Scaling up Cactus Scrub Restoration at the Irvine Ranch

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THREATS TO BIODIVERSITY

ECOSYSTEM AND BIODIVERSITY THREATS

- Habitat Loss & Fragmentation
- Fire Regimes Altered
- Rivers Unrecognizable
- Century of Grazing
- Invasive Species
- Smog (Ozone & Nitrogen)
- Larger Predators Declining
- Lots and Lots of People
HISTORIC IRVINE RANCH

• 44,000 acres now protected
• NCCP developed for region in 1996
• Habitats include oak woodland, riparian, perennial grassland, chaparral, and coastal sage scrub
Natural Community Conservation Plan / Habitat Conservation Plan (NCCP/HCP)

NCCP in Orange County targets Coastal Sage Scrub and associated “target species” including:

• Coastal California Gnatcatcher
• Coastal Cactus Wren
Local Status of 
Cactus Wren (*Campylorhynchus brunneicapillus*)

- Populations in Coastal and Central NCCP have dropped precipitously in the last 16 years
- Population collapse correlated with fire
- Other causes may include dispersal limitations, degradation of habitat quality, and West Nile Virus
FIRE

- #1 threat to habitat
- Fires are too frequent
- Leave few refuges
- Begin along roads
- Are fueled by invasive species
The Plight of the Cactus Wren

- 2323 acres of coastal cactus scrub in Coastal Reserve prior to fire
- 65 territories in Coastal Reserve...decline of 87% from 1992 (Mitrovich and Hamilton 2007)
- 1855 acres of cactus scrub in Central Reserve prior to fire
- Only 67 territories on Central Reserve...a decline of 82% from 2004 (Leatherman 2009)
A SCALED APPROACH

1. Test artificial nest structures to tide Cactus Wren over
2. Test efficacy of planting methods
3. Implement landscape-scale cactus scrub restoration in coordination with restoration efforts of others

Photo: Robb Hamilton
1. ARTIFICIAL NEST STRUCTURES

• Installed 15 artificial structures in NCCP
• All min. 1.5m high; in occupied habitat
• V-shaped structures inserted for nest support
RESULTS

No nests as yet, but evidence of perching and movement of grass / twigs

Future Directions:
• Construct more structures with simpler design
• Incorporate into planted sites for long-term monitoring
2. PILOT CACTUS PLANTING

• Does weeding facilitate cactus establishment?

• Are burned cactus patches better microsites than adjacent weedy?

• Do Cholla and Prickly Pear differ in establishment success?
SPECIES AND WEEDING EFFECT?

- 90% Prickly Pear survived vs 65% Cholla
- Cholla was more likely to grow in Year 1 than Prickly Pear
- Weeding had no significant Year 1 effect
POSITION AND WEEDING WEEDING EFFECT?
POSITON AND WEEDING WEEDING EFFECT?

- No position effect on survival (w/ exception of center)
- No position or weeding effect on probability of growing
Hypothetical *minimal time* for planted cactus pads to reach nesting height:

- **Years**
  - 1
  - 2
  - 3
  - 7

- **Height (cm)**
  - 24 cm
  - 36 cm
  - 48 cm
  - 62 cm
  - 76 cm
  - 88 cm
  - 100 cm

*Reality may be twice that long!*
3. LARGE SCALE HABITAT RESTORATION

• Augments lost habitat (burned cactus) in areas that would benefit existing cactus wrens most

• Minimizes risk of cactus patch destruction during future wildfires

• Builds on pre-existing damaged scrub to accelerate its recovery and targets areas with existing wren pairs
Restoration Candidate Sites

Used 2008 cactus scrub and Cactus Wren maps (Leatherman BioConsulting, provided to NROC)

Targeted severely burned polygons
- Within 1000m of 2008 Cactus Wren
- Within 100m of a partially intact cactus patch
Also Considered

- Small plant /patch size, sparse distribution of burned cactus
- Potential competition from long-lived shrubs
- Extent of weeds
APPROACH

• Collect 15000-18000 cactus pads
• Plant this fall in high priority sites
• Ca. 2/m2
• Monitor cactus wren and cactus over multiple years
• Add artificial nest structures if needed
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• Other IRC Staff

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• The Cactus Wren Working Group