scientists and managers need more information, better risk assessment tools, more experimentation, and robust monitoring.

Uncertainty is high because the risks of managed relocation may be high, and in most cases, costs are expected to be high. Big questions remain surrounding what we value and how far we are willing to go to protect it. "In 2050, what will we would have hoped this group came up with in 2017?" Ted Grosholz, UC Davis, concluded that. We need to identify and articulate not only our conservation goals and objectives, but also the human benefits of managed relocation. We need better information about risks to target species and recipient ecosystems, and we need success criteria, so we know when managed relocation has succeeded.

HIERARCHICAL DECISION-MAKING SYSTEM FOR TRANSLOCATIONS.

The first step is to evaluate whether translocating individuals is necessary for the conservation of a threatened species or population (1st level). Subsequently, the inherent risks involved are assessed (2nd level) and the methodological design of the translocation is evaluated (3rd level). The negative evaluation of the first level indicates that the project should not be carried out and alternative conservation strategies should be found. Conversely, a negative evaluation of the second and third levels may be overcome if the translocation's design is improved.

Taken from: Pérez, I. et al., What is wrong with current translocations? A review and a decision-making proposal. Front Ecol Environ 2012; 10(9): 494–501. Wiley.



Example Managed Relocation Framework slide from the symposium introduction illustrates some of the complexity in the decision-making process. Slide by Marissa Baskett, UCD CMSI. Content from Perez et al 2012.

FOR MORE INFORMATION

Link to Symposium program: https://cmsi.ucdavis.edu/events/interdisciplinary_persp_translocations_symposium_dec42017/index.html

Link to video recording of symposium presentations: http://ats.ucdavis.edu/ats-video/?kpid=0_1fqf4n3g

Greg Backus, UCD postdoc, and Nir Oksenberg, Delta Stewardship Council, are preparing a publication summarizing the event for the San Francisco Estuary and Watershed Science, an open journal: https://escholarship.org/uc/jmie_sfews.

Join us in Monterey this year to share the latest in invasive plant biology and management.

SYMPOSIUM FEATURES

Stewarding biological diversity is inherent in Cal-IPC's mission. Protecting cultural and intellectual diversity is important to our success as well. The 2018 Cal-IPC Symposium explores the ways our work spans these areas. Our program includes talks, posters, trainings, discussion groups and field trips on a range of topics addressing invasive plants and their management. Connect with colleagues from across the state, and get the latest updates on effective tools, relevant research, and strategic management approaches.

Check out trade exhibits from our sponsors, discuss the student paper/poster contests, vote in the annual photo contest, cheer for the awards, and enjoy the social hour with raffle and silent auction – you could leave a winner! Stay for the final day and join a field trip to explore conservation efforts and invasive plant management in and around Monterey.

TRAININGS:

- Invasive Plant Management 101
- Calflora's Weed Manager
- Best Management Practices for Controlling Phytophthora in Restoration

SESSION TOPICS INCLUDE:

Revival of Weed Management Areas, Economic impact of invasive plants, Arundo control projects, Coastal management efforts, Aquatic weeds, Diversity and inclusion in land management, Other invasive species (such as nutria, water snakes, and shot hole borers), Fire ecology and post-fire recovery, Grasslands management, Restoration approaches, Aerial mapping and management, Outreach and communication, and much more.

FIELD TRIPS:

1. **From bombs to biodiversity** (Full day) Visit Fort Ord National Monument.
2. **Salt water to fresh water and everything in between** (Full day) Visit biologically rich Elkhorn Slough estuary and Watsonville wetlands.
3. **From char to verdant** (Full day) Visit the Mitteldorf Preserve after the 1,000+ acre Soberanes Fire.
4. **Righting the upside-down river** (Half day) Visit a cutting-edge partnership to restore the Salinas River.

SPECIAL SPEAKER:

Greg Haubrich, Washington State Noxious Weed Coordinator

OUR VENUE

We're lodging and conferencing on the coast at the Monterey Hyatt Regency. Nestled within 22 acres of soaring Monterey pines, the hotel is close to downtown Monterey, Cannery Row, the Monterey Aquarium, the Monterey Airport, and the Peninsula's most well-known attractions. Our reserved room rate is $125 for single/double occupancy, now through October 1. Use the link on our site to make your reservation.

A great opportunity to network, learn, and celebrate! Photo: Bob Case

REGISTRATION

Visit cal-ipc.org/symposium to register, find information about the Monterey Hyatt Regency, submit an abstract proposal, participate in the photo contest, and find more Symposium information.

Snapshots from the field

Cal-IPC's members and partners are working hard in the field to protect California's open spaces. Last year, several submissions to the Photo Contest showcased conservation projects featuring weed management strategies with dynamic results. Below, several land managers (and part time photographers) share a quick summary of their work battling invasive plants.

Pepperweed up to a horse's belly in Mojave Narrows Regional Park.

Mojave Narrows Regional Park
Jackie Lindgren

Much of the upper and middle reaches of the Mojave River floodplain are heavily infested with perennial pepperweed *(Lepidium latifolium)*. The heavy infestations start near the upstream edge of Mojave Narrows Regional Park, situated between Victorville and Apple Valley. The effects of this immense, water-born seed source are now seen as far downstream as Helendale, Silverlakes, and even Barstow — representing an approximate river reach of 40+ miles. The pepperweed is out-competing many native species common to upper floodplain terrace, mesic riparian, and wetland zones, including cottonwood *(Populus fremontii)* seedlings, willows (*Salix* spp.), cattails *(Typha latifolia)*, bulrushes *(Scirpus, Bolboschoenus,* and *Schoenoplectus* spp.), saltbush (*Atriplex* spp.), and a variety of native forbs and grasses.

Perennial pepperwood has been spreading exponentially since its apparent incipient encroachment about 6-8 years ago, and needs to be controlled or suppressed to the extent possible to prevent further spread. The Mojave Desert Resource Conservation District is currently working closely with the California Department of Fish and Wildlife, Mojave Water Agency, San Bernadino County Department of Parks and Recreation, San Bernadino County Flood Control District, and several private landowners along this river reach to initiate planning and hopefully first-stage treatment. In 2018, we hope to start at the Regional Park and proceed downstream to the geologically historic Narrows (Highway 18). Our application contractor, Forrester and Associates, will use herbicide application as the primary treatment tool, along with other possible integrated approaches. These approaches (and supporting application techniques and products used) will depend upon several biological and environmental factors, including infestation density and distribution, treatment timing, degree of mixed plant composition within infestation segments, soil texture and moisture, degree of inundation or frequent flooding, seasonal groundwater levels, etc. Retreatments will be necessary to maintain suppression or control for this very difficult invasive plant.

Redwood Community Action Agency
Amy Eberwein

As part of an early detection, rapid response weed eradication effort, Redwood Community Action Agency has been using chemical herbicide treatments on several invasive plant species including Himalayan knotweed *(Persicaria wallchi)* in Humboldt and Del Norte Counties.

The photos show the effectiveness of treatment after only one year. Foliar applications of glyphosate are administered once per year in the fall when plants are senescing. This method maximizes the amount of herbicide that is taken in by the roots of the plant. Follow up treatments will continue for 3 to 4 years to entirely eradicate the infection.

Catalina Island Conservancy
Julia Parish

The Catalina Island Conservancy's Catalina Habitat Improvement and Restoration Program (CHIRP) joined forces with Southern California Edison, the City of Avalon and the Santa Catalina Island Company to remove the largest stands of giant reed *(Arundo donax)* and pampas grass *(Cortaderia selloana)* on Santa Catalina Island. Giant reed and pampas grass are invasive grasses that negatively affect riparian ecosystems, increase fuel loads for wildfire, and reduce habitat availability for native species. Both grasses were introduced to the island through ornamental trade as landscaping plants, but also disperse from the mainland during large storm events riding either the wind or waves. Giant reed has been documented taking root on windward beaches after large rainstorms hit the Southern California coastline. The Conservancy's invasive plant project aims to remove all known populations of giant reed and pampas grass from the Island to prevent interisland dispersal.

In February 2017, Conservancy staff and a hearty crew from the non-profit, Ameri-

Himalayan knotweed treatment before and after by the Redwood Community Action Agency.

Before and After removing Aruno donax *at Baker's Dam*

can Conservation Experience, worked on a one-acre restoration site located in Avalon Canyon. The project's first stage consisted of mechanically cutting the dense stands of giant reed, which had reached more than 20 feet in height, using loppers and brush cutters. After the giant reed and pampas grass were trimmed to soil level, the piles of cut vegetation were hauled out of the ravine by a group of alternative spring break students from the University of Colorado-Boulder, to be disposed of at the municipal composting facility. Over two tons of invasive plant matter was cut, sorted, carried and hauled out of the steep canyon restoration site. A fall application of Rodeo© and Habitat© on resprouts produced positive control results. The Conservancy's CHIRP staff intend to monitor the management site for five years and spot treat recruits or resprouts. This is a collaborative management project between multiple island stakeholders and volunteer organizations, which will lead to the restoration of a unique riparian habitat above the town of Avalon.

Mid Klamath Watershed Council
Tanya Chapple

Do you want to know about oblong spurge?
Well, it isn't funny, in fact it's a dirge.
It does better plants harm.
So, we use our strong arm.
Someone must stop this terrible scourge.

The Mid Klamath Watershed Council (MKWC) works to remove priority invasive plants in Northern California, across the boundaries of Humboldt and Siskiyou Counties, and the boundaries of the Six Rivers and Klamath National Forests. Our service area is remote, rural, and vast. The Mid Klamath region contains eight population centers and scattered homesteads along 140 miles of Klamath River. The largest of these towns is home to 1,200 people. The rest of the populations fall between 100 and 600, with a total population of about 4,000. The US Forest Service is responsible for 95% of the land in this area, and much of the watershed area comprises the ancestral territory of the Karuk Tribe. MKWC works closely with the Forest Service and the Karuk Tribe Department of Natural Resources to prioritize locations and species needing removal.

As a grant funded organization, our largest challenge to effectively address invasive plant populations is the ephemeral nature of the grants themselves. Addressing invasive species is a long-term commitment, lasting far beyond a one-year grant cycle or rotations of political change. Funding changes cause an annual gain or loss of ground we can cover. Losing ground before eradication or containment of populations is achieved can negate previous work. Invasive weeds continue to spread and impair ecosystem resiliency. Gaining ground is great, but also must be sustained. A gain can quickly lead to a loss of ground when funding cycles change. Despite funding challenges, our success is evident on the ground. We remain flexible, strategic, and quick to respond. We engage staff, volunteers, and youth, training them to know invasive plant threats and how to remove them. We utilize early detection and rapid response, working across borders, partnered with agencies, Tribes, and other nonprofit organizations. We aim for landscape-level improvements and efficacy at a larger scale. Our long-term success comes from a community involved in the removal of invasive plants and motivated to conserve the unique biodiversity of our home, here in the Klamath Mountains.

Oblong spurge in the Mid Klamath Watershed

Want to share images from your project? Submit photos to the 2018 Photo Contest at cal-ipc.org/photocontest. Contest opens in July. Good luck!

Individual Membership

Stewardship Circle	*$1000*
Champion	*$ 500*
Partner	*$ 250*
Professional	*$ 100*
Friend	*$ 50*
Student	*$ 25*

Members receive Dispatch *and discount on Symposium registration!*

Organizational Membership

Benefactor	*$2000*	*Pro membership for 8*	*Quarter-page in newsletter*
Patron	*$1000*	*Pro membership for 6*	*Eighth-page in newsletter*
Sustainer	*$ 500*	*Pro membership for 4*	*Logo in newsletter*
Supporter	*$ 250*	*Pro membership for 3*	*Name in newsletter*

Organizations receive Professional membership for their staff and newsletter recognition for 12 months!

See cal-ipc.org for full membership details

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CALIFORNIA INVASIVE PLANT COUNCIL

1442-A Walnut Street, #462
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WILDLAND WEED CALENDAR

CNPS PLANT TRAINING WORKSHOPS
June 5-7, Intro to Plant ID, So. Cal, Big Bear, CA
July 10-12, Intro to Plant ID, No. Cal, Truckee, CA
August 7-9, Wetland/Riparian Plant ID, Imperial Beach, CA
www.cnps.org/workshops

Cal-IPC Bay Area Volunteer Training
June 16, Santa Rosa, CA
September 29, Alviso, CA
www.cal-ipc.org/wva

Marine and Freshwater Invasive Species Conference
August 27-29, Beijing, China
conferences.aehms.org/mfis-china/

Bay Delta Science Conference
September 10-12, Sacramento, CA
scienceconf2018.deltacouncil.ca.gov/

Upper Midwest Invasive Species Conference and North American Invasive Species Management Association
October 15-18, Rochester, MN
www.umisc.net

Cal-IPC Symposium
November 7-10, Monterey, CA
www.cal-ipc.org/symposium

California Association of Resource Conservation Districts Annual Conference
November 15-18, Sacramento, CA
www.carcd.org

2nd Annual Innovations in Invasive Species Management Conference and Workshop
December 12-14, Nashville, TN
www.invasiveplantcontrol.com/conference17/

"In California's Los Padres National Forest the U.S. Forest Service is working on a removal project for the tree that involves a tamarisk-eating beetle also native to China and Russia. Sometimes it takes one to know one."

— Ari Phillips, March 16, 2018, "These Are the Worst Invasive Species in the West" on Earther.com

"Connection to nature is not a dispensable amenity but, rather, is essential to the quality of life, health, social well-being, prosperity, and productivity of all Americans."

— From "The Nature of Americans" by Dr. Stephen Kellert and DJ Case & Associates, 2016