

# Welcome to the Cal-IPC Southern California Mini-Symposium at Cal Poly Pomona!

## Invasive Plant Management from Cities to Wildlands

Photo: Arlee Montalvo

Thank you for joining us! We are excited to gather in person again to share news and updates on weed management in Southern California. We hope you will also plan on joining us online November 1-3 when we will gather with colleagues state-wide to connect and learn.

### Statement of Equity, Diversity, and Inclusion:

Cal-IPC is committed to equity, diversity, and inclusion. We are promoting a Symposium environment that is welcoming, safe, collaborative, supportive, and productive for all attendees. We value our diverse perspectives, expertise, opinions, backgrounds, and life experiences, and understand that this collective diversity is essential to meeting our mission and the purpose of this event. To that end, it is expected that we all uphold this commitment by practicing the following:

- Treat everyone with respect and consideration (including using pronouns if indicated on nametag). Communicate openly and thoughtfully and be considerate and curious of multiple views and opinions that may differ from our own.
- Acknowledge our intentions. Take responsibility and address the impact of our words and actions.
- Be mindful of our fellow participants. Alert Cal-IPC staff if we notice a potentially troubling or dangerous situation, someone in distress, or unacceptable behavior.

**Social Media:** Share your enthusiasm! What have you learned? Tag us: @cal\_ipc and #CALIPC2022



**COVID Safety:** A face covering or mask is strongly recommended, though not required. Physical distancing is also recommended. We request that participants be as fully vaccinated as their health status allows.

**DPR CEUs:** Licensed herbicide applicators that have registered for DPR credit and attended the full day can receive 5 hours DPR CEU "Other" credit. Check in and out at the DPR table to sign attendance sheets and to pick up and return Scantron forms. At the end of the day, please take a Certificate of Completion form from the DPR table for your records.



**Tell us how we did!** Use the QR code or go online to fill out the survey:  
[www.surveymonkey.com/r/Pomona\\_Cal-IPC\\_2022](http://www.surveymonkey.com/r/Pomona_Cal-IPC_2022)



**Cal-IPC Southern California Land Management Mini-Symposium**  
**Monday, June 13, 2022, 9:00AM – 5:00PM**  
**AGRIscares** at Cal Poly Pomona  
4102 S University Drive, Pomona, CA 91768

**AGENDA**

- 8:30 – 9:00AM** Registration check-in and coffee
- 9:00 – 9:15AM** **Welcome, Orientation, and Land Acknowledgment**  
Presenter: Jutta Burger, Cal-IPC; Erin Questad, Cal Poly Pomona
- 9:15 – 9:45AM** **Finding Optimism for Effective Conservation in Weed-invaded Southern California**  
Presenter: Justin Valliere, CSU Dominguez Hills
- 9:45 – 10:15AM** **The Potential for Native Vegetation Restoration to Improve Pest Management in California**  
Presenter: Elizabeth Scordato, Cal Poly Pomona
- 10:15 – 10:30AM** Break (+ Poster viewing)
- 10:30AM – 12:30PM** **Concurrent Workshops**
- TRACK 1: Tool Tailgate**  
Instructors: Chris McDonald, UCANR; Aaron Echols, IERCD; Henry DiRocco, independent
- Outdoor demonstration and introduction to common tools used in Wildland IPM, including hand- and motorized tools. Herbicide application, calibration, and safety considerations.
- TRACK 2: Developing a Post-Fire Early Detection Rapid Response (EDRR) Framework**  
Instructors: Lauren Quon, USDA Forest Service; Robert Fitch, UCSB
- Weed impacts on fire regimes and ecology; overview of EDRR. Instructional hike with demonstrations of pre-fire condition assessment, discussion of restoration seed collection and “sustainable” and “ecologically-functional” fuel breaks, and more.
- TRACK 3: Weed Identification and Non-Chemical Management in Restored Areas at the Wildland-Urban Interface**  
Instructors: Erin Questad, Meghan Jeffus, Noah Szczeszinski, Jill Gomez, Cal Poly Pomona
- Restoration research program at the Cal Poly Pomona Lyle Center for Regenerative Studies, grassland restoration, competitive planting and weed suppression, native diversity enhancement, local vertebrates.
- 12:30 – 2:00PM** Lunch and Poster Session
- 2:00 – 3:00PM** **Afternoon Session 1: Case Studies of Problem Weeds and Their Management in Southern California**
- 2:00 – 2:20PM** **Case Study #1: New Weed Problems in Southern California and Why EDRR Matters: Stinknet, Stinkwort, Garlic Mustard, *Volutaria* and More**

Presenter: Chris McDonald, UCANR

2:20 – 2:40PM

**Case Study #2: Using Selective Herbicides to Control Invasive Annual Grasses (while preserving native diversity)**

Presenter: Aaron Echols, Inland Empire Resource Conservation District

2:40 – 3:00PM

**Case Study #3: Keeping Stinkwort at Arm's Length**

Presenter: Alisa Flint, Orange County Parks

3:00 – 3:30PM

Break

3:30 – 4:30PM

**Afternoon Session 2: Fire and Grazing Effects on Invasive Species**

3:30 – 3:50PM

**Case Study #4: Early Detection Surveys for Invasive Plants in the Holy Fire Burn Area, Santa Ana Mountains**

Presenter: Joy England, California Botanic Garden

3:50 – 4:10PM

**Case Study #5: The Role of Fire in Managing Invasive Species at the Santa Rosa Plateau Ecological Reserve**

Presenter: Hailey Laskey, Center for Natural Lands Management

4:10 – 4:30PM

**Case Study #6: Using Goats to Control Annual Grasses and Mustards for Habitat Restoration.**

Presenter: Robert Freese, Irvine Ranch Conservancy

4:30 – 5:00PM

**Final Questions & Wrap-Up**

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**Thank you to our program partners!**

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**GOLD**



**SILVER**



**GRASSROOTS BRONZE**

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## Talk Abstracts

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(Poster abstracts follow in a separate section. List is alphabetical by lead author.)

**Using selective herbicides to control invasive annual grasses (while preserving native diversity).** Aaron Echols (QAL), Inland Empire Resource Conservation District [aechols@iercd.org](mailto:aechols@iercd.org)

This case study will describe methods and techniques that the Inland Empire Resource Conservation District has employed to control and locally eliminate common annual invasive grasses including *Bromus tectorum*, *Bromus madritensis*, *Bromus diandrus*, and *Schismus barbatus* in natural areas with rich native forb diversity. Treatment methods involve the use of post-emergent, grass specific herbicides including two formulations of fluzifop-P-butyl and clethodim. Specific information related to the following will be presented: mixing and application methods for aforementioned grass-specific herbicides; brief overview of a fluzifop-P-butyl label, PPE requirements, special local need label in California; results of phytotoxicity tests of fluzifop-P-butyl on non-grass, native forb species; optimal timing and phenology of annual grass treatment using fluzifop-P-butyl; post treatment grass cover reduction comparisons between plots treated using fluzifop-P-butyl and glyphosate after two consecutive years of treatment; experimental methods for controlling *Festuca myuros*, which is well known to be partially unaffected by grass specific herbicides and can often replace treated *Bromus* species; and seed bank viability of invasive grass species and strategies for effectively depleting the seed bank within a two year period.

**Early detection surveys for invasive plants in the Holy Fire Burn Area, Santa Ana Mountains.** Joy England, California Botanic Garden [jengland@calbg.org](mailto:jengland@calbg.org)

In 2018, the Holy Fire burned 22,870 acres, including 18,165 acres of the Cleveland National Forest in the Santa Ana Mountains, in the Peninsular Ranges of Orange County and Riverside County. Vegetation within the burn area was dominated by chamise (*Adenostoma fasciculatum*) chaparral and mixed chaparral occurring on steep and rugged terrain. Early detection invasive weed surveys and rare plant surveys were conducted throughout the growing season in 2019 by staff from the California Botanic Garden (formerly Rancho Santa Ana Botanic Garden) in partnership with the Cleveland National Forest (CNF) to help mitigate the risk of invasive plant introduction and spread in vulnerable plant communities such as riparian areas, and near known occurrences of Threatened, Endangered & Sensitive (TES) plant species. Geographic Information System (GIS) data was collected in the field for invasive plant infestations and promptly sent to the CNF to

facilitate planning and coordination of Rapid Response treatments. Survey results found that the fire triggered a large-scale aggressive spread of the non-native, invasive salt cedar (*Tamarix ramosissima*) in riparian areas. Multiple detections of stinknet (*Oncosiphon pilulifer*) in areas where it had not previously been documented suggest that this species has recently invading the burn area from adjacent urban areas.

**Keeping stinkwort at arm's length.** Alisa Flint, Orange County Parks [alisa.flint@ocparks.com](mailto:alisa.flint@ocparks.com)

While the invasive annual stinkwort (*Dittrichia graveolens*) is prevalent in neighboring counties, many land managers are working together to slow and halt its steady advance into Orange County. The OC Parks' battle to eradicate stinkwort from the Natural Community Conservation Plan (NCCP) Preserve — which includes several OC Parks facilities — begins with trained and knowledgeable surveyors, accurate mapping tools, coordinated treatments, and ongoing monitoring. OC Parks has been using Calflora observations collected from staff, contractors, and volunteers to track and treat populations of stinkwort quickly and effectively with minimal herbicide. This presentation will outline OC Parks' approach to strategically managing this "unmanageable" species.

**Using goats to control annual grasses and mustards for habitat restoration.** Robert Freese, Irvine Ranch Conservancy [rfreese@irconservancy.org](mailto:rfreese@irconservancy.org)

Restoration is a multi-year process that requires clearing vegetation debris, killing flushes of weeds, and gradually depleting the weed seedbank in the soil. This site preparation phase is followed by introductions of seeds of native shrubs, grasses, and forbs, and several years of maintenance to ensure their establishment. Annual grasses (*Avena* and *Bromus* spp.) and assorted mustards (*Brassica*, *Hirschfeldia*, *Raphanus* spp.) are some of the most common invasive weeds in southern California and present management challenges at all stages in a restoration project. Irvine Ranch Conservancy has used goats for control of these weed species at three stages of restoration: debris clearing, grow and kill seedbank depletion, and maintenance of established native grasslands. While goats were effective debris clearers on steep and rocky sites where mowing was not feasible, they were less effective for seedbank depletion due to the imperfect nature of grazing which allows some weeds to flower and set seed. In this case, two years of goat grazing resulted in only minor shifts in weed species

composition. Goats were highly effective in selectively targeting annual grasses in mid-spring without damaging relatively dormant purple needlegrass (*Stipa pulchra*). These case studies illustrate the versatility of goats as a management tool in restoration and provide guidance for their use.

**The role of fire in managing invasive species at the Santa Rosa Plateau Ecological Reserve.** Hailey Laskey, Center for Natural Lands Management. [hlaskey@cnlm.org](mailto:hlaskey@cnlm.org)

This presentation will cover weed management strategies at the Santa Rosa Plateau Ecological Reserve, looking at the long-term effectiveness of multiple prescribed fires at controlling annual grasses as well as yellow starthistle, and improving habitat for native grasses and wildflowers. The spread of the invasive plant stinknet in post-wildfire areas will also be briefly discussed.

**New weed problems in Southern California and why EDRR matters: Stinknet, stinkwort, garlic mustard, *Volutaria* and more.** Chris McDonald (QAL), UCANR [cjmcdonald@ucanr.edu](mailto:cjmcdonald@ucanr.edu)

This presentation will cover the basic principles of early detection and rapid response and will highlight several weed species that are currently spreading in Southern California with information identification and management.

**Tool tailgate.** Chris McDonald (QAL), UCANR; Aaron Echols (QAL), IERCD; Henry DiRocco (QAL), independent [cjmcdonald@ucanr.edu](mailto:cjmcdonald@ucanr.edu)

This outdoor demonstration will cover various tools and techniques needed for controlling weeds. Tool demonstrations will range from mechanical tools to common backpack sprayers and nozzles. Proper spray tips will also be included to reduce pesticide usage in wildlands.

**Weed identification and non-chemical management in restored areas at the wildland-urban interface.** Erin Questad; Meghan Jeffus; Noah Szcieszinski; Jill Gomez; Cal Poly Pomona [equestad@cpp.edu](mailto:equestad@cpp.edu)

This workshop will include topics related to weed identification, methods of weed control, and the use of restoration to control weeds. Weed species will be discussed and identified, including annual grasses (*Bromus diandrus*, *Bromus madritensis*, etc.), black mustard, milk thistle, and Russian thistle. Participants will view a grassland restoration project that is in the early stages of weed control using a water and mow method timed with the growth of weed species. Weed distribution in open areas and within the southern California walnut woodland ecosystem will

be discussed in relation to environmental factors such as shade and allelopathy. We will demonstrate using restoration to control weeds in these areas and discuss the success of these projects in different habitat types. We also will have a discussion of how vertebrates, through their dietary preferences, affect the distribution of weeds. Finally, we will give an overview of the cost-effectiveness of using various planting and seed methods. The workshop will occur at the Lyle Center for Regenerative Studies on the Cal Poly Pomona campus (walking distance from the conference site).

**Developing a post-fire Early Detection Rapid Response (EDRR) framework.** Lauren Quon, USDA Forest Service; Robert Fitch, UCSB [laurenquon@gmail.com](mailto:laurenquon@gmail.com)

Fire is an important phenomenon that can shape and influence weed infestations in native vegetation communities in southern California. Weeds after fire can become a long-term problem and long-standing issue if not assessed and treated appropriately. This workshop provides a framework for post-fire Early Detection Rapid Response (EDRR) processes and site preparation for restoration for land managers/stewards. Workshop content also focuses on EDRR and prioritizing treatment approaches in anticipation of weed infestations after fire incidents. Management topics such as identifying priority weeds, weed ecology, post-fire EDRR framework, monitoring, and mapping tools will be covered in the workshop. Presentations on assessing pre-fire conditions, post-fire EDRR emerging weeds, EDRR tools, and introducing a post-fire restoration framework GIS modeling tool for national forests will occupy the first hour of the workshop. The training will conclude with a group hike around the Lyle Center to discuss fire-prone weeds, their management, fuel breaks, and implementing EDRR on-the-ground.

**Finding optimism for effective conservation in weed-invaded southern California.** Justin Valliere, CSU Dominguez Hills [jvalliere@csudh.edu](mailto:jvalliere@csudh.edu)

The mention of southern California often conjures up images of a highly modified urban landscape and suburban sprawl, yet the region also contains vast areas of open space and a rich diversity of native species and ecosystems. Shrubland, grassland, and woodland plant communities continue to persist throughout southern California despite the many threats posed by human activities, including that of invasive plant species. Beginning with the colonization of California by Europeans, non-native plant invasion has dramatically transformed large swaths of land, sometimes resulting in complete vegetation-type conversion; one only must look out a window while stuck in traffic at the hillsides of invasive annual grasses and mustards for evidence of such shifts. Other drivers of environmental

change may further promote invasion and exacerbate the negative ecological consequences, including air pollution and resultant nitrogen deposition, climate change, and altered fire regimes (of which invasive species are a major contributor). However, all is not lost, and the resilience of some southern California's native ecosystems provide hope as we work to address the impacts of plant invasion and climate change. This

presentation will present examples of habitats and human management actions that show promise of being resilient. Meeting current environmental challenges will require strong collaboration among scientists, practitioners, and policy makers, public engagement, and training the next generation of invasion ecologists and land managers.

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## Poster Abstracts

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(List is alphabetical by lead author. \* Student Contest entrant.)

**The impact of small vertebrates on community assembly in degraded California sage scrub.** Taylor Edwards; Erin Questad, Cal Poly Pomona [tnedwards@cpp.edu](mailto:tnedwards@cpp.edu)

Native consumers have been found to influence plant recruitment and community assembly, depending on what species they prefer. In California sage scrub, little is known about the preferences of small vertebrate consumers, although their feeding behavior may affect interspecific competition between native and invasive plant species. There is also an unexplored opportunity to investigate which plant functional traits are preferred by herbivores in the sage scrub community. We established caged and uncaged native restoration plots in degraded sage scrub on the Cal Poly Pomona campus in order to investigate the effects of consumers on community assembly. Thirteen native species were hand-seeded into research plots dominated by invasive annual grasses and forbs. Plant species cover and functional traits were measured in experimental communities while motion activated trail cameras recorded consumer activity. Preliminary results showed that most species grew better in caged conditions compared to uncaged; however, invasive short-pod mustard (*Hirschfeldia incana*) and Maltese star thistle (*Centaurea melitensis*) had higher cover in uncaged plots. Overall, consumers appeared to prefer native over invasive species, suggesting that herbivores and granivores may promote non-native success in sage scrub communities. By evaluating the influence of consumer activity on native and invasive competition, this study aims to inform future invasive plant management and native plant restoration efforts.

**How much seed do we need? Success of varied seedling densities and watering efforts on southern California shrubland restoration in plastic tree shelters.** Meghan Jeffus\*; Erin Questad, Cal Poly Pomona [majeffus@cpp.edu](mailto:majeffus@cpp.edu)

Southern California shrubland communities face expansive type conversion into invasive grasslands due to many anthropogenic factors. A solution to unpredictable precipitation is to add water manually as part of a restoration, though the associated costs may prove difficult in large-scale projects. Native species are outcompeted by intense propagule pressure from invasives, which can be solved by increasing the density of seeded natives. Plastic tree shelters have shown to increase plant growth success by providing favorable conditions for seedlings, though seeding shrub species directly into tree shelters is relatively novel. By removing the unpredictable precipitation by watering, we predict there will be higher levels of success at lower seeding densities, reducing the amount of seed needed for successful restoration. To determine if watering is worth the additional cost, and if it has an effect on seeding density success in a restoration, we propose an experimental restoration field experiment in tree-shelters at the John T. Lyle Center for Regenerative Studies at Cal Poly Pomona. *Diplacus longiflorus*, *Amsinckia intermedia*, and *Eriogonum fasciculatum* — three species commonly utilized in restorations — have been seeded into tree shelters at varied densities from 10 to 200 seeds per shelter. Half of the tree shelters will be given water on a schedule based on outplant watering regimes. Preliminary seedling presence and amount data from January to May 2022 has been collected. This study aims to quantify the effect of watering treatment on the number of seeds necessary for a successful restoration without a surplus of wasted resources and costs.