

# *Vinca major* and stone pine control in an endangered island endemic plant population – an update



# **Presenter - Ken Owen**

## **Channel Islands Restoration**

### **Project Collaborators:**

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**Clark Cowen, Jim Roberts**

**– Channel Islands National Park**



# Sea-cliff bedstraw

## *Galium buxifolium*

Rubiaceae (Madder Family)



# Distribution



Pt. Conception

Santa Barbara

Ventura

San Miguel

Santa Cruz

Santa Rosa

Anacapa

Los Angeles Metropolitan Area

Santa Barbara

Santa Catalina

San Nicolas

San Clemente

PACIFIC OCEAN

San Diego  
Metropolitan Area



A satellite-style map showing the Northern Channel Islands. The islands are depicted as small, green, irregularly shaped landmasses scattered across a dark blue sea. The surrounding mainland is visible in the upper right, showing a mix of green and brown terrain. A semi-transparent grey box is overlaid on the top left of the map.

# Distribution

*Northern Channel Islands*

# Distribution

**San Miguel**

**Santa Rosa**

**Santa Cruz**

**Anacapa**



# Distribution

5

populations

Last collected  
1930

21 populations

San Miguel



Santa Rosa

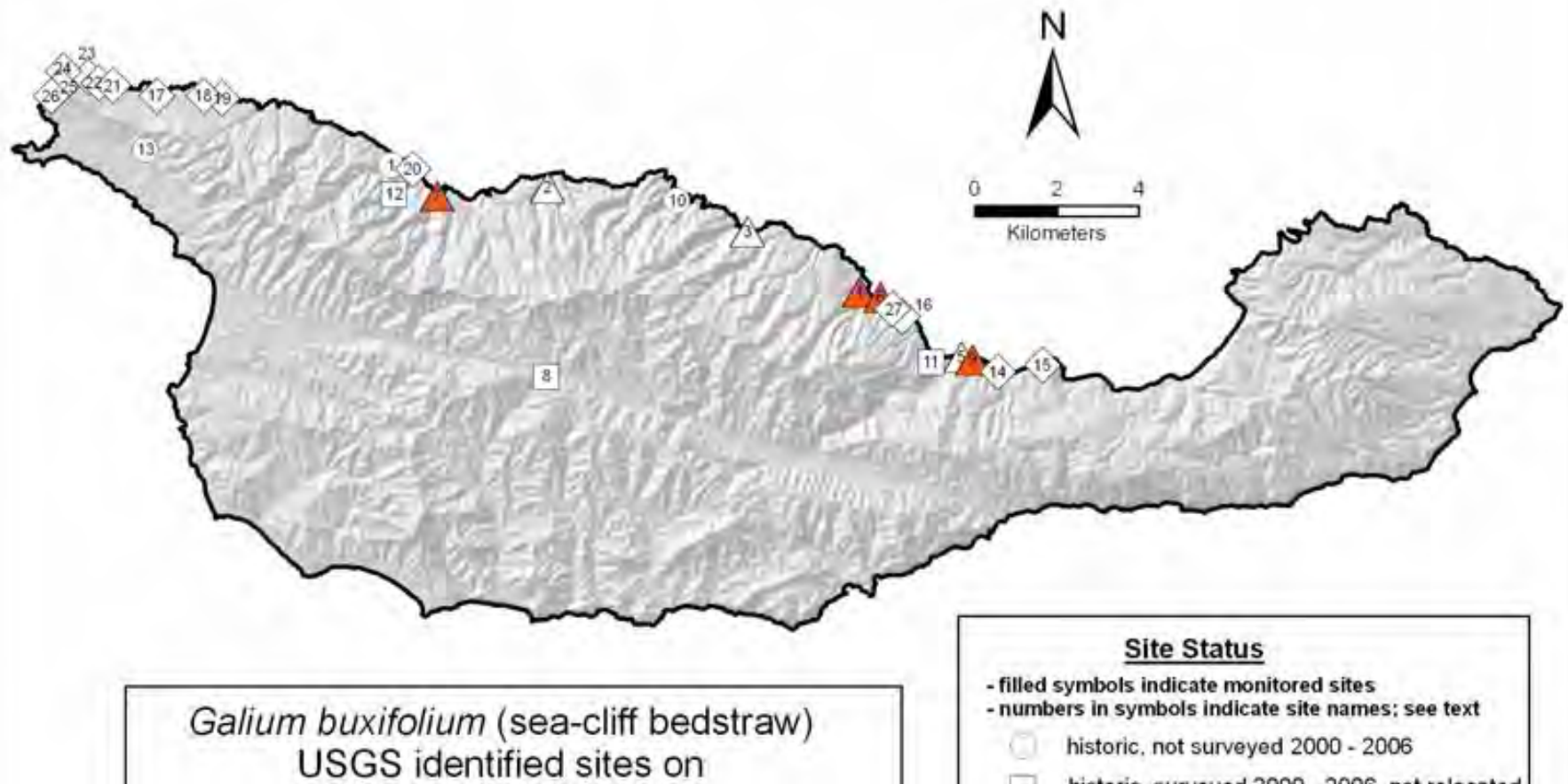
Santa Cruz

Anacapa

26 total confirmed populations



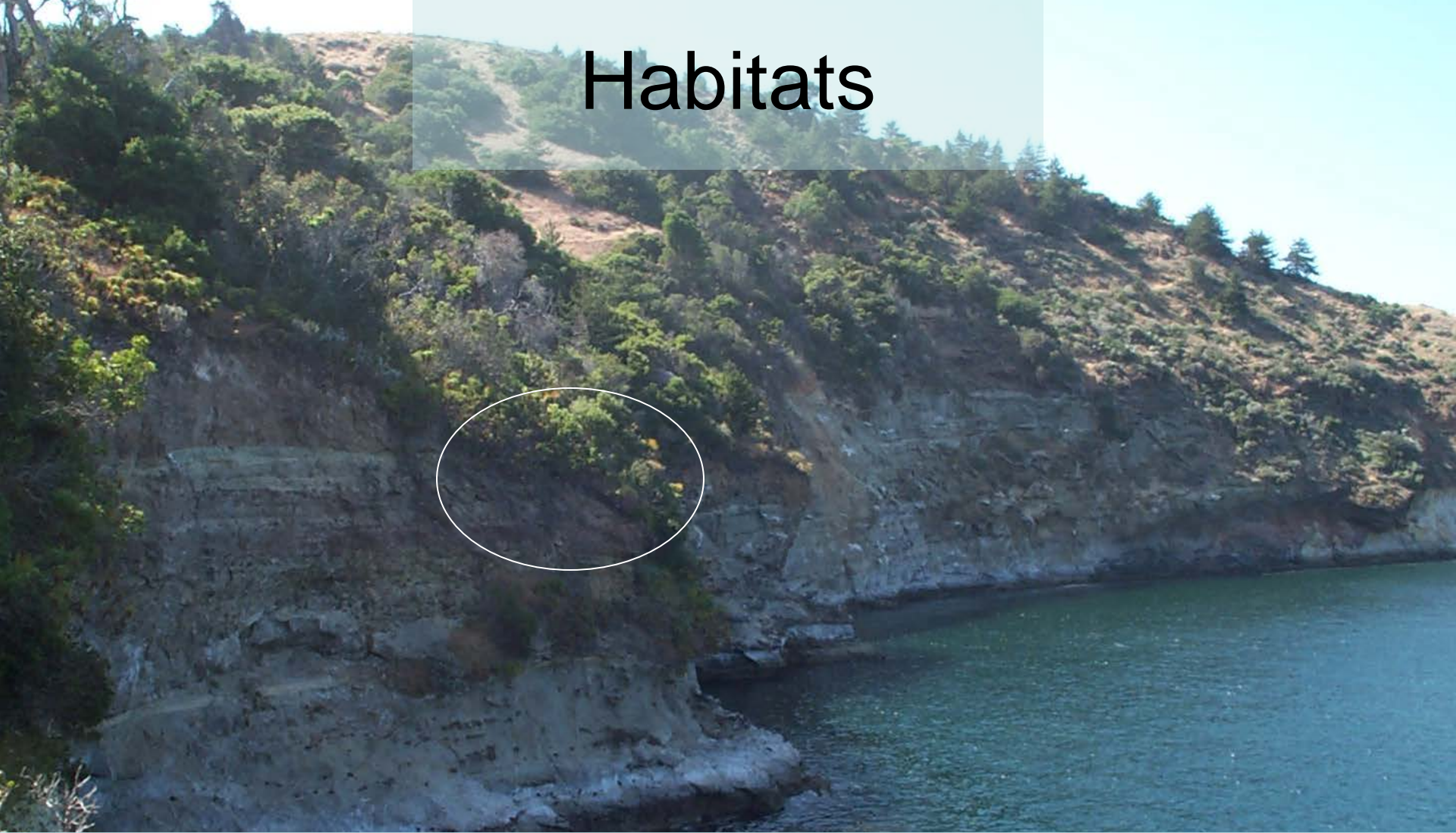
# Santa Cruz Island Distribution



- Seven of 13 historic populations confirmed by recent site surveys
- There are 14 newly discovered populations
- A total of 21 populations with confirmed historic or new records
- Numbers range from 1 to about 200 plants each
- Area occupied ranges from 1 to 8,000 square meters



# Habitats



- Cliff faces
- Refugia
- Dominated by remnant native shrubby vegetation
- Formerly more widespread on terraces above cliffs

2004. 4. 28 15:13



# Pelican Bay



2005 5 26 14:

# Pelican Bay 1913 - 1937





# Pelican Bay Today





# The Problem:

## Greater periwinkle (*Vinca major*)

1. *Galium* and the *Vinca* appear to be spreading from the cliff face upslope onto a series of natural outcrops, and rock walls and benches
2. Native scrub community appears to be recovering at the site
3. *Vinca* appears to be moving into the native scrub where it displaces small plants, including small *Galium*.



# Problem Resolution

1. Reduce *Vinca* cover and encourage *Galium* spread to sites away from *Vinca* for self-sustaining population
2. Develop and demonstrate a methodology for control of an invasive weed within the habitat of an endangered plant



# Project Objectives

- *Vinca* control on all but vertical cliff face
- Natural native plant community expansion
- *Galium* expansion beyond current boundaries (no planting)



2005 5 26



# Project Design

Multi-year effort in collaboration - USGS,  
NPS, TNC, USFWS, CIR, County of SB

Treat *Vinca*

Maintenance

Monitor:

- Treatment success
- Effects on native community and *Galium*

2005. 5. 26 14:14



# 2 Stages

A person wearing a blue wide-brimmed hat, a blue jacket, and blue gloves is working in a field. They are holding a pair of orange-handled shears. The field is filled with green vegetation and several orange flags are planted in the ground. The background shows a dense thicket of trees and bushes.

## Stage 1 - Implementation

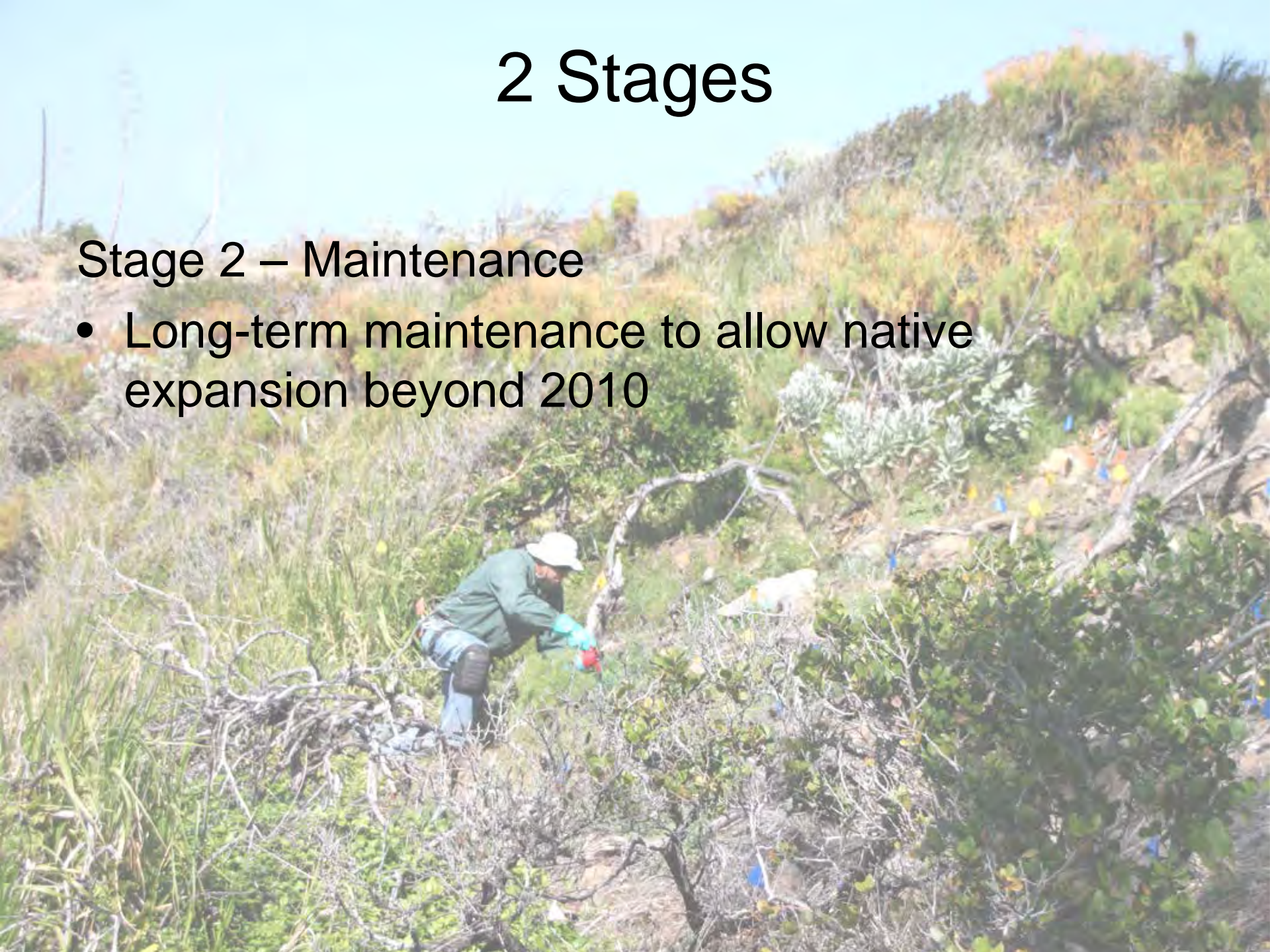
- Initial heavy treatment to eliminate (reduce by 90%) *Vinca* cover on terrace 2009-2010



# 2 Stages

## Stage 2 – Maintenance

- Long-term maintenance to allow native expansion beyond 2010





# Monitor effectiveness

- Galium demography
- *Vinca* cover
- Plant community composition



2005 5 26



# Risks:

- Incomplete *Vinca* kill and wasted effort
- Unintended *Galium* mortality
- Habitat damage
- Human safety

2005. 5. 26 14:14



# Stage 1 - Implementation

- Development phase (dates/techniques)
- Collect data on size-class structure  
Galium, Vinca cover, native plant community
- Collect and bank seed as insurance against loss
- USFWS funding/permitting
- Develop rappelling techniques for safety



# Techniques

X Anchor Point

x Rebar stakes

● Belayer location

— Safety lines

▲ Work area

















# Hand-removal Vs. Herbicide Treatment



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Both ends of the flag inserted in ground



Galium plant separated from Vinca























Treated *Vinca*



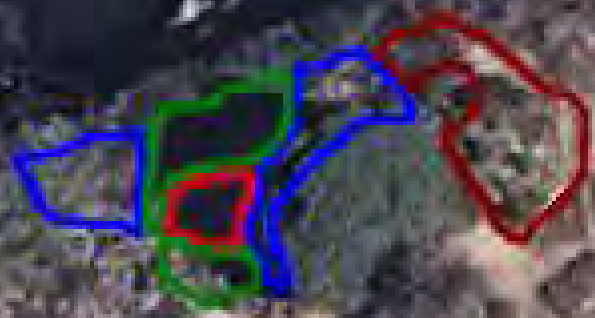
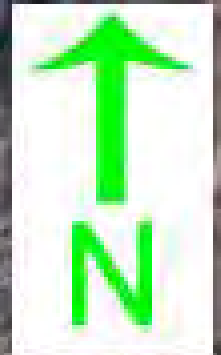
Galium





# Initial Treatment

- 2/1/09 - 2/2/09
- 5/13/09
- 5/20/09 - 5/21/09
- 5/27/09





# Results!



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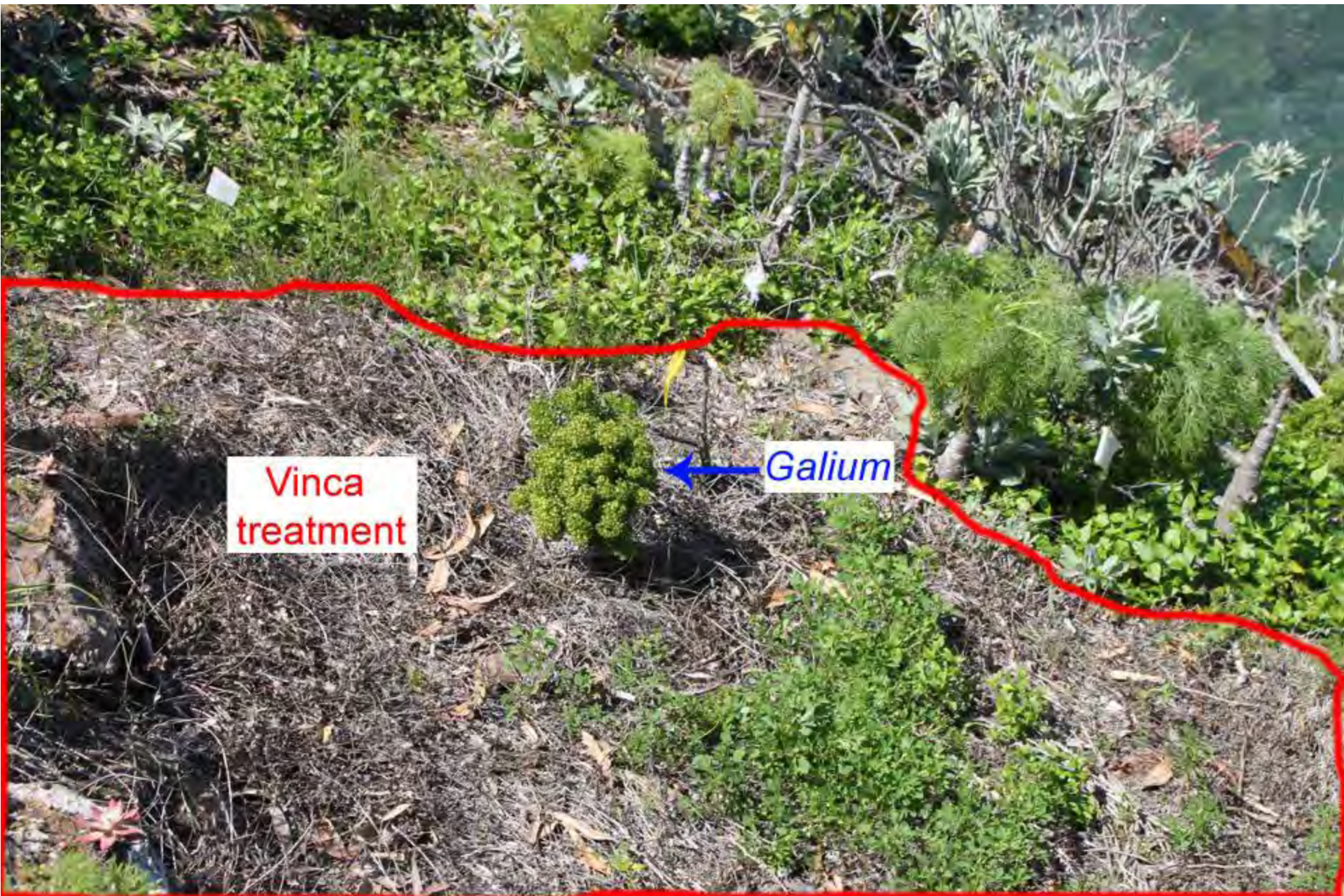












Vinca  
treatment

Galium





















































Galium

Vinca



A photograph of a natural landscape. In the foreground, there is a gnarled, grey tree trunk with several branches extending across the frame. The ground is covered with various green plants, including tall grasses and smaller leafy vegetation. A white rectangular label with the word "Galium" in blue cursive font is positioned on the left side of the image. Four blue circular markers are placed on the ground, pointing to specific locations where Galium plants are growing. The background shows more dense greenery and a bright, sunny sky.

*Galium*



# Challenges

- Work setting – access and safety
- Accessing Vinca plants
- Weather and herbicide application window
- Protecting Galium from herbicide
- Limiting habitat damage
- Vinca is tenacious!



# Monitoring Results

- Data prior vs data post
- *Galium* occupied area
- Number of *Galium*
- *Galium* stage structure
- *Vinca* kill rate
- *Vinca* cover
- Plant community composition (relevés)









Stone pine removed 2011

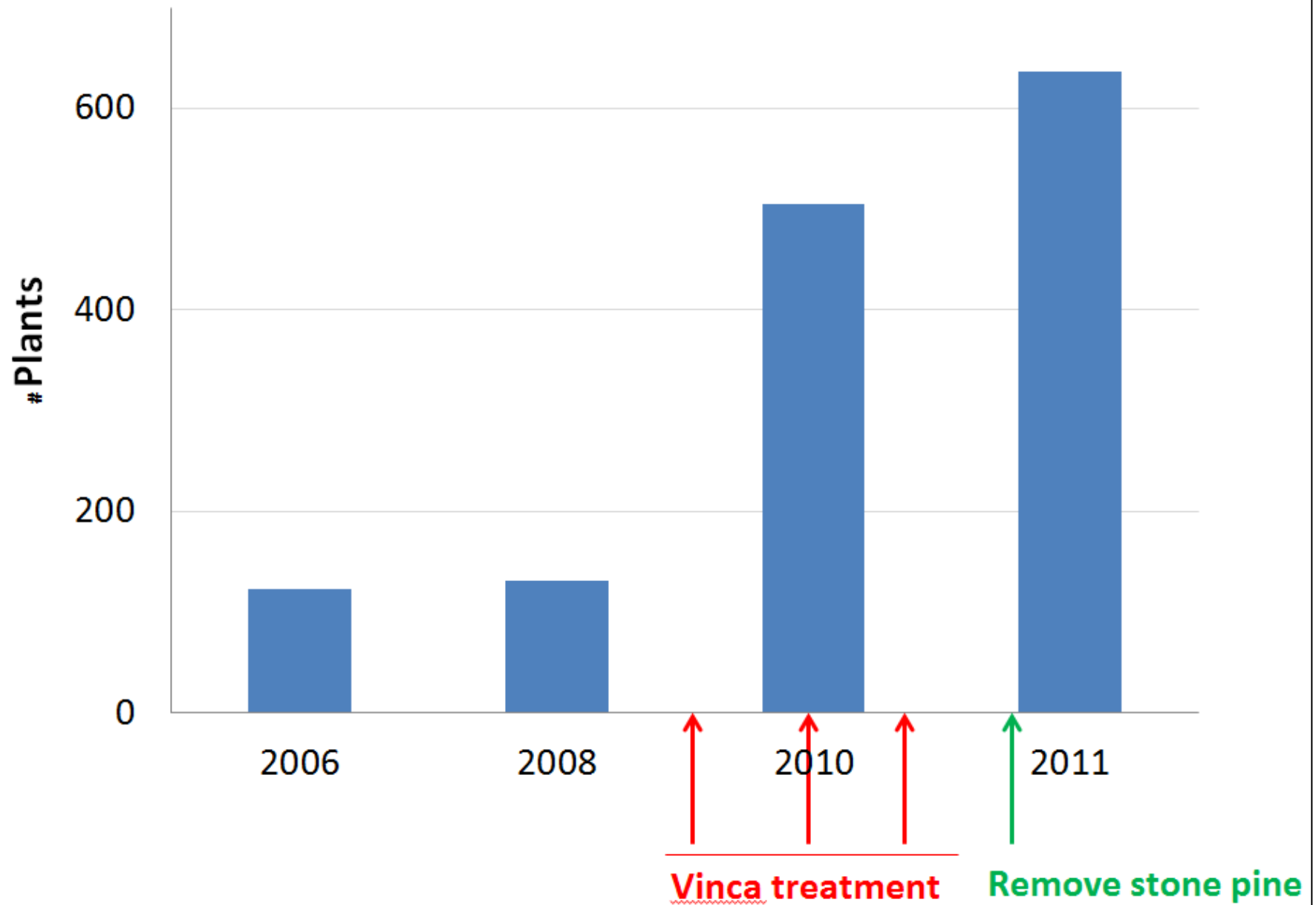


# Conclusions:

- Vinca kill at least 95% (techniques worked)
- Minimal habitat damage or damage to existing Galium
- *Galium* mortality primarily from newly recruited seedlings, not related to Vinca control
- Net increase of more than 500 Galium plants



# Total *Galium buxifolium* plants 2006-2011, Pelican Bay, Santa Cruz Island



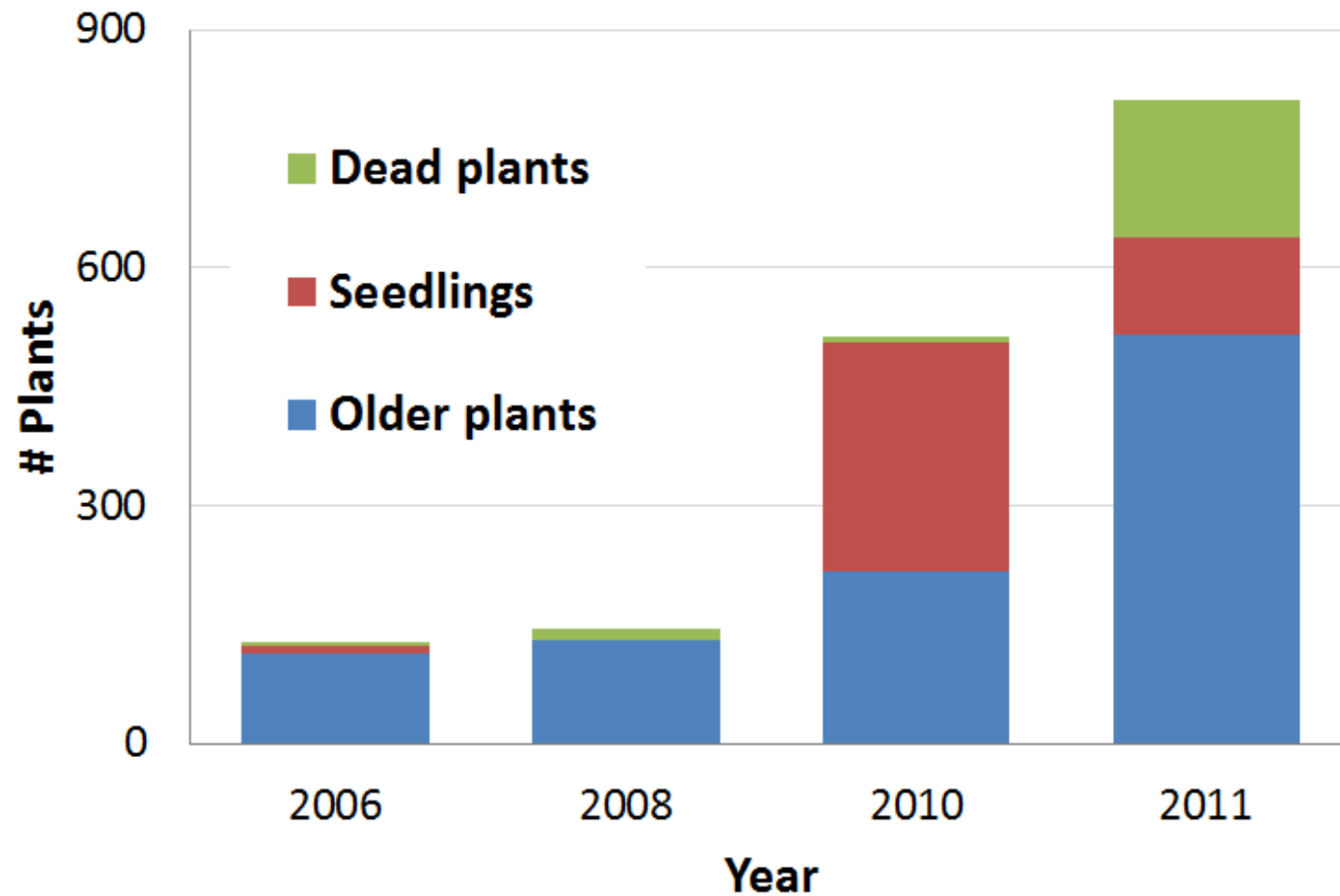


**Total *Galium buxifolium* plants 2006-2011,  
Pelican Bay, Santa Cruz Island**

	2006	2008	2010	2011
Seedlings	9	1	289	121
Older plants	114	130	216	516
Total live plants	123	131	505	637

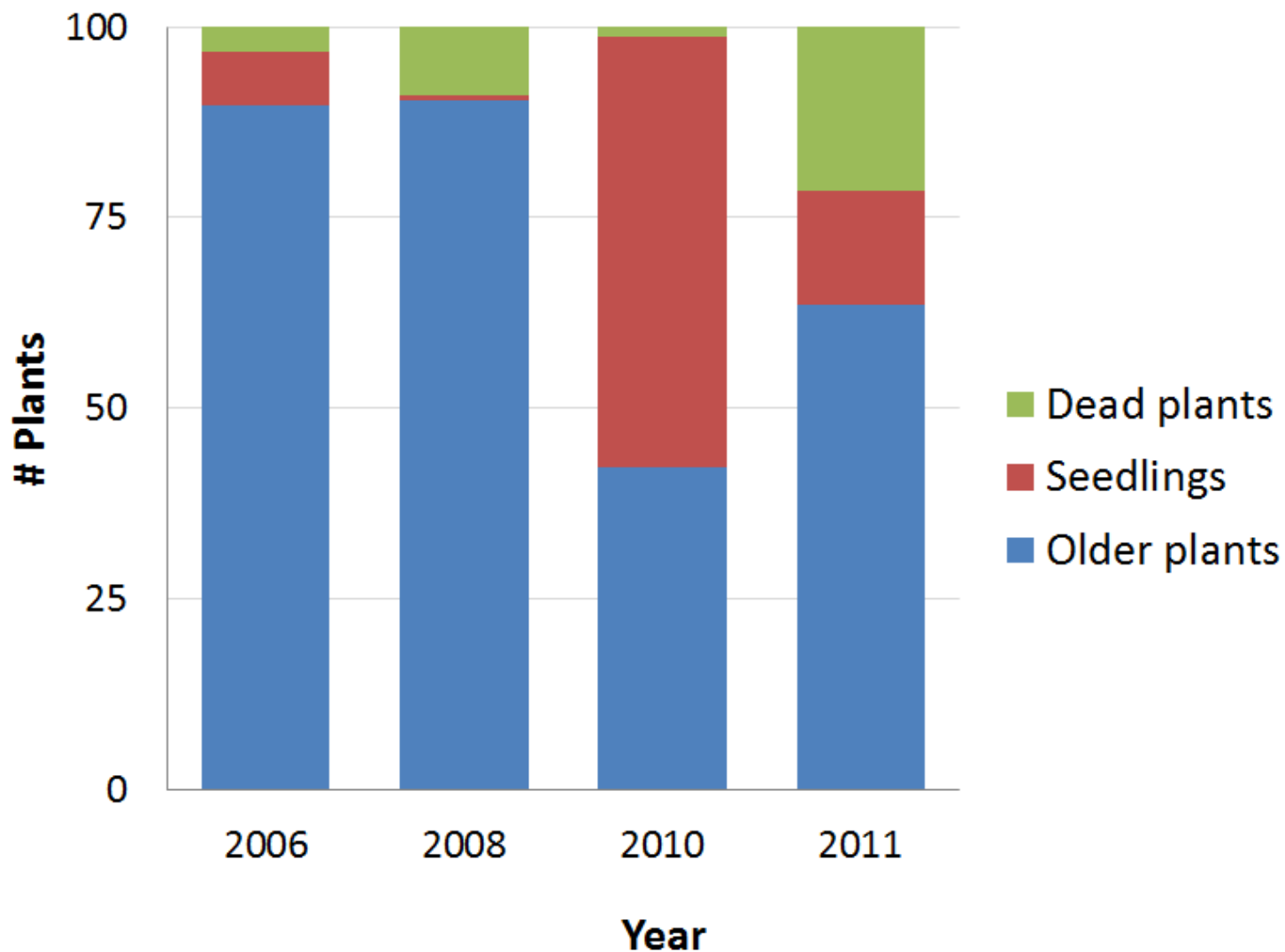


# Number of *Galium buxifolium* plants by life stage 2006-2011, Pelican Bay, Santa Cruz Island





# Percent of *Galium buxifolium* plants by life stage 2006-2011, Pelican Bay, Santa Cruz Island





# Stage 2 - Maintenance

- Continue monitoring and maintenance
- Vinca control – cliff face distribution
- Look for natural expansion over several years
- Assist expansion if necessary in future project





# Questions?

