NEWSLETTER OF THE CALIFORNIA INVASIVE PLANT COUNCIL

# Dispatch


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*Protecting California's environment and economy from invasive plants*



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# What the EPA really says about glyphosate

**By Executive Director Doug Johnson**

In recent public meetings where the use of herbicides for restoration has been questioned, I've heard the claim that "the US Environmental Protection Agency (EPA) says that glyphosate harms 93% of federally listed species." This is not true, but it's an understandable interpretation.

EPA Biological Evaluation (BE) of glyphosate classifies 1676 of 1795 federally listed species in a category of "Likely to Adversely Affect" (LAA). That may sound bad, but here's the context.

Section 7 of the Endangered Species Act requires agencies to consult with the US Fish & Wildlife Service (FWS) when the agency's proposed actions might affect listed species or critical habitat. Registration of pesticides by the EPA is one such action. The required consultation process involves (1) EPA producing a BE as a coarse screening of all listed species to filter out any that conclusively have no potential to be impacted by the pesticide, and then (2) the FWS completing a Biological Opinion on all of the LAA species to determine if any are actually at risk of being harmed. For glyphosate, the first step has been completed, but the second has not.

**The fact that a misleading bureaucratic label can provoke such confusion on the part of decision makers is almost comical.**

This process is laid out in the EPA publication, "Revised Method for National Level Listed Species Biological Evaluations of Conventional Pesticides." The document makes clear that all species will be classified as LAA" unless they can be ruled out as "Not Likely to be Adversely Affected" (NLAA) by meeting criteria like: "Based on conservative assumptions, is it likely that <1 individual is exposed?" or "Based on conservative assumptions, will <1 individual have impacts to survival, growth or reproduction?" or even "Is the species most likely extinct?" This is a very coarse screen.

Of the listed species classified as LAA, 56% are plants. It's no surprise that glyphosate, a nonselective herbicide, would harm them if sprayed on them. Another 25% of the listed species are aquatic animals or amphibians. Because the BE includes not just glyphosate, but also formulations of glyphosate, of course there could be impacts if a formulation not approved for aquatic use were to be mistakenly applied to an aquatic environment, because it contains surfactants known to be harmful to aquatic life.

Finally, the BE's assessments include harm to the other organisms that a listed species depends on for "prey, pollination, habitat, or dispersal." Given that plants form the foundation of the food web, and that glyphosate is a nonselective herbicide that will harm plants, it's no wonder that pretty much everything *could* be affected.

This misinterpretation of EPA's findings has been promoted in many settings, including by a member of the California Wildlife Conservation Board, where it has contributed to rejection of restoration proposals that use glyphosate. The fact that a misleading bureaucratic label can provoke such confusion is almost comical, but the stakes for the environment are high. Continuing to spread this misinterpretation is a disservice to California's environment.

The Cal-IPC Board of Directors has approved a "Policy on the Use of Herbicides for Land Stewardship" that will support our continued efforts to engage stakeholders and decision makers on this key topic. Find it at www.cal-ipc.org/herbicidepolicy.

# Wildland Weed News


Illustration by Ryan Jones

## CAL-IPC UPDATES

**2024 Symposium –** Join us Online, Oct. 23-25. See details on page 9. Stay tuned for a schedule of in-person trainings.

**Herbicide policy –** Cal-IPC has adopted a policy on the importance of herbicide as one of the tools for controlling invasive plants, supporting our advocacy efforts locally and state-wide. Read it at www.cal-ipc.org/herbicidepolicy

**Plant assessments –** A new grant from the Western IPM Center will support our continued work with partners in Washington, Oregon, Nevada, and Arizona to conduct risk assessments of potential new invasive plants.

**WMA support –** Cal-IPC continues to work with CDFA to get funding to county Weed Management Areas with state funds secured in 2022 by our advocacy. We are also providing technical assistance for WMAs to plan strategic projects.

**AB-2509 –** Cal-IPC worked with Assembly Member Ash Kalra (D-San Jose) to introduce a bill to the California legislature defining "invasive species" and "integrated pest management" in code.

## ON THE COVER

In this photo, crew members from ACS Habitat work to break untreated *Arundo donax* away from native vegetation before herbicide application. Widely distributed, *Arundo* threatens riparian systems and watersheds from Monterey to San Diego. Read about work being done to remove *Arundo* in San Ramon using volunteer crews on page 6.

This issue's cover was a submission to the 2021 Cal-IPC Photo Contest. Join the contest and share your work with the land management community. More info at www.cal-ipc.org/photocontest. Cover photo: Jasmine Ruvalcaba, Resource Conservation District of Monterey County.

**Stinkwort –** Cal-IPC joined UC Santa Cruz researchers and others for a one-day workshop on the biology and control of *Dittrichia graveolens*. Read more on page 8.

## OTHER NEWS

**Co-stewardship –** The California Biodiversity Network held a February conference, "Indigenous Co-Stewardship of Public Lands: Lessons for the Future." Results will be published over time by the UC Berkeley Institute for Parks People & Biodiversity at parks.berkeley.edu

**Seed Bank –** *High Country News* (March 1 issue) features a cover article on restoration by liberating the native plant soil seed bank, including removal of invasive plants.

**Stinknet –** *The Sacramento Bee* (and others) covered *Oncosiphon pilulifer*, a weed spreading from southern California into Arizona.

**IPBES –** The Invasive Alien Species Assessment Report from the Intergovernmental Platform on Biodiversity and Ecosystem Services has been posted, along with a Summary for Policy Makers and factsheets on themes such as the role of businesses, stakeholder engagement, and interactions with climate change. See www.ipbes.net/ias.

**WCB –** The California Wildlife Conservation Board published a "2023 Year in Review" describing some of the 127 projects they were able to fund with $496 million.

**Land trusts –** At the first WCB meeting of 2024, the California Council of Land Trusts was awarded $5 million to build capacity for land trusts across the state and help them protect one million acres of land over the next three years as part of a push toward 30x30 goals.

**Connectivity –** A new bill in the California legislature (AB-1889, Friedman) aims to require community general plans to include a wildlife connectivity element.

**Workforce –** A December 2023 article in Calmatters describes an effort in San Diego County to provide restoration skills training for unhoused people living in urban canyons. San Diego Canyonlands paid workers through an Environmental Career Opportunities habitat renewal training program.

**Fire mascot –** Move over, Smokey Bear. Burnie the Bobcat and his friends want people to know about good fires. The Pyro Futures project provides a planner's perspective to our path forward, and the book "Design by Fire" lays out multiple future scenarios, including "Pyric Commons," "Wrath of Fire," and "Right to Burn." Vote for your favorite new mascot at www.pyrofutures.com/mascot

**EDRR handbook –** The California State Parks EDRR Handbook is available in the online resource library of the California Landscape Stewardship Network at calandscapestewardshipnetwork.org/resources-library.

**Delta symposium –** A recording of the November 2023 Delta Invasive Species Symposium is now posted on YouTube, featuring presentations on "understanding connectivity in an invaded estuary."

**English holly –** The December 2023 issue of *High Country News* featured an article on "Horrible holly: A festive plant runs amok" describing "the scientists and conservationists fighting to save the Northwest's forests from an invasive plant" (*Ilex aquifolium*, rated as "Limited" in California by Cal-IPC).

## YOUR MEMBERSHIP

Thank you for keeping your membership current. Note that your expiration date is shown on the mailing label of this newsletter. Cal-IPC's success in meeting its mission depends on your vital support.

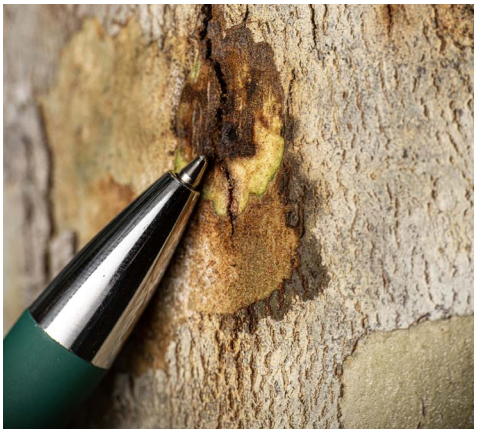
# Bad news borers arrive in San Jose

Randall Oliver, UC Statewide IPM Program

A tiny tree-killing beetle that has plagued Southern California for more than a decade has recently been identified in Northern California, in the city of San Jose. Known commonly as invasive shothole borers (ISHB), the sesame seed-sized beetles attack and reproduce in more than 65 species of trees found in California, including both native and introduced landscape trees. In San Jose, infested trees have been identified in two of the beetles' favorite host species, sycamores and box elders. Other highly susceptible hosts, such as willows and cottonwoods, are also common in the city's riparian areas.

Surveying and trapping efforts are just gearing up, so the full extent of the infestation is not yet known. However, based on the high level of infestation in some trees, it appears the beetles have been in the area for some time, perhaps several years. Additionally, it is possible they exist elsewhere in Santa Clara County and beyond.

Previously, the beetles were known to be established in seven Southern California counties, including Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura. In addition, a single beetle was found in a trap in Santa Cruz County in 2014 and in San Luis Obispo County in 2016, but no further beetles were detected in either county. A multi-agency working group has been surveying and monitoring the beetles' presence in California for several years, noting that they have been moving northward and eastward from established areas in Southern California, possibly through the movement of infested green waste and firewood. The beetles are not strong flyers.



*Entry holes are round and about 0.85 mm wide, the size of a ball point pen tip. Photo: Krystle Hickman, UC IPM.*

*Galleries within ISHB infested castor bean. Photo: Akif Eskalen, UCANR.*

Many of the trees infested by invasive shothole borers decline significantly, become safety risks, and eventually die. The beetles have killed hundreds of thousands of trees in Southern California. How can such small beetles do so much damage to trees? In part, because they can multiply so rapidly without natural enemies to keep them in check.

In addition, they are not acting alone. Although the beetles tunnel through the live wood of trees, they do not eat it. When they bore into trees, creating the tunnels where they will raise their young, the beetles also introduce a Fusarium fungus that is their food source. Over time, that fungus expands and leads to a disease that blocks the tree from transporting water and nutrients, killing the tree.

As in Southern California, it is probably too late for an early detection and rapid response program to eradicate the ISHB/Fusarium Dieback pest/disease complex. However, the threat can be effectively managed and is not a reason to panic. The most important step in the management process is conducting an ongoing visual survey and trapping program that identifies the most severely infested trees. These "amplifier trees" can be a source of beetles to infest other trees in the area. ISHB/FD can be kept under control through the removal of amplifier trees, combined with ongoing active monitoring of infestations.

*Dr. Beatriz Nobua-Behrmann leads a training session to help Southern California volunteers monitor and report sightings for invasive shothole borers. Photo: Krystle Hickman, UC IPM.*

Additionally, insecticide/fungicide combinations can be applied via trunk sprays, soil drenches, soil injections, or trunk injections to save high-value trees, such as heritage trees. Lightly to moderately infested trees generally do not need to be treated and may be managed through selected removal of infested branches.

Since the beetles spend most of their life inside the host tree, identification of infestation relies on observation of signs and symptoms on the infested tree. The main sign of infestation is the presence of entry and exit holes in the trunk, branches, or both that are perfectly round and roughly the size of the tip of a medium ballpoint pen. Additional signs and symptoms can include wet staining around the holes, sawdust-like boring dust, gumming, and sugary buildup (common in avocado trees).

Since every host species responds differently to the pest/disease complex, the combination of signs and symptoms observed might vary. However, entry holes are always present in infested trees. Branch

*(Continued on page 14)*

# Preventing weed spread by preparing for wildfire

Doug Johnson, Cal-IPC

Land managers know that wildfire can be bad news for controlling weeds. Fires can clear overhead canopy, fertilize the soil, and activate seeds, all potentially invigorating invasive plant populations. More importantly, suppression activities — firefighters and equipment out on the landscape — can be major vectors for introducing and spreading weeds.

When a wildfire strikes, suppression efforts to contain it happen fast, with very limited time to influence how suppression activities happen. However, there are many decisions that can affect the risk of spreading weeds, and having key information at the ready can have an important impact on how suppression plays out.

A major piece of information is mapped "areas to avoid." These might be locations where a rare plant grows, where it is a high priority to avoid disturbance from people and equipment. "Areas to avoid" might also include locations of key weed infestations, which are vulnerable to being spread on boots, clothing, dozer tracks, and truck tires. If suppression personnel can plan ways to work around these areas without hampering their efforts, it can prevent significant weed spread.

*NPS Resource Advisors (READs) discuss resources at risk with fire suppression managers. Photo courtesy NPS.*

*Understanding fire suppression operations can help land stewards anticipate tactics that might have impacts, like tree felling and creating firelines. Photo courtesy NPS.*

Ideally, land stewards have taken the time to build relationships with the personnel who will be responsible for suppression when a wildfire occurs on the land they manage. This helps to iron out the type of information they will need and the best format. This information can then be kept handy as a guide in multiple places so it can be made available during an incident.

Along with the potential for moving weeds around on site, there is also the possibility that vehicles, equipment, and personnel can introduce new weeds to the site. Thus, as a prevention strategy, it is important that everything arrives at the site free of weeds or weed seeds.

One of the key elements for ensuring weed-free vehicles is setting up and using a wash station, which allows for the cleaning of soil and vegetation from a vehicle using high-pressure water. The wash water is captured and weed seeds are filtered out.

Joanna Clines, of the Sierra National Forest, recommends that contract specifications require wash stations to "include elevated tracks with slots or perforations that allow wash water and weed seeds to be deposited in a containment area below." This helps prevent contaminated mud and water from being driven through and seeds or propagative plant parts being picked up and transported by tires, which she has seen with many weed wash set-ups.

One important location for a major fire response is the incident command post (ICP), where equipment is staged. When these locations are infested with weeds, the weeds can be transported by vehicles, equipment, and personnel to areas where firefighting work is being conducted. For regularly used ICP sites or other likely staging areas, controlling weeds can be an important way to limit such spread.

*For weed wash stations, raised tracks are important to keep vehicles from driving through weed seeds shed from other vehicles. Water is captured, filtered, and re-used. Photo: Joanna Clines.*

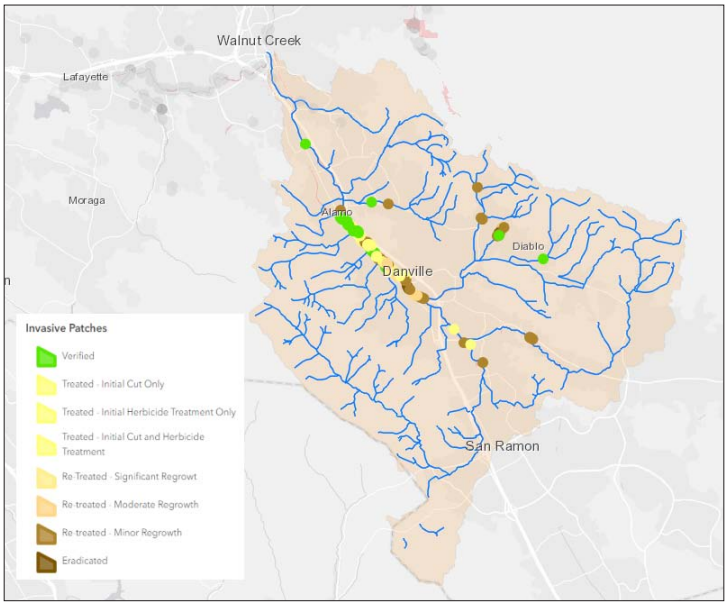
Cal-IPC worked with the National Park Service (NPS) to produce a guide on how land managers can prepare for wildland fires. At the 2023 Cal-IPC Symposium, National Park Service Ecologist Steve Buckley gave a talk and led a workshop on fire readiness. Download the 12-page booklet, "Preparing for Wildland Fire: A Step-by-Step Guide for NPS Invasive Plant Managers" at www.cal-ipc.org/fireprep. Find recordings of Steve's talks in the Symposium archive at www.cal-ipc.org/2023-symposium-video.

# San Ramon Creek's *Arundo* is on the road to eradication

Mike Anciaux and Dick Heron, Friends of San Ramon Creek

San Ramon Creek, a tributary to Walnut Creek in the San Francisco East Bay, spans 19 miles with 131 miles of tributaries, flowing through suburban residential areas year-round. Founded in 2012, the Friends of San Ramon Creek (FSRC) is a volunteer group dedicated to promoting a healthy creek environment.

In 2013, we assessed threats to the watershed's health and identified the invasive *Arundo* donax as the primary menace. Despite finding numerous infestations covering thousands of square feet, our small group of volunteers committed to eradicating this threat through a multi-year project.




*San Ramon Creek Arundo Infestations (end of 2023)*

Over subsequent years, we formed a dedicated volunteer team and implemented a successful strategy, removing significant *Arundo* patches. This success attracted grants, supporting both volunteer initiatives and contractors to expedite the project.

Introduced in California in part to stabilize creek banks, *Arundo* has become an invasive menace, spreading far beyond its intended footprint. This tall grass, reaching 25 to 30 feet in height, resembles bamboo and grows rapidly, up to 4 inches per day during the growing season. Thriving near waterways, it diverts water flow, causing erosion, and outcompetes native vegetation in low-altitude streams and rivers across California. *Arundo*'s aggressive growth consumes large amounts of water, depriving surrounding vegetation of vital resources. Its presence offers little habitat or food, blocks wildlife corridors, and poses a significant fire hazard. Its unintended spread has resulted in adverse ecological consequences, undermining its initial purpose.

In the San Ramon Creek watershed alone, we mapped about 150 patches of *Arundo* covering 4.5 acres of land. Patches were highly visible but still small enough that they could be removed without heavy equipment. However, much of the *Arundo* was on private property and on very steep banks. Removal efforts began with smaller patches and expanded from there.

In 2018, we began using ESRI's ArcGIS Online to map *Arundo* patch locations, combining aerial views for identification and on-site verification, resulting in mapping 140,000 sq ft in 2020. We now employ both ArcGIS Online and Field-Maps, a mobile app, for web-based and on-field map access and editing, visible publicly at www.wcwatershed.org/arundo-map.html.

In 2019, FSRC committed to weekly workdays for *Arundo* removal with a growing volunteer group. Over the years, the total amount of discovered *Arundo* increased as patches expanded, and additional patches were found. The treated *Arundo* square footage has increased yearly with a growing volunteer base, improved

*Volunteers working as a team to cut, haul, and chip the* Arundo.

techniques, and extended seasons. FSRC secured grant funding to enlist contractors for additional support.

By the end of the 2023 *Arundo* removal season, we achieved an 85% removal target, totaling 150,000 sq ft., in the sub-watershed. Sites where *Arundo* was removed are now under monitoring and re-treatment and should be completely eradicated in the coming years.

The effort's success owes much to the dedicated team of volunteers working every Friday morning during the *Arundo* cutting season, from April 15 to October 15. Mainly retired or with job flexibility on Fridays, these volunteers enjoy the exercise, camaraderie, and sense of accomplishment. A key factor in FSRC's success is the team's input, implementing numerous innovations to streamline the process, ensuring a continuous flow of *Arundo* from cutter to dumpster, with everyone actively engaged.

*A partially removed patch of* Arundo *with 30 ft-tall stalks.*

## Success depends on preparation

The *Arundo* removal process begins by identifying high-priority patches, with emphasis on upstream locations to prevent downstream propagation. Gaining landowner permission is crucial, achieved by researching county records and reaching out through letters, emails, or direct contact. An on-site assessment by an FSRC representative, in collaboration with the owner, determines the best approach for volunteer access and the optimal method for stalk removal.

Upon securing permission, a small FSRC team readies the site, often on challenging, steep slopes. To improve safety and minimize environmental impact, makeshift staircases using staked ladders are implemented. Hauling *Arundo* up steep slopes is facilitated by temporary plywood ramps, preventing damage to the terrain.

For patches across the creek, temporary bridges are constructed to avoid walking in the water. Work is conducted within the permitted timeframe (April 15 to October 15), authorized by the California Fish and Wildlife Department Operations Letter. Rhizome digging is prohibited, and precautions are taken to avoid disturbing nesting birds or other animals. Coordination with the CDFW is maintained by notifying them of each new work location.

## A dirty, difficult, but rewarding job

A team of 10 to 12 volunteers can remove *Arundo* very efficiently. One or two individuals use loppers to cut stalks to approximately six inches. Each cutter has a helper gathering and bundling the cut stalks. Haulers transport bundles to the ramp's base, where another volunteer attaches a rope with a large hook for efficient pulling up the ramp. Once at the top, a team member transports the bundle to the chipper, aiming for a seamless process without reassembling or stopping.

After an area is cleared, a team member uses a backpack sprayer to treat the cut stumps with a glyphosate-based herbicide approved for riparian use, with added marking dye for easy tracking. Treatment success varies based on stump visibility and the patch's regrowth tendency, influenced by rhizome maturity and energy storage.

Follow-up monitoring and re-treatment is vital to our process. A team of 7 stewards manages specific patches. In the first year post-cutting, frequent visits (every 3 to 4 weeks) are essential due to regrowth. Some patches may require recutting if they grow too tall before treatment. Retreatment frequency ranges from monthly for fast-growing patches in the initial year to once a summer for older patches cut years ago. FSRC declares a patch "eradicated" after 24 months without regrowth. We have seen it skip a year, then regrow.

## Grant funding, volunteer capacity, and know-how

FSRC's volunteer team success has enabled us to secure grant funding. Initially, we received a modest yearly allocation from the Walnut Creek Watershed Council, covering equipment rentals, supplies, and contractor-led removal on small sites. As our achievements grew, a grant from the Contra Costa County Fish and Wildlife Committee expanded our efforts. In 2023, an $84,000 grant from the CDFW Office of Spill Prevention Response/National Fish and Wildlife Foundation funded a contractor for significant patch removal. Despite the grant, our volunteer team surpassed the contractors' *Arundo* removal.

Operating informally, FSRC partners with the Contra Costa Resource Conservation District as our fiscal sponsor, aiding financial transactions and grant applications — a crucial element in our success.

The FSRC team eagerly anticipates the 2024 *Arundo* removal season, aiming to clear nearly all patches in the San Ramon Creek watershed (some owners remain unconvinced). Volunteer efforts are central, with hopes for grant support to tackle larger patches.

San Ramon Creek feeds into Walnut Creek, and *Arundo* infestations also affect creeks in Lafayette, Concord, and Pleasant Hill within the Walnut Creek watershed. FSRC collaborates with creek groups in these tributary watersheds, aiding their *Arundo* removal initiatives.

We encourage other community volunteer organizations to take on big projects. With a few committed leaders, strong collaborations, a well-organized volunteer team, a long-term strategy, and follow-through, great things can be accomplished. Learn more at www.wcwatershed.org/friends-of-san-ramon-creek.html.

All images courtesy of the Friends of San Ramon Creek.

# Stinkwort workshop: Biology, control, and management

Miranda K. Melen, University of California, Santa Cruz

Stinkwort (*Dittrichia graveolens*) is a fall-flowering annual in the Asteraceae family, producing yellow radiate flowers and wind-dispersed fruits. It grows in disturbed soils along transportation corridors, agricultural fields, construction sites, industrial areas, and hillsides. The plant can be distinguished by its sticky foliage and strong, camphor-like odor.

Native to the Mediterranean Basin in Europe, stinkwort has successfully invaded other continents, including North and South America, Australia and New Zealand, and South Africa. Stinkwort is a "late-seasonal annual," which means it germinates during the rainy season, spends several months as a cryptic rosette before bolting in June, and flowers from September to December. It disperses seeds from October through December.

In California, stinkwort was first observed in Santa Clara County in 1984 and has since spread throughout most of the state. The USDA lists stinkwort as a high-risk invasive species based on rapid spread and high impact potential. The CDFA describes stinkwort as a "noxious weed," and Cal-IPC gives it a "moderate" and "alert" rating. It is unpalatable to livestock and so contributes to the degradation of range quality, and exposure to its oils can cause a severe rash.

On February 15, 2024, a diverse group of nearly 130 participants met in San Jose and online for a hybrid workshop dedicated to stinkwort. The goals of the workshop were to disseminate information on stinkwort biology, control, and monitoring techniques, while fostering dialogue and collaboration among stakeholders. The meeting was supported by funding from the U.S. Department of Agriculture's (USDA) National Institute of Food and Agriculture (NIFA) program and sponsored by Valley Water, California State Parks, Cal-IPC, and UC Santa Cruz.

Invited talks covered topics from basic biology to management and policy. On the biology side, talks covered stinkwort phenology and impacts, response to disturbance and competition, seed bank dynamics, response of populations after fire, niche evolution, and insights from the native range. Applied talks focused on early detection and rapid response, the nuts and bolts of stinkwort control, managing populations along roadsides, gravel quarries as a vector for invasion, eradicating populations at the leading edge of invasion, and managing populations in sensitive habitats. The final talk summarized Cal-IPC's latest information on upcoming funding and policy opportunities, along with updates on USDA's nascent biological control program for stinkwort.

*Stinkwort growing in a mowed field in late summer in San Jose. Photo: Andrew Lopez.*

An interactive session facilitated small group discussions on stinkwort biology, control, vectors, early detection and rapid response, and impacts. The session structure enabled participants to circle through all the topics while exchanging ideas and establishing valuable connections. Everyone learned something new, and the room was buzzing! Online

*(Continued on page 14)*

*Participants walked to a nearby percolation pond managed by Valley Water to hear about the successes and failures associated with stinkwort management. Photos: Miranda Melen.*


*Photos(L-R): American Conservation Experience, Kevin Moncrief*

## *Connect with your colleagues at the 2024 Cal-IPC Symposium!*

Join us for our 33rd Annual Symposium! In a turbulent year, we have decided to hold the event online. We will miss seeing everyone in person, but we will relish the ability for all to participate without breaking the bank.

Theme sessions will explore the ways in which we can "get ahead of the curve" by focusing efforts on the early stages of the "invasion curve." This means employing strategies of prevention and early detection/rapid response — strategies that are simple conceptually but more complex in practice. Speakers will share their work at the local, regional, and statewide levels.

Other sessions will dig into a range of topics on invasive plant management and stewardship. We plan to hold in-person workshops throughout the year as well, so stay tuned for announcements of events. See you in October!

### SHARE YOUR WORK

We want to hear from you! Your research and insights inform our community. Submit your proposal for a full talk, lightning talk, or poster to the **Call for Abstracts by June 15**. Find guidance and a recording of our "How to Write and Submit an Abstract" workshop on our website.

Share your photos, too! The **2024 Photo Contest** will be open for submissions July 15 through September 15. Winners will be announced at the Symposium.

### 2024 STATEWIDE WMA MEETING

Join participants from Weed Management Areas across the state to share information on coordination, mapping, early detection, and collaborative projects

.

### SPECIAL SESSIONS:

- Prevention: The First Step in Protecting Resources
- New Arrivals and Expansions
- Herbicides: A Hot Topic

### OTHER TOPICS INCLUDE:

Restoration and recovery in diverse habitats; Protecting rare plants; Management tools and methods; Integrated Pest Management; Biocontrol; Art and weeds; and more.

### DPR CREDITS

We will apply for continuing education units from the California Dept. of Pesticide Regulation, including 2 units fulfilling Laws & Regulations requirements.

### SPONSORSHIP

Your organization can sponsor the Symposium! Help us keep registration affordable and support our work. Benefits for sponsoring organizations include free admissions, exhibitor space, recognition on Symposium materials, and Cal-IPC membership.

### STUDENTS AND EARLY CAREER

Student presenters who choose to participate in our Student Contests for talks and posters receive feedback from expert reviewers. Cash prizes are awarded to top presenters!

Students and emerging professionals, join the Career Panel and ask advice from the experts in land management.

**Limited Income and Student rates** are available for individuals who find registration costs prohibitive. We encourage field techs, conservation corps members, and other front-line staff to use this rate.

### REGISTER AND MORE

All the latest Symposium information is online. Submit an abstract, register to attend, sign up as a sponsor, enter the Photo Contest, and more at **cal-ipc.org/symposium.**

# Herbicide Calibration Survey results

Constance Taylor, Cal-IPC

From April to June of 2023, Cal-IPC surveyed conservation professionals regarding their use of herbicide calibration in wildland and non-row crop applications. We defined calibration as "measuring and adjusting pesticide applications to ensure even application of the pesticide over the target area at the intended rate." The purpose of this survey, funded by the California Department of Pesticide Regulation (DPR), was to gauge current trends and needs regarding herbicide calibration training.

Responses from this survey have helped Cal-IPC focus training opportunities to address on-the-ground needs of invasive plant management practitioners. Survey responses have also improved our general understanding of different barriers to calibration, which have guided us as we've designed new resources for wildland herbicide application. The overall goal is to make calibration information and skill-building more accessible, and therefore prevent over- or under-application of herbicide in wildland and non-row crop settings.

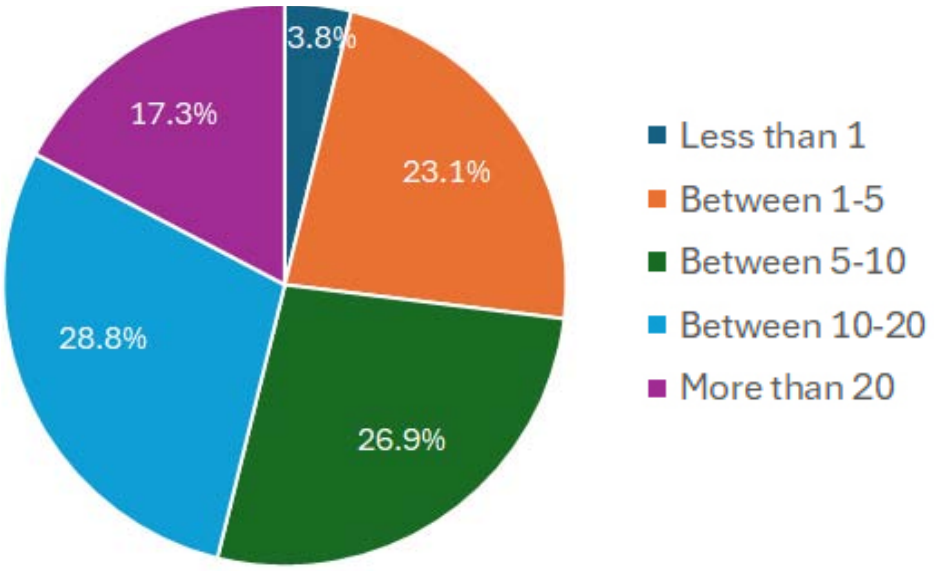



*Figure 1. Responses to the question, "Approximately how many total years have you applied herbicides throughout your career?"*

## Methods

The survey was initially sent to more than 300 practitioners via email. These contacts were gathered from DPR Continuing Education Unit registrants from the past three years of Cal-IPC's annual symposium, other Cal-IPC contact forms, and land manager staff of organizations throughout California. All people contacted were encouraged to forward the survey to colleagues. The target was 100 responses — ultimately, we received 104 unique responses.

The survey was made up of 20 questions, and survey respondents remained anonymous. Questions asked about application experience (Questions #1-4), settings and geography (#5, #6), frequency of herbicide calibration (#7-10), monitoring herbicide use and acreage covered (#11, #12), what application methods are commonly calibrated for (#13), most recent calibration training and interest in future trainings (#14-17), methods or equipment applicators would like more calibration training on (#18-19), and a short-response question for anything else the respondent wanted to add (#20).

**This survey is a useful starting point to determine what applicators are generally interested in learning more about.**

## Results

The majority of respondents (84.6%) had applied herbicides within the past 5 years. In this same 5-year timeframe, 13.5% said they did not use herbicides directly but were involved in or managed herbicide programs, and only 1.9% had not used herbicides or been part of a project that used herbicides.

It was interesting to note that the majority of respondents (68.9%) responded "yes" when asked if they manage herbicide training for applicators. It implies that within the network of people who this survey reached, many are in a position to recommend training and new tools to herbicide applicators they manage.

There was a wide range in years of application experience in the respondent demographic, with only 3.8% having less than one year cumulative experience applying herbicides (Figure 1).

The top three application methods reported were spot spray (100%), cut stump (87.4%), and broadcast spray (69.9%). Hack and squirt (56.3%) and basal bark (50.1%) were also common techniques reported, while wicking (35%) and injection, drill & fill, and hack & squirt (35%) were somewhat common. Uncommon application methods reported were submersed injection (aquatic) / granular spreader, drizzle, low volume drizzle, and granular broadcast (all 1%).

The top three settings practitioners reported having worked in over the past

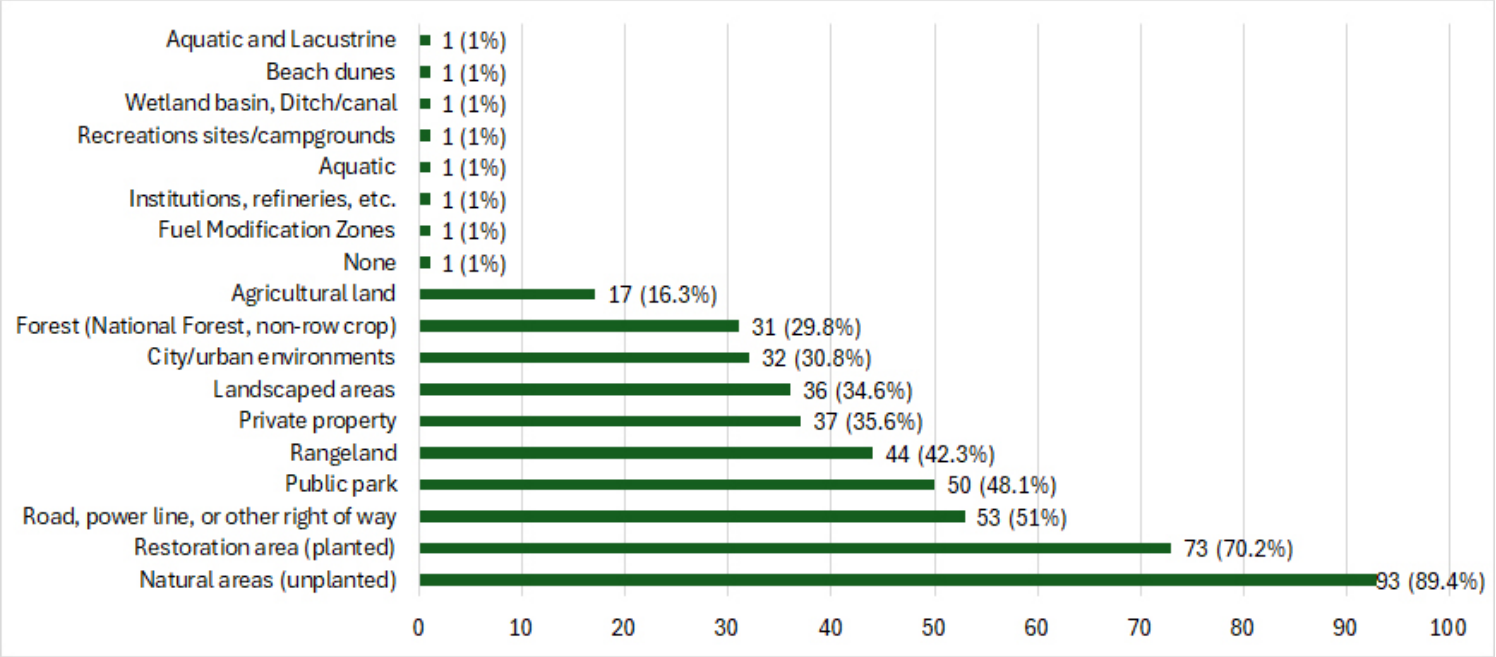



*Figure 2. Responses to the question, "Which setting(s) have you worked in within the last five years? Check all that apply."*

five years were unplanted natural areas (89.4%), planted restoration areas (70.2%), and road, power line, or other rights-of-way (51%). Responses indicated that 16.3% of practioners had worked on agricultural land, which could include non-row crops or a career change from row-crop settings to wildland or non-row crops within the last five years. See Figure 2 for all responses, including write-in answers.

Over one third (39.8%) of respondents had not calibrated their herbicide usage in the past five years. This is a significant amount, and points to a distinct need to improve access to calibration training and knowledge across the state. Of those who responded "no" to whether they had calibrated usage in the past five years (41 respondents), the number one reason given was that it did not help in the settings in which they typically apply herbicides (41.5%). The second reason was that people do not feel confident doing it on their own (26.8%), and the third was that people did not know how (19.5%).

To the question "Have you ever received calibration training?," 27.9% of all 104 respondents had never received calibration training. Of the 72.1% who had received training, approximately half had received training within the last three years.

Sixty nine percent of respondents said they would be interested in receiving calibration training, while 14.4% reported they would not be interested in receiving calibration training. The rest responded "maybe," giving varied reasons for what would attract them to a training, such as what techniques and equipment the training focused on, cost of training, whether the respondent's employer is phasing out herbicide use, scheduling conflicts, and whether or not a comparison of different techniques were to be included.

Regarding the type of equipment people are interested in learning to calibrate, most respondents were interested in learning more about backpack sprayers for spot spraying (83.3%). Spot spraying was also the most used application method reported, with the highest level of interest in respondents wanting to learn more about how to calibrate this method. As such, we have been working to meet this demand by creating lesson plans and training focused on refining spot spraying calibration techniques. This has included creating hands-on lesson plans focused on spot-spray calibration in variable vegetation swaths, and calibrating using volume per acre versus percent solution, so applicators are more aware of how much herbicide they are using per acre.

Many respondents also showed interest in learning ways to calibrate other types of manual equipment such as squirt guns, spray bottles, nozzles, frilling, drizzle, wicking, and basal bark. Accordingly, we are also building out training around these methods for those interested in learning more.

This herbicide calibration survey is a useful starting point to determine what applicators are generally interested in learning more about, and how calibration is being used in wildland and non-row crop herbicide applications. This survey also indicated that there is strong interest in more calibration training being offered across the state. Cal-IPC is grateful to all of the individuals who took the time to respond to the survey, to DPR for providing the funding for this project, and to our partners at University of California Cooperative Extension for working with us to improve calibration training for conservation specialists throughout the state.

For a complete list of survey questions or to get a copy of the full DPR report, contact ctaylor@cal-ipc.org

# Considering field safety through an equity lens at the 2023 Cal-IPC Symposium

Constance Taylor and Claire Meyler, Cal-IPC; Amy Chong and Marion Anthonisen, Golden Gate National Parks Conservancy

The Justice, Equity, Diversity, and Inclusion (JEDI) workshop at the 2023 Cal-IPC Symposium focused on field safety for those who may be at higher risk for harassment or danger because of their identity/identities when doing research or other work in the field. Field safety often focuses on risks such as heat exhaustion, dehydration, snake bites, and other natural hazards that can impact physical safety. Less common is an equivalent focus on social hazards that could be inflicted by the public or colleagues, such as being harassed, assaulted, or having law enforcement called. Those who are women, LGBTQIA++, of a minority religion, Black, Indigenous, or people of color are more likely to experience these social hazards, which can affect someone's decision to stay in a profession and have a significant negative impact on their physical and mental health.

*Participants joined breakout groups to discuss case studies on equitable field safety. Photo: Constance Taylor.*

During this hour-long discussion facilitated by Cal-IPC and Golden Gate National Parks Conservancy staff, participants discussed real-world scenarios and brainstormed ways to minimize risk for themselves, their colleagues, and/or their organizations. During our short time together, concepts that bubbled to the top focused on creating a work culture that acknowledges the higher risks that some people face, and actively mitigates both physical and social hazards to prevent as much adversity as possible. Practically, this could take a number of forms such as having a code of conduct for all field crews; ensuring all field staff know how to report incidents; pre-trip meetings to establish shared expectations that include behavior toward colleagues and incident report protocol; and providing soft skills instruction to a work group such as trainings focused on implicit bias, conflict resolution, and bystander intervention.

While there is still much work to be done, it is promising that many organizations are beginning to work towards greater equity in field safety and recognizing that this issue can, and does, push talented people out of a profession that needs them.

## Collected resources for continued reading:

**"Safe fieldwork strategies for at-risk individuals, their supervisors and institutions" by Amelia-Juliette Claire Demery and Monique Avery Pipkin**
https://tinyurl.com/safe-fieldwork-strategies As a result of identity prejudice, certain individuals are more vulnerable to conflict and violence when they are in the field. It is paramount that all fieldworkers be informed of the risks some colleagues may face, so that they can define best practice together. Authors recommend strategies to minimize risk for all individuals conducting fieldwork.

**"Toilet stops in the field: An educational primer and recommended best practices for field-based teaching" by Sarah Greene, Kate Ashley, Emma Dunne, Kirsty Edgar, Sam Giles, Emma Hanson, University of Birmingham Earth Sciences Department**
https://tinyurl.com/toilet-stops Many institutions do not have guidelines surrounding toilet stops on field trips, and the topic is rarely discussed. This document is intended to educate staff and students about toilet stops and menstruation in the field. This document also contains a set of recommendations for field work and field trips with the aim of minimizing stress and anxiety for all parties.

**"Birding While Black" by J. Drew Lanham**
https://lithub.com/birding-while-black/ On race, belonging, and a love of nature. Excerpt from *The Home Place: Memoirs of a Colored Man's Love Affair With Nature* by J. Drew Lanham

**"California Law Prohibits Workplace Discrimination and Harassment" by CA Civil Rights Department**
https://tinyurl.com/ca-workplace-law The law prohibits harassment of employees, applicants, unpaid interns, volunteers, and independent contractors by any person.

**"The Harassment Problem in Scientific Dream Jobs" by Sarah Scoles**
https://www.outsideonline.com/culture/opinion/harassment-problem-scientific-dream-jobs/ Overview of the issue regarding harassment and safety in field research, including highlights of people and groups working to change the culture.

# One topic, two videos: Site hygiene education with Civicorps and East Bay Regional Park District

Constance Taylor, Cal-IPC

In 2023, Cal-IPC partnered with two organizations to create educational videos about preventing the introduction of weeds and soil diseases in wildlands, which is a big part of site hygiene. Similar to washing your hands after going to the bathroom so germs aren't accidentally spread, site hygiene refers to simple, everyday actions like cleaning tools, shoes, and other equipment so weed seeds and destructive plant pathogens like soil phytophthoras aren't accidentally spread into places where they can do a lot of damage.

Cal-IPC partnered with Oakland Civicorps and Hip Hop for Change (HH4C) to create a short music video that introduced the concept of site hygiene, and also worked with East Bay Regional Park District (EBRPD) to create a more in-depth training video about soil phytophthoras, the effect of these pathogens in ecosystems, and how site hygiene can help prevent their entrance into wildlands.

## "Come Clean, Leave Clean" music video

Cal-IPC was awarded a grant by the Alameda County Fish and Game Commission for the music video with Civicorps corpsmembers and HH4C. The full project, with the exception of video editing and mixing and mastering the final song, was completed during two six-hour working sessions. Five corpsmembers, ages 18-26, were tasked with understanding the concepts, creating a beat, writing the lyrics, recording the final song, and coming up with the video shots, all in this short amount of time!

The first work day covered Hip Hop history, rhyme structure, beat making, what site hygiene is and why it's important, choosing a music sample, making the beat, writing all the lyrics, and recording a rough cut of the song. The second day, all of the final vocal tracks were recorded, Corpsmembers decided what they wanted the video shots and visual flow to be, and all of the visual elements were recorded at the Oakland Civicorps Job Training Center in West Oakland. This video is meant to be used as a fun and engaging supplementary education tool alongside more in-depth training around site hygiene. Watch it at www.cal-ipc.org/cclc

*Video still from "Come Clean, Leave Clean" music video*

*Animation still created by Petr Kosina from "Don't Spoil the Soil" video*

## "Don't spoil the soil: Soil pathogen prevention for everyone"

Cal-IPC worked with the EBRPD Stewardship department and University of California Agricultural and Natural Resources to create a 20 minute video for EBRPD staff training as well as an informational resource for the public. Tedmund Swiecki, Ph. D. from Phytosphere Research generously donated his time and expertise to aid the project, and allowed us to use many photos and videos collected from his years of Phytophthora research.

The focus of the video is on the impacts of soil Phytophthora in wildlands, especially within East Bay natural areas, and how site hygiene can prevent these devastating pathogens from entering new environments. This video has information relevant to a wide audience, from home gardeners and

*(Continued on page 14)*

## Bad News Borers

(Continued from page 4)

*Trunk of a heavily infested California sycamore. Photo: Beatriz Nobua-Behrmann, UC Cooperative Extension.*

dieback is often a symptom of an advanced infestation. Since many other pests and diseases can cause similar symptoms, proper pest identification is critical.

Proper management of green waste is also essential to stopping additional spread. Chipping infested wood to one inch or smaller will kill 99.9% of the beetles. Chips that are 3 inches or smaller will kill 98% of the beetles. To eliminate the beetles from the wood, chipping should be followed by other steps like composting or solarizing. If the area is already infested, chips can be used as mulch for the surrounding trees. Chips that have not been composted or solarized should not be used as mulch in a different location.

Visit www.ishb.org for more information.

## Stinkwort

(Continued from page 8)

participants had their own version of breakout groups and documented their brainstorms with Jamboards.

A field trip to a nearby percolation pond overrun by stinkwort and managed by Valley Water gave participants a first-hand look at a typical invaded site and the challenges of some on-the-ground management efforts. It also reinforced the importance of collaborative action in addressing invasive species challenges.

If you see stinkwort, remember to report it! Help with early detection by mapping it on Calflora or iNaturalist.

## Civicorps and HH4C

(Continued from page 13)

mountain bikers to those doing major land restoration projects. Though as an organization Cal-IPC does not often focus on soil pathogens, site hygiene best management practices to stop their spread are essentially the same actions used to prevent weed introductions. By following basic site hygiene practices, the spread of weeds as well as soil pathogens can be reduced by up to 99%! Watch the video online at www.cal-ipc.org/dontspoil

We hope you enjoy the videos, and send them along to your friends, family, and colleagues!



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***Check all websites for latest event updates***

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sercal.org

**California Invasive Species Action Week**
June 1-9
wildlife.ca.gov/Conservation/Invasives/Action-Week

**California Forest Pest Council Weed Tour**
June 18, Anderson, CA
caforestpestcouncil.org/events

**Neobiota**
September 3-6, Lisbon, Portugal
neobiota.eu/conferences

**NAISMA Annual Conference**
September 30-October 3, Missoula, MO
conference.naisma.org

**Land Trust Alliance Rally**
September 25-28, Providence, RI
alliancerally.org

**Cal-IPC Symposium**
October 23-25, Online
cal-ipc.org/symposium

***"It is important to note that the output generated is the potential number of individuals that could be impacted (based on the assumptions of the simulation), not a prediction that they will be impacted. Throughout this analysis, the BE maintains conservative assumptions and may overstate the number of species exposed to and impacted by a pesticide."***

— US Environmental Protection Agency, Biological Evaluation for Glyphosate (Chapter 4, pages 4-5)