

Justification for iceplant solarization and leave-in-place method

Summary of techniques:

Solarization of iceplant monocultures will be the primary removal method implemented by project partners and participants using large black tarps to eliminate radiant sunlight. The tarps will be left on for approximately two months during warm weather, at which point the tarps will be removed and the desiccated iceplant material left in place.

This technique allows for the eradication of iceplant without the use of herbicides or heavy soil disturbance. Leaving the desiccated iceplant in place also prevents erosion through the retention of the existing root structure, even though it will no longer be viable. Soil-disturbing activities can lead to non-native vegetation invasions because opportunistic non-native plants are better adapted to infiltrate areas following ground disturbances. Soil bacteria, fungi, and other microorganisms create a natural below ground ecosystem that is disrupted when the soil layers are mechanically displaced.

The desiccated iceplant also acts as a form of mulch, helping to control non-native species invasions, while keeping the soil moisture high for native plants. Wetland habitats at Ballona have been heavily disturbed and most are hydrologically disconnected from estuarine waters. Retaining moisture in the soils through the use of 'mulch' will encourage native salt marsh regrowth with fewer plantings needed. Previous studies have confirmed the presence of a native seed bank beneath the iceplant (Johnston et al. 2011, 2012, R. Brody, pers. comm., 2015).

Minimizing or eradicating soil disturbance through the retention of desiccated iceplant also allows for the preservation of culturally-sensitive areas. The protocols described above will retain any existing resources in place.

Restoration events may also involve a small amount of additional hand-pulling of invasive species by volunteers along the margins of the iceplant monocultures in areas that are too patchy (with intermixed native plants) for broad-scale solarization. This will avoid impacts to existing native salt marsh vegetation.

Projects that have had successful experience implementing this solarization and leave-in-place method:

- 1) Channel Islands Restoration (CIR) in partnership with South Coast Habitat Restoration, Carpinteria State Beach and the Carpinteria Creek Coalition with funding provided by the Southern California Wetland Recovery Project. **Carpinteria Creek Mouth project** in Carpinteria, California.
 - Project involved first "solarizing" the iceplant (eradicated it by placing sheets of black plastic over the iceplant thereby heating it and depriving it of light). While leaving the desiccated iceplant in place, CIR staff and volunteers installed nearly 2000 native plants after the plastic was removed.
 - Photos:



Left: staff suspends sandbags from stakes and lines to hold the plastic sheeting in place on a steep slope. Middle and right: finished sections.



Project site (looking south) after removal of plastic sheeting and initial installation of native plants.



Project site (looking north) after removal of plastic sheeting and initial installation of native plants.



Project site (looking south) after removal of plastic sheeting and initial installation of native plants.

- 2) Channel Islands Restoration. Additional sites where this method has been used include: **Coal Oil Point Reserve (Devereux Slough Project), North Shore-McGrath sites, Santa Cruz and Anacapa Islands.**

Darlene Chairman. President Emerita, Santa Barbara Audubon. **Devereux Slough project** in Ventura, California

Photos:



Funding through the Audubon California and Wetland Recovery Project.

Successful eradication of approximately ½ acre of non-native iceplant via tarping and leave-in-place method.

- 3) Richard Brody. Land Manager, CDFW Ballona Wetlands Ecological Reserve.
richard.brody@wildlife.ca.gov. 310-455-3243 – Experience with successful implementation of this iceplant removal technique in the Ballona Reserve in 2008.

Additional Relevant Websites with Similar Successful Projects:

- http://www.schabitatrestoration.org/?page_id=563
- <http://www.nps.gov/chis/learn/nature/restoring-anacapa-island-native-plants.htm>
- <http://coaloilpoint.ucnrs.org/IBAProjectPhotos.html>
- <http://coaloilpoint.ucnrs.org/images/NorthEastCorner/index.html>
- <http://www.santabarbaraaudubon.org/SBAudubon/sbasrest.html>
- <http://scwrp.org/grants/cwrgp/>
- <http://scwrp.org/projects/ucsb-campus-lagoon-salt-marsh-restoration/>
- <http://scwrp.org/projects/ormond-beach-native-plant-restoration/>
- <http://ccber.ucsb.edu/ecosystem/management-areas-campus-lagoon/lagoon-island-campus-point>

Relevant Literature

Hale, Nathan William. 2013. Restoring native plants following invasive malephora crocea (coppery iceplant, aizoaceae) eradication on anacapa island. ProQuest Dissertations Publishing.

http://www.sci.sdsu.edu/SERG/restorationproj/chaparraland/point_loma/plantspeciesman/orcutt.html

http://ccber.ucsb.edu/newsletter/CCBERPdfs/CCBERNewsletter_Volume004.pdf

<http://www.parks.ca.gov/pages/23071/files/iceplant%203up%20final.pdf>