Women Against Invasive Olives: Standards of practice for removal of *Olea europaea* on Santa Cruz Island

Bailey Thieben & Hope Weber 2025

VISIT OUR WEBSITE!

CIES

Who We Are

The **California Institute of Environmental Studies** (CIES) was established in 1976 to monitor seabirds in Southern California. Since its founding, the non-profit has expanded its boundaries and performs a number of restoration projects, primarily on the Channel Islands.

Invasion on Santa Cruz Island

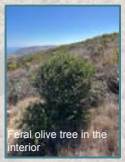
- Largest and most diverse Channel Island
- Ranching from early 1800s-1980s, after 9,000 years of Chumash habitation
- Pigs, sheep, and cultivated/non-native flora significantly altered landscape
  - Olive grove planted in 1887
  - Olives were spread but kept at bay by browsing animals
- Grazing animals were eradicated, olives were released from browsing pressure (able to grow and potentially reproduce
- Feral olive management began formally in 2007 (work done a few year prior) under "The Fennel Project" by NPS and is now primarily worked on by CIES
- This season our efforts are solely based on surveying and treating feral olives

The Olive Problem

- Spread from the protected Smuggler's Cove Historical Olive Grove (1887)
- Invade southern California grasslands and shrublands
- Shade out native vegetation under their canopies
- May disrupt mycorrhizal connections of native plants (Besnard & Cuneo 2016)
- Dispersed by feral pigs and sheep (eradicated in 2007)
  - Thought to be dispersed by birds (ravens, scrub jays)
- Cultural preservation of the historical olive grove prevents full eradication and requires continued maintenance


Preparing to chainsaw large olive tree


Historical Smuggler's Cove Olive Grove


Feral olive tree in the interior

Takeaways

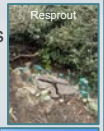
- Olives will grow anywhere
- Cut/stump & paint is this easiest method for full time olive work
- Be consistent and detailed in all mapping

Methods

- Pulaski*
  - Effective but very physically demanding
  - Difficult to do for an entire 8-10 hour day
  - Good for small trees/burls
- Manual cut/stump and paint (hand saw)*
  - Great for most plants
  - Details! Include method, location, and past successful kills
- Manual girdle and paint
  - Good for single stem olives too large to cut down
- Mechanical cut stump and paint (chainsaw)
  - Great for multistem, much lower effort than hand saw
  - Hard to carry out in the field, safety/fire risks
- Drill and fill
  - Easier than chainsawing farther out in the field
  - Uses a lot of herbicide, might not kill all included tissue

*Methods the authors have used

Herbicide Formula
Triclopyr/Imazapyr (Garlon 4 Ultra 2%/ Polaris 0.5%); Agridex 1%


Resprout


Chainsaw


Cut Stump Before

Cut Stump After


Cut Stump Before


Cut Stump After


Pulaski Before


Pulaski After

Treatment Tips

- Multistem olives have a lot of included cambium that needs to be treated
  - All live cambium needs to be treated (even tiny re-sprouts or suckers, which can grow from seemingly dead stumps)
- Additional slash & paint
  - If you think herbicide might not reach exposed roots or burl, add a few slashes and apply herbicide
- When olives are growing inside/near native plants, we often cut stump to avoid disturbing soil or harming natives with the Pulaski


Included cambium


Slash & paint


East Santa Cruz Island

Mapping Using ArcGis

Weed Point: Point that indicates treatment (weed target, formulation code, etc).
Hidden Weed Point: Represents a surveyed olive in its precise location, but has not yet been treated.
Thumbs Up: When the hidden weed point is treated, it is edited to a blue thumbs up.
Historical Treatments: Feral olives that have been treated in past years.

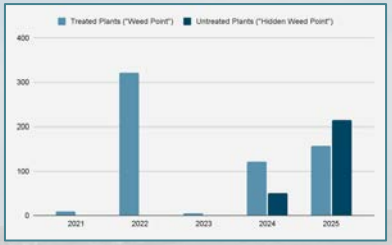
Our Data

Olive spread

- Olive grove area: **~6.2acres** (0.01 mi^2)
- Known feral olives area: **~13408 acres** (20.95 mi^2)
  - Area drawn around all treated and surveyed olives on SCI

Olives found versus treated in the last 5 years

- Mapping data is incomplete/inconsistent
- Important to see that high numbers of olives are still being found after years of treatment



Challenges and Suggestions

- It's hard work!
  - Split days up between surveying/treating or chemical/manual treatment
- Gaps/inconsistency in historical data
  - Map consistently and revisit past treatment areas
  - Details! Include method, location, and past successful kills
- Olives grow in difficult terrain
  - Work with others, and use tools that fit the terrain (ex: don't Pulaski on an unstable cliff)

Future Directions

- Continue surveying for olives
  - Many olives were removed before CIES was involved, and we are finding so many more
- Return to past treatment sites to monitor success of treatments

Acknowledgements: Thank you to Clark Cowen and Jane Weichert for giving us the skills and support to do our work. Thank you as well to Annie Little and NPS and to Mike Parker and Katy Carter with CIES.

References
Besnard, G., & Cuneo, P. (2016). An ecological and evolutionary perspective on the parallel invasion of two cross-compatible trees. AoB PLANTS, 8, plw056. https://doi.org/10.1093/aobpla/plw056