

# Conserving Cactus Wren Populations in the Nature Reserve of Orange County

Kristine Preston  
Nature Reserve of Orange County



Photo Karly Moore

# Cactus Wren

(*Campylorhynchus brunneicapillus*)

Inhabits deserts in  
American southwest



Coastal populations  
restricted to cactus scrub  
in southern California



# Cactus Wren Decline



# Today's Talk

- Efforts to conserve Coastal Cactus Wren
- Why are Cactus Wren populations declining in Orange Co?
- Results of 2009 - 2010 Cactus Wren monitoring
- Restoring cactus scrub in the Coastal Reserve

Photo Kris Preston

# What Steps are Being Taken to Conserve Cactus Wrens in Southern California?



Photo Karly Moore

## Natural Community Conservation Plans (NCCCP)

- USFWS & CDFG - designed to protect habitats & species after 1993 listing of California Gnatcatcher as federally threatened
- Broader than State & Federal Endangered Species Acts
- Objective - conserve natural communities at ecosystem scale while accommodating economic growth & development



Photo Birds of North America

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# NCCP's Conserving Coastal Cactus Wren

San Diego, Western Riverside County, Palos Verdes Peninsula, Orange County



Photo Christine Beck



Photo Karly Moore

# Conserving Cactus Wren in Central & Coastal Orange County

# Nature Reserve of Orange County (NROC):

- Orange County's Central & Coastal NCCP/HCP
- Established 1996
- ~37,000 acres conserved
- Coastal & Central Reserves



# NROC

- Multiple land owners & managers
- Three target species: orange-throated whiptail, California Gnatcatcher & Coastal Cactus Wren
- Coverage/conditional coverage for 36 other species



# Conservation of Cactus Wren in NROC

NROC conserves over 4,100 acres of cactus scrub in Orange County's Central & Coastal Reserves





**Since we have conserved so much habitat, why are we concerned about Cactus Wren in the NROC?**



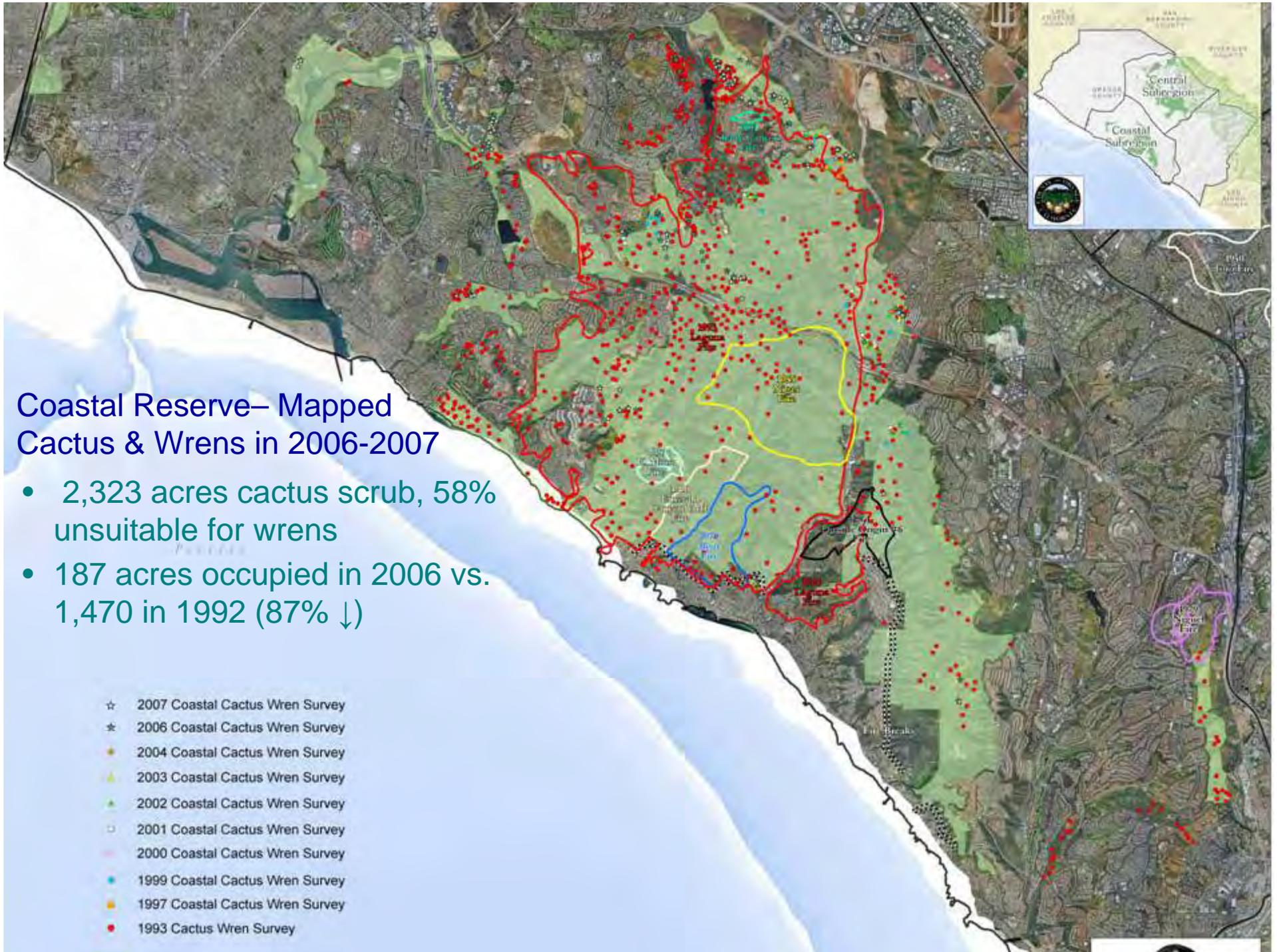
Santiago Fire – 10-07, CBS News Photo

1993 Laguna  
Fire burned  
75% of Coastal  
Reserve

2007 Santiago  
Fire burned  
75% of Central  
Reserve



Santiago Fire – 10-07, CBS News Photo







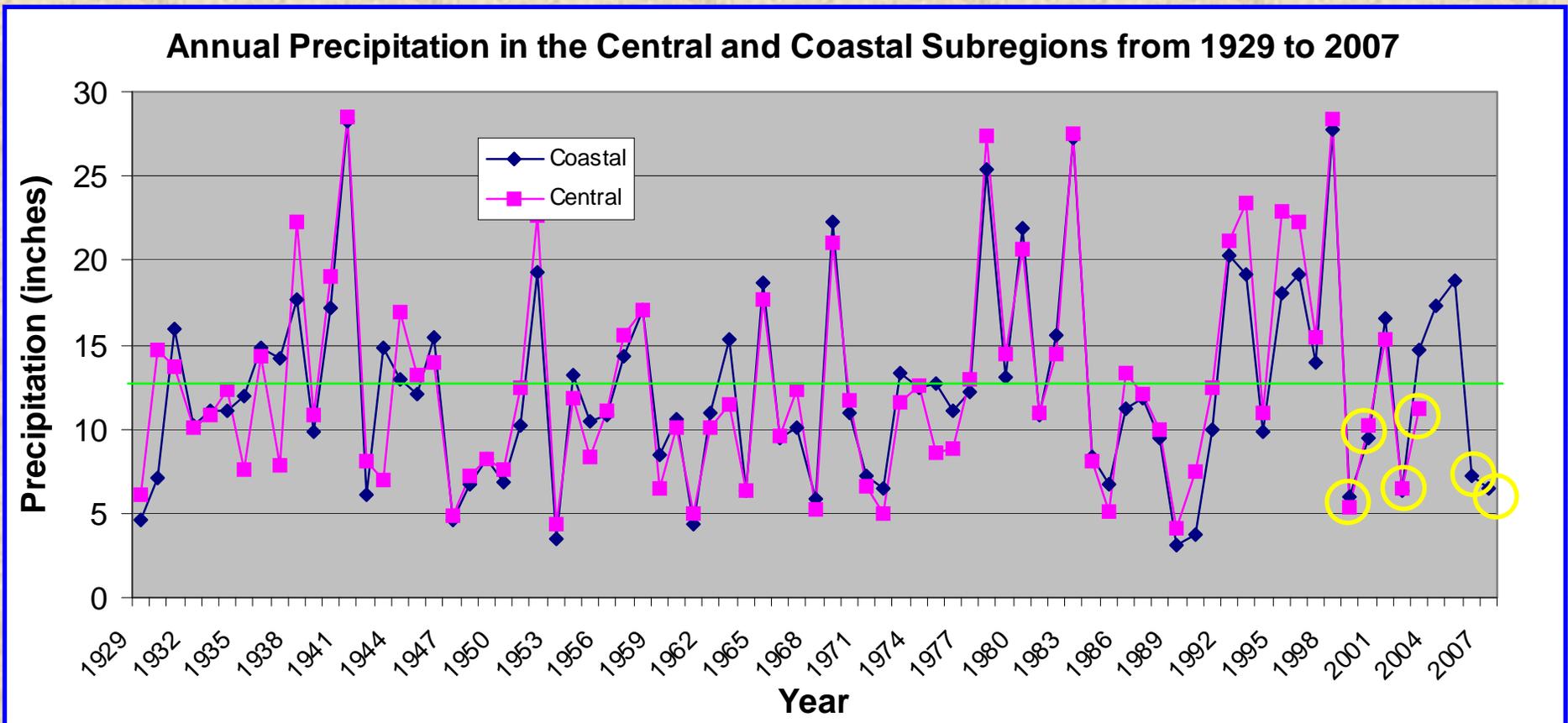
**Why have Cactus Wren  
populations declined in unburned  
habitat?**

# Potential Factors Contributing to the Decline of Cactus Wrens

- Low productivity (food limitation, nest predation)
- Low survivorship (predation, disease)
- Isolated small populations (vulnerable to local extinction with limited opportunity for individuals to disperse and recruit into population)
- Lack of suitable habitat

# How important are nest predation and food limitation in Cactus Wren productivity?

- Population decline & low productivity during recent droughts
- Role of predation in nest success & individual survival unknown



# NROC Monitoring Study

## Objectives:

- Monitor individual productivity & annual survival
- Monitor dispersal & recruitment of individuals into local populations
- Identify threats to the persistence of Cactus Wren
- Collect genetic material for taxonomic analyses



# NROC Monitoring Team

Dana Kamada, Karly Moore, Scott Thomas & Kris Preston





Photo Trish Smith



Photo Kris Preston



Photo Kris Preston



Photo Kris Preston



Photo Elisabeth Brown

**Volunteers have been a BIG help surveying for Cactus Wrens**

# NROC Monitoring & Banding Effort

- 2009 reproductive monitoring - 34 territories at 5 sites
- 2010 reproductive monitoring - 47 territories at 9 sites
- Banded 328 birds (65 AHYs, 263 HYs)

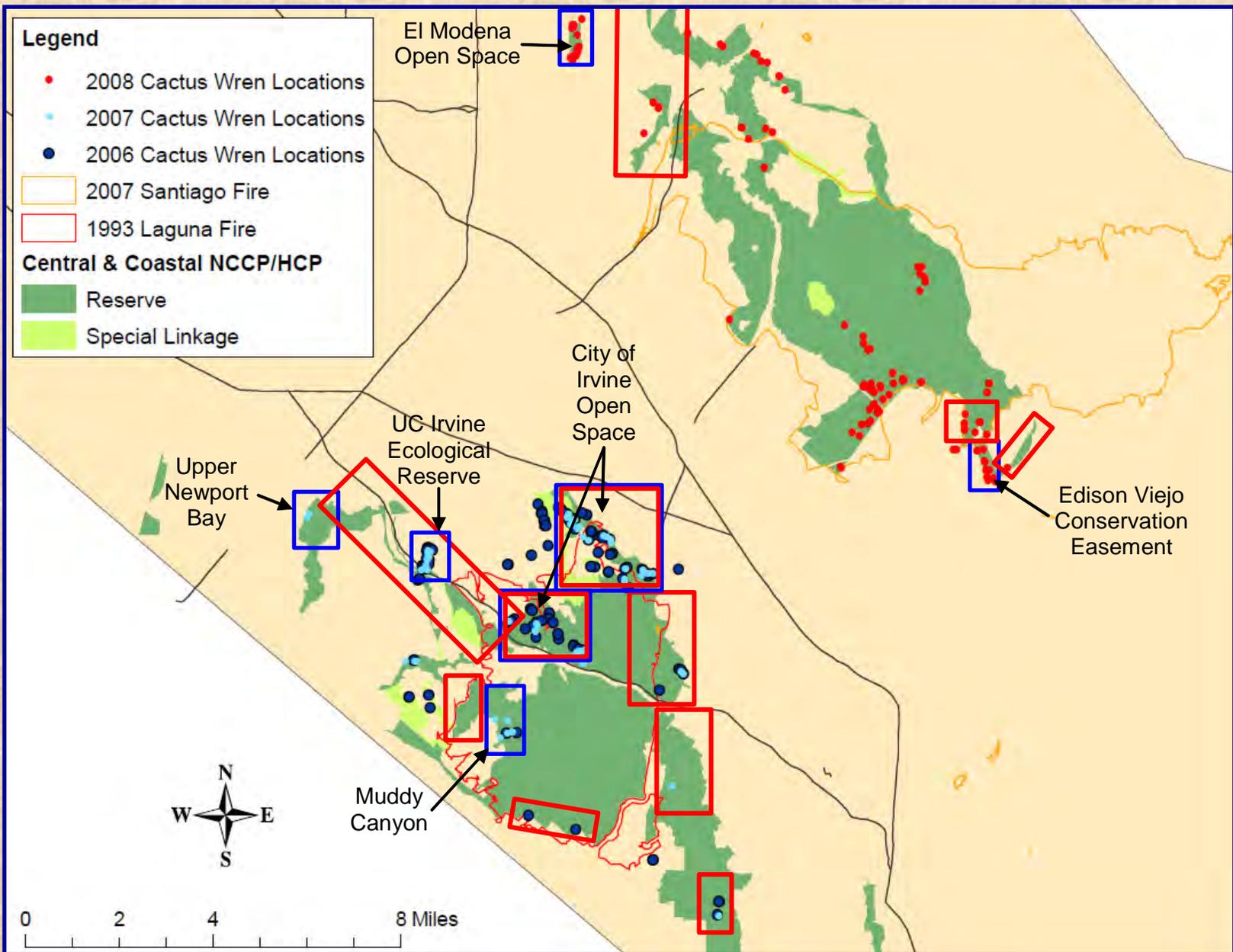


Photo Maria Carillo



Photo Karly Moore

# NROC 2010 Monitoring Study



# Reproduction 2009

- 74% of pairs successfully produced young
- Average 2.5 fledglings/pair (n=32)
- Average 3.2 fledglings/successful pair (n=25)
- Unsuccessful: repeated nest predation, loss of one/both birds, late season pairing



Photo Dana Kamada



Photo Kris Preston

# Reproduction 2010

- Reproductive success higher in 2010
- 91.5% of pairs successfully produced fledglings
- Average 3.3 fledglings/pr (n=46)
- Average 3.4 fledglings/successful pair (n=42)
- Phenology of initial nests highly variable
- Nest failure – predation, starvation?, infertility



Photo Karly Moore

# How Do 2009-2010 Compare with Previous Studies?

- NROC nest monitoring during extreme 2007 drought – 50% of pairs produced fledglings
  - 0.9 fls/pr (n=12)
  - 1.6 fls/successful pair (n=7)
- Harmsworth San Joaquin foothills study – 100% prs successful, average 4.3 fls/pr in 1997 and 4.3 fls/pair in 1998 (n=10 prs/yr)
- Atwood's 1993-97 Palos Verdes Peninsula study - 3.0 to 3.6 fledglings/pr (28 total prs monitored; 3-9 prs/yr over 5 yr study)

# NROC Coastal Reserve Populations Slight Expansion in 2010

- In 2010, pairs re-established in Buck Gully & Boat Canyon where wren had disappeared in 2007
- City of Irvine population (4 sites) larger than anticipated in 2010 compared to 2007 surveys & 2009 anecdotal observations



Photo Kris Preston

# Adult Survival

- 19 of 49 (39%) of banded adults with established territories disappeared from 3-09 to 6-10
- Most individuals disappeared between breeding seasons



Photo Kris Preston

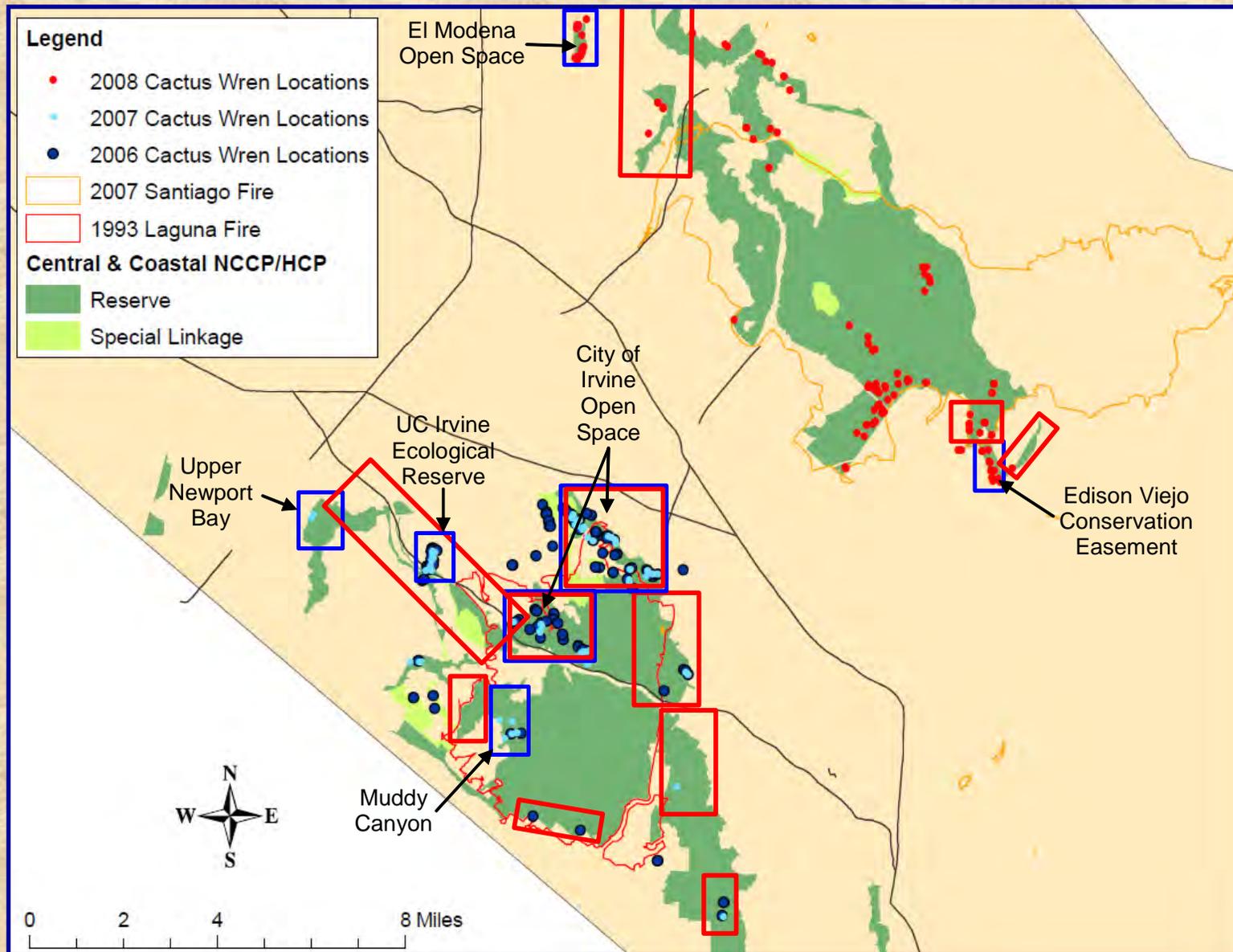
# Changes in Pair Composition

**Cactus Wren pair composition changes between 2009 & 2010 (both members of pair banded in 2009)**

Pair bond status 2009 to 2010	Number of pairs	% of pairs
F leaves M mid-breeding season after 1st brood & breeds with another M	1	6.3%
F forced out of territory by another F in 2010	3	18.8%
Pair dissolves after 1st breeding season, become floaters	1	6.3%
Pair dissolves after 1st breeding season, obtain new territories & mates	1	6.3%
F disappears mid-breeding, suspect alive with FIs, M gets 2nd F & breeds	1	6.3%
Mate disappears between breeding & remaining bird gets new mate	2	12.5%
Both birds disappear (die?) between breeding season	1	6.3%
Pair remains together 2009 & 2010 breeding seasons	6	37.5%
Total	16	

For pairs changing mates: 62% “divorced”  
& 38% had partner disappear (dead?)

# Monitored dispersal of banded birds (2010) at 18 sites (including 9 monitoring sites)



# Juvenile Dispersal

- Documented dispersal of 16 juveniles in 2010 (7 F, 9 M)
- Juveniles dispersed average 0.4 miles (straight) or 0.6 miles (through natural habitats)
- 9 young established breeding territory at natal site
- Juvenile dispersal distance less than other studies

Atwood 2002 average = 1 mile, outlier - 6.2

Bontrager & Gorospe 1995, average = 0.8 mile, outlier = 3.5



Photo Karly Moore

# Adult Dispersal

- 10 adults dispersed from 2009 locations to new 2010 territories
- Adult average dispersal 0.6 mile (straight line) and 1 mile (natural habitat)
- 80% of adult dispersals were by females



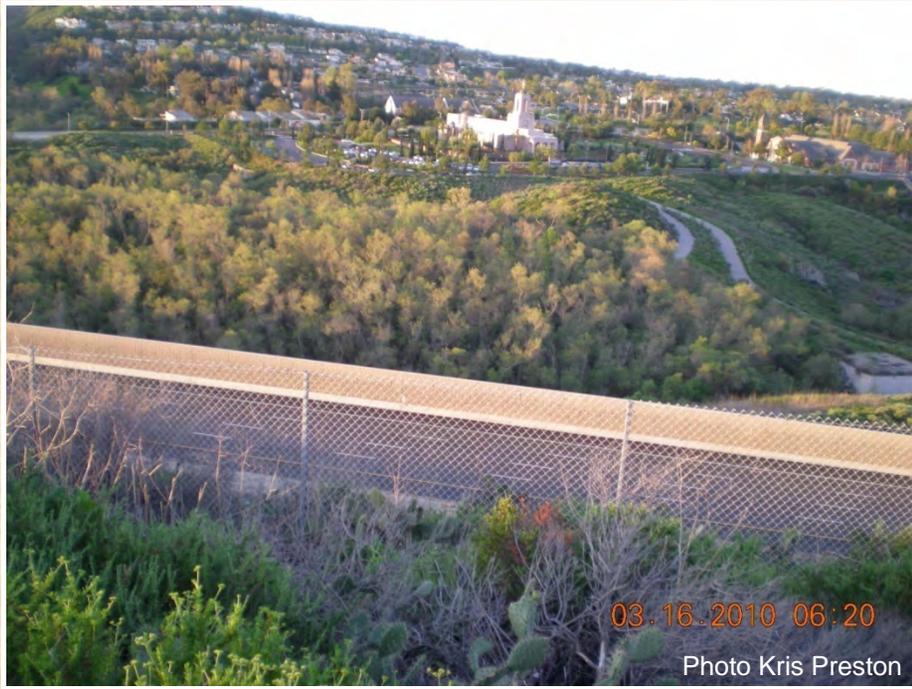
Photo Karly Moore

# Dispersal Milestones

- Three long distance dispersals so far
- Dispersing birds are crossing SR 73 Toll Road (8 lanes)

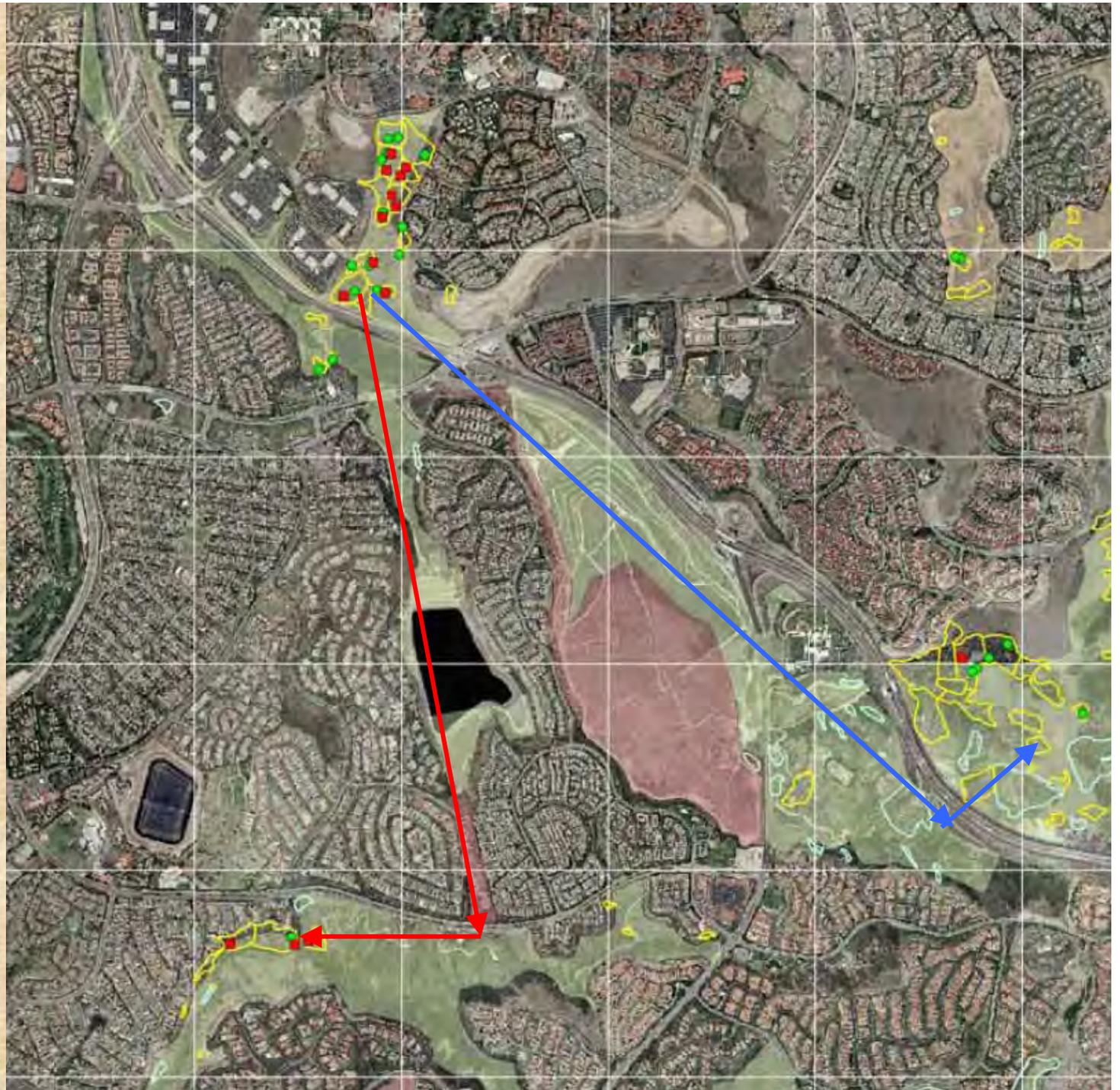


Photo Karly Moore



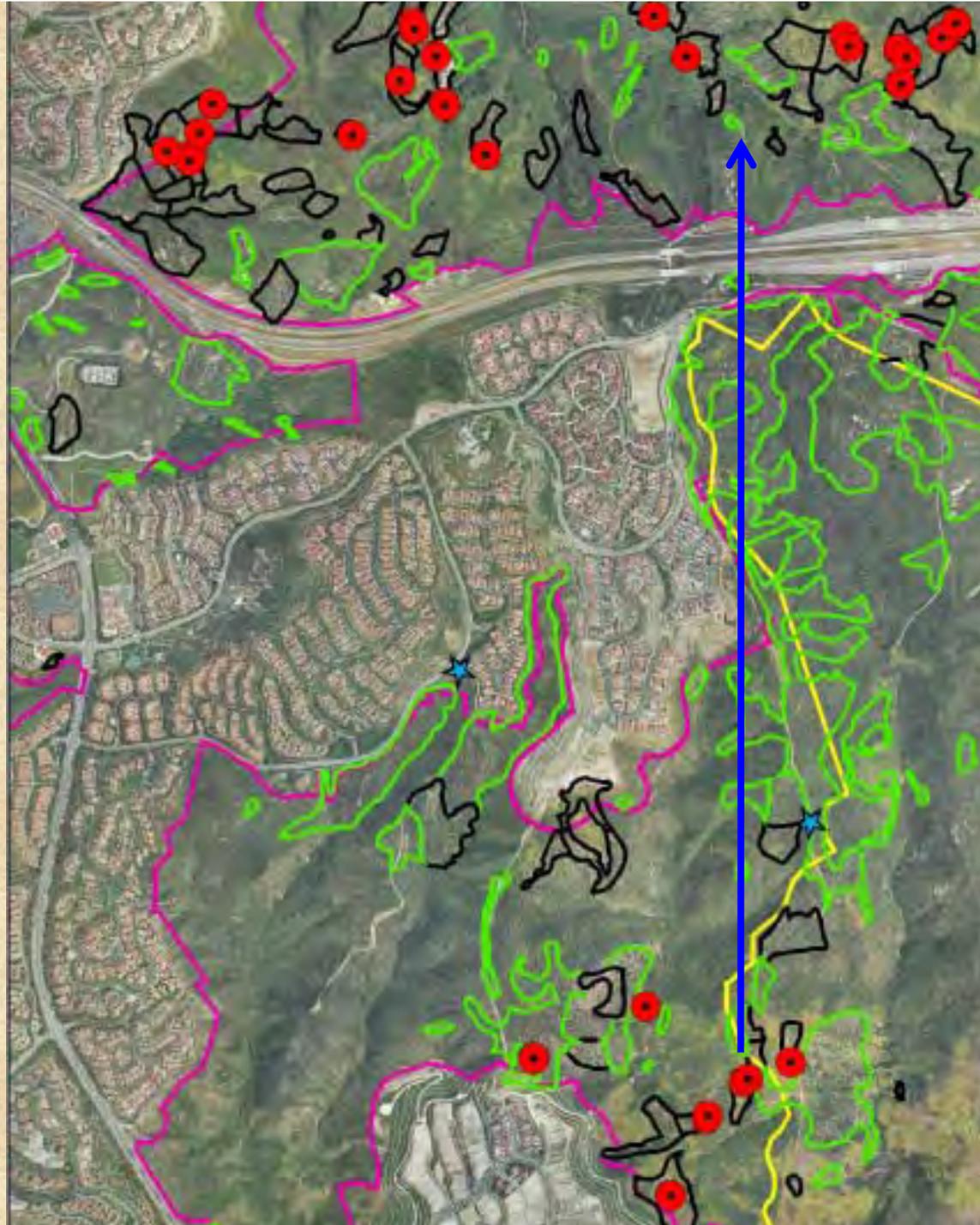
Pair of  
banded  
juveniles  
disperse  
2.7 miles

Banded  
adult  
female  
with  
unbanded  
male  
disperse  
3.1 miles





AHY  
unpaired  
female  
disperses  
2.2 miles  
(finds mate  
at new site)



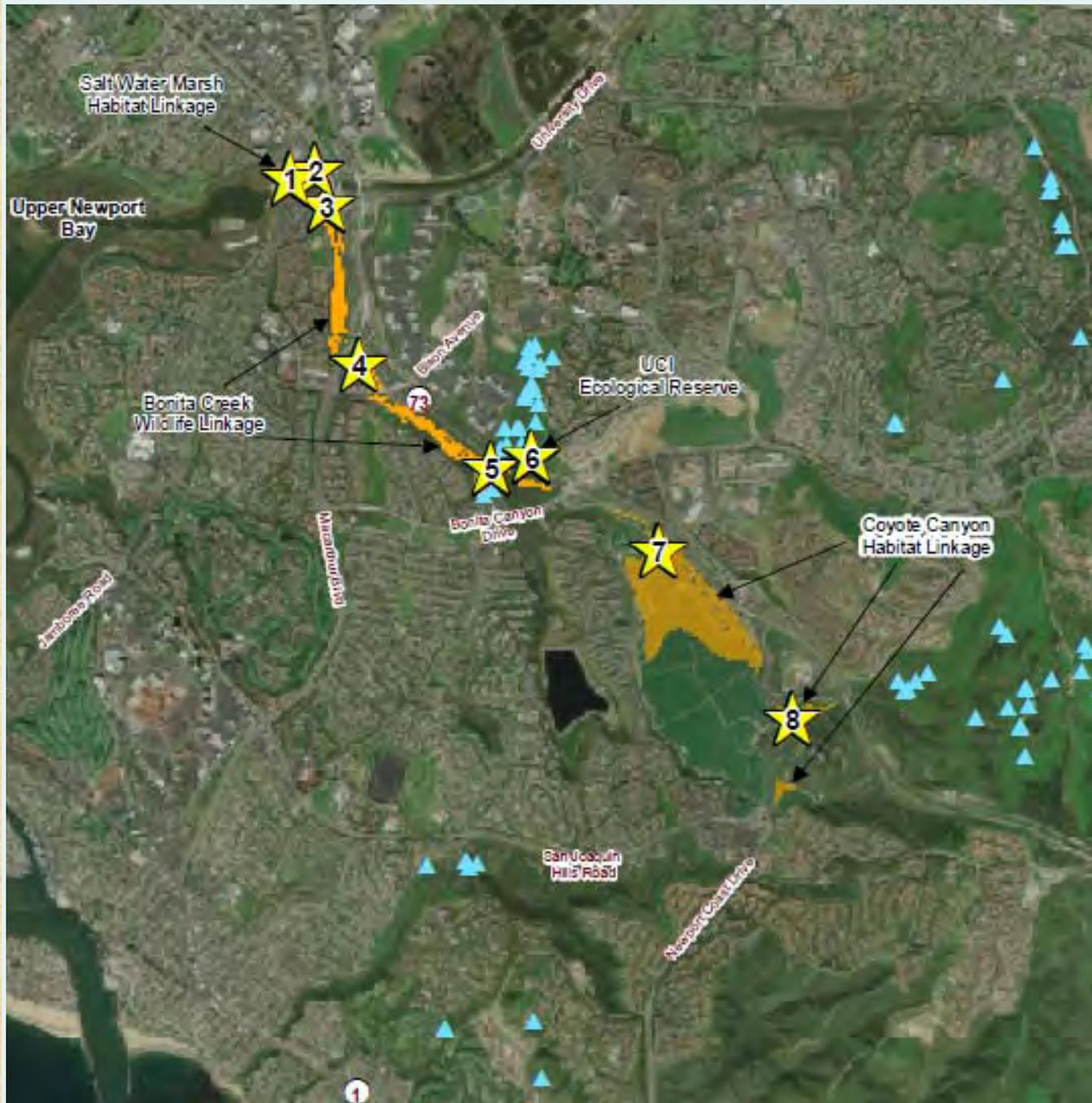
# Restoration of Cactus Scrub

- Can take many years for cactus to grow back after fire & become suitable for wrens
- NROC and land managers are implementing cactus scrub restoration projects

Photo Kris Preston

# Cactus Wren Habitat Linkage Enhancement & Restoration Project

- NROC, TCA & UCI are restoring a linkage along SR-73 & creating breeding habitat at UCI Ecological Preserve
- Project is funded by CALTRANS Environmental Enhancement & Mitigation Program

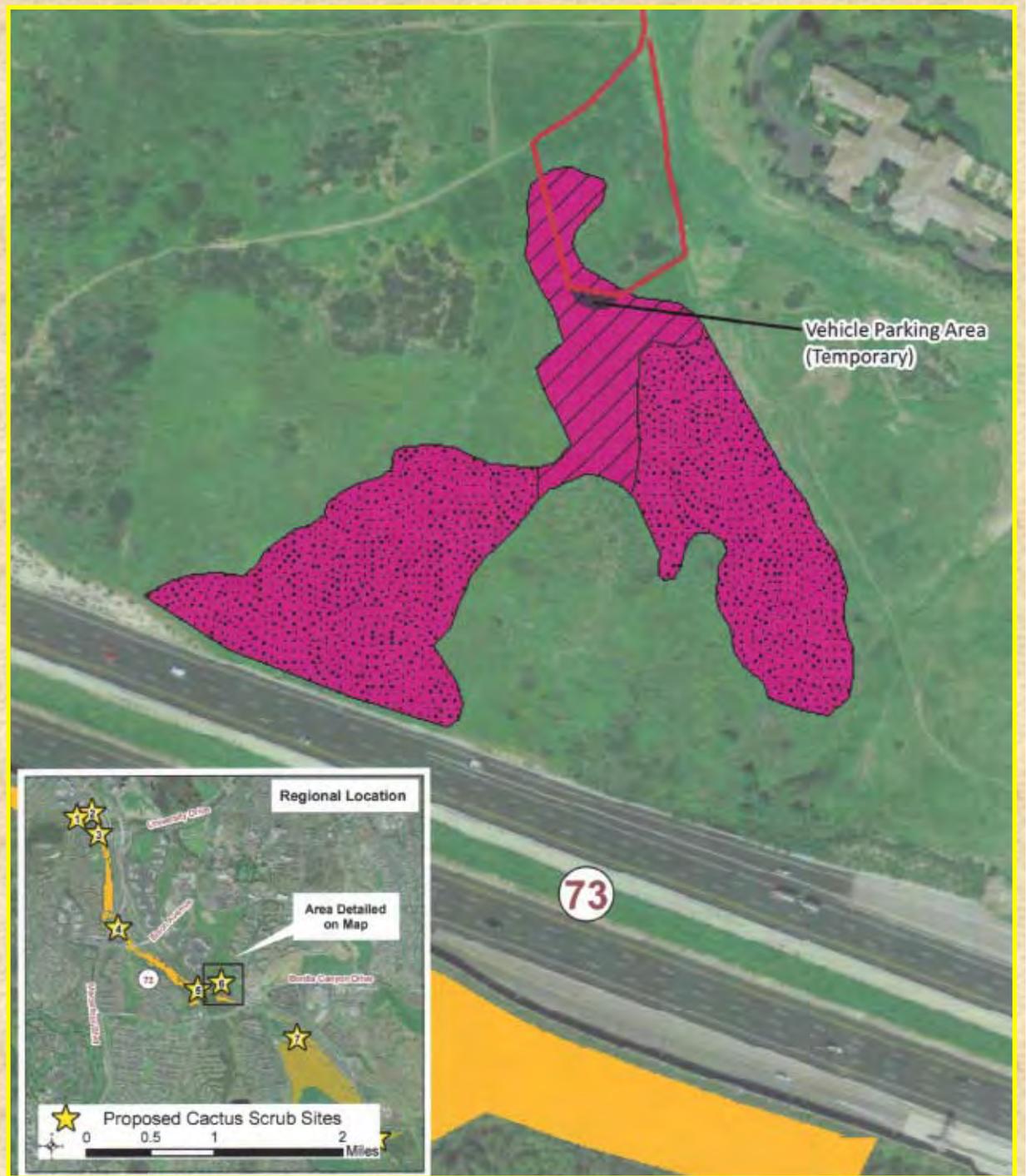


# NROC/TCA/UCI Cactus Restoration Team

- Valarie McFall, Transportation Corridor Agencies
- Margot Griswold, Restoration Ecologist, NewFields Co
- Nakae & Associates, Installation Contractor
- Kris Preston, NROC
- Peter Bowler UCI
- **Project initiated fall 2010**



**Cactus scrub  
restoration at  
UCI Ecological  
Preserve  
4.1 acres**





**Before**



**After  
(hopefully)**



Photo Kris Preston

## **Donor Site (Anteater & Bonita Creek)**



Photo Kris Preston



Photo Kris Preston



Photo NewFields



Photo NewFields



Photo Kris Preston

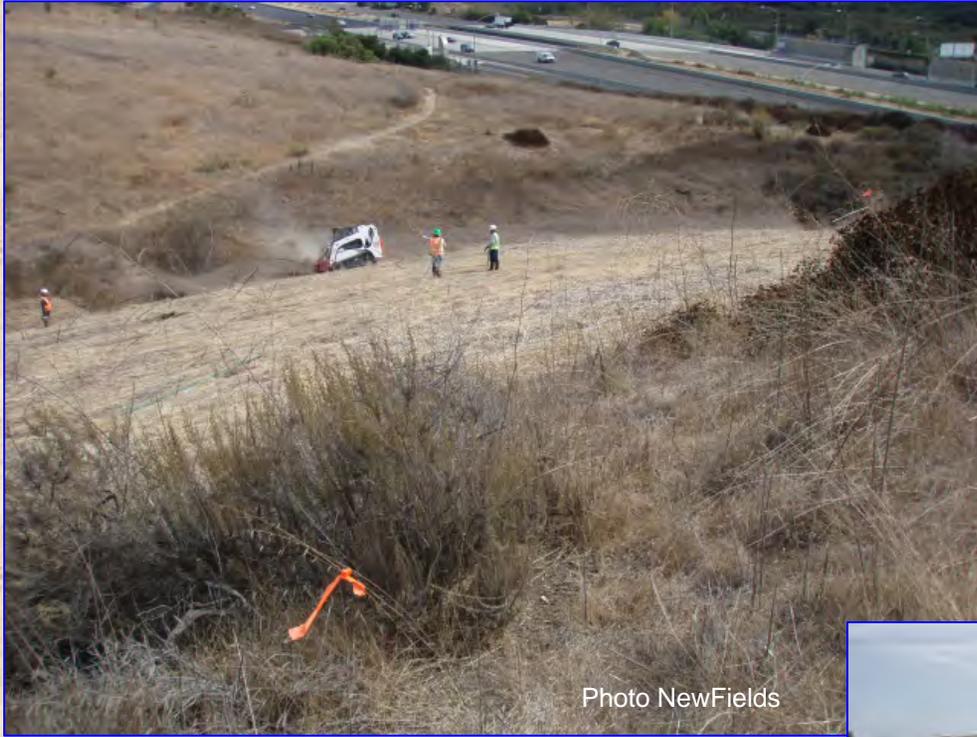


Photo NewFields



Photo NewFields



Photo NewFields



Photo NewFields



Photo: NewFields Co



Photo: NewFields Co



Photo: NewFields Co



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Photo NewFields Co



**This year a new pair of Cactus Wren were observed using large transplanted cactus adjacent to mature patch of cactus scrub**



Photo NewFields Co



NROC will be receiving OCTA Measure M funding to restore 8 more acres of cactus scrub at UCI in 2011

Photo: Kris Preston

# Acknowledgements

- California Department of Fish & Game
- NROC Board of Directors
- NROC Technical Advisory Committee
- Transportation Corridor Agencies
- NewFields Co
- Nakae & Associates
- UCI Office of Campus & Environmental Planning

- Irvine Campus Housing Authority
- Peter Bowler, UCI Ecological Preserve
- Dana Kamada
- Karly Moore
- Scott Thomas, Sea & Sage Audubon
- Trish Smith, The Nature Conservancy
- Sandy DeSimone, Audubon Starr Ranch

## Volunteers:

Marian & Steve Alter	Sally Menzel
Susie Anon	David Pryor
Portia Arutunian	Shirley Reynolds
Elisabeth Brown	Susan Sheakley
Maria Carillo	Paul Strauss
Deana Collins	Peter Wetzel
Mayra Garcia	Kathy Young
Bethany Glaeser	
Gail Gutierrez	
Janette Havens	
Robert Holcomb	
Dilip Kumar	
Dana Lee	



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