

## Facilitating Recovery of a Long-Disturbed Chaparral Site in Santa Barbara County



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## State Water Project Route



## Construction Drawings



## Measures to Reduce Impacts to Burton Mesa Chaparral

- Narrowed Corridor
- Extra Workspace
- Cut Vegetation Outside Trench
- Rerouted Corridor to Disturbed Areas
- Monetary Incentives
  - Oaks
  - Chaparral

## Classes of Burton Mesa Chaparral



Class 1



Class 3

## Right-of-Way Success Criteria

### Burton Mesa Chaparral

- Topsoil stable for  $\geq 3$  years
- 40% cover by native perennials in 5 years
- Minimum of 6 native perennial species per 1-m belt transect
- Weed abundance no greater than adjacent

## Right-of-Way Success Criteria

### Oaks in Burton Mesa Chaparral

- Minimum 1 inch basal diameter
- Minimum 3 feet tall
- Vigorous appearance
- 3 years with no irrigation + 2 years with no herbivore protection



## Right-of-Way Success Criteria

### Sand Mesa Manzanita

- Minimum 4 years survival
- 3 years with no irrigation + 2 years with no protection
- Normal form and morphology with vigorous condition



## Burton Mesa Mitigation Site

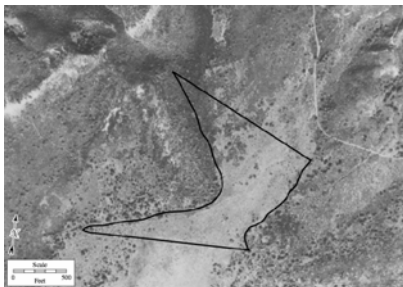


Overview photograph taken in March 1997

## Goal

*To initiate and facilitate the recovery 25 acres of non-native annual grassland to habitat dominated by native woody vegetation typical of Burton Mesa*

## Site in 1938



Source: Fathelal Aerial Survey, UCSB Map and Imagery Lib

## Site in 1956



Source: Mark Hall Aerial Survey, UCSB Map and Imagery Library

## Site in 1995



## Challenges



## Mitigation Plan

- Fencing
- Burn
- Seeding
- Container plants
- Bird perches
- Irrigation
- Planting plan
- Experimental approach
- Planting methods
- Sampling plan
- Reference area (control)
- Target area

## Fence Design



## Burn



## Seeding

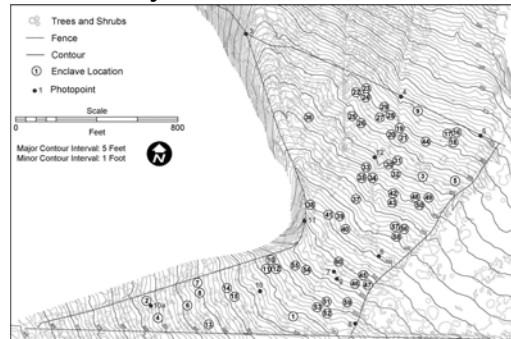
Table 2. Seed Mix

Species Common name (Scientific name)	lb. per acre
California sagebrush ( <i>Artemisia californica</i> )	2
Mountain mahogany ( <i>Cercocarpus betuloides</i> )	0.5
Mock heather ( <i>Ericameria ericoides</i> )	0.7
California buckwheat ( <i>Eriogonum fasciculatum</i> )	2.5
Deerweed ( <i>Lotus scoparius</i> )	0.4
Dune lupine ( <i>Lupinus chamissonis</i> )	1
Bush monkeyflower ( <i>Mimulus aurantiacus</i> )	0.3
Black sage ( <i>Salvia mellifera</i> )	0.2
<b>Total</b>	<b>7.1</b>

## Bird Perches



## Layout of Enclaves



## Species planted in Enclaves

- Chamise (*Adenostoma fasciculatum*)
- Purisima manzanita (*Arctostaphylos purissima*)
- Coast ceanothus (*Ceanothus cuneatus* var. *fascicularis*)
- Coast live oak (*Quercus agrifolia*)
- Coffeeberry (*Rhamnus californica*)
- Redberry (*Rhamnus crocea*)
- Black sage (*Salvia mellifera*)
- Sand almond (*Prunus fasciculata* var. *punctata*)



## Devices used to Protect Plantings

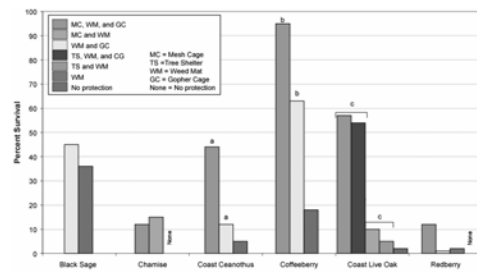


## Burton Mesa Mitigation Site



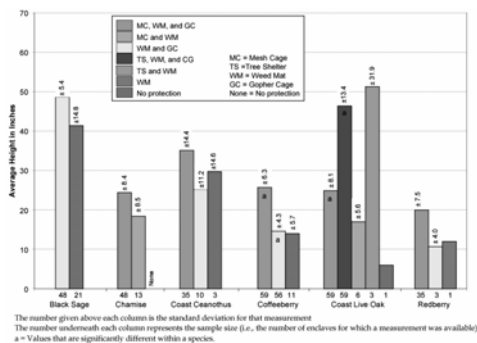
Overview photograph taken in April 2000

## Survival of Plantings with Different Protective Devices

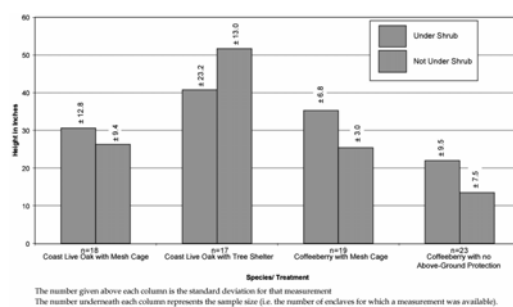


Where there is no column and "None," survival was 0 for plantings without any protection. Columns with like letters above them designate values which are considered statistically significantly different.

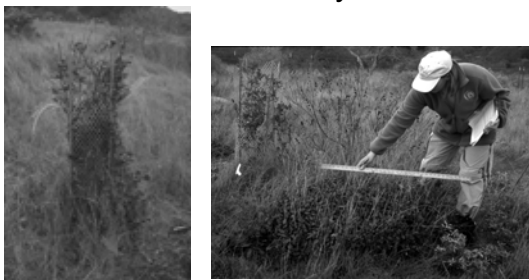
## Height of Plantings with Different Protective Devices



## Height of plantings under existing Shrubs

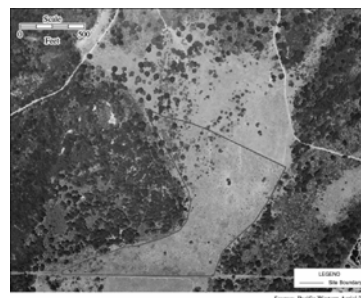


## Impacts of Deer Browse on Coffeeberry



Photographs taken in October 2003

## Site in 2004



## BMMS Site



Photographs taken in March 2003



## Lessons Learned

- Nursery
- Durability of protection devices
- Total cost and funding
- Quality of supplies
- Repair costs
- Timelines for success
- Coordination with regulators