

Native plant recovery in seeded and
non-seeded plots following exotic Fennel
(*Foeniculum vulgare*) control on
east Santa Cruz Island – ten years post treatment.
Channel Islands National Park

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Paula Power, Ecologist, Channel Islands National Park

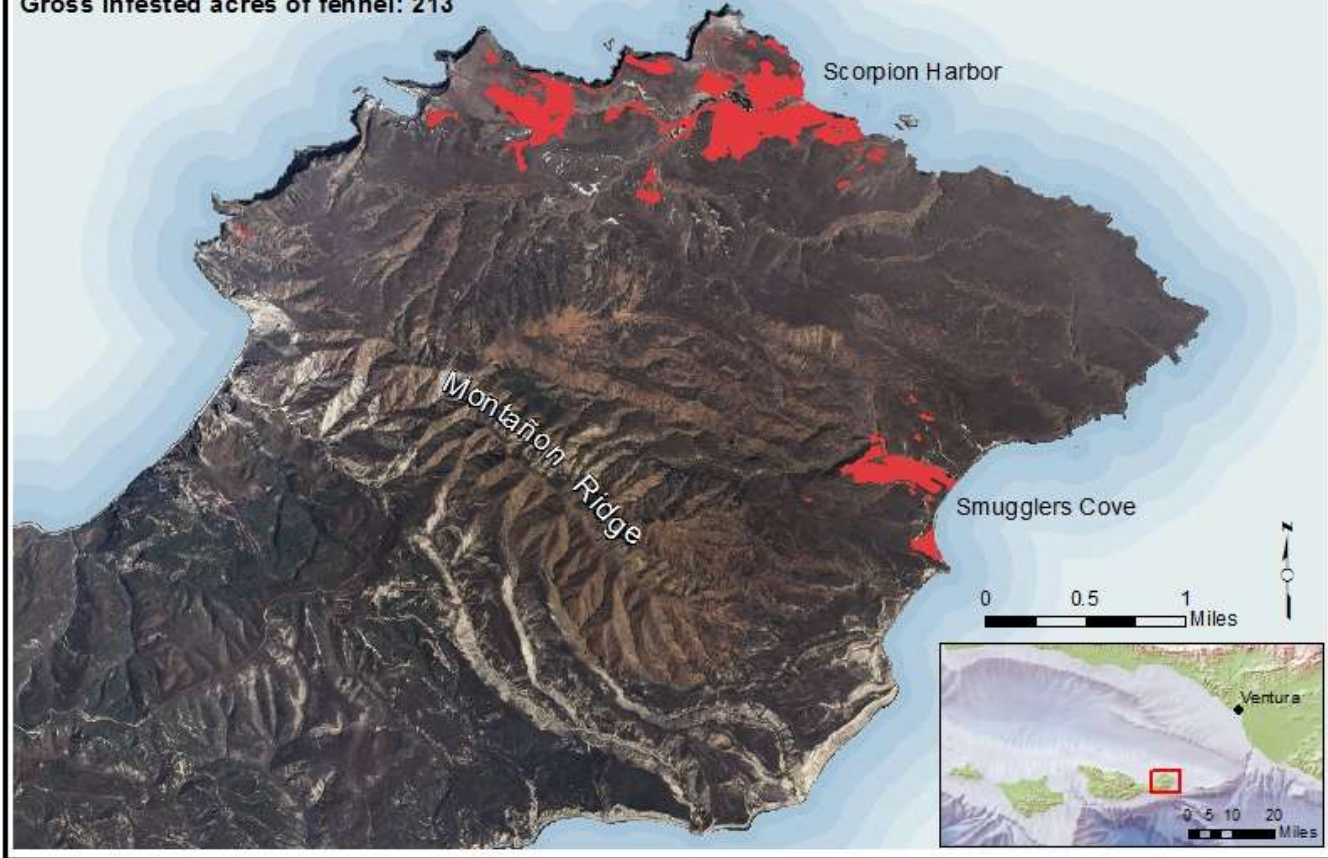
James R. Roperts, Channel Islands National Park

Thomas Stanley





Fennel Treatment Footprint East of Montañon Ridge, East Santa Cruz Island, CA
Gross infested acres of fennel: 213



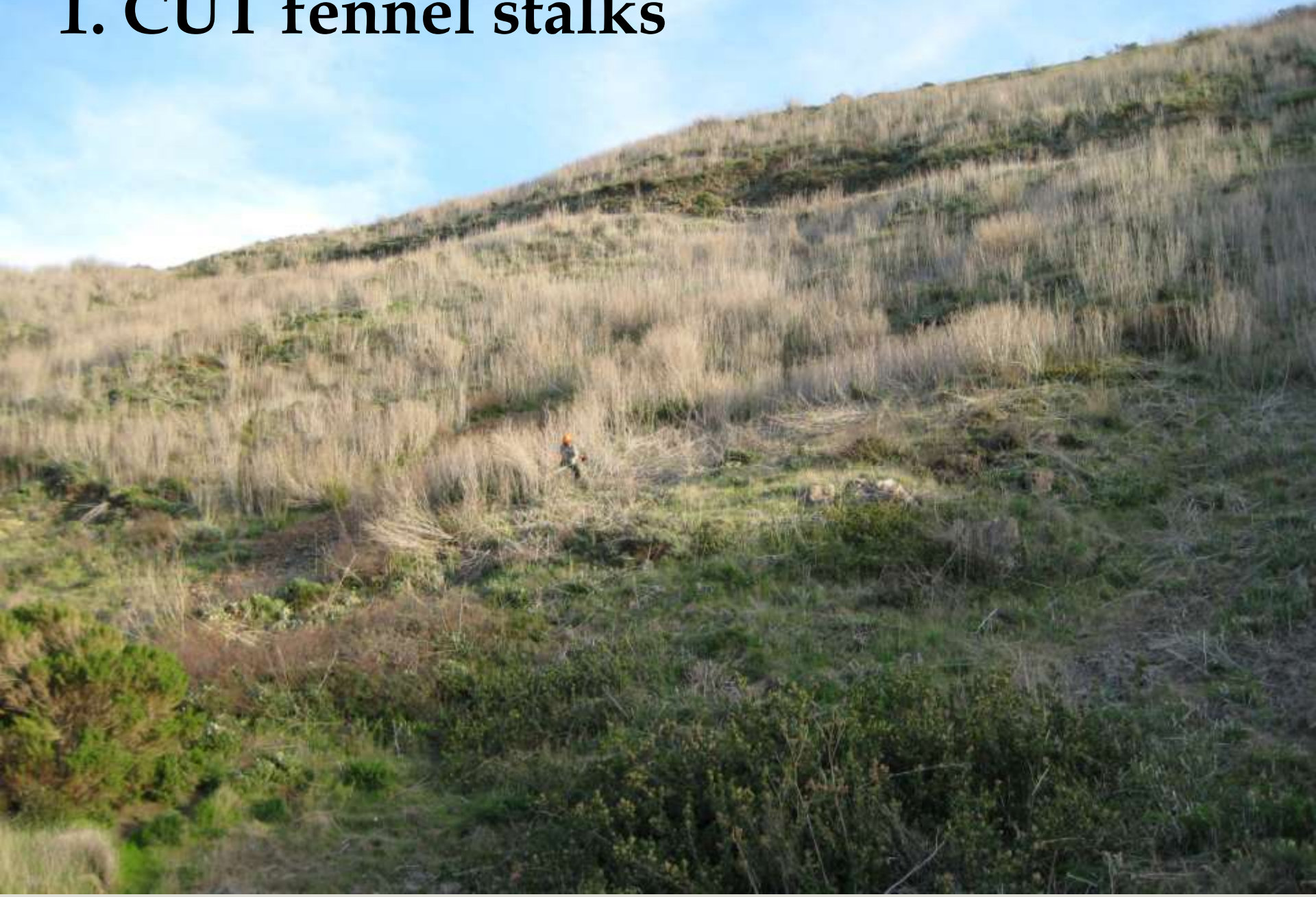
2007 Condition: Fennel dominates vegetation at Scorpion and Smugglers

Project Goal: Treat all fennel east of Montanon Ridge
Control fennel so that native plants recover and are the dominant vegetation at Scorpion and Smugglers.

**Challenge: Treat every fennel plant on
East Santa Cruz Island - 213 acres**



1. CUT fennel stalks



2. BUNDLE fennel stalks



3. BURN fennel stalks



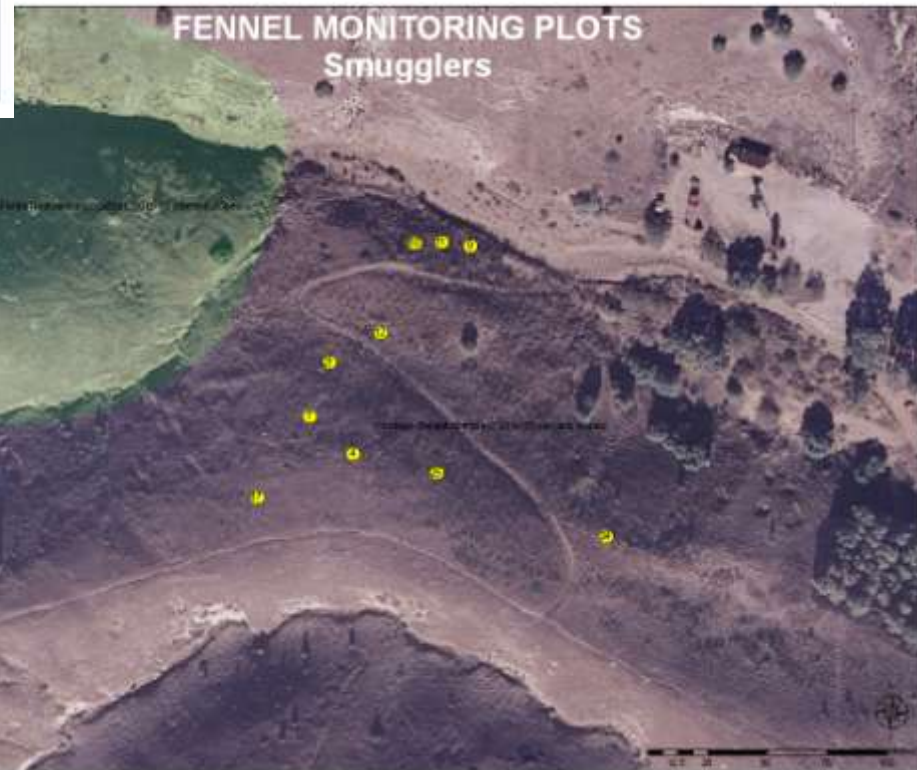
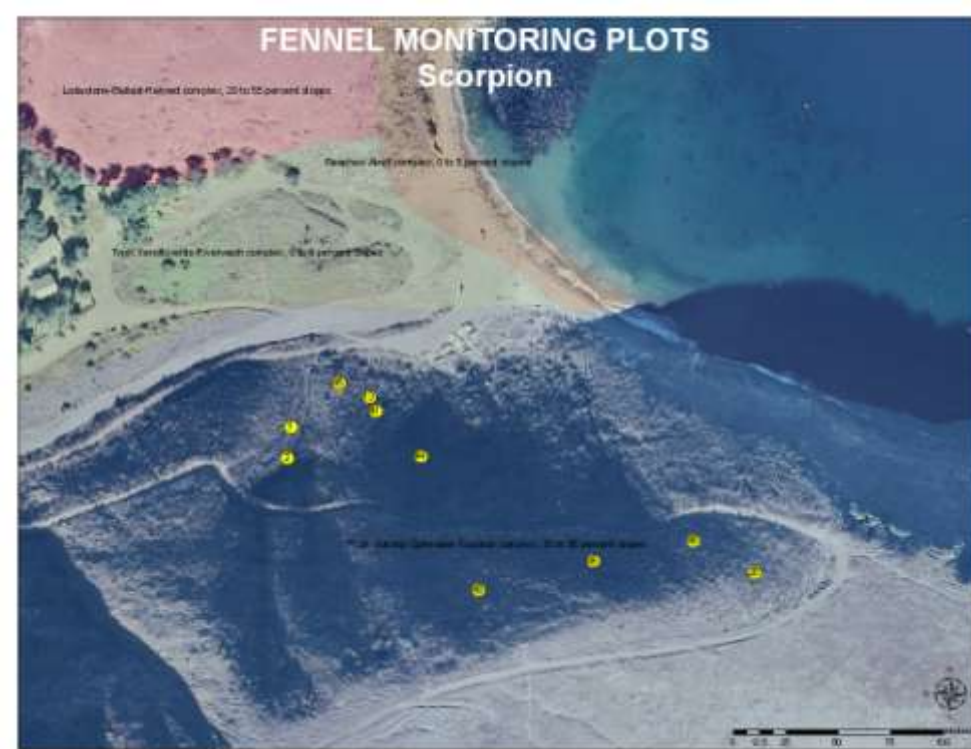


**4. TREAT every
fennel plant with
Garlon 4 Ultra**



5. Monitor success of treatment

MONITORING PLOTS
SCORPION and SMUGGLERS

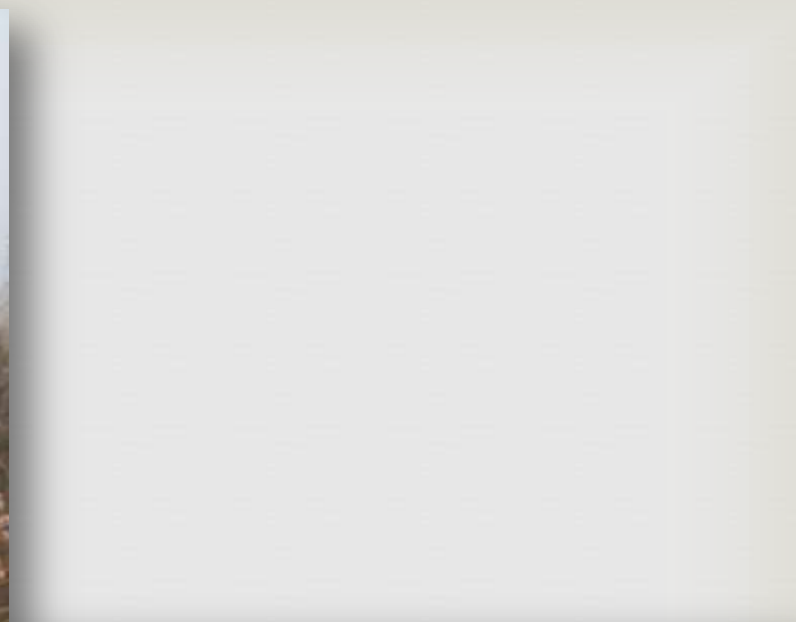


*10 - 1 m² paired plots

*TREATMENT: Seeded

*CONTROL: Unseeded

*Collect data each spring 2009 - 2012,
2018



Eriogonum grande var grande

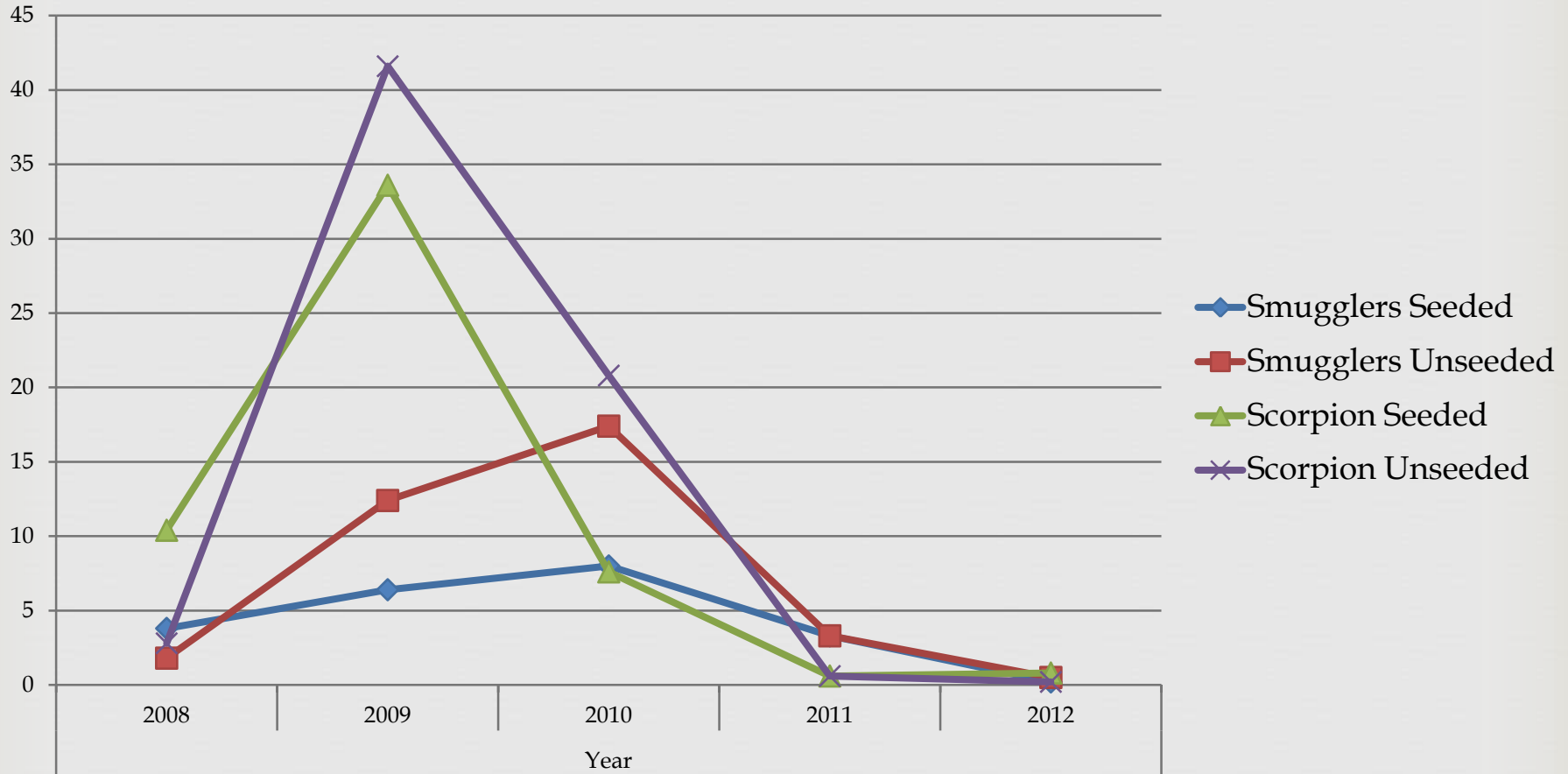
Eriogonum arborescens

Artemisia californica

Coreopsis gigantea

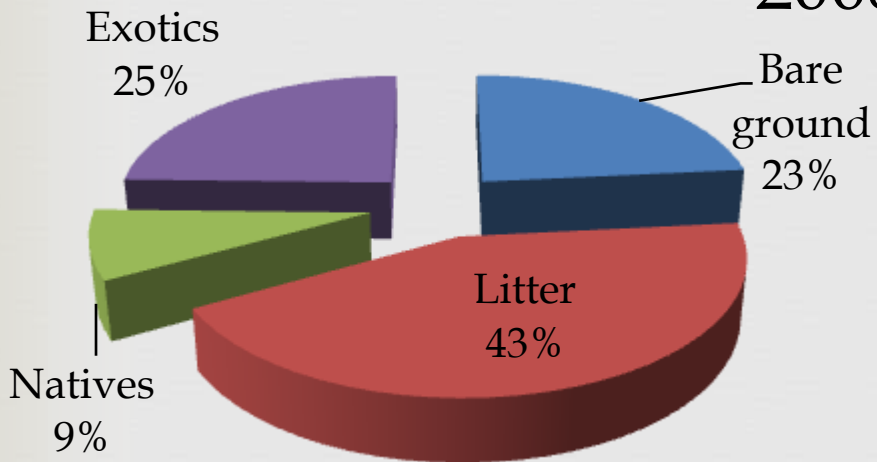


Number of fennel seedlings in monitoring plots

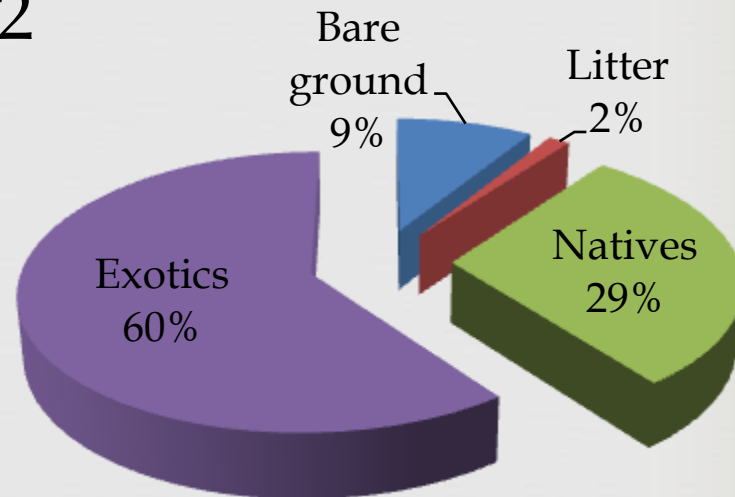


Scorpion Seeded-%cover $n=10$

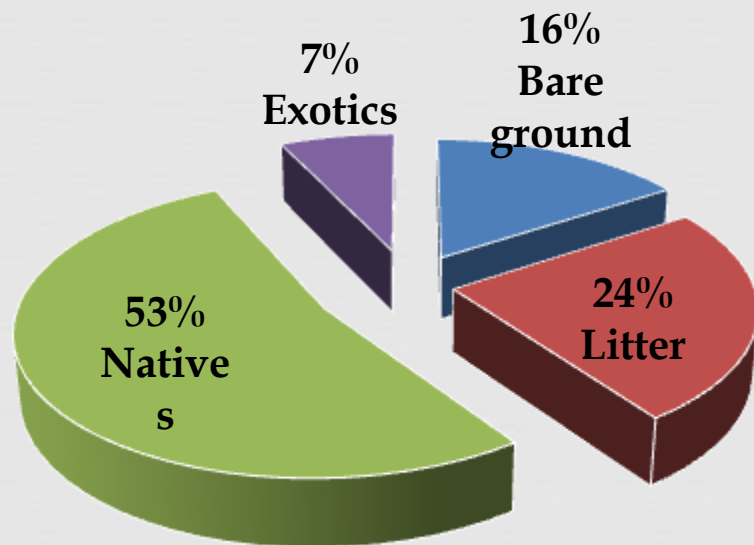
2008



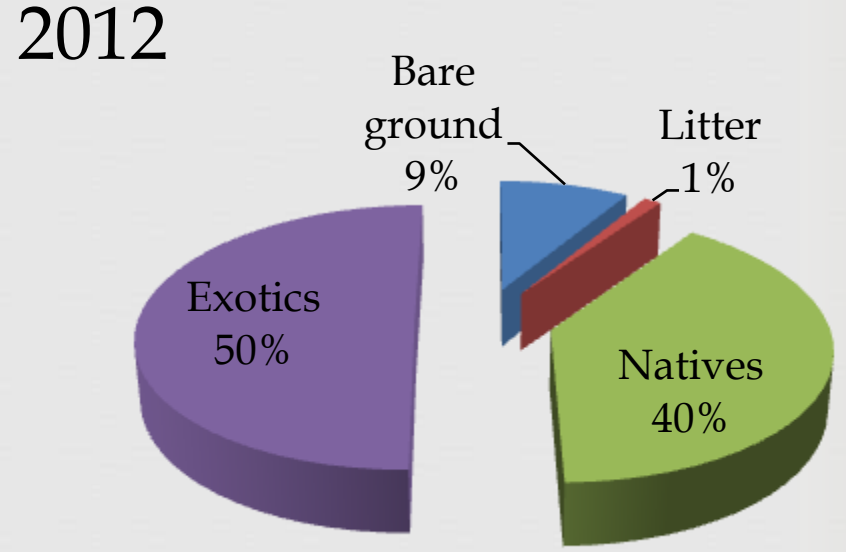
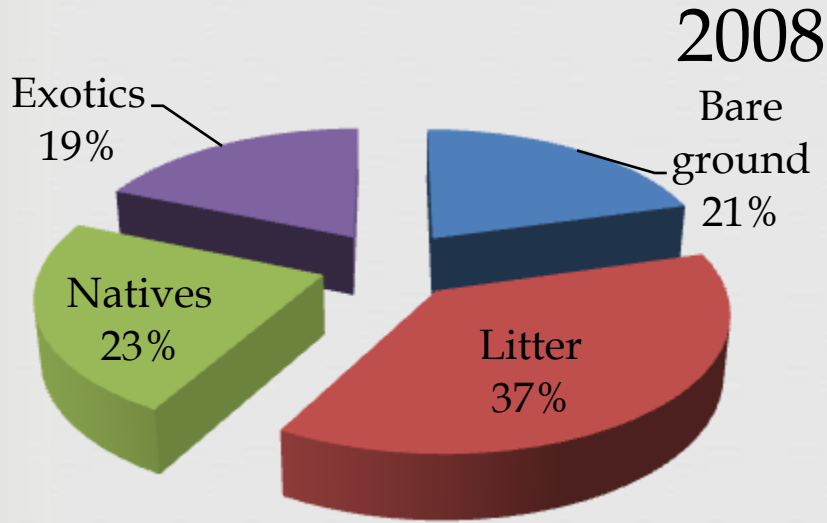
2012



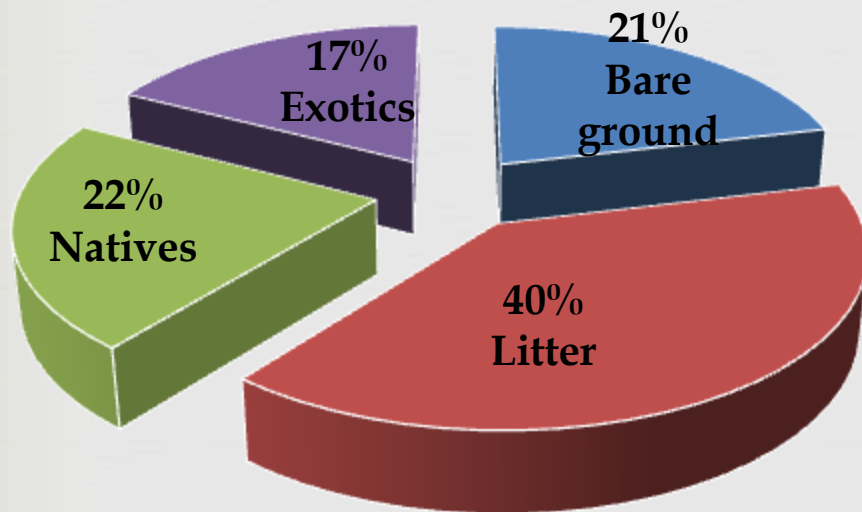
Scorpion Seeded-%cover $n=10$ 2018



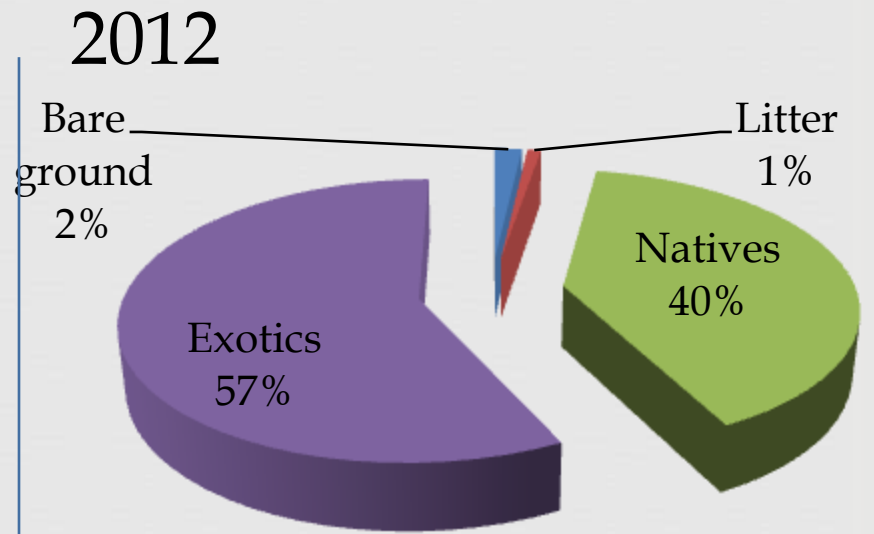
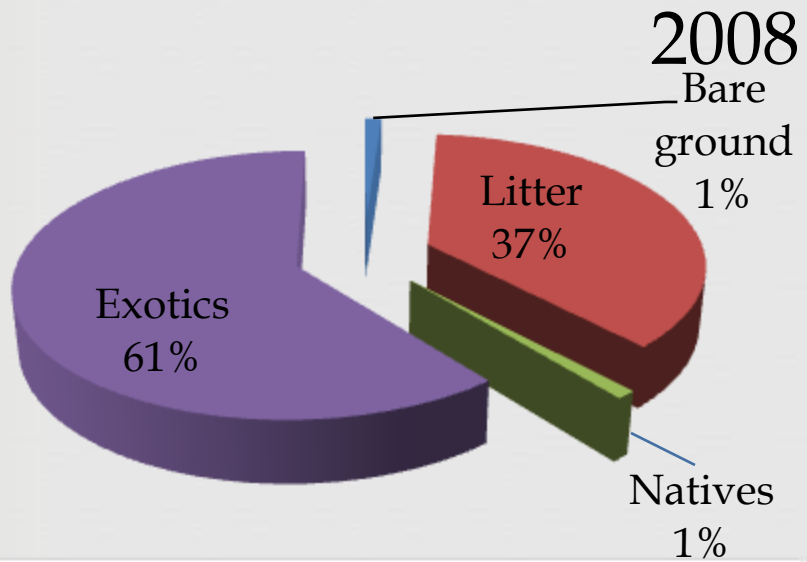
Scorpion Unseeded - %cover $n=10$



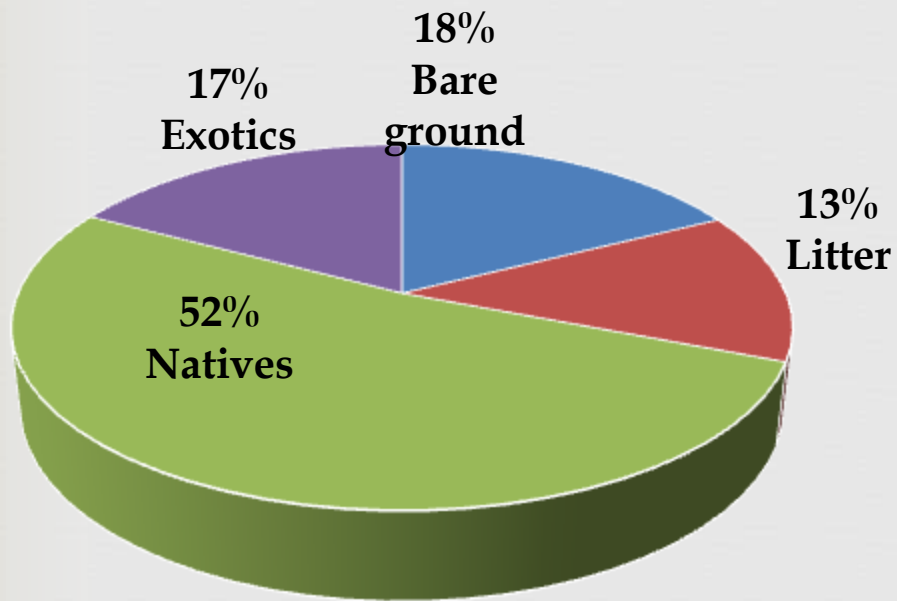
Scorpion Unseeded - %cover $n=10$ 2018



Smugglers Seeded - %cover $n=10$

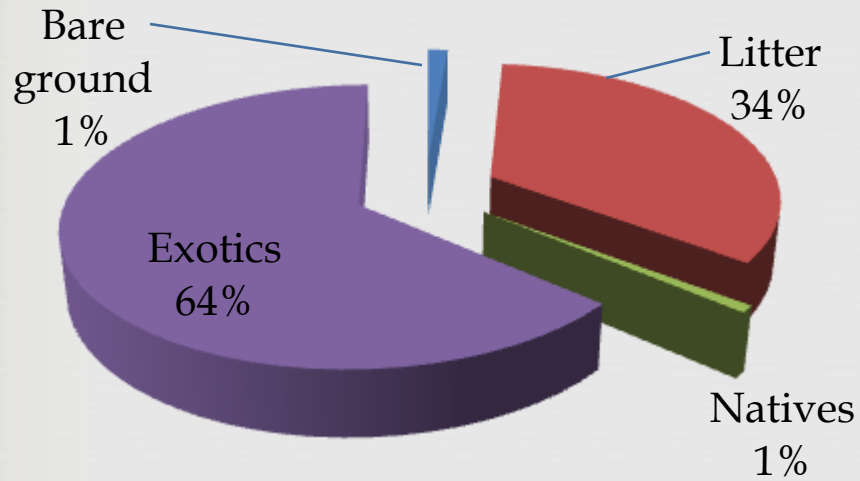


Smugglers Seeded - %cover $n=10$ 2018

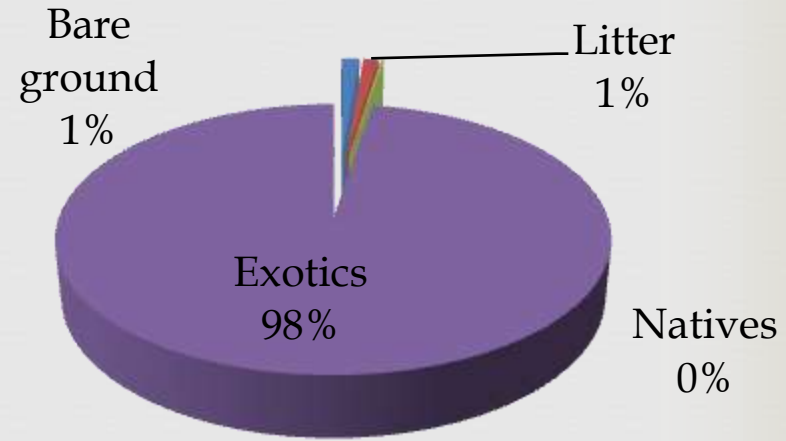


Smugglers Unseeded - %cover $n=10$

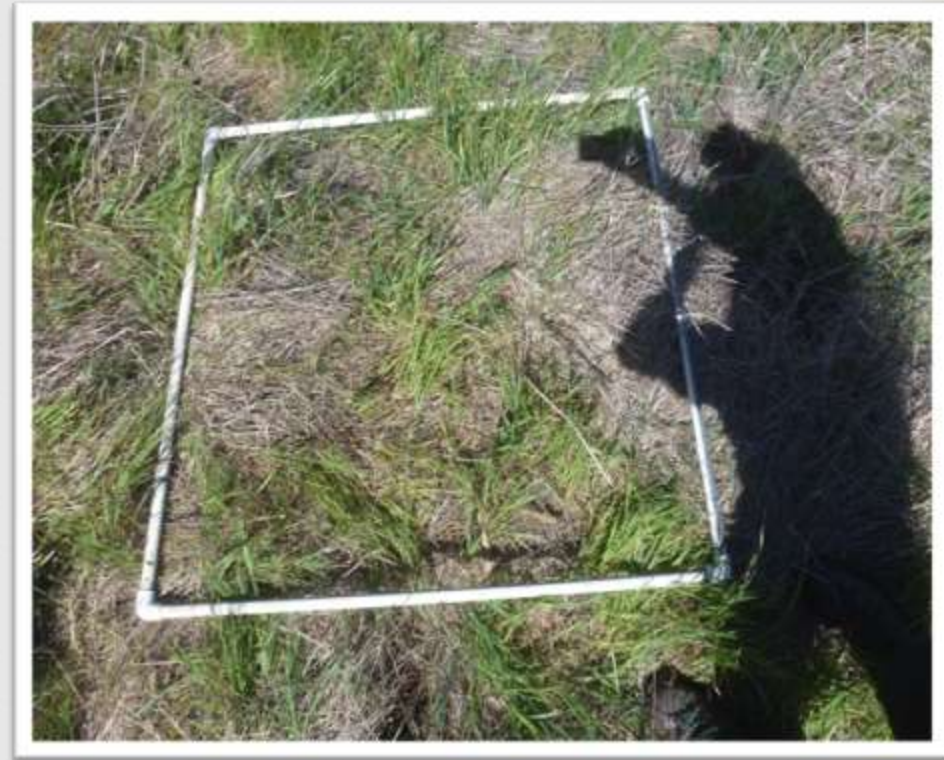
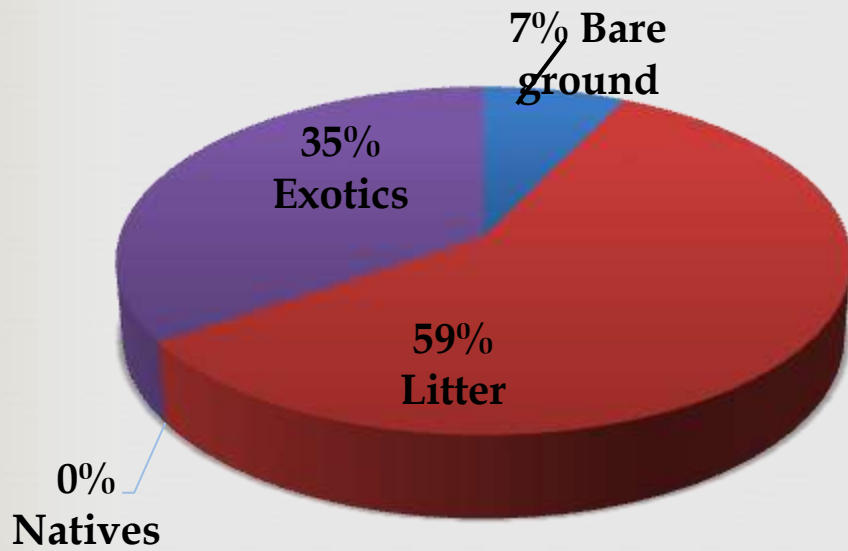
2008



2012



Smugglers Unseeded - %cover $n=10$ 2018



SO WHAT?

As vegetation expanded in the absence of fennel, fewer fennel seeds germinated. Fennel seeds are likely lurking in the soil waiting for disturbance at which point they readily germinate.

At Scorpion native plants will dominate the vegetation.

At Smugglers exotic grasses dominate when fennel was removed and without seeding the exotics will continue to dominate; however, *Coreopsis* and Island buckwheat can successfully establish with additional seeding.

Fennel *can* be controlled

- Treat in spring after rosette forms

- Use 1% Garlon 4 Ultra on rosettes in spring

- Use 2% Garlon 4 Ultra later when bolting begins

- Treat plants and seedlings each year for 10 years

Fennel seeds germinated after disturbance.

Acknowledgements

NRPP – project funding

Jim Roberts – fennel slayer
extraordinaire

Volunteers

Santa Monica Trails Council

Randy Nelson

Lulis Cuevas

2008



2012



2008



2012



2008



2012

































Santa Cruz Island Fennel Infestation



Legend

- Occasional Fennel
- Scattered Fennel
- <50%
- 50-75%
- >75%



0 5 10 Miles

Scorpion Anchorage

Montañon Ridge

Smugglers Cove

Legend





