NEWSLETTER OF THE CALIFORNIA INVASIVE PLANT COUNCIL

Dispatch

VOLUME 31 NUMBER 3

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Protecting California's environment and economy from invasive plants

Cal-IPC Dispatch
Winter 2023 – Vol 31, No. 3
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FROM THE DIRECTOR'S DESK

Renaming species

By Executive Director Doug Johnson

You may have heard that the directors of the Audubon Society have been engaged in discussions about changing the organization's name. This is because John James Audubon, in addition to being a major ornithologist, was also an active supporter of slavery, and maintained that some humans were "inferior."

Though the Audubon Society has decided, for now, to retain the name, plenty of chapters have opted for new nomenclature (for instance, Golden Gate Audubon is now Golden Gate Bird Alliance). Though it is sensible to judge people by the standards of their time, it is also reasonable to question if we should continue to celebrate people who do not uphold our values today.

It's not just the bird organizations that are being renamed, it's the birds themselves. The American Ornithological Society will be renaming all bird species who are named after a human. Not all were bad people — though some were — so the decision to avoid naming animals after humans who "discovered" them is a simple way to avoid evaluating each person. It's also a way to avoid casting human egos over other species.

Members of the plant world are engaging in similar discussions. Witness the California Native Plant Society changing the name of their quarterly journal from Fremontia to Artimesia because of John C. Fremont's darker aspects.

Perhaps you have traveled to British Columbia, where placename signs bear the indigenous name as well as the colonial name. This movement is happening here in California, too. Patrick's Point State Park on the Del Norte County coast has been renamed Sue-meg State Park, using the Yurok name for the place, rather than the name of the settler known for murdering natives.

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Much like removing Confederate monuments, renaming species or organizations does not "erase history." Rather, we are choosing to critically examine what historical figures we celebrate. Not that renaming necessarily "fixes" anything, but it does serve as a semantic marker for our beliefs and aspirations. Challenging everything that has come before can be taken too far, of course, but it's not a bad instinct to periodically re-examine our frameworks and terminology. Healthy growth is a good thing — for our environment, our organizations, and ourselves.

ON THE COVER

This year's hybrid Symposium met in-person at Cal State Chico, where we presented the Ryan Jones Catalyst Award to Dr. Don Hankins, professor in the department of geography and planning, for his work at the Big Chico Creek Ecological Reserve (BCCER). He led a field trip to tour sites where cultural burning and mechanical controls have been used for more than 20 years to manage yellow starthistle and other invasive plants. The cover photo features a crew worker at BCCER working with a team to set prescribed fires. Read more on the Symposium on page 8.

Cultural burning also featured prominently in the opening plenary, where several speakers shared ways in which indigenous knowledge is being integrated into wildland stewardship. Read more about this session on page 10.

Cover photo courtesy Chico State Enterprises.

Wildland Weed News


Illustration by Ryan Jones

CAL-IPC UPDATES

Symposium 2023 – Thank you to the 600+ participants who joined us, whether in-person or virtually, for our first ever hybrid Symposium. See details on page 8.

Fire readiness – We have posted best practices guidelines for ways to prevent weed spread during wildfires by planning ahead. Though focused on National Park Service units, the principles are universal.

Rare plants – We have posted the results of a multi-year project studying the impacts of invasive plants on rare native plants on the Central Coast.

WMA grants – We are providing capacity building support for county Weed Management Areas in anticipation of grants in 2024 to WMAs from the California Dept. of Food & Agriculture, which is aiming to have WMA grants under contract by the middle of 2024.

AB-99 – Cal-IPC took an "oppose" position to this bill, which aims to restrict Caltrans roadside use of herbicide, due to our concerns about the interpretation of integrated pest management. The State Senate deferred the bill until 2024, and we will continue to work toward common ground on this bill and issues around herbicide use.

ISCC funding – Cal-IPC advocated unsuccessfully for reinstatement of $5 million for high-priority invasive species projects, previously slated for the state's interagency Invasive Species Council of California but cut due to changing state budget conditions. The initial funding supports work on shot hole borers, desert knapweed, and *Caulerpa* seaweed, as well the PlantRight program, yellow starthistle biocontrols, and more.

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.

OTHER NEWS

EDRR funds – The interagency Invasive Species Council of California approved a mechanism for public agencies to access rapid response funds for emerging invasive species issues — up to $100,000 for one year of initial response. Also, the national Aquatic Nuisance Species Task Force has made available $1 million in rapid response funding for newly detected aquatic invaders.

Landmark report – In September 2023, the Intergovernmental Platform on Biodiversity and Ecosystem Services released a landmark Invasive Alien Species Assessment detailing impacts, costs, and recommendations. Invasives play a key role in 60% of global extinctions, and the annual costs (currently $423 billion a year) have quadrupled every decade since 1970.

Grazing – AB-675 made progress in the pursuit of prescribed grazing as a wildfire prevention measure and will be picked up again in 2024 after resolving concerns with CalFire. Wage exemptions for goat grazing work — without which vegetation management with goats would become prohibitively expensive — was extended for two years while the state studies the issue.

Catalina controversy – The Catalina Island Conservancy has proposed removing imported mule deer from the island to protect endangered native plant communities using sharpshooters from helicopters, resulting in public outcry. At Cal-IPC, we understand the difficulty in removing animals that are beloved to some in the community. However, we agree that it is necessary to protect biodiversity.

River renewal – River Partners is accelerating the pace of riparian restoration in California, with an influx of nearly $50 million in 2023. Their new Heritage Growers Native Seed and Plant Supply will provide seed for large restoration efforts like the Klamath River Renewal Project, the biggest dam removal and river restoration in world history.

Herbicides – The documentary "Into the Weeds" screened nationally this fall, providing backstory on the first major lawsuit against Monsanto and Bayer over potential health impacts of Round-Up herbicide. Also, environmental groups successfully sued the US EPA to force a faster process for reviewing pesticides' potential for harm to federally listed species.

Champion – Heather Schneider of the Santa Barbara Botanic Garden was named a Conservation Champion by the Center for Plant Conservation, a nonprofit dedicated to protecting rare plants in North America, for her work on mainland and California island species. Heather and SBBG partner with Cal-IPC to study the impacts of invasive plants on rare native plants on the central coast.


Heather Schneider as a Cal-IPC Student Liaison. Photo: Cal-IPC archives.

Species highlight: Perennial veldt grass *(Ehrharta calycina)*

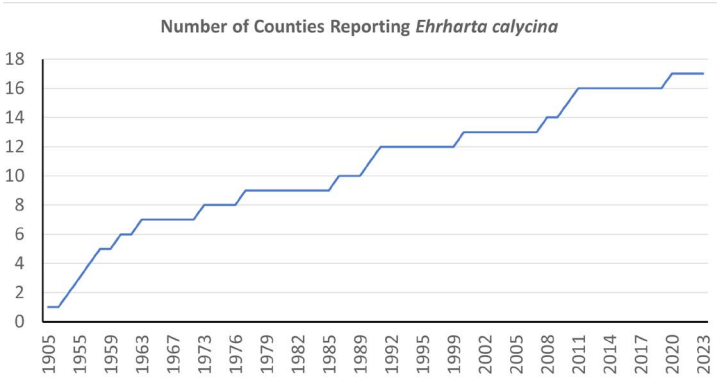
Jutta Burger, Science Program Director, Cal-IPC

It's hard to avoid a direct confrontation with *Ehrharta calycina* (perennial veldt grass) if you're botanizing along central California's coast. This species is rated "High" in Cal-IPC's Invasive Plant Inventory and has the unsettling habit of colonizing some of the most endangered and spectacular habitats in our state, including coastal dunes, fore-dunes, bluffs, native grasslands, and stretches of coastal sage scrub and chaparral shrublands.

Ehrharta calycina was first introduced into California in the early 1900s, initially for erosion control and later as forage for livestock (Love, 1963; Smith et al., 1999). Active planting of this species occurred through to the 1960s, when its impacts began to be noticed. Since then, it has spread explosively in California and other Mediterranean climate regions. It is a serious threat in Australia, where is has invaded sensitive Banksia woodlands, changed fire frequencies, and converted habitat (Fisher et al., 2009).

Ehrharta calycina favors disturbed and sandy, friable soils, but is also fully capable of invading undisturbed habitat and sites with higher clay content. Although its expansion across the state may have tapered off a little, perennial veldt grass now occurs in 17 counties and new county records are still appearing (most recently from San Mateo County in 2020, based on records in Calflora.org).

Awareness and concern about *E. calycina's* impact on sensitive plant communities and species have also grown. It has been called out as a direct threat to several federally- and California-listed plant species that occur along the central California coast. These include Vandenberg monkeyflower (*Diplaucus vandenbergensis*), Pismo Clarkia (*Clarkia speciosa* ssp. *immaculata*), and Nipomo Mesa lupine (*Lupinus nipomensis*), among others (USFWS 2019; USFWS 2020, USFWS 2023).



Number of counties with perennial veldtgrass records in California over time (Calflora 2023; including direct Calflora data entries, as well as iNaturalist, CCH2, and CalWeedMapper imports).

Perennial veldt grass inflorescences. Photo: Ron Vanderhoff (Calflora).

Perennial veldt grass is thankfully relatively easy to identify, in contrast to many other grass species. It has a bunching, "tufted" growth habit, grows up to 75 cm, and turns slightly orange-purple with age. Its inflorescences are loose panicles, with branchlets distinctly arranged in one (downward) direction and spikelets that each contain a single fertile floret (Smith 2012). The leaf collar, where the leaf blade and sheath join, is a distinct red-purple color, with a papery ligule and an edging of fine hairs.

Perennial veldt grass typically grows from December to May and produces seed from March to June, but is opportunistic both in germinating and flowering. Although individual plants grow by tillering, *E. calycina* spreads exclusively by seeds, which it produces in abundance and which are easily moved by wind (Whitaker et al., 2016). Estimates from Australia are that 75,000 seeds can be produced in a square meter (Smith et al., 1999). Although not much is known about its seed dormancy, field observations suggest that a seed bank can persist for 5-10 years (J. Hall, pers. comm, 2023). Fire can kill a large portion of *E. calycina*'s seed bank but will inevitably further promote establishment and spread because plants can regrow and reproduce so quickly thereafter (Fisher et al., 2009).

Ehrharta calycina threatens local biodiversity in multiple ways. It alters coastal dune systems by stabilizing soil, can change soil chemistry, and has been shown to contribute to increased fire frequency and type conversion of shrubland to invasive-dominated grassland (Alba et al. 2019). In shrub-dominated systems such as chaparral (and likely elsewhere), a recent study found that *E. calycina* grows longer roots early in the growing season than co-occurring native

shrubs at several soil depths. This kind of root growth likely gives it a competitive edge not only relative to many native seedlings but also to established native shrubs with deeper roots (Phillips et al., 2019). At Cal-IPC's 2016 Symposium, Phillips also reported that *E. calycina* depletes soil moisture in summer months significantly more than native vegetation and bare ground (Phillips 2016).

In a recent compilation of data from local expert reports, USFWS 5-year reviews, and California Natural Diversity Database (CNDDB) and California Plant Rescue (CAPR) information, Cal-IPC found records of eleven federally-listed species in central coastal California that currently co-occur with and therefore are currently potentially threatened by this highly invasive species. Unfortunately, invasive plant co-occurrence data for listed plant species are not always collected during population monitoring or seed collection visits, so the list of sensitive plant populations with *E. calycina* is almost certainly an underestimate.

As an example, Cal-IPC's recent field work with Santa Barbara Botanic Garden recorded co-occurrence of *E. calycina* with Gaviota tarplant (*Deinandra increscens* ssp. *villosa*) in populations that did not previously have co-occurrence described in CNDDB. Stands of *E. calycina* that occur close to, but not directly with sensitive plants or communities may also impact them indirectly. For instance, *E. calycina* stands growing near to Morro manzanita (*Arctostaphylos morroensis*), have been indirectly implicated in increasing fire frequencies where it occurs, which threatens this highly localized shrub's survival (Halsey 2007).

The role that *E. calycina* plays in modifying animal communities is less clear. One study conducted in San Luis Obispo County found that the federally-endangered Heerman's kangaroo rat (*Dipodomys heermanni*) preferred eating *E. calycina* seed both in the lab and in highly invaded habitat, despite preferring shrubland habitat that is threatened by this species (Trunzo 2015). This makes sense since many rodents aren't picky about sourcing the origins of their food!

Leaf blade and sheath with red-purple collar. Photo: Ron Vanderhoff.

Ehrharta calycina *growing in sensitive coastal dune habitat. Photo: © Neal Kramer (CalPhotos).*

Native herbivores may also be playing a role in the local distribution of *E. calycina*. Researchers found that black-tailed jackrabbits at Bodega Bay in Sonoma County reduced perennial veldt grass stature and seed production in exposed sites where plants were not protected by other neighboring vegetation (Cushman et al., 2011).

Effective management of *E. calycina* typically involves an integrated weed management approach, involving both manual control and herbicides and, due to its capacity to germinate opportunistically, multiple treatments per season. Grass-specific herbicides (e.g., clethodim, sethoxydim, and fluazifop-b-butyl) are variably effective, based on practitioner observations, but are especially useful where native herbs and shrubs occur (Cal-IPC Herbicide data gathering workshop, July 2022; J. Hall, pers. comm. 2023). Although there is some indication that clethodim is more effective on *Ehrharta* than other grass-specifics, permissions on its use are somewhat ambiguous: practitioners should review product labels and consult their local agricultural commissioner for guidance on where it may be applied before attempting treatment.

Use of clethodim is further complicated by reports of resistance that has developed in a closely related species (*Ehrharta longiflora*) in Australia (Heap 2015). As a result, some practitioners are opting to incorporate broad-spectrum herbicides for spot treatments whenever possible.

Manual removal by digging works well for small plants and accessible areas where plants are intertwined with native vegetation. Digging at a larger scale can be inefficient and creates greater disturbance. In many central coastal California sites, digging is also problematic because of its risk to buried cultural resources (from coastal tribes, including Chumash, Gabrieleno, SalHinan, Esselen, and Costanoan). Note that herbicide techniques mentioned here do not constitute recommendations and applicators should make sure that any application is consistent with label specifications and formally recommended for specific site conditions by a licensed Pest Control Advisor.

Tarping can work but cannot be implemented at scale and utilizes a large amount of plastic. Grazing and mowing are apparently only effective at reducing populations when it is high intensity, which can impact other vegetation and create disturbance. Burning is ineffective because it stimulates regrowth of *E. calycina*. (See Alba et al., 2019; DiTomaso and Kyser, 2013).

Given that *E. calycina* is a very effective competitor for water, is associated with increased fire frequency, and can easily invade intact sensitive habitats in California, it is a worthy target to prioritize,

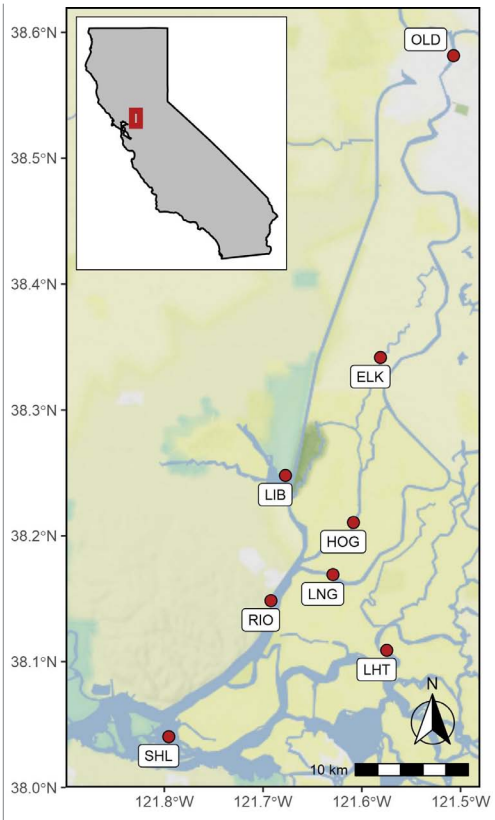
(Continued on page 11)

Assessing the invasion of ribbonweed in the Sacramento-San Joaquin Delta using UAVs

Nick Rasmussen, JT Casby, Anthony Elias-Linarez, and Brian Armstrong,
California Department of Water Resources

In 2017, the Division of Boating and Waterways (DBW) found an unknown aquatic plant growing in the Sacramento River next to Long Island in Sacramento County. During the next few years, additional patches were found scattered around the Sacramento-San Joaquin River Delta (hereafter referred to as the Delta). In 2021, the Plant Pest Diagnostics Center of the California Department of Food and Agriculture (CDFA) used DNA sequencing to identify this plant as ribbonweed (*Vallisneria australis*). This represents the first documented occurrence of this species growing in the wild in North America.

Mature ribbonweed plant with a new plantlet forming on a stolon. Credit: Nick Rasmussen, DWR.



Map of known locations of ribbonweed in the Delta. Inset shows the location of the Delta in California. ELK = Elk Slough, HOG = Hogback Island, LHT = Lighthouse Marina, LIB = Liberty Island, LNG = Long Island, OLD = Old Town Sacramento, RIO = Rio Vista, SHL = Sherman Lake. Credit: Nick Rasmussen, DWR.

Ribbonweed is native to eastern Australia and has been introduced in New Zealand, Japan, Hungary, Belgium, France, Italy, the Netherlands, and Germany. This species is commonly grown as an aquarium plant, so non-native populations are likely established from aquaria dumped into local waterbodies. This submersed aquatic plant is a perennial that roots in sediment and grows narrow, straplike leaves up to 3 meters long. This species can grow in still or flowing water and in fresh or brackish conditions (up to at least 11 ppt salinity). It tolerates low light, allowing it to grow in deeper waters (up to 8 meters deep) and more turbid conditions than many other aquatic plants.

Ribbonweed is dioecious and can disperse via seeds. However, throughout much of its introduced range, it does not reproduce sexually. In the Delta, reproductive structures have not been observed. It reproduces vegetatively by creeping stolons, gradually creating dense monocultures. It also disperses via rhizome fragments, like those produced by disturbance via boat propellers. In the Delta, several ribbonweed patches are in areas with high boat traffic (such as boat launch ramps and marinas), creating a high risk of vegetative spread.

Since the discovery of ribbonweed in California, two government agencies have evaluated the threat it poses to the state. CDFA assigned it a pest rating of "B," the second highest risk category. The California Department of Fish and Wildlife concluded in their risk assessment that ribbonweed should be considered an invasive species because it causes or is likely to cause harm to the state's economy, ecosystem, and/or human health. Consequently, they gave DBW, which is responsible for aquatic weed management in the Delta, permission to begin control efforts.

Based on the behavior of ribbonweed in other parts of its invaded range, we know that it has the potential to outcompete native aquatic plant species, decrease dissolved oxygen, impede boat navigation, slow water flows needed for flood control and water delivery, degrade restored wetland habitat, and harbor non-native predatory fishes. Though established non-native aquatic plants in the Delta, such as Brazilian waterweed (*Egeria densa*), can create many of these same problems, ribbonweed may extend the

Two of DWR's UAV pilots, Brian Armstrong (left) and JT Casby (right), collecting imagery near Long Island where this species was first detected. Credit: Nick Rasmussen, DWR.

UAV imagery of the ribbonweed patch growing in the Mokelumne River near Lighthouse Marina (LHT). Note the tracks through this patch caused by boat traffic. The size of this patch at the time of imagery collection on July 25, 2022, was 893 m2. Credit: JT Casby, DWR.

spatial extent of these impacts because it may be able to grow in deeper and saltier water than other non-natives.

Given the potential damage that this species could cause, our agency, the California Department of Water Resources (DWR), decided it was important to quantify the magnitude of the infestation. We considered that unoccupied aerial vehicles (UAV), commonly known as "drones," could be an effective tool. Since DWR has an existing UAV program, we used our equipment to map this species based on localities in the Delta identified by DBW.

Remote sensing tools often do not work well for monitoring submersed aquatic plants, but we thought the structure of ribbonweed patches would make it amenable to this approach. Specifically, it grows in dense monocultures, has foliage that grows to the water surface, and is visually distinguishable from all other submersed plant species in the region.

Imagery for all patches was collected using a DJI Phantom 4 Pro RTK equipped with a 2.5-cm CMOS 20-megapixel camera with red, green, and blue (RGB) bands. UAV missions were conducted between July 11, 2022, and February 2, 2023. While some sites could be approached by land, many required the launching of UAVs from boats.

All missions were timed to correspond with low tides and occurred during a period of drought when turbidity, water velocity, and water depth across the Delta were relatively low. Missions were also generally conducted on sunny days from 9am to noon, when there was sufficient light penetration into the water with minimal glare and low wind speeds. This suite of conditions maximized visibility of the submersed ribbonweed foliage in the imagery. Images collected by the UAV were stitched together into orthomosaics, which were imported to ArcGIS where patches were manually delineated with polygons to measure patch area.

We found that UAVs worked well as a tool for monitoring ribbonweed, provided imagery collection was timed with favorable environmental conditions. We were able to map virtually all known patches and even identified some previously undetected ones. We estimated the total known area of ribbonweed in the Delta to be 28,562 m2 (~5.5 football fields), with the largest infestations in Elk Slough (12,748 m2) and Sherman Lake (12,135 m2). Our estimate is likely conservative because, although DBW has conducted boat-based surveys across parts of the Delta, there has not been a systematic ribbonweed survey of the entire Delta (~243 km2 of waterways), so there could be patches that we have not measured. With our UAV monitoring approach, we can measure new patches as they are found and remeasure known patches through time to estimate growth rates.

DBW is currently planning control measures for ribbonweed. They intend to start by conducting experimental treatments of several patches with the aquatic herbicide that was found to be most effective in a small mesocosm trial, Aquathol K, whose active ingredient is dipotassium salt of endothall. They will use bubble curtains to increase contact time between the herbicide and plants in this tidally dynamic environment.

We will coordinate with DBW to collect UAV imagery before and after the herbicide treatments to help evaluate control efficacy. Eradicating ribbonweed from the Delta will be difficult owing to multiple factors: the limited set of herbicides that are both allowed by regulations and capable of controlling ribbonweed; the challenges of using herbicides in flowing water; and the limitations on resources available to target this species. However, given the threat this species poses to the economically and ecologically important Delta, we must try.

Meanwhile, people in other areas of California should watch for this species because it (and other *Vallisneria* species) is still transported and sold for the aquarium trade. Submit specimens from new California localities to CDFA, following the instructions on their website at www.cdfa.ca.gov/plant/reportapest/

2023 Cal-IPC Symposium in Photos

The last week of October, Cal-IPC hosted our very first hybrid Symposium, with a sold-out attendance of 300 participants meeting in-person at Cal State Chico, and 350 more joining us on the virtual platform. This year's theme, "Reuniting for Resilience," shared our excitement to gather once again in-person. It's a reminder that we are most effective when we come together — whether it's to share insights across cultural or organizational boundaries, to pull weeds side-by-side, or to mentor the next generation of California stewards. Over four days, attendees shared the latest in invasive plant biology and management with talks, posters, training, discussion groups, and field trips. Here are some highlights!

Dr. Don Hankins (center), Professor at Chico State, led a field trip to the Big Chico State Ecological Reserve to tour a site where cultural burning and mechanical treatment initiated in 2021, and compared it with sites where this restoration work has been implemented for ten years, twenty years, or more. For his dedicated work on this project, Cal-IPC presented Don with the Ryan Jones Catalyst Award for work that advances the stewardship community. Photo: Nicole Valentine.

Allison Sanger, Botanist at Lassen National Forest, was awarded the Ken Moore Wildlands Restoration Award for her tireless work organizing weed management in support of watershed restoration projects. Photo: JP Marié.

Lucky winner Doug Gibson celebrated winning an REI giftcard at the annual Raffle and Reception. Thanks to our generous donors and guests, this event raised $3,354 for Cal-IPC's work. Photo: Claire F. Meyler.

Kim Armstrong (left, in blue), Restoration Biologist at River Partners, co-led a field trip to tour a former walnut orchard transformed into a publicly accessible site at Bidwell-Sacramento River State Park. In addition to controlling agricultural weeds, their team planted plugs of native sedge grass around this massive valley oak to outcompete invasive grasses and to protect roots from foot traffic. Photo: Claire F. Meyler.

Cal-IPC presented John Malpas with the Jake Sigg Award for vision and dedicated service for his work building and managing Calflora's Weed Manager software to map and track invasive plant populations. Photo: Claire F. Meyler.

The Symposium kicked off with the Statewide Weed Management Area Meeting, to share updates and information about securing grants, designing projects, researching plants, selecting tools, reporting finds, acquiring permits, and engaging communities. Photo: Constance Taylor.

Participants in the discussion "Considering field safety through an equity lens" brainstormed strategies to improve field safety protocols and minimize risk for individuals whose identity/identities may place them at higher risk for harassment or danger when conducting field work. Photo: Claire F. Meyler.

Attendees connected during the Poster and Sponsor session and during breaks. Photo: Claire F. Meyler.

Training farmworkers for stewardship

Doug Johnson, Cal-IPC

The opening plenary of our 2023 Symposium in Chico featured presentations on ways indigenous knowledge is being integrated into wildland stewardship. José Luis Duce spoke on the traditional role of fire as a primary stewardship tool across many parts of the world, and its role in today's world. Lucía López spoke on her experience as an immigrant farmworker, currently training to control invasive plants for restoration projects.

José is part of a prescribed fire team from the Watershed Research and Training Center in Hayfork (Trinity County). The team shares cultural burning across California and beyond through TREX (training exchanges). With local Prescribed Burn Associations (PBAs) forming across California, the knowledge of how to safely put good fire on the ground is a highly sought-after resource.

Substantial knowledge is held within indigenous communities that have lived on the land for hundreds of generations. Across the Americas, from Chile, Ecuador, Brazil, and Honduras, as well as in Portugal, Spain, France, and Indonesia, the cultural use of fire is being re-integrated into management practices, and José emphasized the importance of cross-boundary sharing.

One way cross-boundary sharing is impacting California is through immigrants who come with land management knowledge and skills. Lucía is an indigenous Mixtecan from the southern part of Mexico. She is in California as a farmworker in Napa vineyards. When North Bay Jobs with Justice began working with her and other farmworkers on ways to improve their employment situations, they realized that many immigrants bring a lot more than agricultural skills. They bring experience of working on the land that is valuable for today's needs of restoring our landscapes to make them more climate resilient.

Boundary-crossing exchange of knowledge and experience strengthens our ability to care for the landscape. Photos courtesy José Luis Duce.

Here is what Lucía had to say of her life and work, through a translator: "I'm from a small community in Oaxaca, Mexico. I learned at a young age from my parents. I started out at age 5, my job was to make tortillas for my older siblings who were working on the land. As I got a bit older, I started to pull broom. In some places, there would be a lot of broom so if we wanted to be able to plant corn and beans, we would have to remove the broom.

We would work together, my sisters, my cousins, and myself. With big broom, there would be three of us to pull it out. We would work together to pile it and then we would burn the broom so that we could plant.

This is part of the reason I teach my kids that it's important to take care of Mother Earth, and it's important to learn our language of Mixteco. Spanish was something that I learned later, in high school, and it was very hard for me. When I first came to this country, I felt ashamed of speaking my native language. But now I feel proud. And that's that language that I primarily speak.

One of the projects that I'm working on is *Arundo*, or "carrizo" as it is called in Spanish. They grow really tall, as tall as trees, and it's very dangerous for fires. It's also sucking up a lot of the water and damaging our river. This is very different from the work we do in the vineyards because we're working together as a team, we're paid well, and we're able to

Lucía López (at the podium) shares her story as a farm worker and practitioner of cultural land management at the 2023 Cal-IPC Symposium, with translation from Max Bell Alper (right), North Bay Jobs with Justice. José Luis Duce, Watershed Research and Training Center, listens onstage, while Don McEnhill and Birkin Newell, Russian Riverkeeper, attend remotely, visible on the screen above. Photo: Doug Johnson.

take breaks. But it's still hard to make a living because rents are so high.

Doing this work [of cultural burning] feels really good. I wake up in the morning with excitement. I want to fight for what we deserve, and to teach my kids to take care of Mother Earth. And, more than anything, to make sure that I continue to teach my native language to my kids and to carry on traditions, like the traditional clothing that we wear. Thank you very much for listening to what I have to share."

Lucía's team works on *Arundo* removal with Russian Riverkeeper. Especially around the town of Healdsburg, the *Arundo* poses significant fire risk. The organization's executive director, Don McEnhill, and colleague Birkin Newell say that working with the team of indigenous workers has been markedly different than working with contractors in the past because they bring so much knowledge and skill, as well as an innate sense of hard work and caring for the land. They self-organize to get the work done, Don says, requiring virtually no oversight. Though he has been working on the land for 60 years, he says that he learns a lot from working with these partners.

Max Bell Alper and Marianna Zavala from North Bay Jobs with Justice helped to organize the session at the Symposium and joined Lucía and José in presenting. In closing the session, he posed this challenge, "The people who are laboring to do this work should be people that we respect and honor. People should be able to take care of their families, earn a good wage, and take care of the land all at the same time. We are re-knitting these connections and taking on these challenges. How do we learn from each other to build that future?"

We greatly appreciate their leadership in connecting farmworkers to stewardship work in ways that provide a livable wage. Cal-IPC will look for ways to support this continued evolution of the restoration workforce and help it move from pilot projects to steady ongoing efforts.

For excellent reporting on these trabajadores de la tierra, see the April 5, 2023, article in *Yes! Magazine* online, "From Farmworkers to Land Healers."

This image from October 2022 shows the first burn in centuries at the Robinson Rancheria oak woodland, as it was previously illegal for tribes to implement burning at this site. Photo courtesy Robinson Rancheria, Lake County Prescribed Burn Association.

Perennial veldt grass

(Continued from page 5)

especially along the coast. Dry and more variable conditions associated with climate change will likely only exacerbate this species' impact, so do your best to stop this plant from getting a foothold where it hasn't done so already!

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Herbicide calibration training for wildland conservation

Constance Taylor, Cal-IPC

Use of herbicides in wildland areas can be a powerful conservation tool in the integrated pest management toolbox. In sensitive habitats, properly-applied herbicides can cause less disturbance to habitat than manual removal. In other cases, attempted manual removal can actually encourage growth for some invasive species, like Japanese knotweed and tree-of-heaven.

At the Riverside training session, Scott Oneto uses a demonstration rig to show the difference between nozzles. Photo: Jutta Burger.

Since there are many considerations when managing invasive plants in wild areas, knowing how and when to use herbicides can save not only time and money, but most importantly, the habitats themselves. Calibration is a large part of the "how" when applying herbicides in wildlands. It refers to measuring the amount of herbicide you're applying to a target area, and adjusting your equipment to ensure that herbicide is not being under- or over-applied. But where does one get this type of specialized training?

Enter the Department of Pesticide Regulation, who awarded Cal-IPC a grant to create a suite of training programs focused on the topic of proper calibration of herbicides for use in wildlands. The funding will support a number of initiatives that include a calibration training video in Spanish and English, best management practice summaries for herbicide calibration in a wildland setting (also in Spanish and English), and four free in-person trainings throughout California. All parts of this project will be completed by the end of 2024.

The first of four in-person trainings kicked off June 23, 2023, in Riverside, California at the Riverside Corona Resource Conservation District. Forty attendees spent the day learning about calibration math, the purpose of calibration, herbicide safety, and nozzles. Field practice was a large part of the training, covering application techniques like spot spraying, drill and fill, stump cut, broadcast spraying, and orchard gun use.

Demand was high for this training, with registration maxed out weeks in advance. Attendees brought a wide range of experience with herbicide application in wildland settings, from years in the field to being brand new to this work. This session was a success thanks the enthusiasm and invaluable expertise from training instructors Aaron Echols (Inland Empire Resource Conservation District), Tom Getts (University of California Cooperative Extension), Shani McCullough (Riverside Corona Resource Conservation District), Chris McDonald Ph.D (University of California Cooperative Extension), and Scott Oneto (University of California Cooperative Extension).

Our second training, also filled to capacity, was held in Chico on Oct 25, 2023, during the Cal-IPC Symposium. We were fortunate to have the expertise of training leaders Tom Getts and Scott Oneto. The focus was primarily on best practices to calibrate backpack spraying in addition to covering basics such as nozzles and calibration math. Field practice was again a significant part of the three-hour event, and participants were able to receive real-time feedback on spraying techniques.

Two more free trainings will occur in 2024, with one in northern California and one in southern California. Email ctaylor@cal-ipc.org to be put on a mailing list for calibration training updates. We hope to see you there!

Shani McCullough discusses overspray and droplet size with backpack sprayers at the June training session. Photo: Constance Taylor.

In Chico, Stephanie Ponce uses water to demonstrate spraying vegetation of varying height at a consistent rate. Photo: Constance Taylor.

Family supports Cal-IPC's training work with endowment

Doug Johnson and Claire F. Meyler, Cal-IPC

Cal-IPC will be able to help twenty emerging professionals attend the Cal-IPC Symposium each year thanks to the newly-endowed John H. Anderson Land Steward Training Fund. Established by his family, the fund was created to honor the memory of John Anderson, founder of Hedgerow Farms native seed company in Winters, CA (Yolo County).

John was a longtime supporter of Cal-IPC's work. In 2014, Cal-IPC presented John with an award for his dedication to protecting California's wildlands and commitment to sharing experience and opportunity with others. In addition to being a pioneer in the native seed realm, John helped start the California Native Grasslands Association, which has become an ever-stronger champion for protecting the state's grasslands.

John mentored many people in caring for the land over the years. All of us at Cal-IPC are honored to carry forward John's passion and enthusiasm for this work to guide future generations. Thanks to the generosity of this award, we can provide travel grants to help emerging professionals participate in the annual Cal-IPC Symposium and other training activities.

John Anderson was passionate about educating and inspiring people to work in stewardship. Photo: Cal-IPC archives.

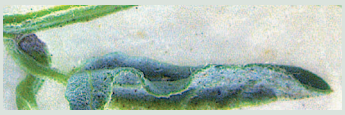
In 2023, the fund extended travel awards to twenty applicants. Luis Morales, Reserve Steward at the Bodega Marine Reserve, and recipient of a 2023 Travel Award shared his story with Cal-IPC. "I am so grateful for this generous donation and would like to acknowledge the donors for this gift. I am a restoration practitioner working in coastal prairie restoration. I was inspired to join this work by my Mexican heritage, as I am a descendant of farmers/grazers and have found the intersection of grassland restoration and grazing to be a space where I belong. Two years ago, I started a goat grazing business to reduce fuels and investigate grazing as a precursor for restoration. Meanwhile, I'm a part time grad student at Oregon State University in natural resource stewardship. I am committed to dismantling barriers for underrepresented scientists and field researchers, and I want to mentor early career students and be a leader in coastal resource management."

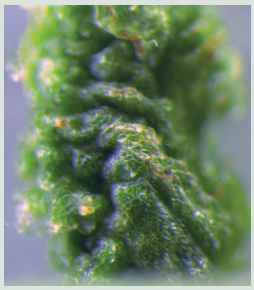
Elissa Callen, an ecological artist, horticulturist, and educator was another Travel Award recipient willing to share her story. "I just want to say thank you for dedicating funds to help people attend this conference. I had never been to the Cal-IPC conference and was so excited to see what would unfold. After a history of working with plants in horticulture and agriculture since 2016, I made the shift at the beginning of 2022 to specifically focus

(Continued on page 14)

Elissa Callen (left, crouching) joined the Symposium field trip to Bidwell-Sacramento River State Park, where she shared an array of color swatches that she created using botanical inks derived from California invasive plant species. Photo: Doug Johnson.

HAVE YOU SEEN...?





The USDA Agricultural Research Service's weed biocontrol lab in Albany, CA, requests folks in the field to report any observations of damaged leaves on field bindweed (*Convolvulus arvensis*). This may reflect galling as a result of a mite biocontrol agent. Galled plants appear stunted and tend to be found in drier areas. Symptoms include rolled and thickened midribs and leaf margins with a rough granular surface, occasionally reddish. Report sightings to Jacqueline.Sarratt@usda.gov.

Cal-IPC Endowment

(Continued from page 13)

on ecology and native species conservation through my art practice. I was already prioritizing the use of native plants in my horticulture career doing landscape design, but I wanted to use my talents to serve a purpose that felt more important and reached a wider audience. I now teach workshops creating pigments from invasive species, to help educate people on the importance of native plant conservation and the negative impact invasive plants have on biodiversity. I incorporate a stewardship component, giving guidance in identifying and removing invasive plants. My interdisciplinary background means I am able to fill in the gaps between art and science to help make these disciplines more accessible and inclusive. I want to help exemplify the message that intersectional perspectives and undertakings are not just possible but are valuable. The information I learned at the Symposium will directly impact what I am able to share with the students in the classes I teach."

Luis Morales poses with a young member of his weed-grazing goat herd. Photo: Luis Morales.

Thank you to all the awardees for sharing your energy, enthusiasm, and experience at the Symposium. We look forward to many more years working together. And, thanks to the John H. Anderson Land Steward Training Fund, we hope to welcome many more new folks to the field.

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February 23, Stockton, CA
carangeland.org/2024-summit

International Invasive Species and Climate Change Conference
January 30-31, Online
naisma.org

National Invasives Species Awareness Week (NISAW)
February 26-March 3
nisaw.org

Public Lands Alliance
March 4-8, San Francisco, CA
publiclandsalliance.org

Western Society of Weed Science
March 4-7, Denver, CO
wsweedscience.org

SERCAL
May 8-10, University of Redlands, CA
sercal.org

United Nations Conference on Biological Diversity
October 21-November 1, Columbia
cbd.int

Cal-IPC Symposium
October 2024 - TBD
cal-ipc.org/symposium

"The idea of whether people should intervene in these areas is based on a myth that they've been separate from people in the past. What we see is a lived, cultural landscape. So, we might need to do a little trammeling to steward the land."

"Giant Sequoias Are Burning. Should We Replant Them?" California Report, *Aug. 18, National Public Radio.*