

Ten years of Challenges and Successes Managing
a Highly Invasive Weed in Carlsbad, San Diego County, CA



Sarah Godfrey

Preserve Manager- Center for Natural Lands Management
Cal-IPC Symposium October 17, 2019

Family Brassicaceae

- Small, pale yellow flowers
- Heart-shaped cotyledon
- Beak-shaped pod



La Costa Greens Wards Weed, Carlsbad, CA

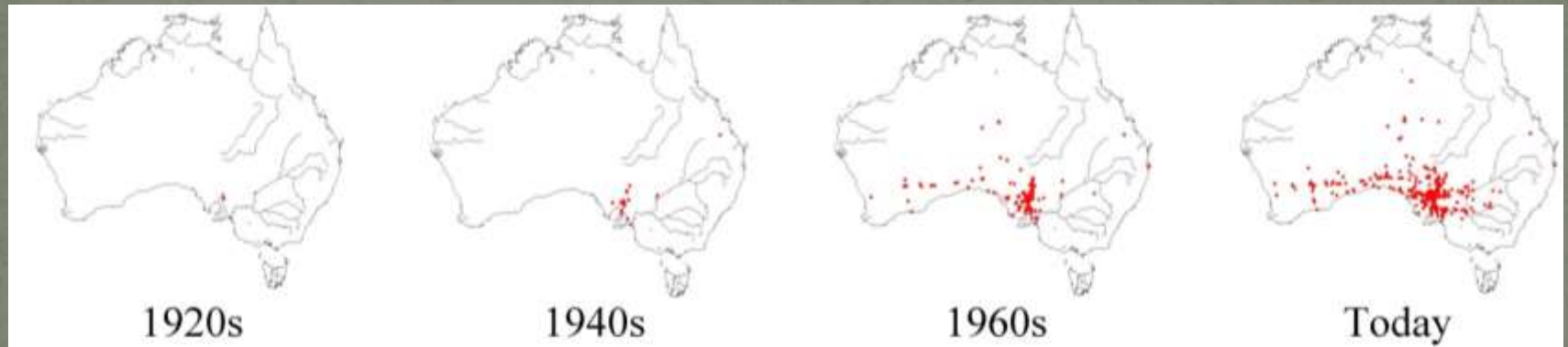


2007 Occurrence

Ecology of the landscape

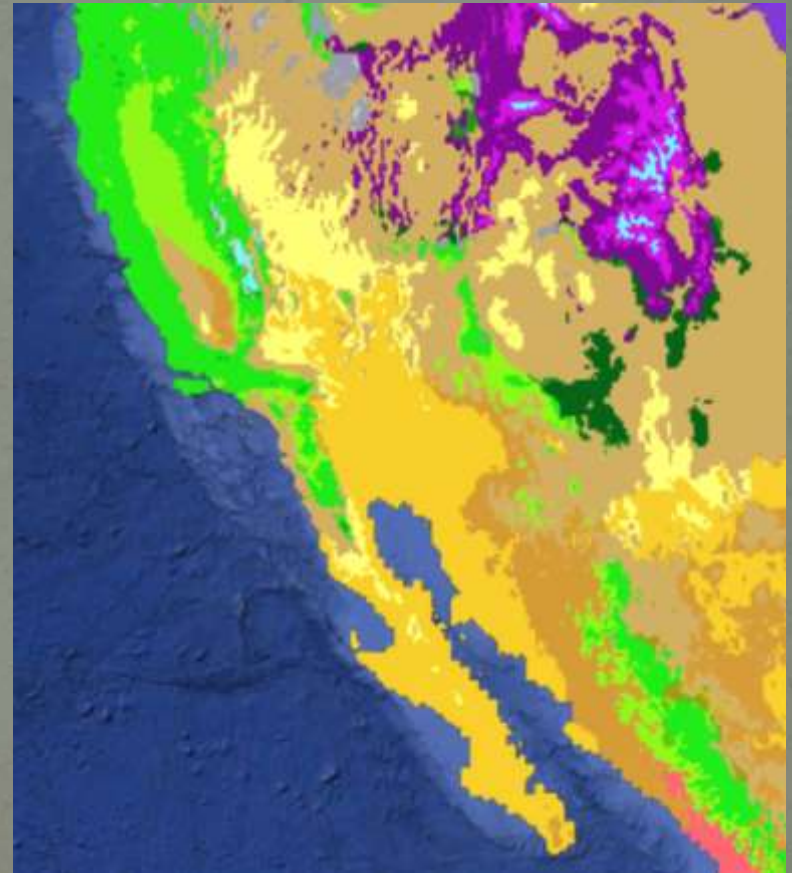
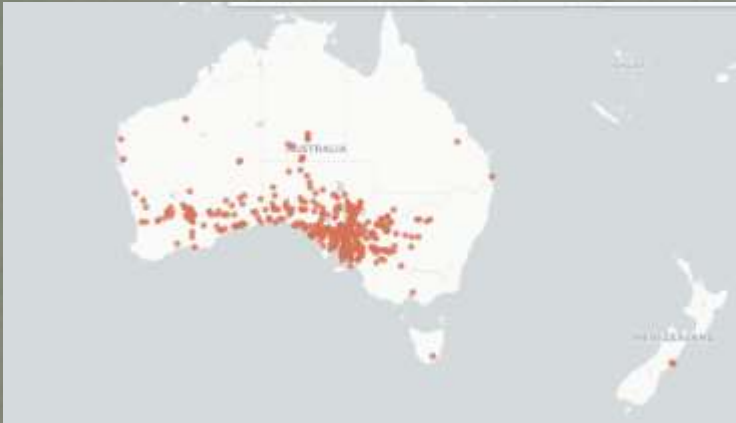
- Highly urbanized landscape
 - Carlsbad HMP, San Diego MHCP/MSCP
- Native coastal sage scrub habitat
 - *Artemisia californica*, *Encelia californica*
- MSCP- Protected Species
 - CA Gnatcatcher
- Opportunity for eradication?

In Australia, research into herbaria, historic correspondence and published distribution information suggests that a single introduction in 1915 at a single location eventually spread throughout the continent (Cooke et al 2011).



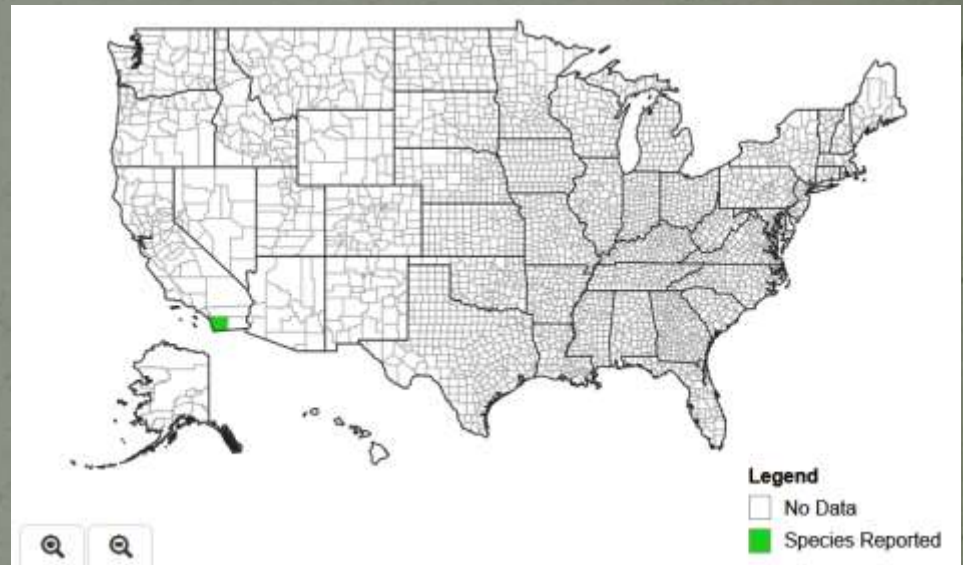
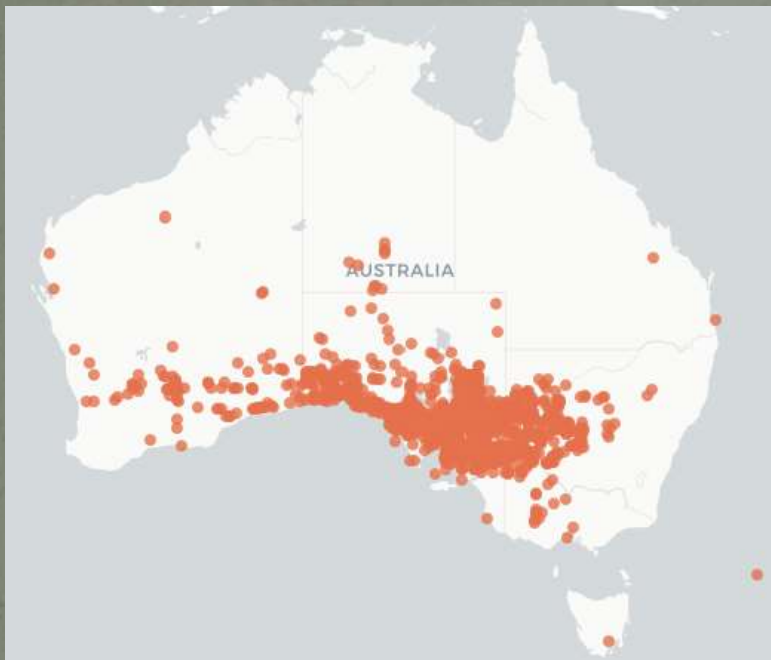
Source: (Cooke et al 2011).

The climate of S. Australia matches SW US



Slide Courtesy of Chris McDonald, UCCE

Current Australian Distribution and Location in United States



Slide courtesy Dendra, Inc

La Costa Greens Wards Weed, Carlsbad, CA



2007 Occurrence

La Costa Greens Wards Weed, Carlsbad, CA

2007 Occurrence

New Occurrence



2012 Occurrences

Rancho La Costa Habitat Conservation Area
Carlsbad, CA

0 1,000 2,000
Feet



Wards Weed, Carlsbad, CA



2007 Occurrence

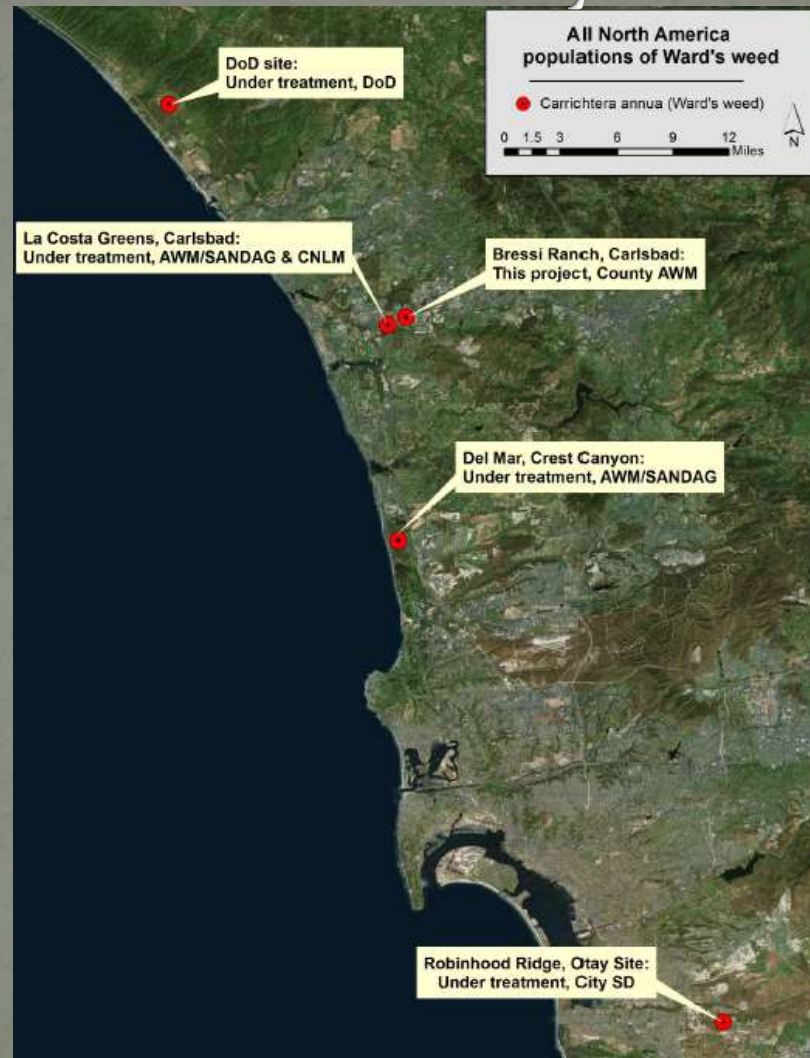
Current Extent of Ward's Weed

Rancho La Costa Habitat Conservation Area
Carlsbad, CA

0 1,000 2,000
Feet



Challenges: Spreading throughout Carlsbad and into other parts of SD County



Source: Dendra, Inc 2019

Challenges: Plant physiology

- Extremely high seed count (up to 30,000 seeds/sq. m)
- Germinates throughout year (November - ???!)
- Two seed banks allowing it to spread throughout the year
 - Seeds are dormant in the soil waiting a few years to germinate
 - The parent plant holds onto fruits for up to a year keeping seeds safe from predators and diseases

Challenge:

Up to 30,000 seeds per square meter



Challenges: Shapeshifter!

- California Adolphia *Adolphia californica*
- CNPS Rare Plant Rank 2B.1



Challenges: Herbicide Application with Backpacks

Telar (chlorsulfuron): post and pre-emergent, spot treatments

- broad-spectrum, effective on mustards, controls annuals/seedlings

Glyphosate: post emergent, spot treatments

- broad spectrum

Hand pulling: post emergent



Challenges: Hand Bagging

- Time consuming
- Repeat entries
- Creates soil disturbance
 - Stimulate seedbank
 - Opportunity for seed transport



Challenges: Irrigated Landscapes



Challenges: Secondary Invasions

- Eliminating native shrub cover allows for more invasive species competition and introduction
- Repeat site visits and soil disturbance



Success: An Herbicide That You Can Spray Over Native Shrubs

- Irvine Ranch Conservancy Research 2016-17
- Dow (Corteva)
- University of California Cooperative Extension

Gallery (Isoxaben):

- Pre-emergent
- Very good broadleaf control
- Does not have deleterious impacts to shrubs

Successes: Herbicide with Power Sprayer



Successes: Herbicide as a Tool

- Gallery (Isoxoban) prevents seed emergence
- Maintains structure and diversity of native shrubs
 - Grasses and geophytes thrive



Successes: Fuel Zone Clearance



March 2018

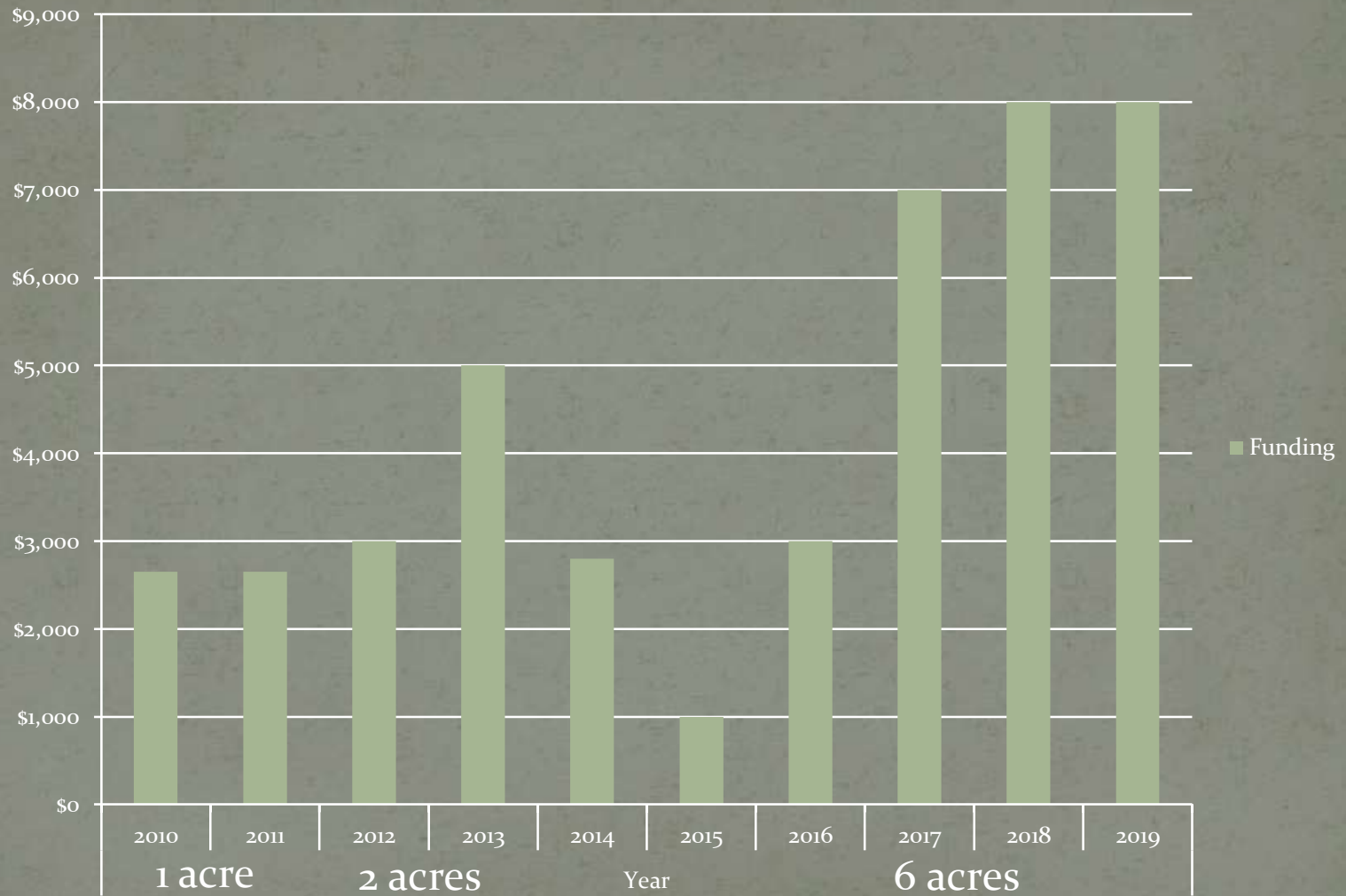


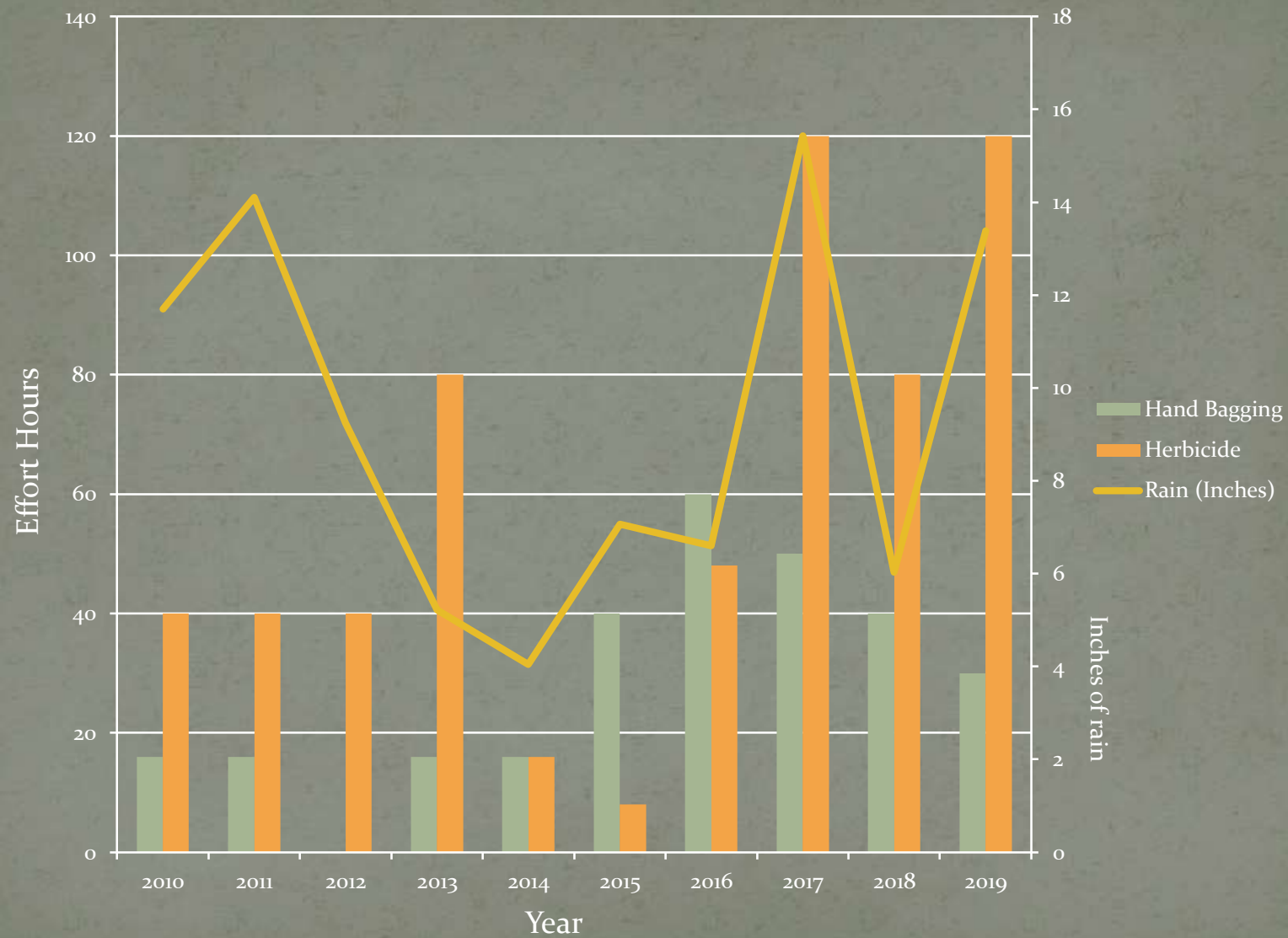
November 2018



August 2019

Funding Per Year





Successes: Knowledge is Power

- Literature review
- Outreach
- Collaborative funding
- Action!



ALERTA DE ESPECIES INVASIVAS

Ward's Weed • *Carrichtera annua*

Mejores prácticas de gestión

- Use ropa, botas y equipo que no retenga la tierra y el material vegetal (lona, nylon y cuero).
- Minimice las visitas al sitio en áreas infestadas (especialmente cuando el suelo está húmedo)
- Limpie la ropa, las botas y el equipo cerca de las áreas ya infestadas y lejos de las vías fluviales antes de abandonar el lugar de trabajo.
- Deje los materiales vegetales en el sitio para evitar la propagación durante la eliminación fuera del sitio

Evite cortar para limitar la propagación de semillas

Invasive Species Alert

Common name: Ward's weed

Scientific name: *Carrichtera annua* (L.) DC.

Debatte

-Mediterranean region and Western Asia (native), invasive in Australia

Identifying Factors:

- Small bristly-haired plant, 5-40 cm
- Leaves: < 10 cm and deeply divided into multiple narrow lobes
- Flowers: pale yellow, 4 petals, 8-9 mm with purple veins
- Fruit: 6-8 mm in drooping position, topped with spoon-shaped petals



Discussion

- Seeds dispersed via foraging animals and ants over short distances
- Long distance dispersal on vehicles, clothing, large animals, and agriculture

<http://www.ingentafr.com>

- Replaces perennial native species in some environments

Lucretia Ellet

-Some resemblance to western taro mustard

Management:

-If spotted please notify Sara Allen: sara@hawaii.edu & Victor News: vnews@hawaii.edu
to schedule treatment ASAP.

<http://www.elsevier.com/locate/jbiotec>
<http://www.sciencedirect.com>

The City of
SAN DIEGO

Success: Partnerships

Dendra, Inc



Thank you!



Sarah Godfrey- sgodfrey@cnlm.org, 760-300-3187