

# 2006-2007 CACTUS WREN STUDY

## NATURE RESERVE OF ORANGE COUNTY

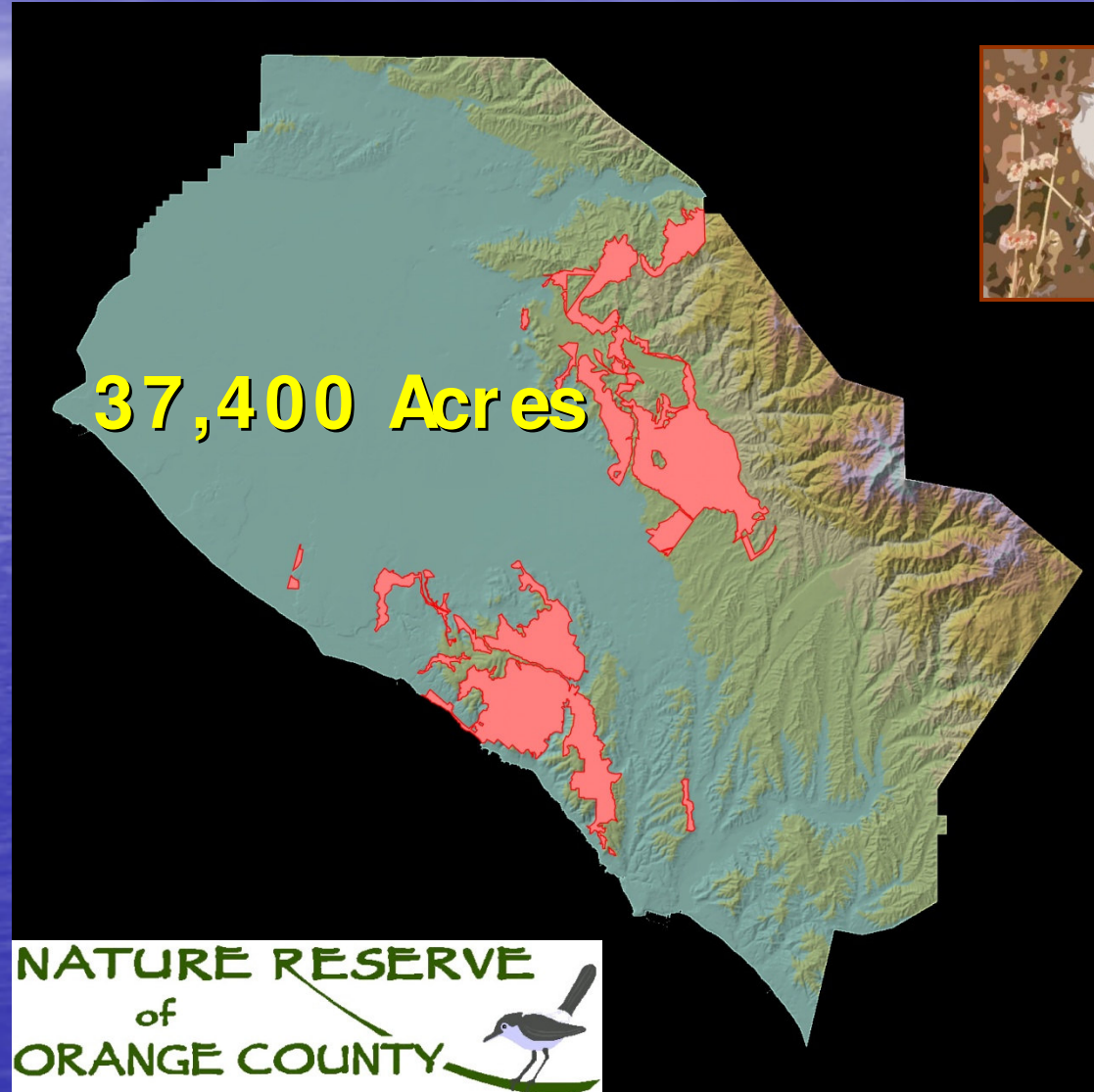
ROBERT A. HAMILTON

WILLIAM B. MILLER

MILAN J. MITROVICH



# NATURE RESERVE OF ORANGE COUNTY (NROC)



# Coastal Reserve

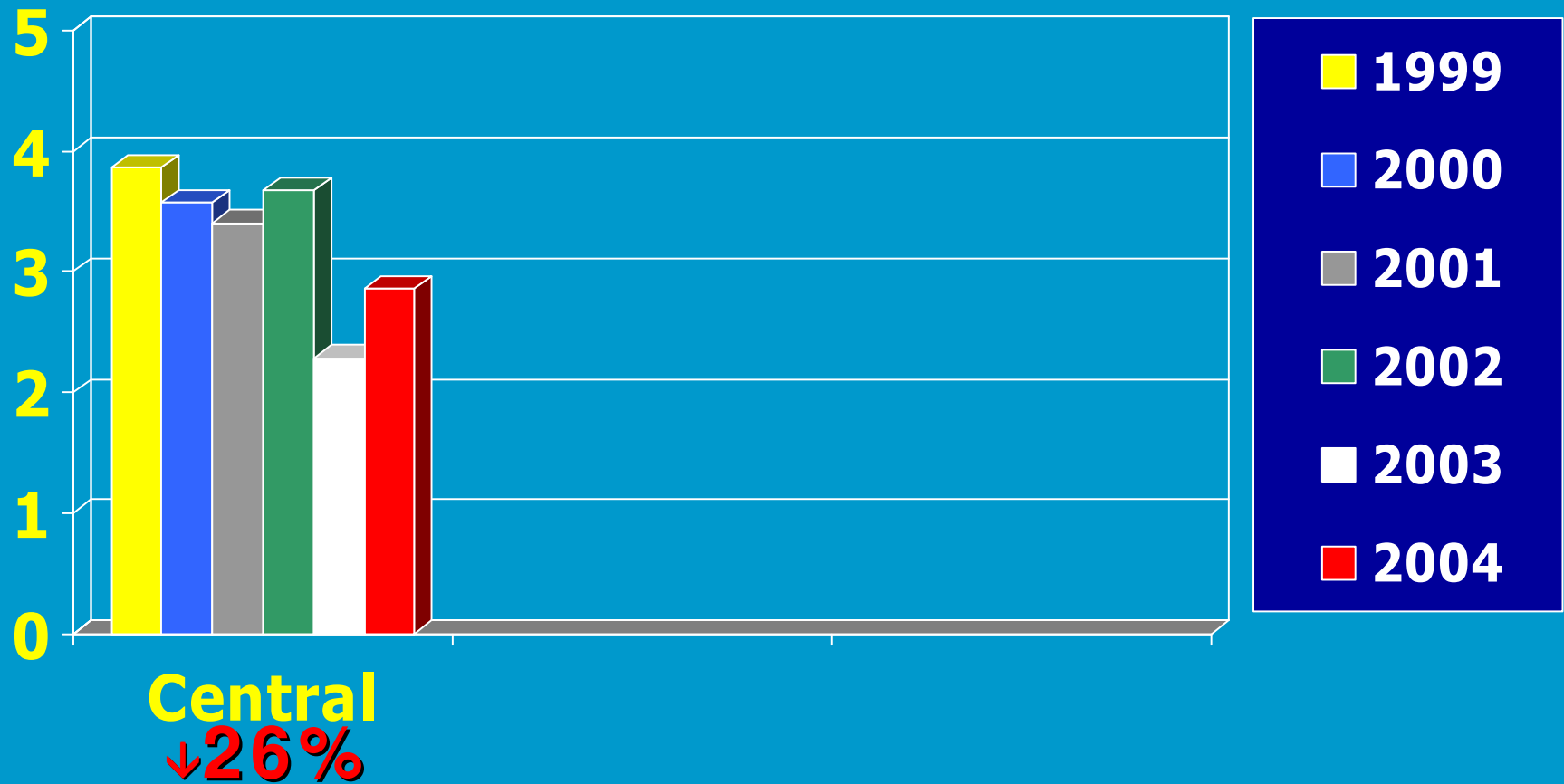
NATURE RESERVE  
of  
ORANGE COUNTY



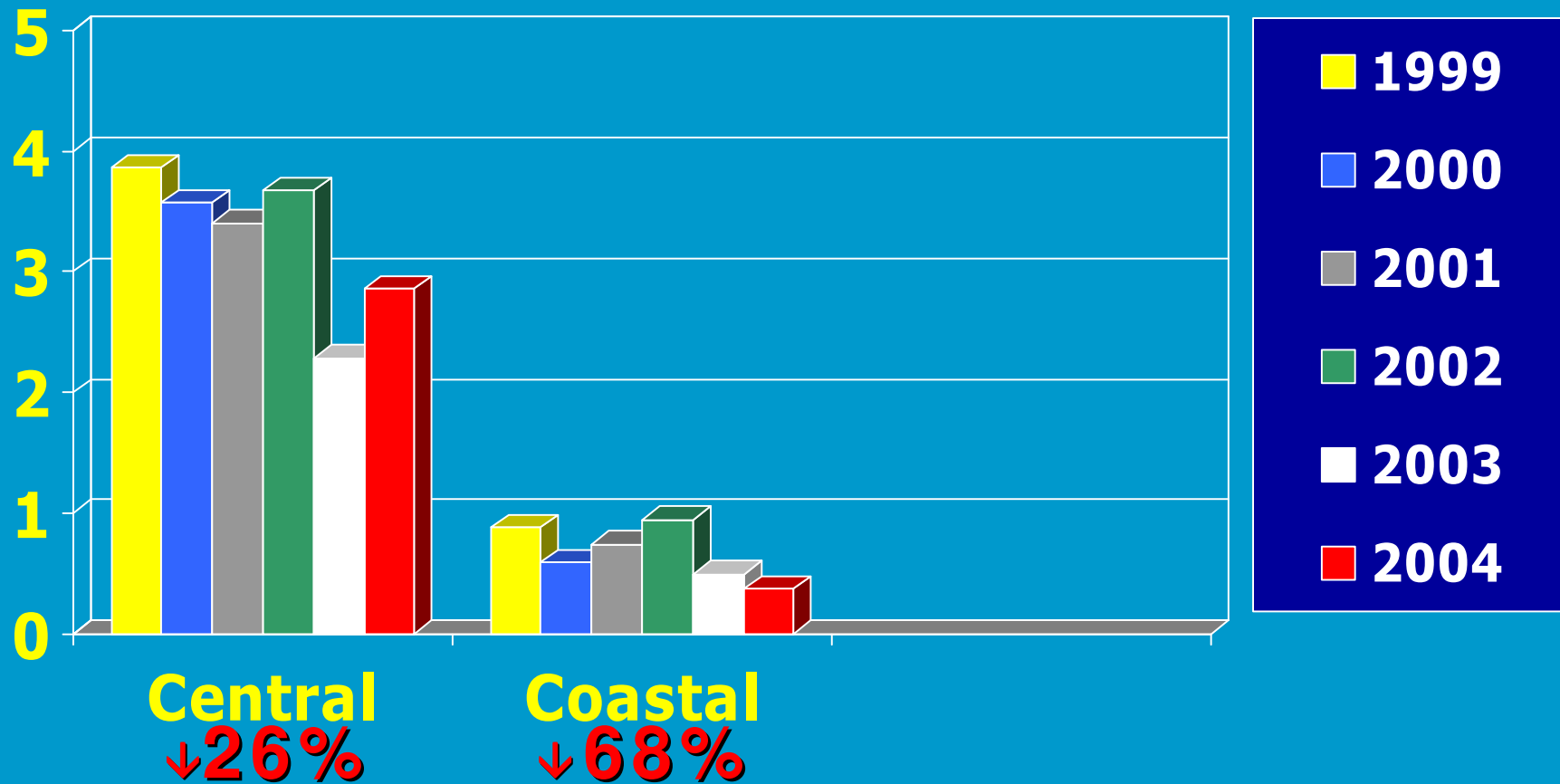
17,200 acres

San Joaquin Hills  
Aliso & Wood Canyons

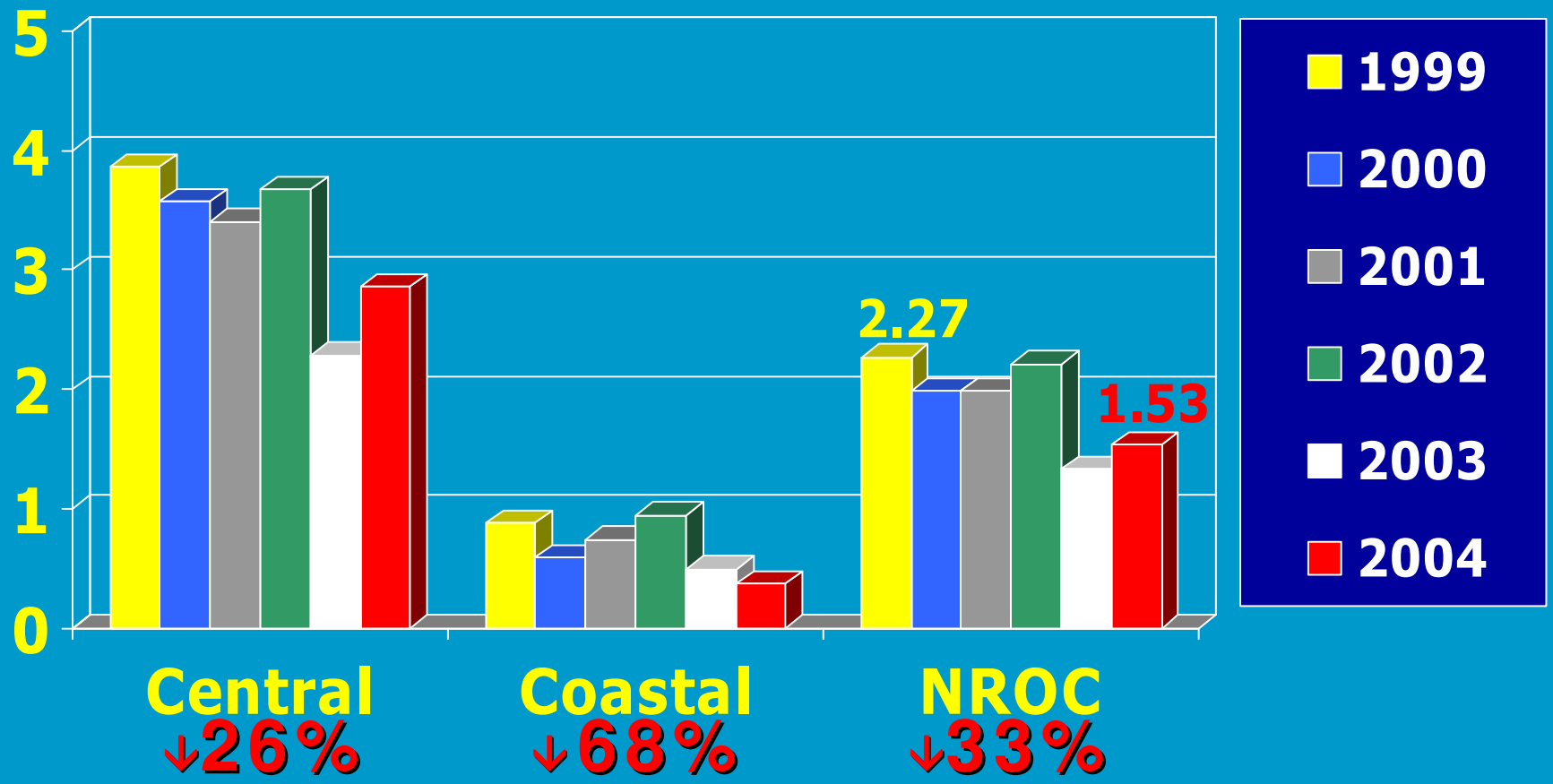
# 1999-2004 Population Trend Territories/Site



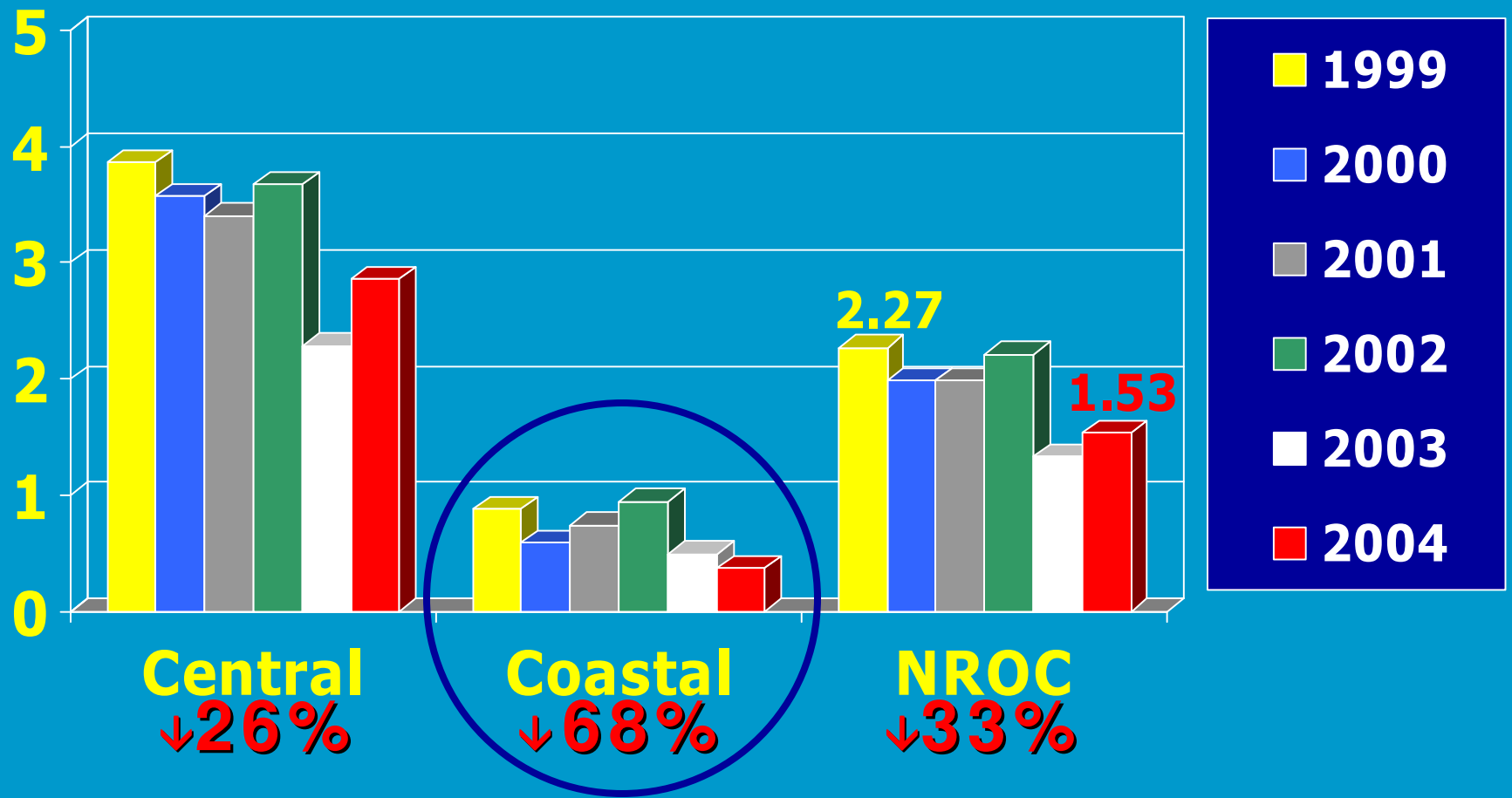
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# Information Gaps



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- \* Knowledge of current Cactus Wren distribution
- \* Knowledge of what constitutes prime, adequate, and inadequate habitat
- \* Evaluation of cactus recovery 13 years after fire
- \* Valid comparisons with 1992 Cactus Wren data to identify potential factors other than habitat loss



# Cactus Mapping Methodology

\* Mapped all cactus resources



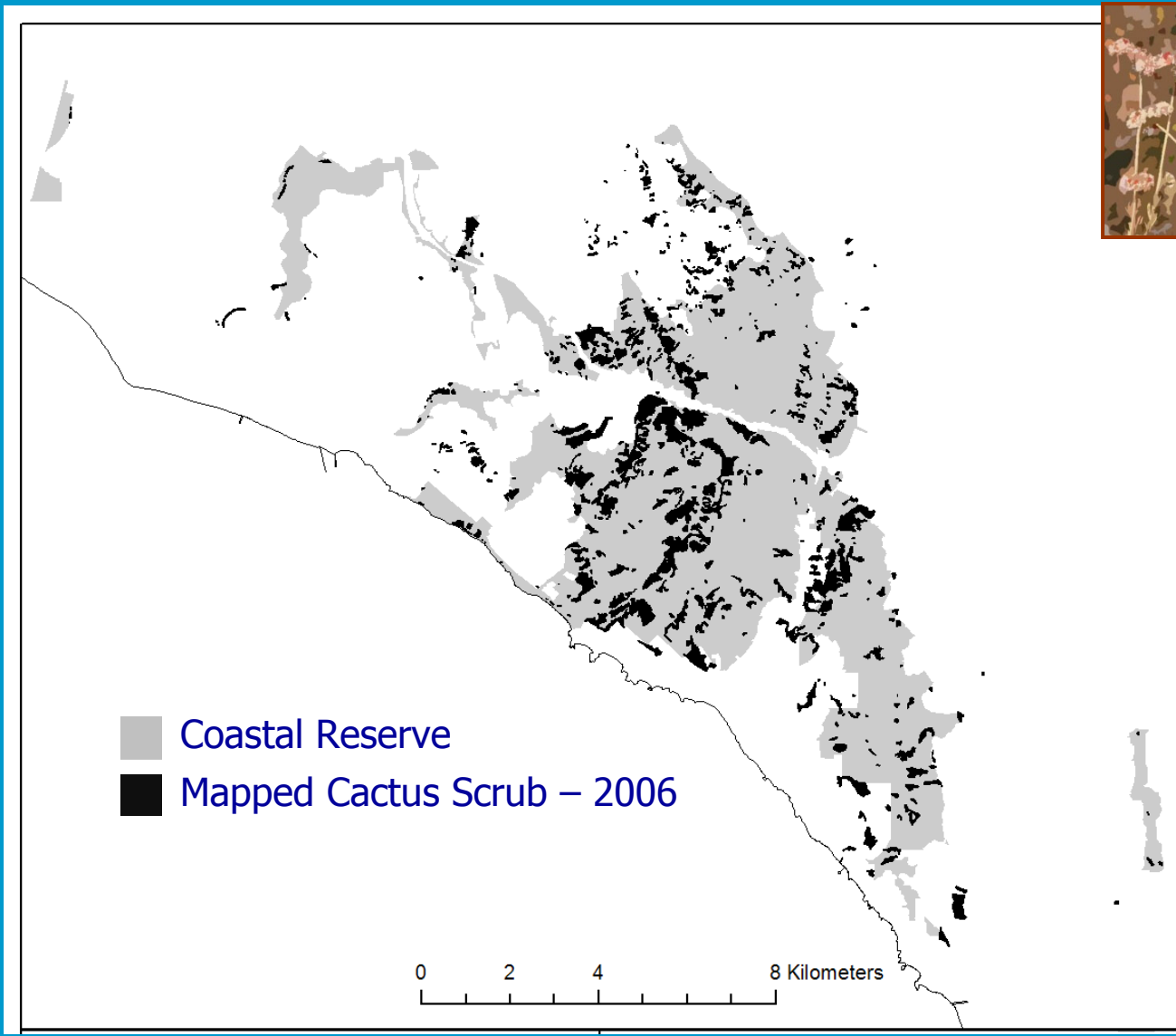
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- \* Delineated polygons around "occupiable" cactus



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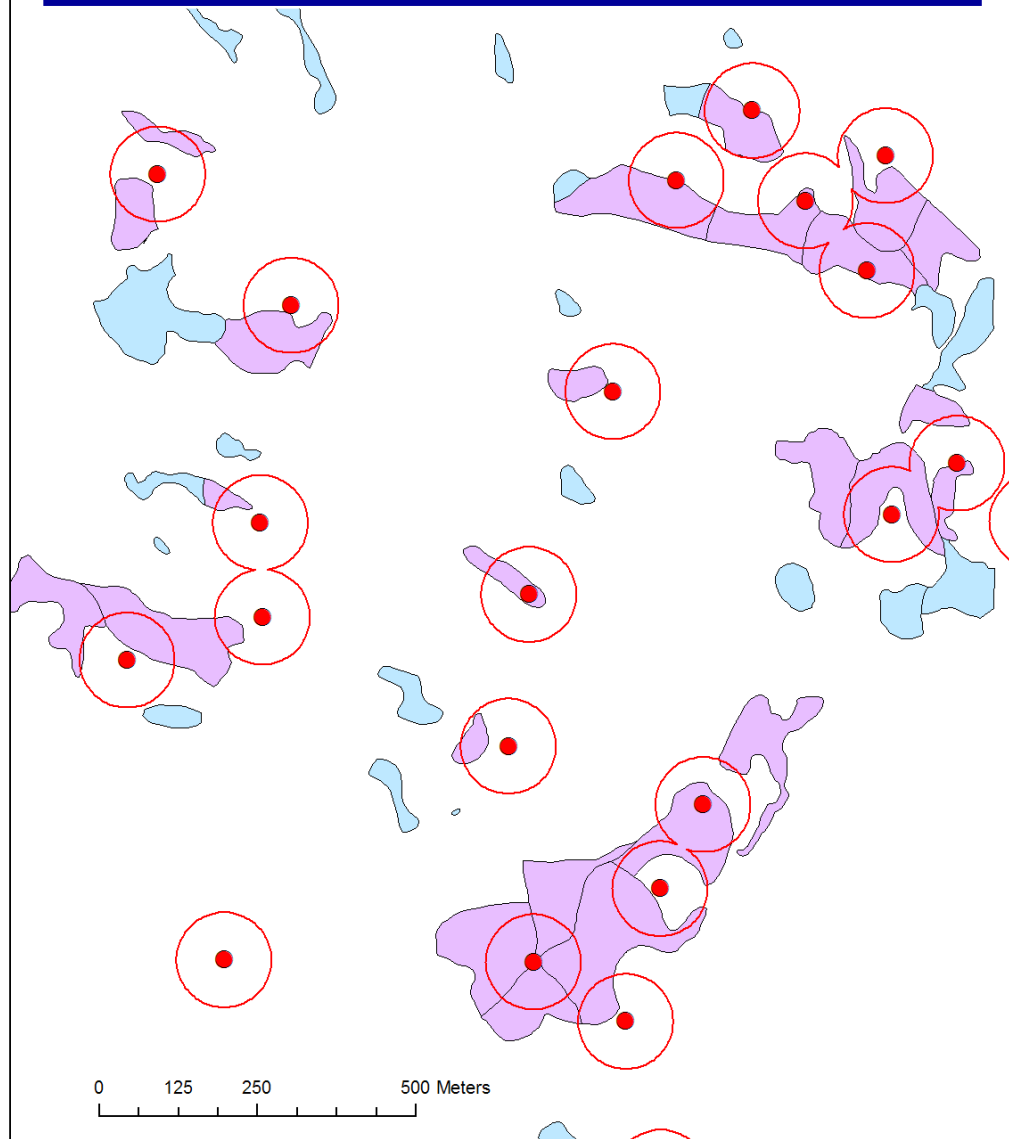
- \* Mapped all cactus resources
- \* Delineated polygons around “occupiable” cactus
- \* Subdivided polygons into sites for surveys

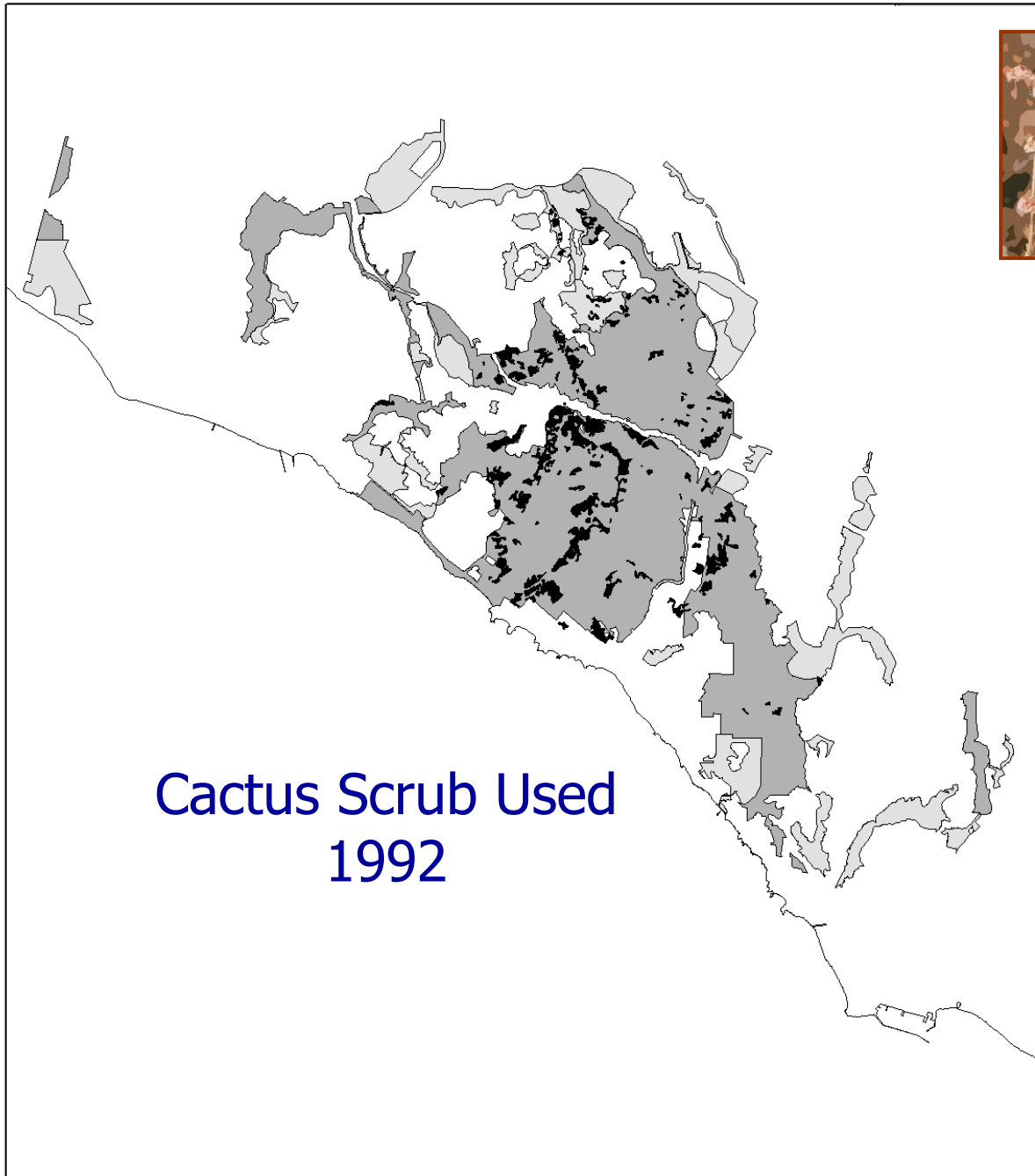




“Backed into” an approximation of pre-fire cactus scrub distribution by overlaying 1992 Cactus Wren locations with 2006 mapping of cactus scrub.

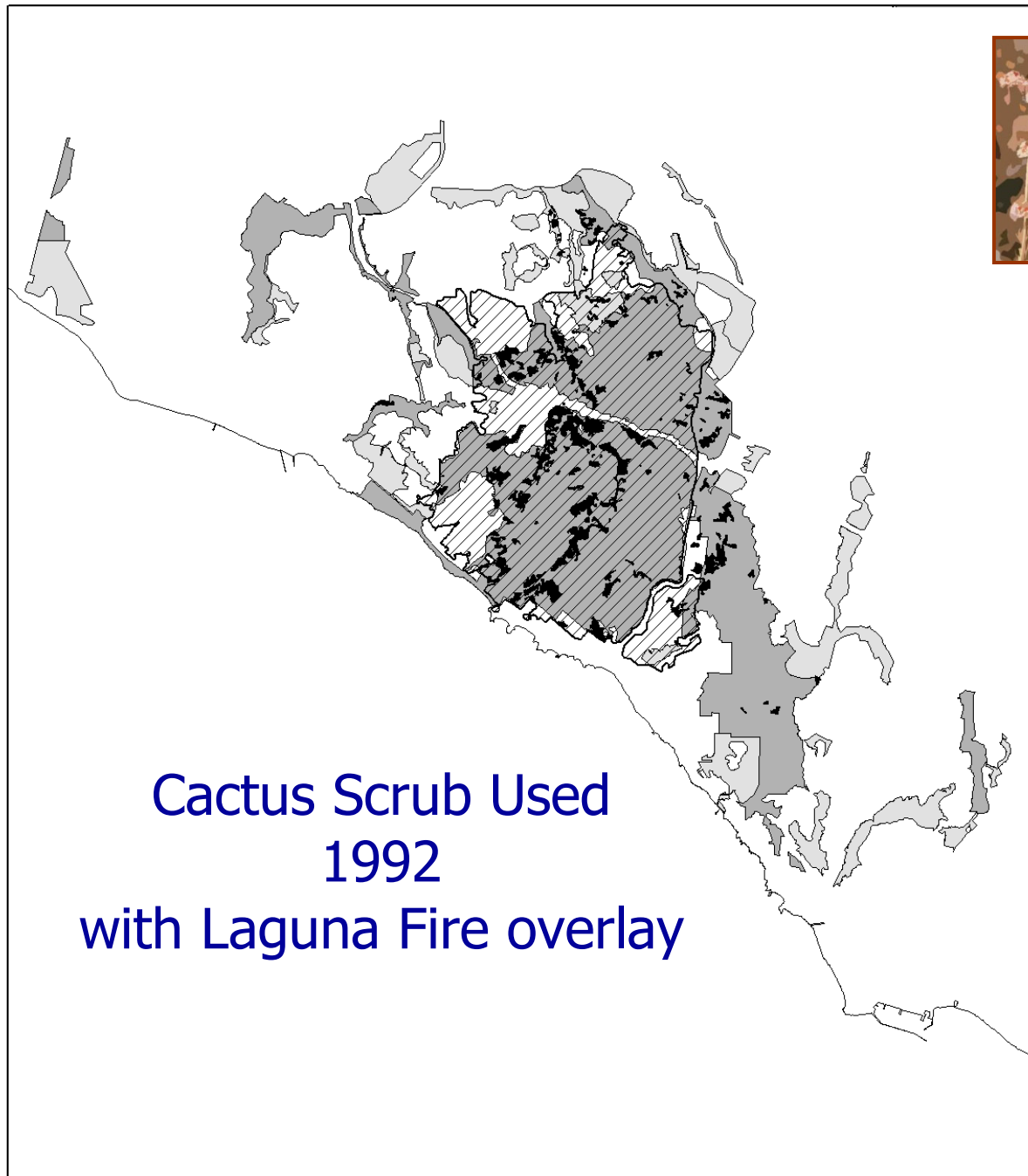
## 75m distance rule for defining historical site use



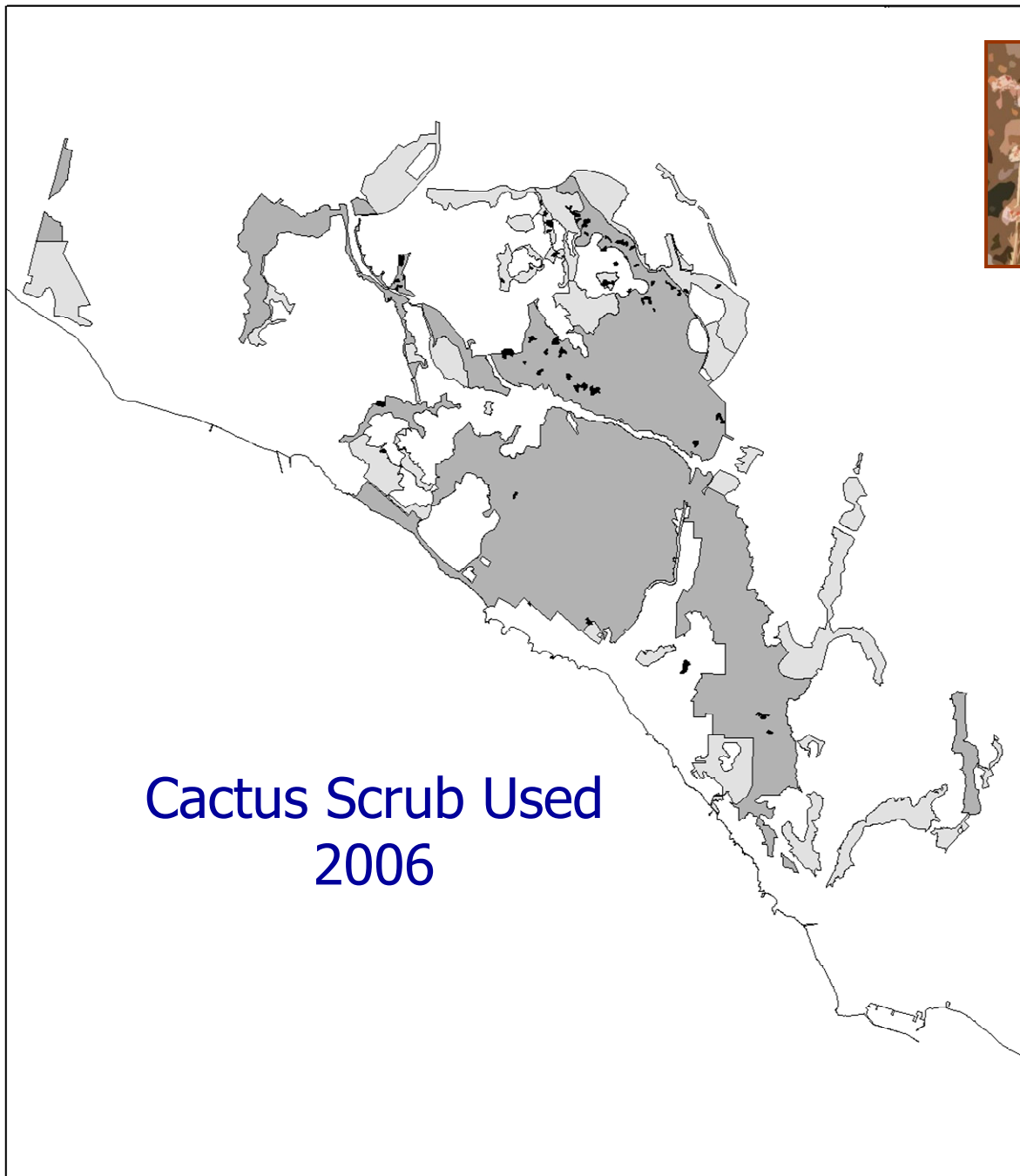


Cactus Scrub Used  
1992



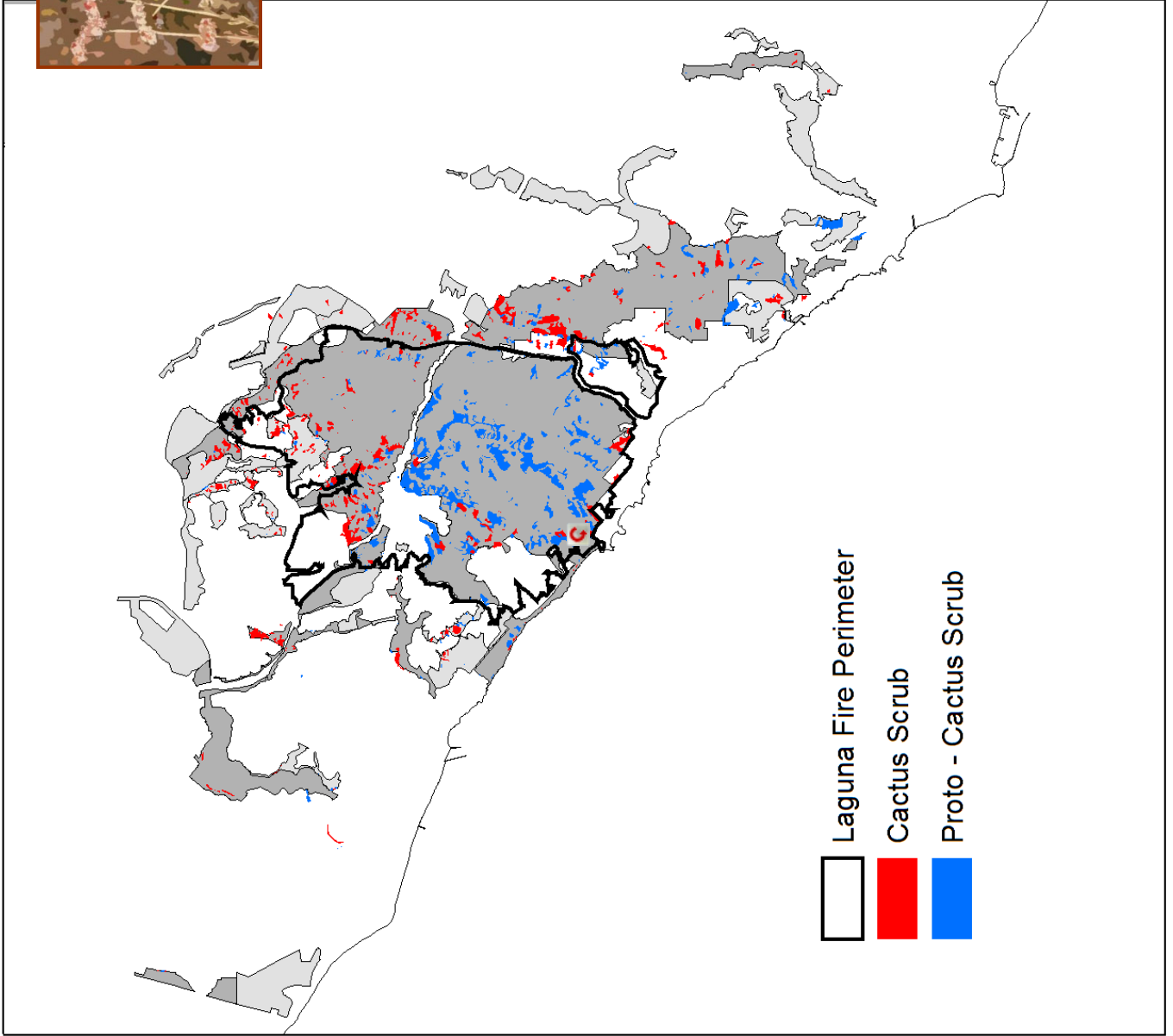


Cactus Scrub Used  
1992  
with Laguna Fire overlay



Cactus Scrub Used  
2006





# Survey Methodology



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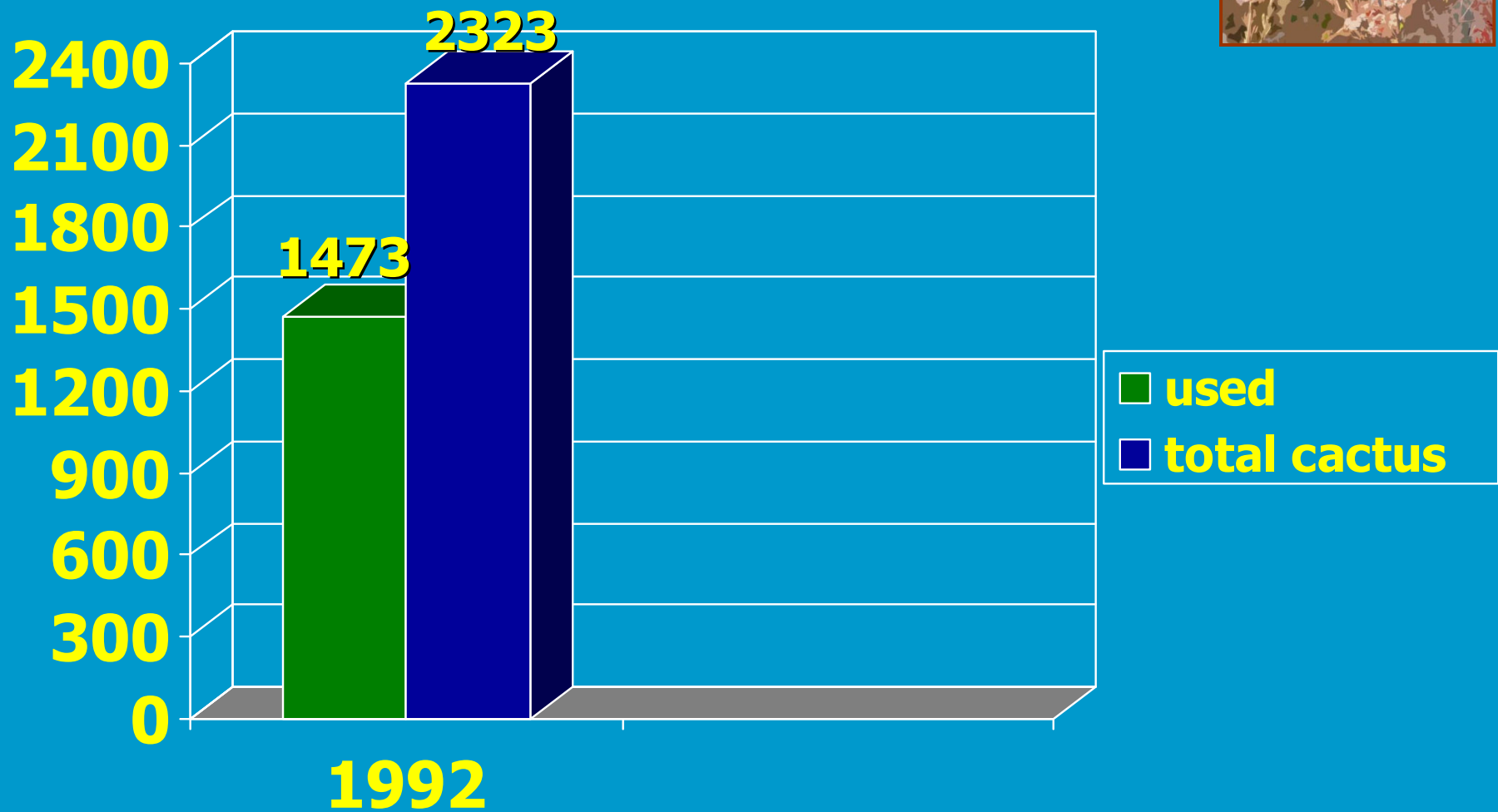
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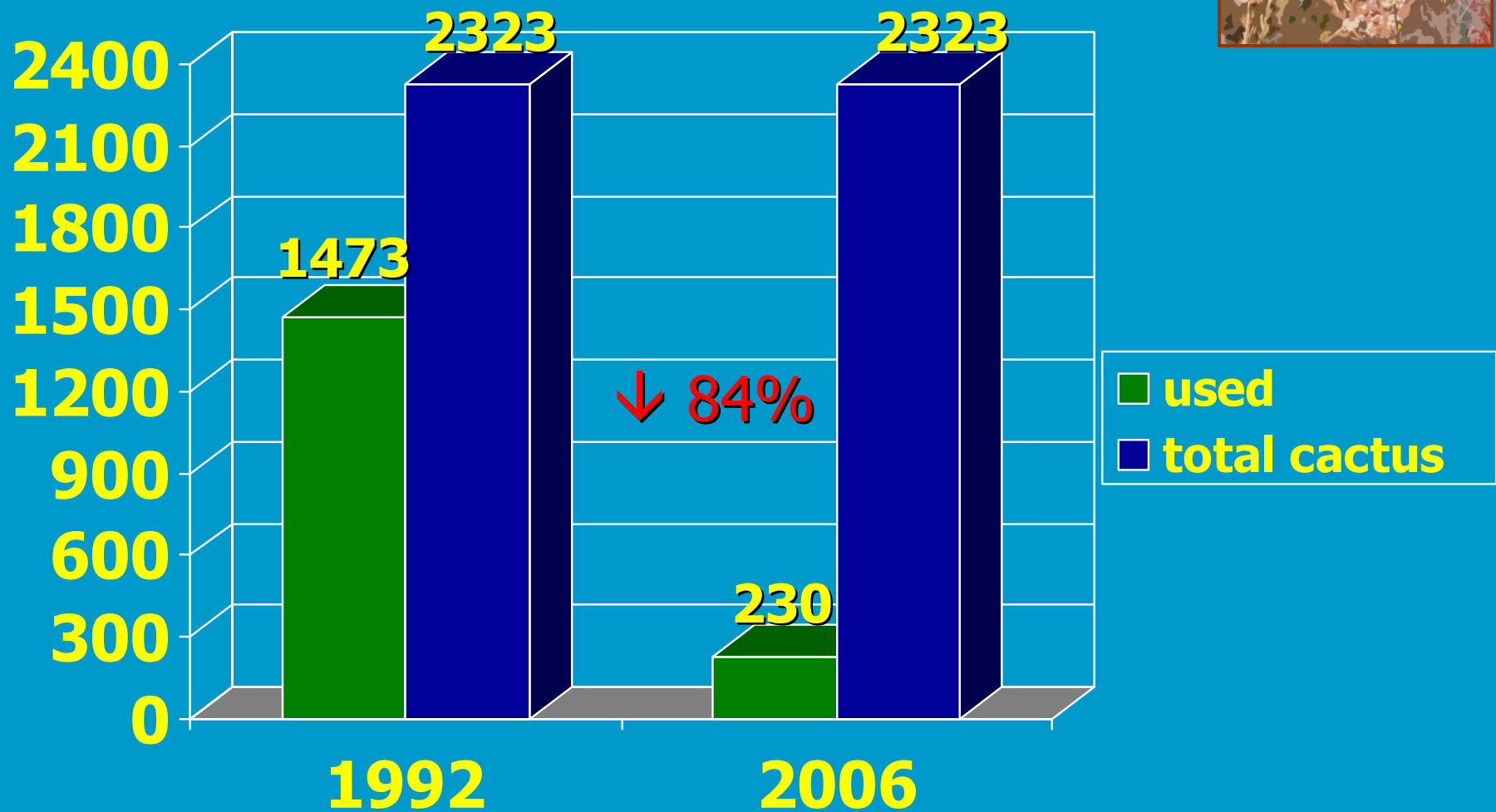


- \* "Percent Area Occupied" approach
- \* Incorporates detection probability into occupancy or use estimate
- \* Site = sample unit, not individual birds
- \* Allows modeling of factors associated with occupancy/use (i.e., habitat suitability)

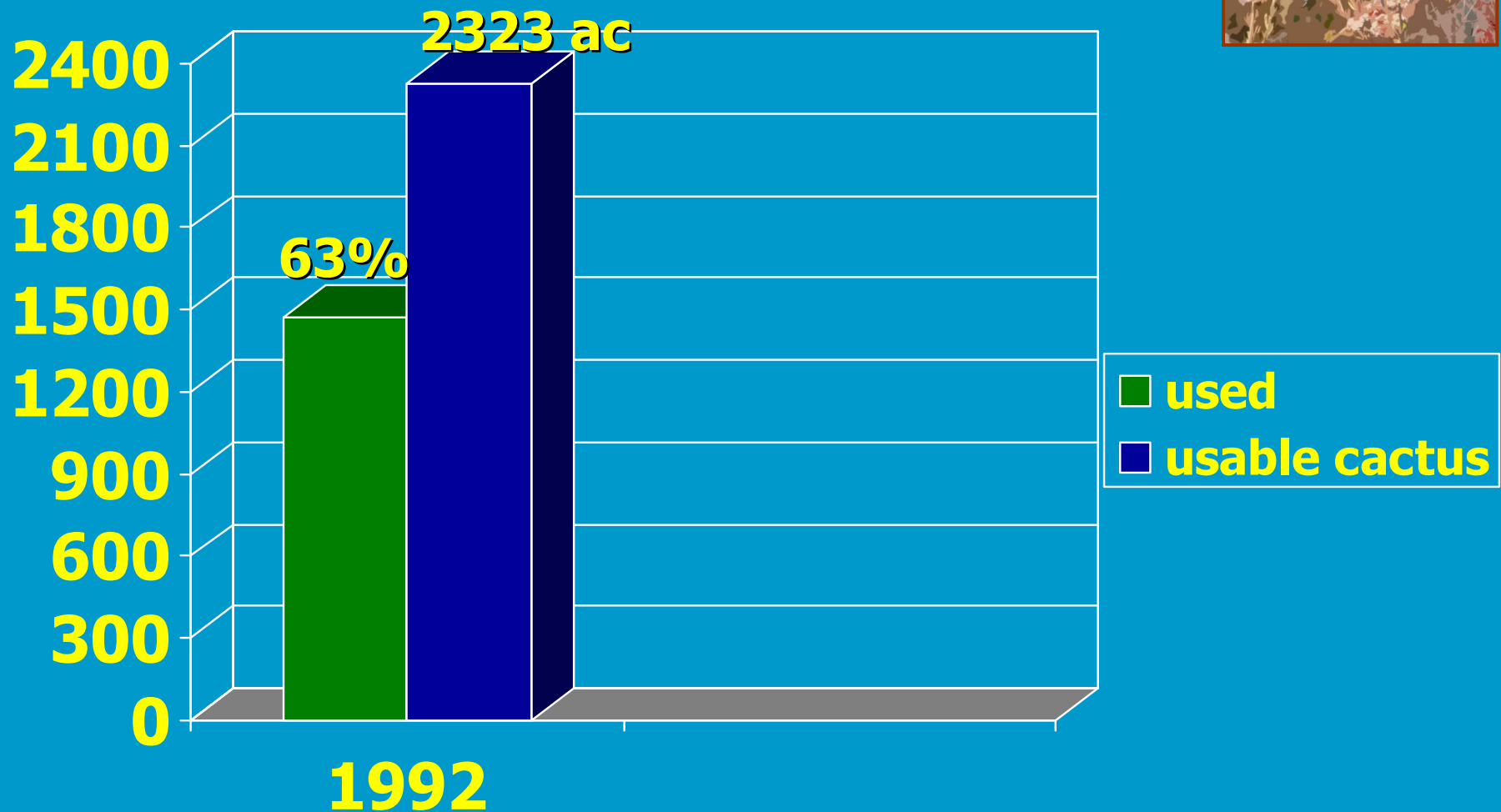
# Acr es of Cactus Scrub Used



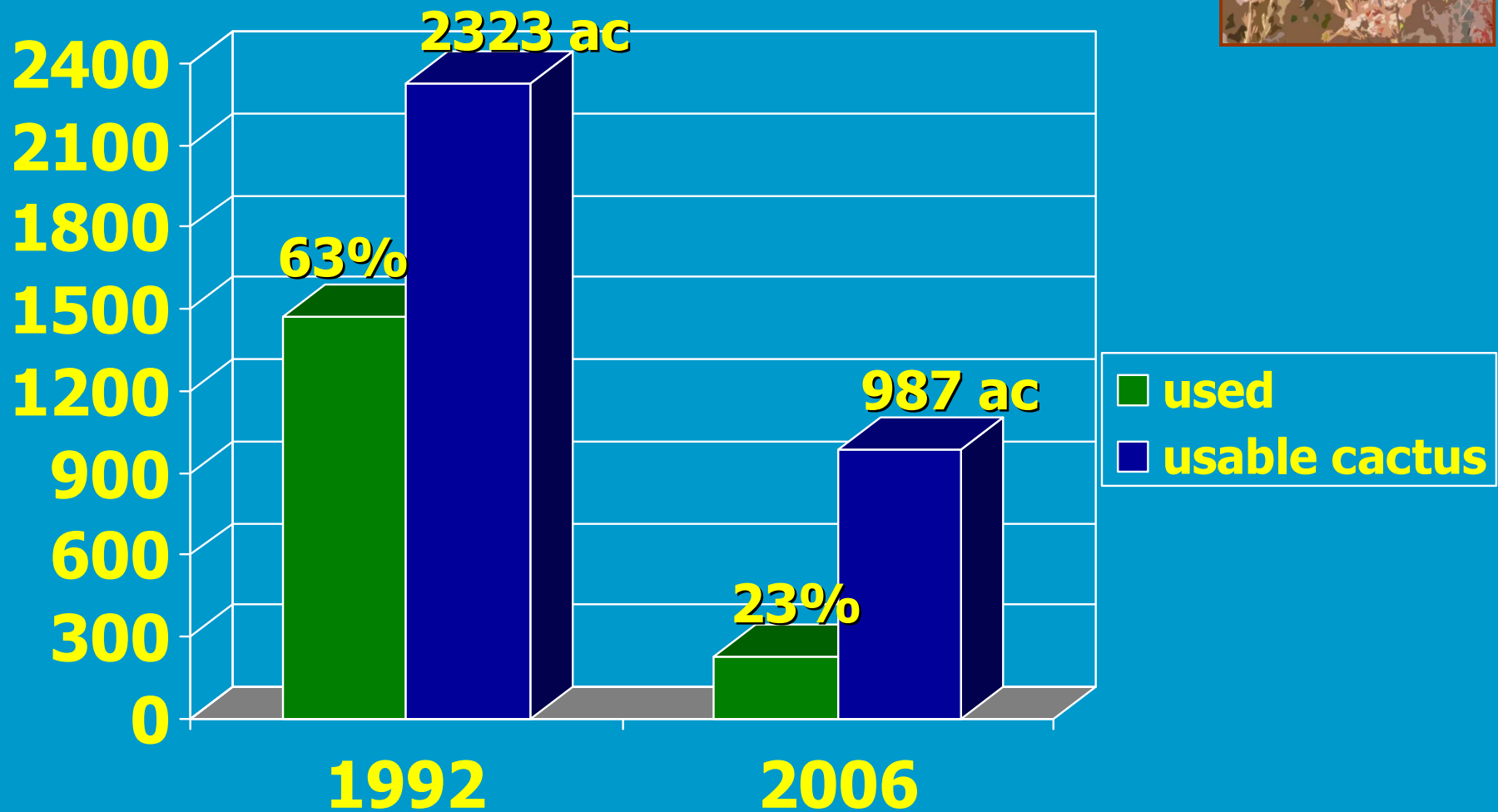
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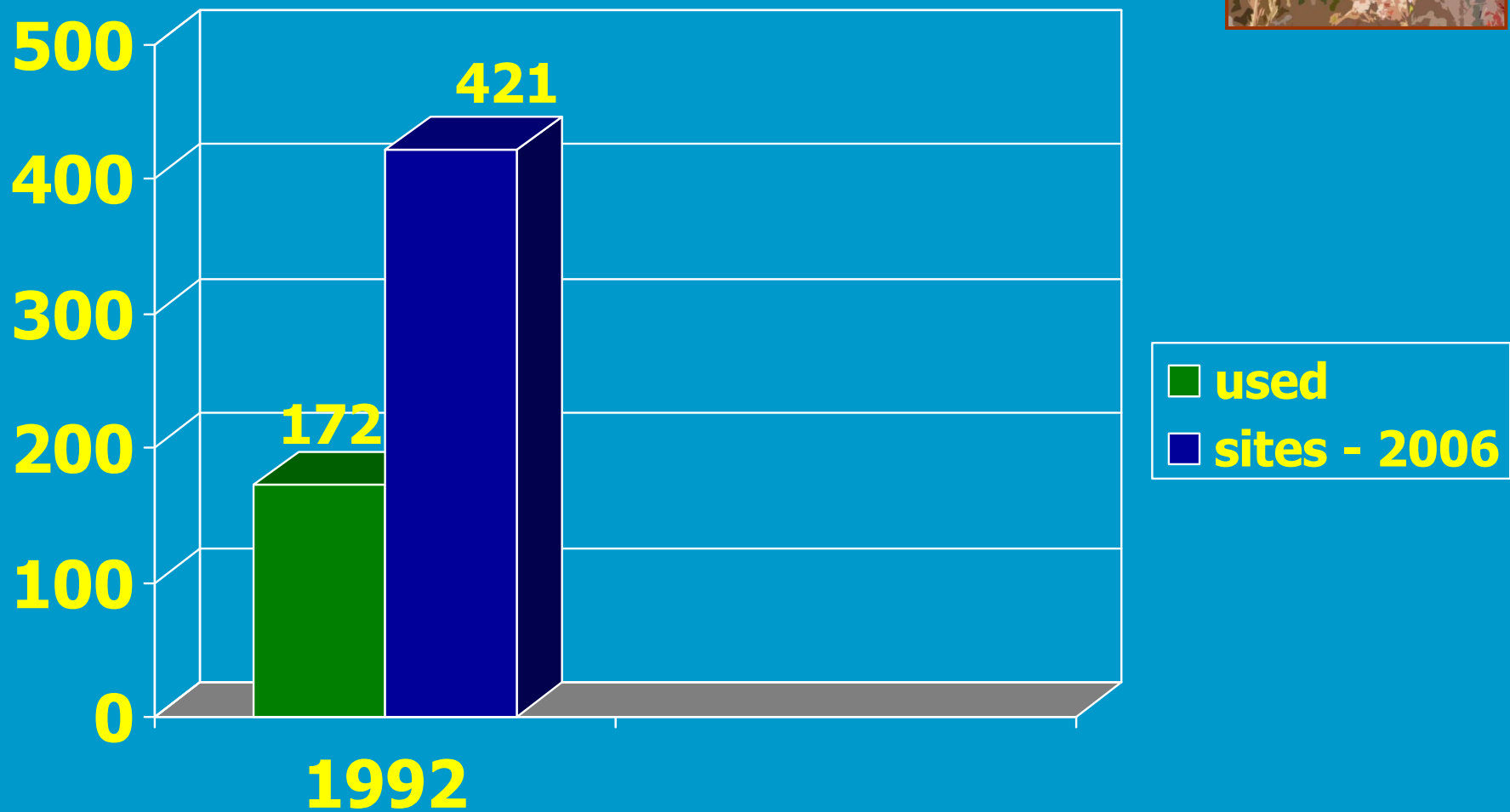
# Use of "Occupiable" Cactus Scrub (acre for acre)



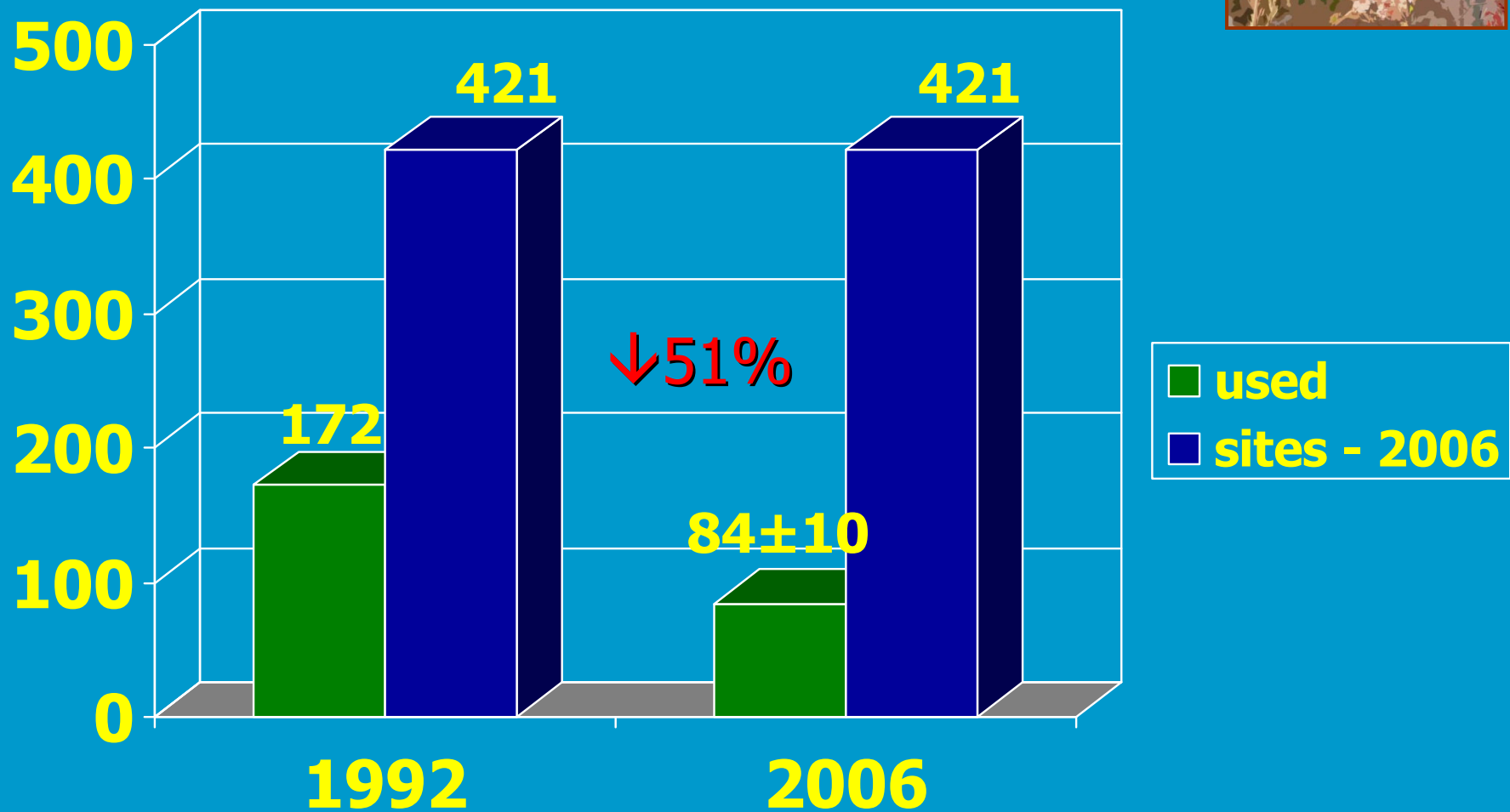
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- \* 296 sites surveyed both years
- \* Each year we used habitat variables as covariates for estimating Cactus Wren detectability and habitat use
- \* Compared inferences about territories with estimates of habitat use

## Comparing 2006 with 2007

	2006	2007
$\Psi$ (Sites Used of 296)	$63 \pm 9$	$58 \pm 11$
p (average detectability)	0.55	0.40*
Inferred territories	46	23

\* Based on model with constant detection probability

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- \* 2007 results suggest we need to modify monitoring methods to achieve greater independence among sites
- \* 2007 results increase our concerns about the decline of Cactus Wren populations in the coastal subregion!

## Causes of Decline



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- \* Look for differences among Management Units to identify and evaluate other causes of decline
- \* Examine differences in habitat quality – what constitutes “prime habitat”?

# Some Important Habitat Variables



Class 1 Cactus Scrub:  $\geq 1$  contiguous acre with  $\geq 20\%$  cover of mature cactus ( $\geq 1$  m tall)

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(Additional cactus scrub classes and cholla types were recorded, as were dominant plant species and other potentially relevant variables)

# Defining "Prime Habitat"

## Class 1 Cactus Scrub



# Defining "Prime Habitat"



**Class 1 Cactus Scrub**

or

**Cholla Type 1**



# Defining "Prime Habitat"



**Class 1 Cactus Scrub**

or

**Cholla Type 1**

plus

**Mexican Elderberry (*Sambucus mexicana*)**



Sambucus mexicana  
Adoxaceae  
© G. D. Carr

# Defining “Prime Habitat”

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**equals**



**“Prime Habitat” — 103 of 427 sites have Prime Habitat**

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**Other sites: estimated occupancy 11% ( $\pm$  3%)**

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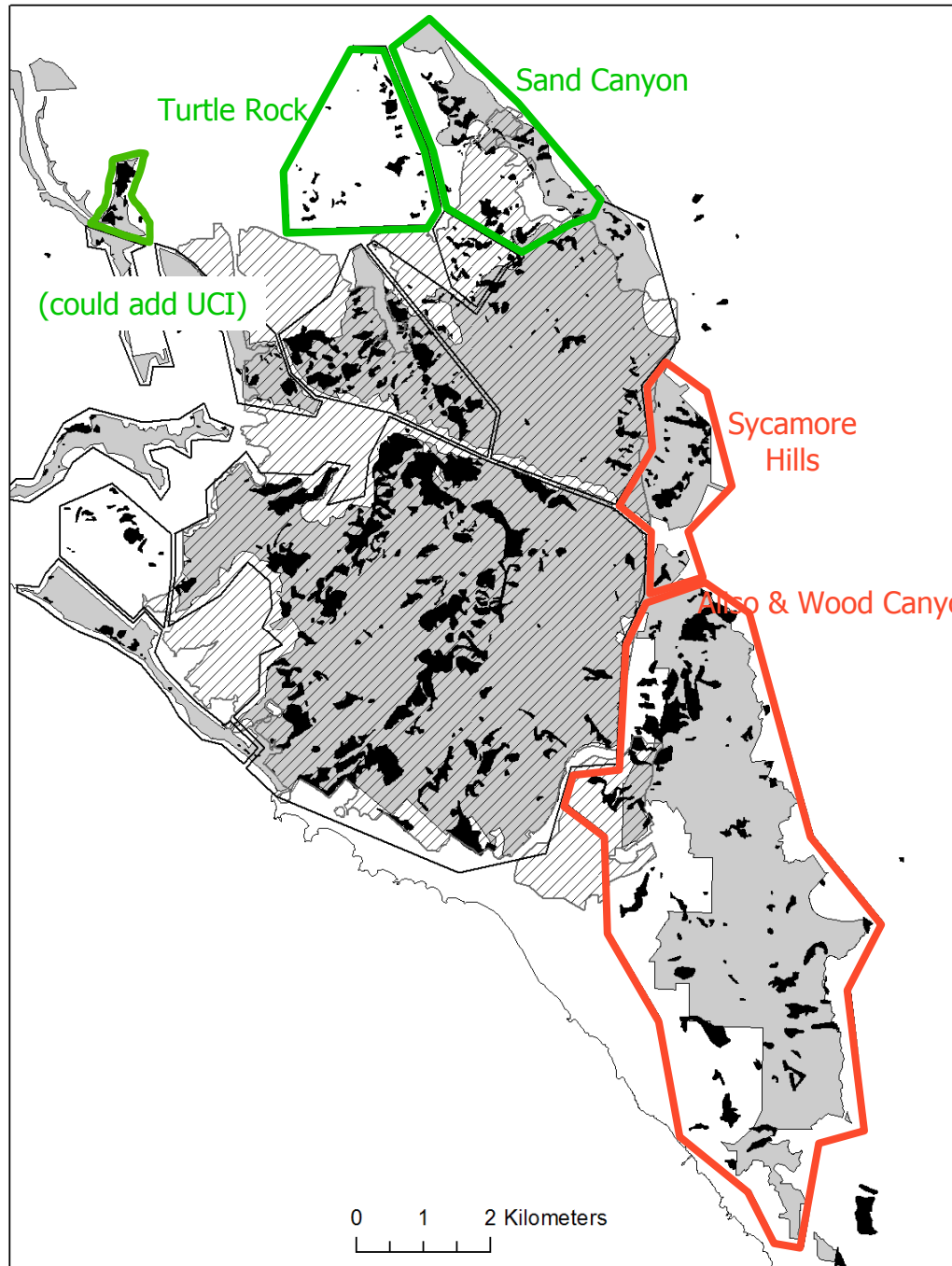
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**Analyzing These Four Unburned  
 Management Areas  
 (and maybe UC Irvine)  
 May Help to Explain Population Decline**



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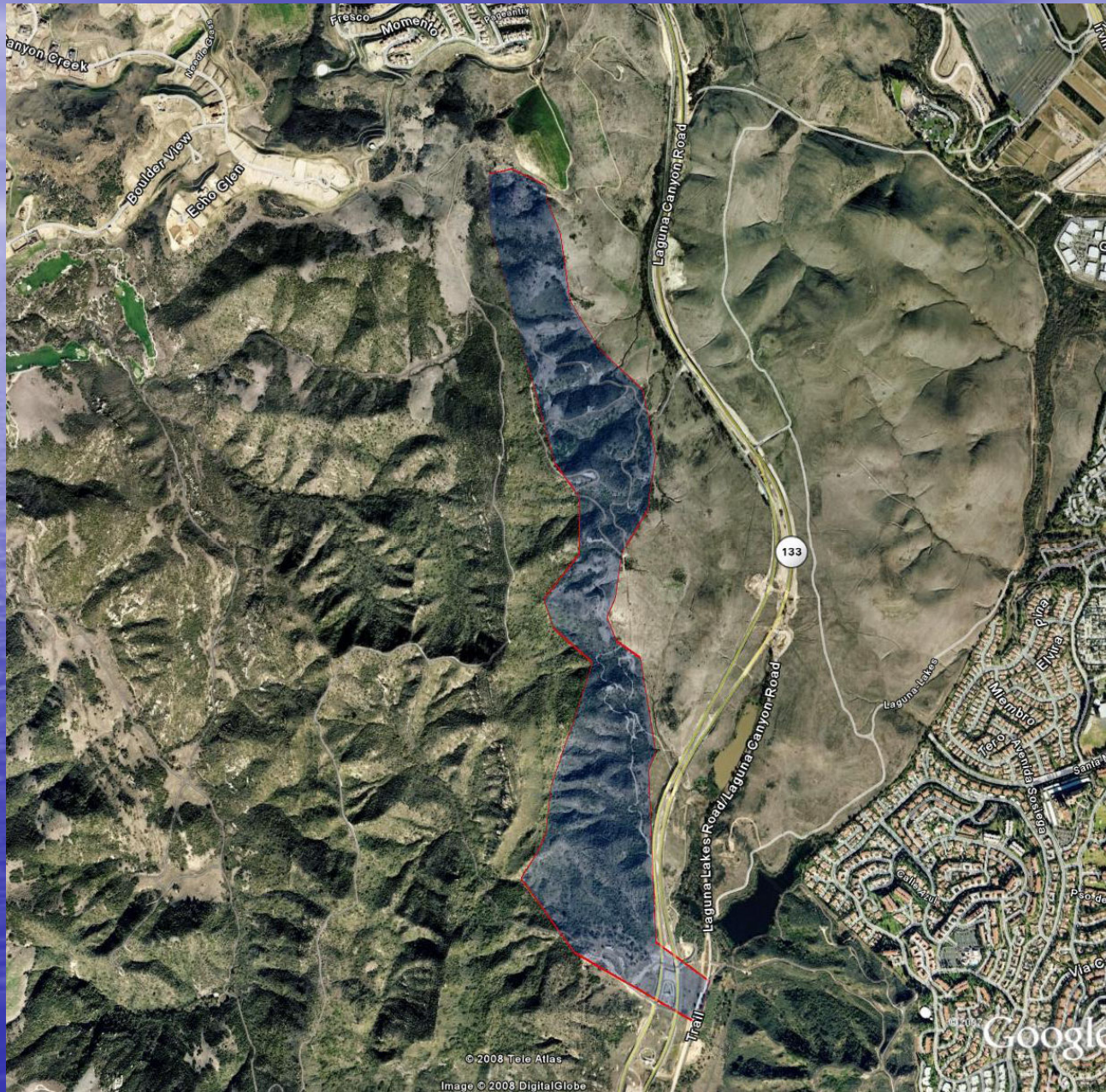
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- \* Establish cactus connection from northern population to Sycamore Hills?

# “Cactus Corridor”





**NATURE RESERVE**  
**of**  
**ORANGE COUNTY**

A stylized illustration of a bird perched on a green branch. The bird is shown in profile, facing left, with a dark body and a lighter-colored head. The branch is a simple, curved green line.