



# MARITIME SUCCULENT SCRUB RESTORATION AND MANAGEMENT FOR CACTUS WRENS

by Mark Doderro

# Planning for Restoration

- Select a site
- Develop a plan
- Seed collection
- Plant propagation
- Implementation
- Maintenance, monitoring, and reporting

# OHV Damaged Areas, Overgrazed Lands and Manufactured Slopes can be Restored





# Possible Restoration/Enhancement Goals



Improve Ecosystem Function  
Mustard Invasion  
into Preserved MSS



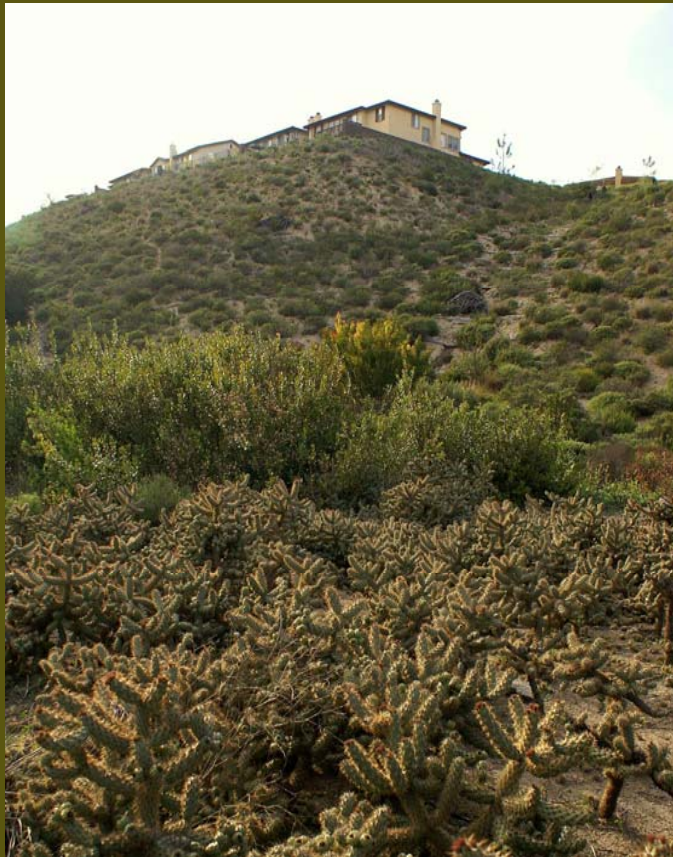
Habitat for  
Restoration  
Rare Species-  
Variegated  
Dudleya



Improve  
Conditions for  
Native  
Pollinator  
Populations



# Create Low Fuel-Low Water Habitat





# Seed Collection, Bulking and Storage



Appropriate timing  
of Seed Collection  
from Local Sources



Seed Bulking  
of Native Grasses



Store Seeds  
in a Cool, Dry  
Location



# Advantages of Using Native Soil

- Reduced Nutrient Content Which Inhibits Weed Growth (Native Species Are Often Adapted to Low Nutrient Conditions)
- Improved Water Retention Compared to Traditional Nursery Mix
- Native Mycorrhizal Component Already in Soil
- Reduced Transplanting Stress



# Large-Scale Cactus Salvage Operations





# Controlled Drought in the Nursery

Plants are Pre-conditioned for Low Water Environments by Limiting Available Water at the Nursery



Guest Nursery  
Acclimated Plants at the Restoration Site

# Site Preparation



Site Grading/Recontouring



Weed Thatch Removal  
Using Weed Whips



# Site Preparation-Habitat Structure



Native Brush Piles and Natural Rock Cobbles Provide Structure



# Plant Installation



Hand Excavation



Auger Used in Rocky/  
Hardpan Soils



Planting Salvaged Native Bunchgrasses

# Water Truck Irrigation in Remote Restoration Locations



## Temporary Irrigation used to Establish New Plantings





# Invasive Species Management



Follow up Spraying  
to Control Weeds



Reduce Non-native Flash Fuels  
Mustards-Annual Grasses

# Maritime Succulent Scrub Restoration-Otay Ranch





# Regional Location

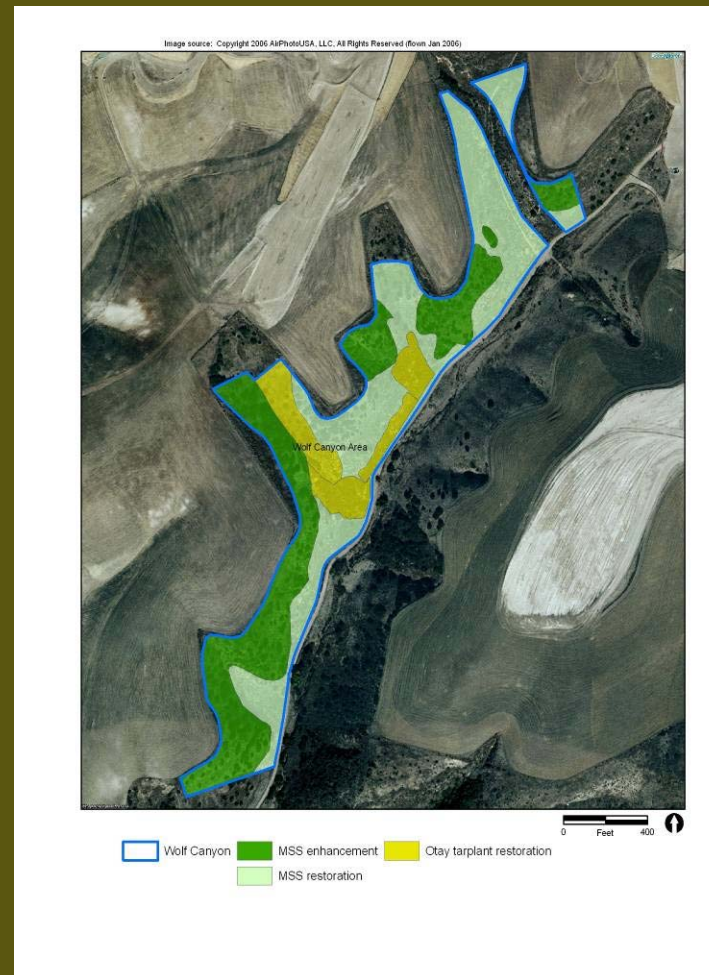
 Project location



# Restoration Locations Olympic Parkway Slopes and Wolf Canyon

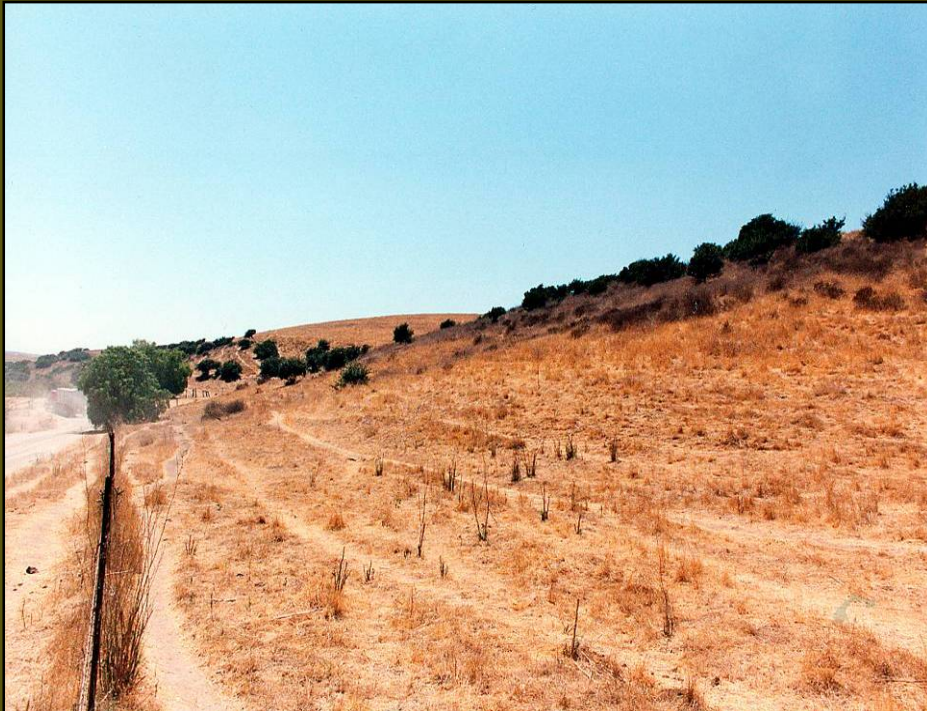


# Wolf Canyon Preserve and MSS Restoration Areas





# Prior to implementation, the Wolf Canyon Site was Dominated by Non-native Weeds





# Manufactured Slope Preparation



Native brush piles and natural rock cobbles provide structure



# Large-Scale Cactus Salvage and Plant Propagation





# Other Species Salvaged For Relocation

Geophytes



Invertebrates





# Propagation of Characteristic MSS Species



San Diego Bursage



Anderson's  
Boxthorn



Native  
*Erodium  
texanum*

# Sensitive Species Salvage and Propagation



Coast Barrel Cactus



Snake Cholla



# Barrel cactus propagated from locally collected seed





# Restoration After Weed Removal

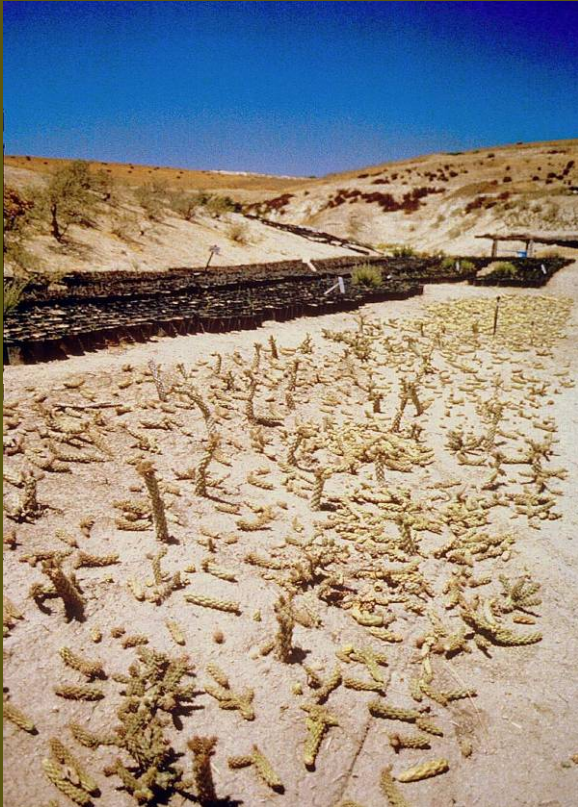




# On Site Nursery Grown Plants Increase Native Cover and Diversity







Cholla propagation



Flowering jojoba



Flowering Adolphia



# Site Appropriate Species-Long Sequential Flowering Season-Pollinator Support



Viguiera



Cleveland's  
Sage



Gumplant

Mojave yucca





# As Cover and Diversity Increases Wildlife Use Increases





# Development of More Complex Food Webs



Meloid Beetle-Pollen Feeder



Tarantula hawk



Lynx spider with prey

# Listed and sensitive animals now occupy the MSS restoration areas



Coastal California Gnatcatcher



Coastal Cactus Wren Nest



# Wolf Canyon Before and After

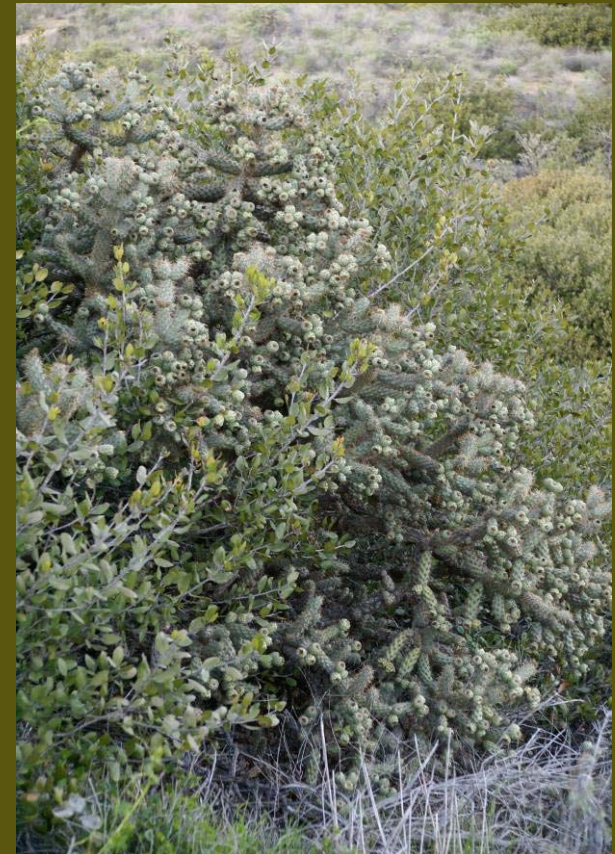


# Long-term Native Vegetation Management for Sustainability and Fuel Reduction





# Lemonadeberry Can Dominate Sensitive Habitat Adaptive Vegetation Management





# Post-fire San Diego National Wildlife Refuge



October 26, 2007



February 25, 2008



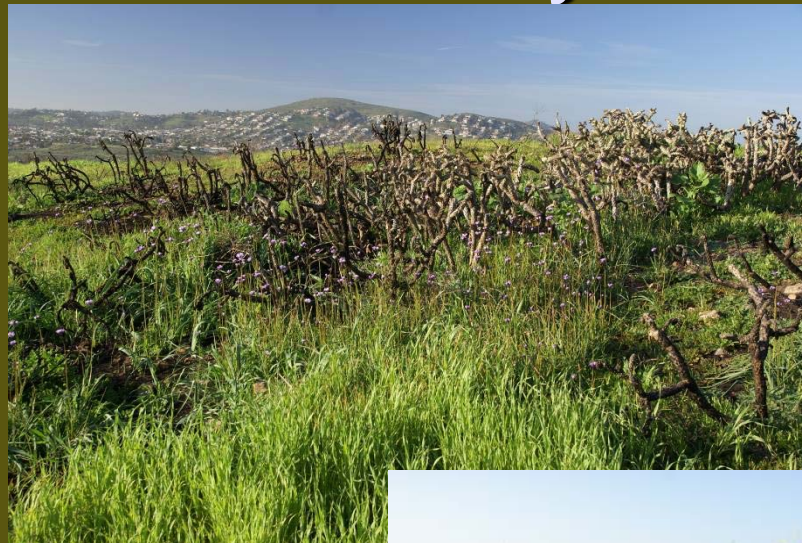
March 31, 2008



# Non-Native Grasses Can Dominate the Understory Postfire



October 2007



February  
2008



March 2008



# Post-fire Resprouting and Dead Cholla





# Prioritize Management Funding to Maintain Cactus Wren Habitat





# Thank You!

