

Response of cactus wrens and cactus habitat to wildfires at Upper Chiquita Canyon Conservation Easement

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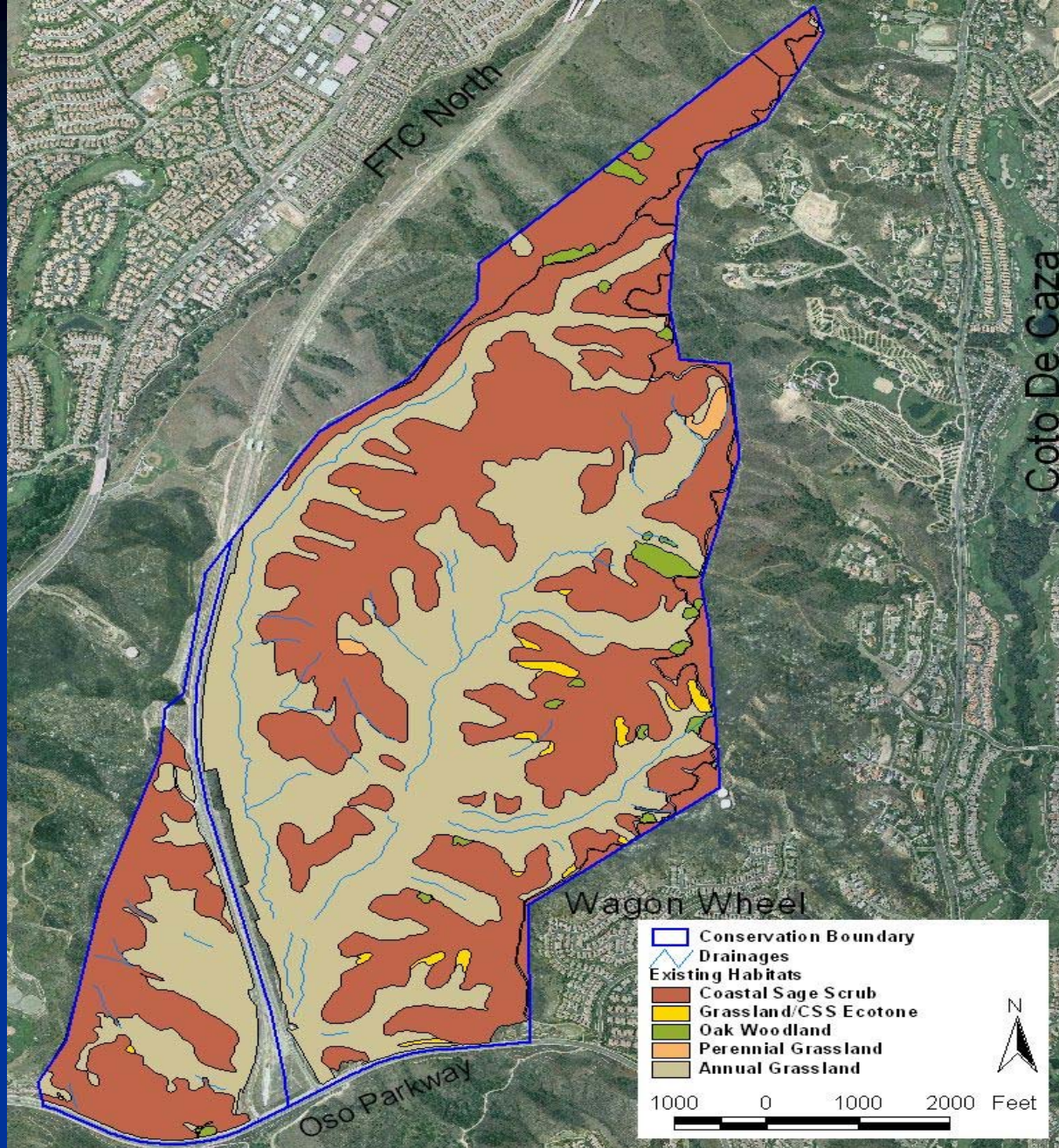


History

- TCA purchased a Conservation Easement in Upper Chiquita Canyon as part of the mitigation for Foothill Transportation Corridor - FTCN
- Site has been actively managed since 1996, including;
 - Site maintenance
 - Access
 - Exotic weed control
 - Monitoring

Conservation Easement

- totals approximately 1,200 acres
 - 631 acres of coastal sage scrub
 - Including significant areas of cactus scrub
 - Remaining areas primarily non-native grassland
 - Some oak woodland, native grassland



Vegetation communities in the Conservation Easement

(Source: Earthworks Restoration, Inc.).

Upper Chiquita Canyon Conservation Easement



Upper Chiquita Canyon Conservation Easement



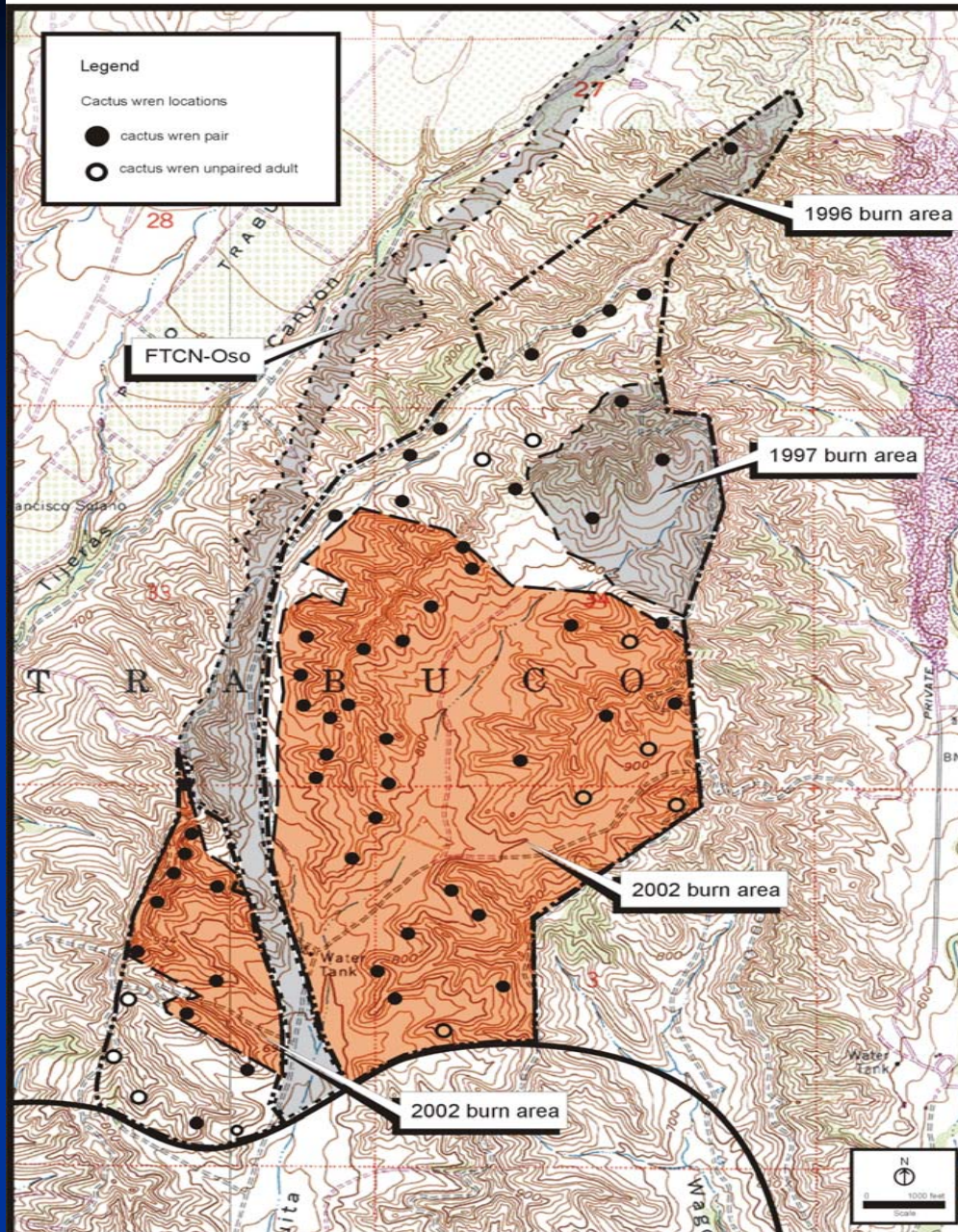
Recent Fires

- Several recent fires have occurred in the Conservation Easement
 - 1996, 1997, 2002
- Currently the site is a mosaic of burned, recovering and unburned habitats



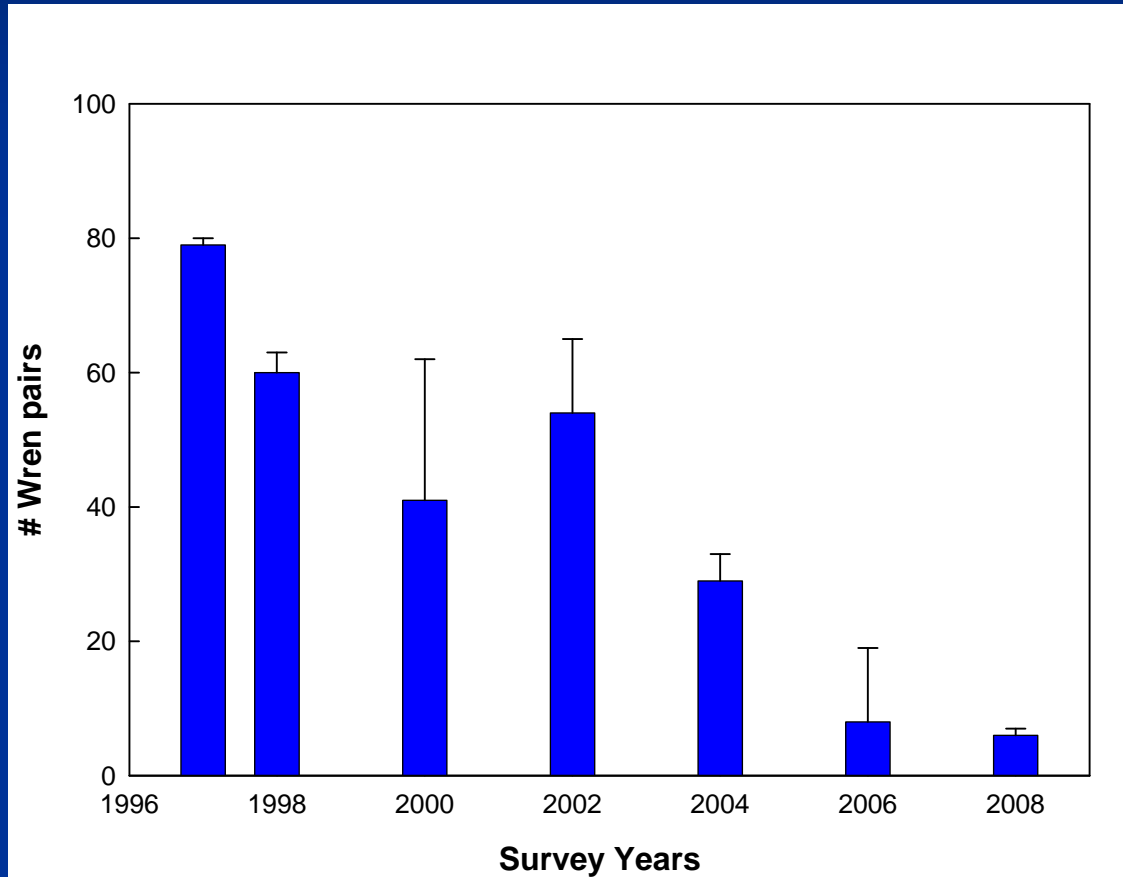
Cactus wren surveys

- Bi-annual surveys since 1997
- All potential habitat surveyed 3 times in spring
- Standard play-back protocol surveys
- Unit of measure
 - Breeding pair
 - Unpaired resident birds also recorded



Distribution of Cactus Wrens in Upper Chiquita Canyon Conservation Easement, May 2002

Cactus Wrens in Upper Chiquita Canyon Conservation Easement



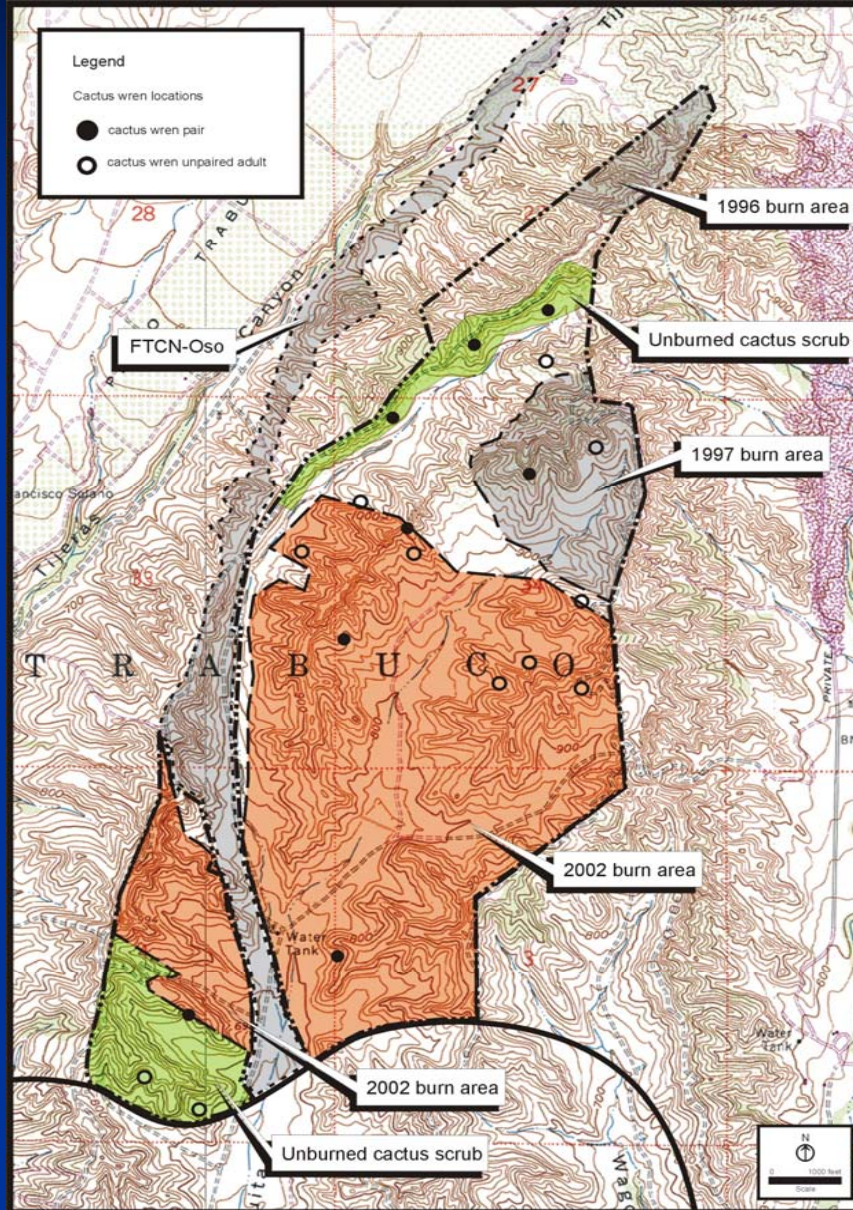
Wren population status

- Population relatively stable pre-2002 fire
- Significant decline after 2002 fire
- No change in wren numbers in unburned CSS immediately before and after May 2002 fire
 - i.e. no apparent displacement of wrens from burned areas to adjacent unburned areas in first months after fire
 - Where did wrens from burn area go?
- Some wrens used burn area for several weeks after fire
- In 2006 - 2 wren pairs occurred in burn area, in partially burned cactus scrub

Occupied cactus wren habitat within 2002 burn area – partially burned cactus scrub



Distribution of cactus wrens in the Conservation Easement, 2006



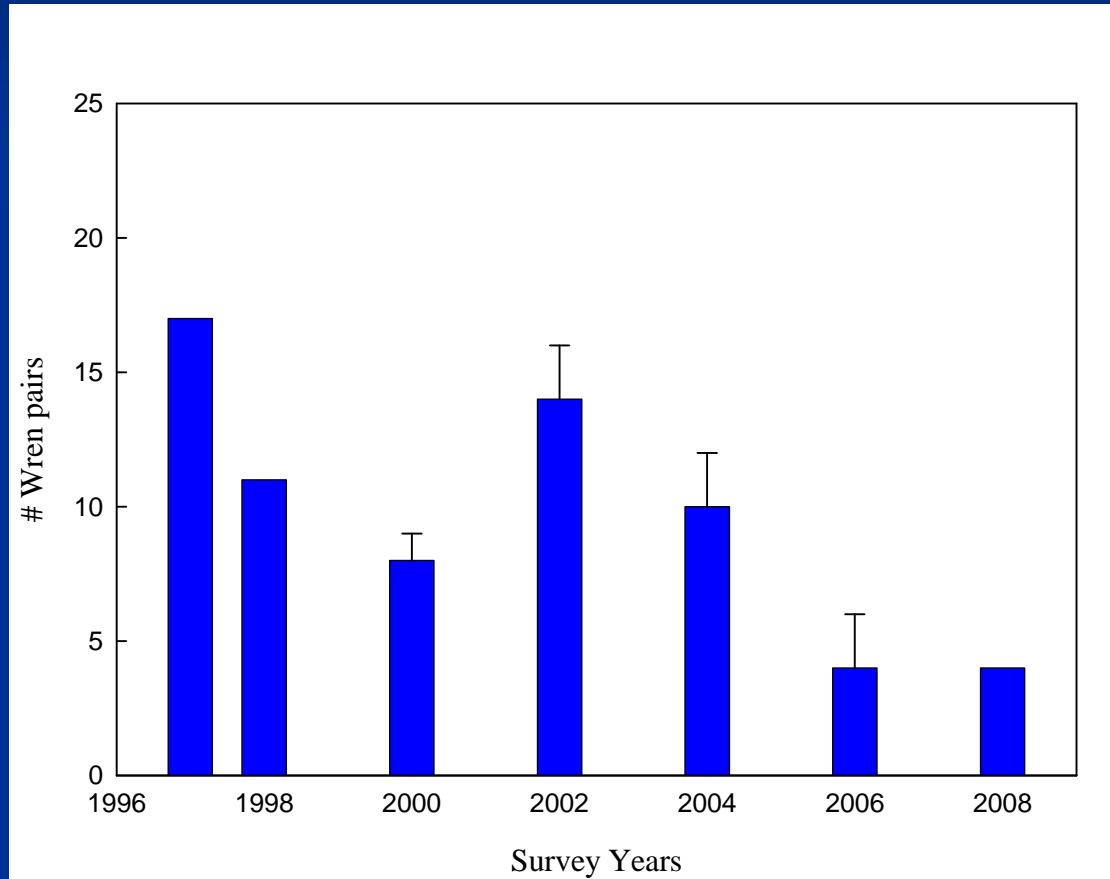
Unburned cactus scrub in Upper Chiquita Canyon Conservation Easement



Unburned cactus scrub in Upper Chiquita Canyon Conservation Easement



Cactus Wrens in unburned portions of Upper Chiquita Canyon Conservation Easement



Wrens in unburned habitat

- Unburned areas still support significant cactus scrub
- Population relatively stable through 2002
- Significant decline since 2002
- Appears to have leveled off in 2008

Summary of wren status

- 1997 through 2002 population relatively stable
- Significant decline as a result of 2002 fire
- Continued declines after 2002 in unburned habitat

2002 Chiquita Fire

- 2002 fire burned 325 acres of CSS including significant areas of cactus scrub
- fire consumed all vegetation within the burn area except some cactus patches and a few patches of CSS
- Cactus slower to recover from fires than other CSS plants but little quantitative data exists for cactus recovery from fires
- 20 permanent transects established in burned cactus scrub after 2002 fire
- Cactus characterized as black (dead), yellow (stressed but still alive) and green (healthy)
- Annual surveys first five years and every five years thereafter

Cactus scrub burned in 2002 fire, June 2002



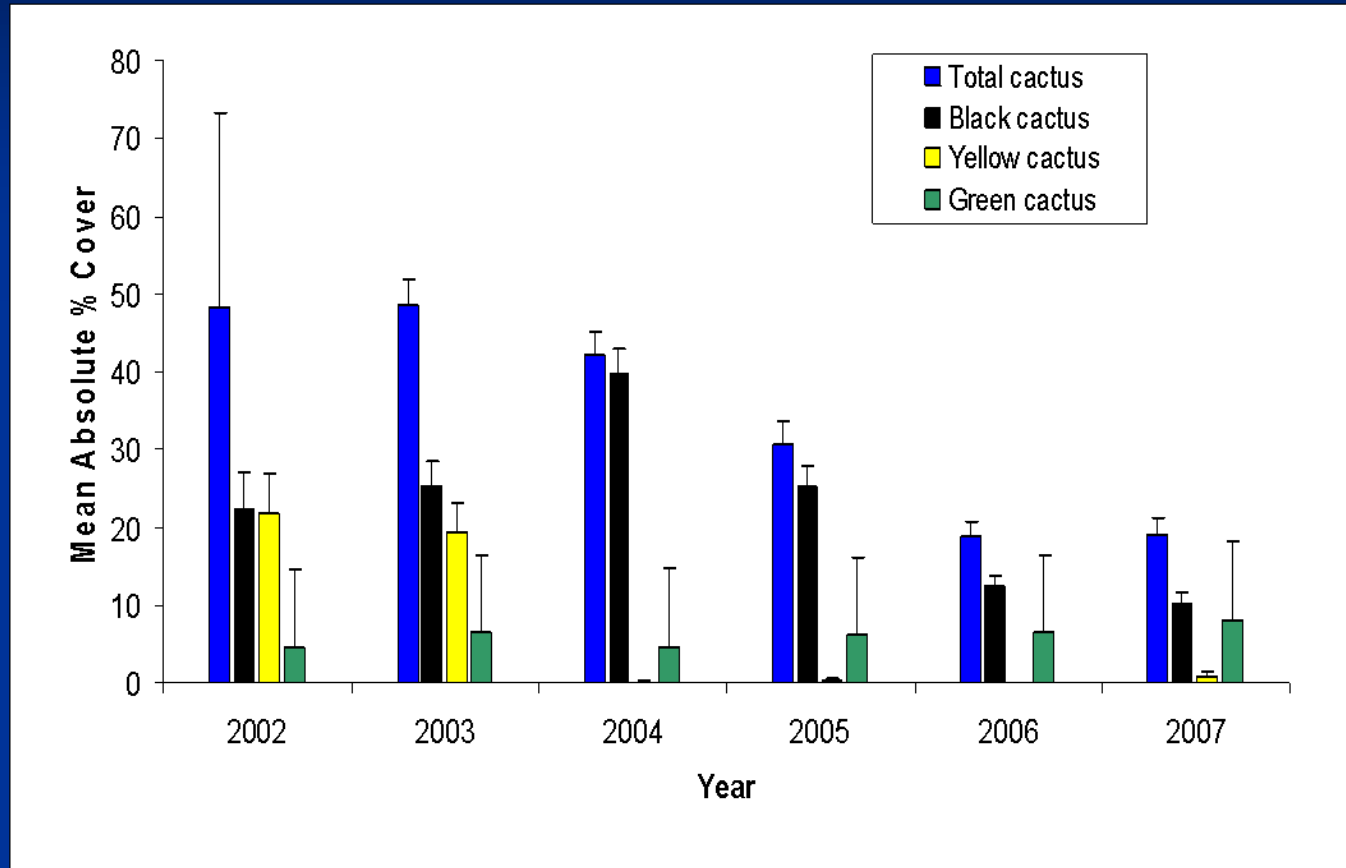
2002 burn area showing typical CSS recovery pattern

- Initial increase in species richness in the first few years following fire, due to seed bank germination, resprouting, and seed dispersal
- Rapid proliferation and colonization of native fire-following species such as morning-glory and deerweed, followed by decrease in these species 4-5 years after fire
- Recovery of mid- to late-successional species such as laurel sumac, coastal sagebrush, California buckwheat, bush monkeyflower and black sage
- 5 years post burn absolute cover of shrubs and herbs remains less than in mature coastal sage scrub

Cactus scrub

- Immediately post-burn cactus scrub consisted of 49.2% bare ground and 48.4% cactus
 - 23% black cactus
 - 22% yellow cactus
 - 5% green cactus
- Over the first few years post-burn majority of yellow cactus died due to stress
- by 2007 (5 years after fire);
 - 10% black cactus
 - <1% yellow cactus
 - 8.1% green cactus

2002 Burn Area



Mean absolute percent cover (and standard error) of cactus cover from 2002 Burn Area. 2002 data collected within six weeks after the fire.

Cactus recovery

- 16% average annual increase in cover of healthy (green) cactus
- Mean cactus height increased each year since fire
- Data and field observations indicate that growth of green cactus is currently vigorous, and percent cover is expected to increase significantly in future years
- Cactus eliminated from 7 of 20 transects

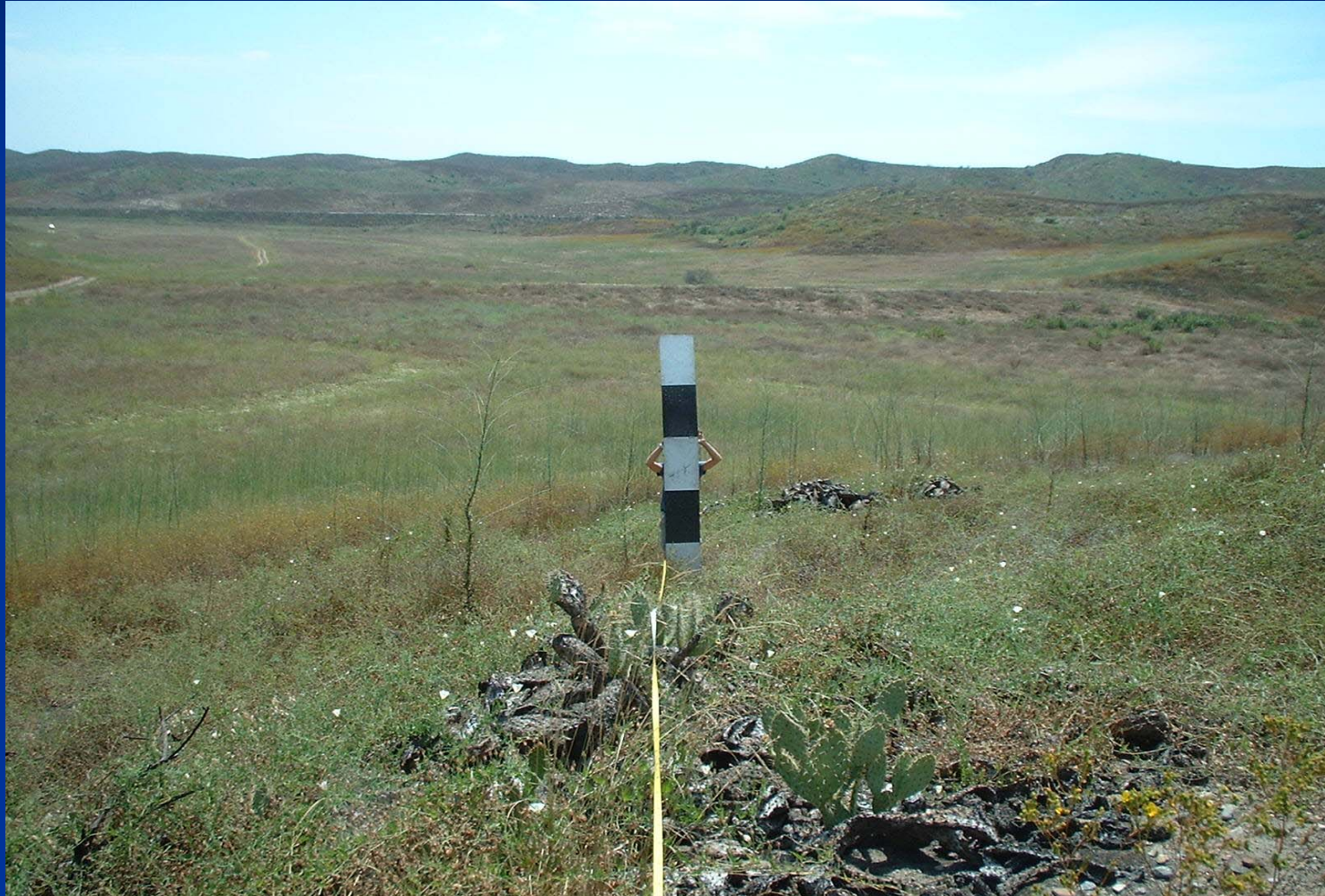
Transect #02B6 - July 2003



Transect #02B6 - May 2007



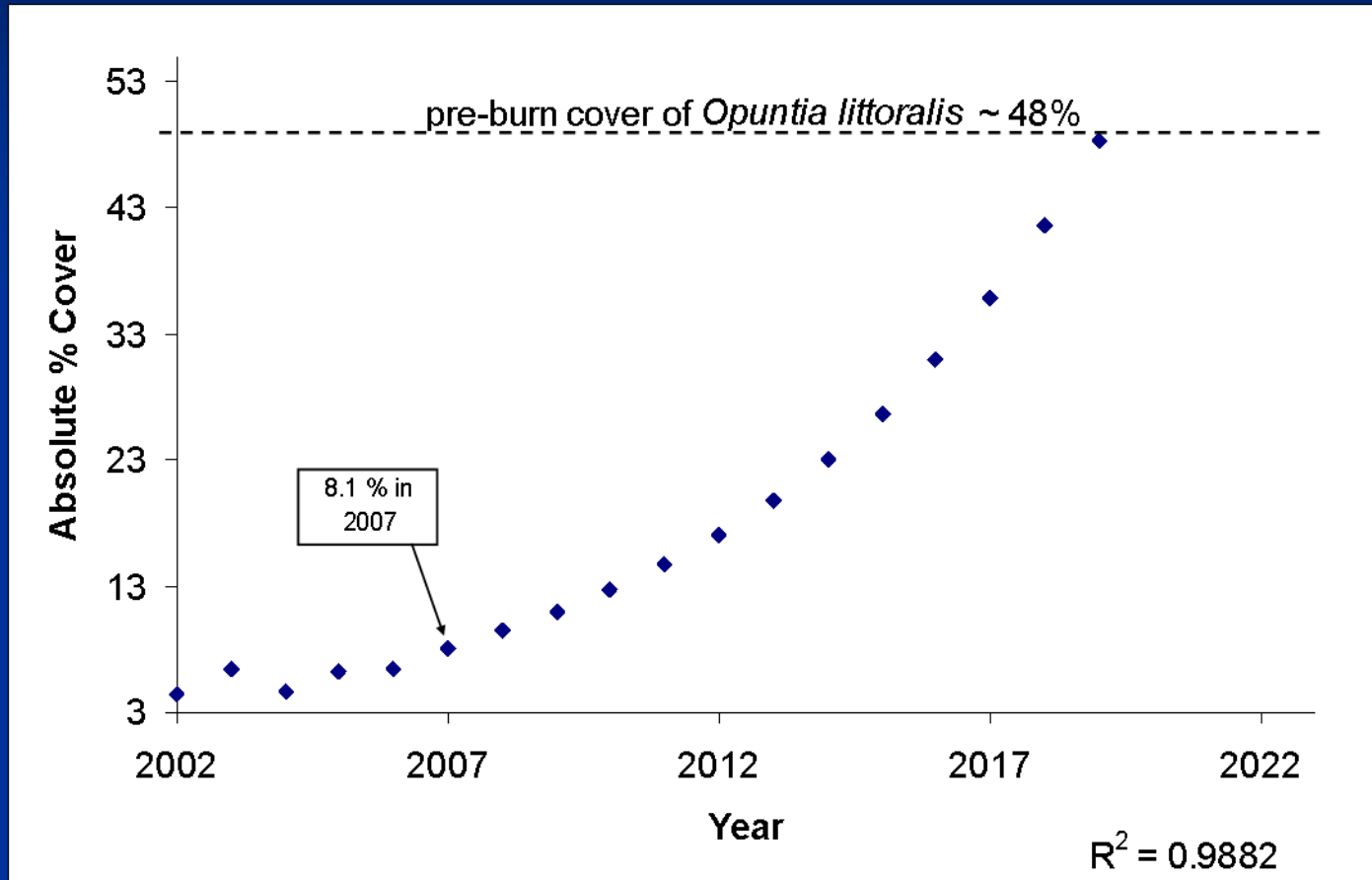
Transect #02B16 - July 2003



Transect #02B16 - June 2007



live cactus (*Opuntia littoralis*)



Projected time for live cactus (*Opuntia littoralis*) to recover to pre-burn cover values, assuming an average annual increase of 16%.

Summary

- CSS showing typical post-fire recovery pattern
- Majority of burned cactus dies immediately or within 2 years post-fire
- Cactus eliminated from approximately 35% of transects
- Cactus recovers slowly, approximately 16% per year
- Expected to recover to pre-fire conditions ~20 years after burn

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