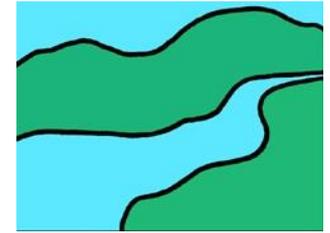


Lessons Learned in Fire Recovery and Restoration

The San Dieguito River Park and the Witch Fire of 2007



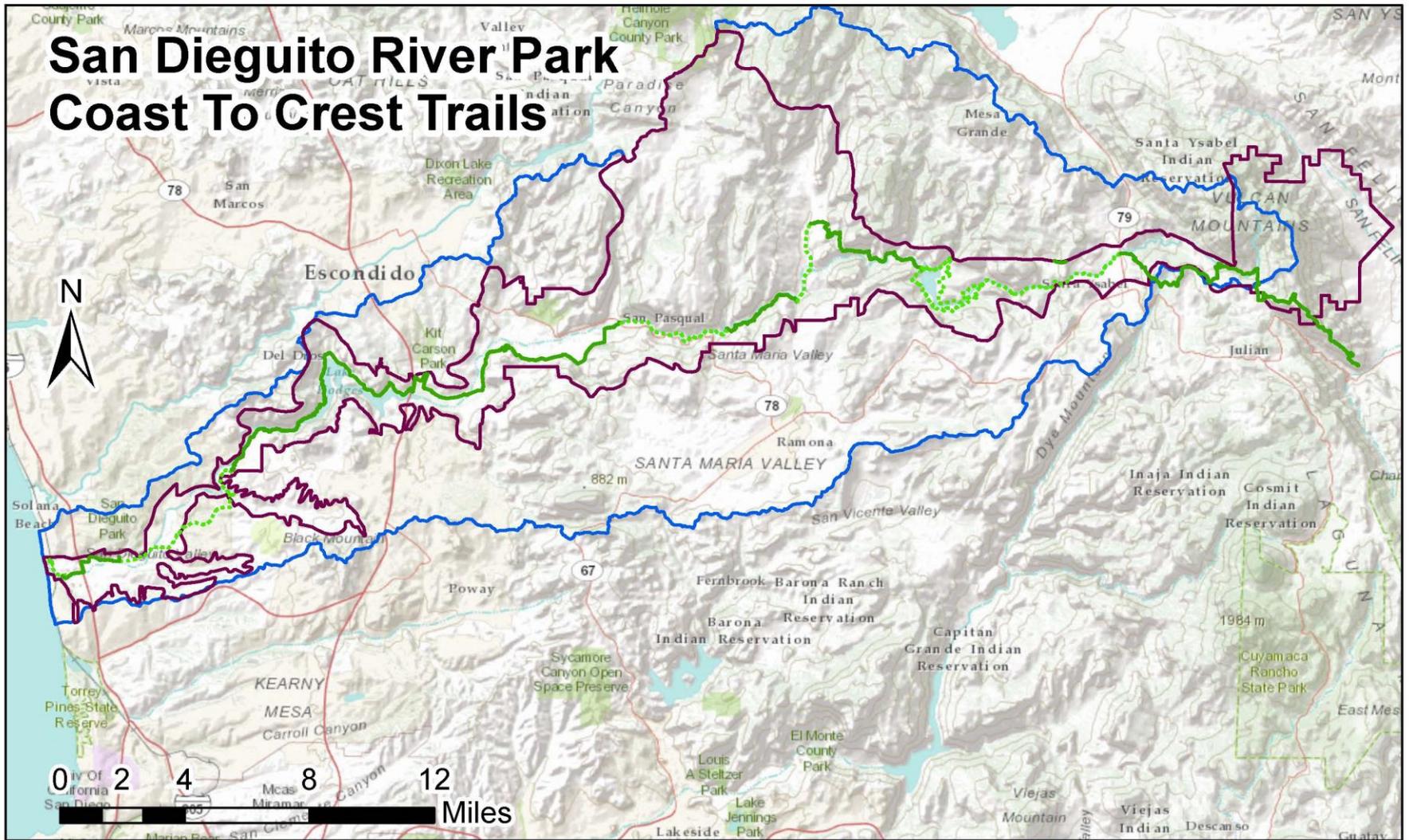
The San Dieguito River Park



- The San Dieguito River Park is a regional park in San Diego County created in 1989 with a planning area that encompasses 74,000 acres.
- The Park extends from the River's source on Volcan Mountain (just north of Julian) to the River's mouth at Del Mar.
- The Park has 65 miles of trails for hikers, mountain bikers and horseback riders.

www.sdrp.org

San Dieguito River Park Coast To Crest Trails



SDRP Watershed and Focused Planning Area

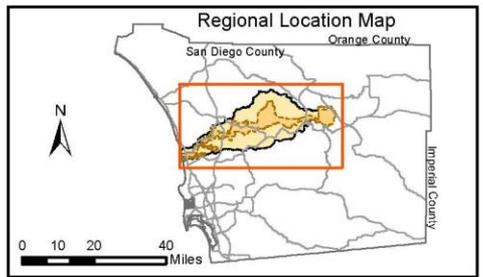
- Focused Planning Area (FPA) - 94,322.85 Acres
- San Dieguito River Valley Watershed

Coast To Crest Trails

- Coast To Crest Trail-Existing
- Coast To Crest Trail-Concept
- Coast To Crest Trail-Proposed



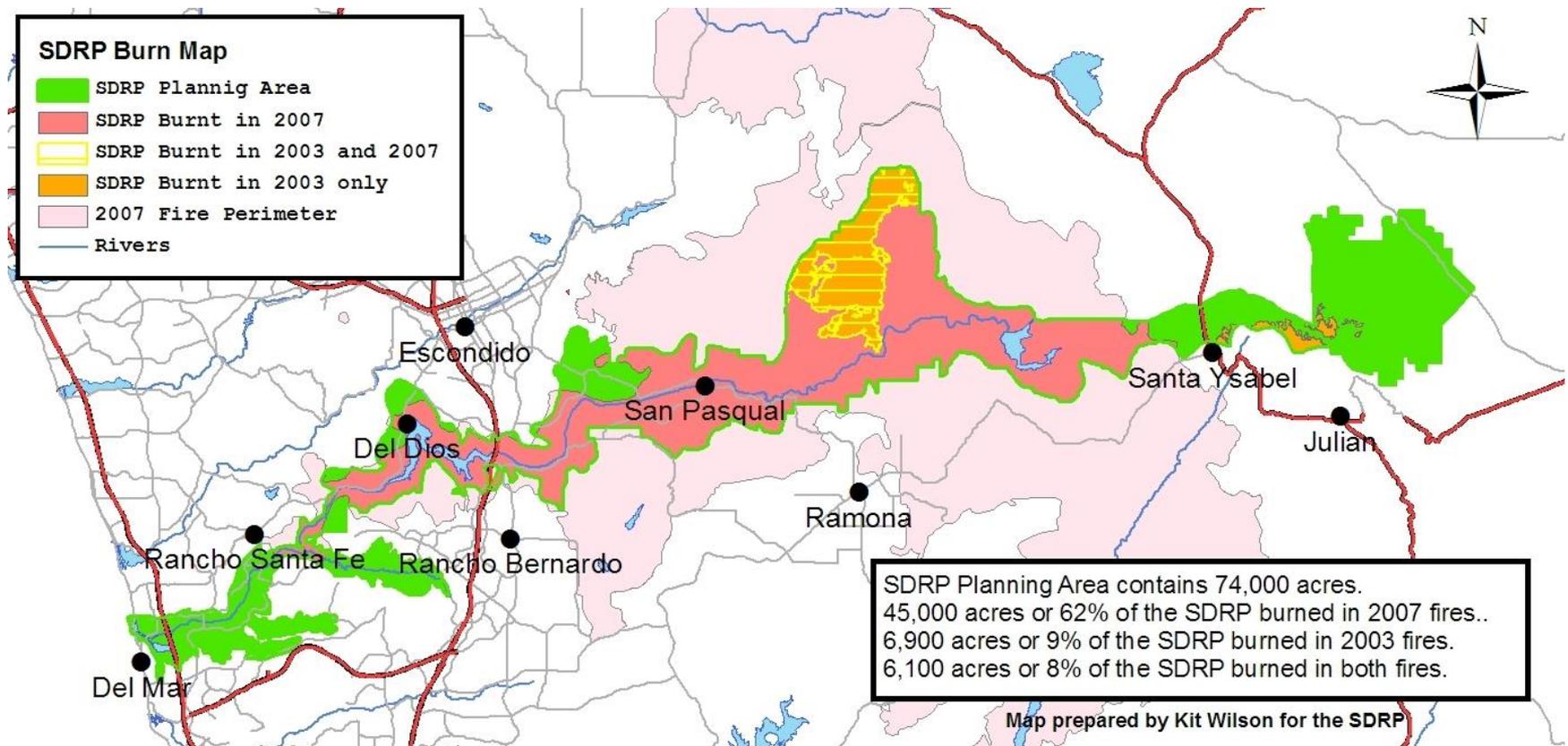
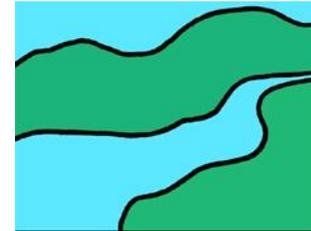
Stateplane, Zone 6, NAD83, feet



Second-largest Fire in California History

- In October 2007 the Witch Fire burned huge areas of San Diego County
- It was declared a State and National Emergency.
- 1040 homes , 414 outbuildings, 239 vehicles burned and 70 homes and 25 outbuildings damaged.
- 2 deaths and 39 injured firefighters.
- 62% of the San Dieguito River Park FPA was burned including 40 miles of trail.

Area Burned





Witch Fire -SDRP

\$2,356,352.00 in Damages

How the River Park was Affected

- The River Park office and all its contents was totally destroyed except for the cat, a Native American pot, and the first SDRP Ranger badge.
- All Park vehicles (except one truck that was in the shop), tractor, excavator, and trailers were destroyed.
- All power equipment and tools were burned.
- A historic building that had been restored in 2004 was burned to the ground except for four adobe walls that remained standing.
- 40 miles of trails were damaged by the fire and the subsequent erosion.
- Hundreds of park features like wood steps, retaining walls, check dams, fences, culverts, benches, picnic tables, kiosks, interpretive signs, and **13 bridges (514 feet of bridge tread)** were destroyed
- Thousands of signs and sign posts were gone.
- Photographs, Park library, and archives destroyed.

DEL DIOS GORGE TRAIL under construction.



What did We Learn?



- Office/Employee Issues
- Volunteers/Communication Issues
- Financial Issues
- Emergency/Safety
- Prevention of Further Destruction Issues
- Recovery

Office/Employee Issues

- Plan Ahead – It can happen anytime, every year, or maybe never.
- Store important documents such as titles, inventories, resolutions, policies, agreements, etc, at a secure site and/or digitally.

Photo Inventory

- ✓ Office: Inside & Outside
- ✓ Vehicles,
- ✓ Equipment
- ✓ Tools.

**Back up the photo inventory.*



Staff Contact

- Normal methods of communication may not be available in the event of an emergency.

Employees may be evacuated and personally affected.



Back up! - Provide the tools to employees and make backing up mandatory for essential computers.



Volunteers/Communication

- **Remember your volunteers!** Your volunteers want to help out in an emergency and can be important assets.
- **Assign someone to interface with Volunteers and identify ways they can help.**
- Emotions
- Communicate with the public and let them know what has happened and what steps you are taking and why.
- New volunteers and help from the community.



Website, Facebook, and Twitter:

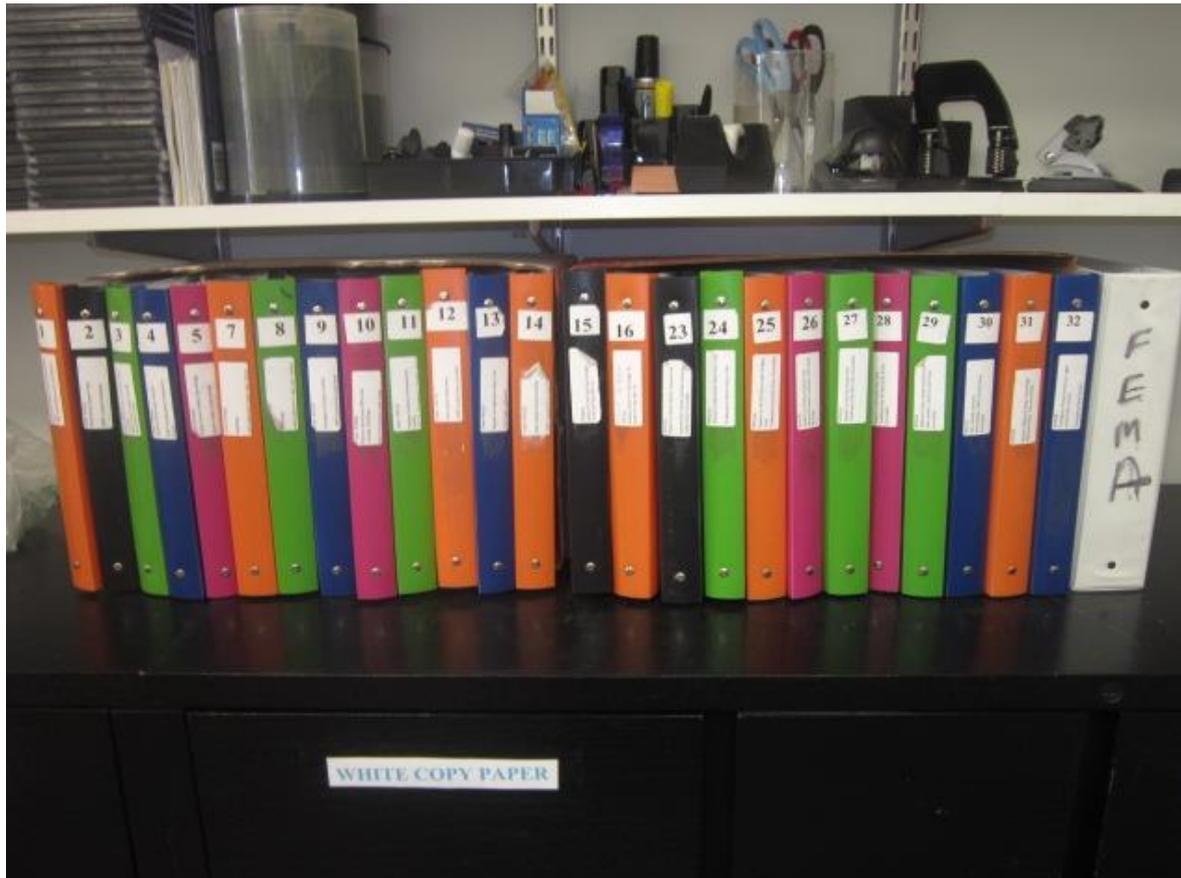
communicate your message more effectively than a simple sign at the trail head



Financial Issues

- Make an application to FEMA for assistance immediately, even if you have insurance.
- Public Relations – gain support and sympathy
- Trail Asset Inventory – Be prepared using GIS.
 - Theodolite – iphone tool that volunteers use.
- Take pictures of the damaged areas and facilities immediately after the fire.
- Damage Description: “The fire/flood/ earth quake did this _____.”
- Protective measures – Safety theme
- Allocate staff to work with FEMA.

Damage in the San Dieguito River Park was categorized into 32 separate projects.



Financial Issues, continued

- FEMA will pay 75% of the estimated repair cost, the State will pay 18.75%, and the local agency affected by the disaster will be responsible for 6.25%.
- Keep detailed work logs for each employee who works on repairing and replacing damage. You will be reimbursed for this if you can show the time worked.
- Comply with Federal and State contracting and environmental requirements.

Emergency/Safety Issues

- Safety has to be your first consideration. Sign trails “closed” and/or barricade them immediately because of dangerous debris on the trails.
- Natural and Cultural Resources deserve protection
- Recreation: The public wants to check things out.
- Move fast with protective measures and closures.
- With the change in the terrain and vegetation and loss of trail fencing and signs, trail users tended to go off-trail.



Downed Utilities, equipment, unstable ground, unsafe trees, tripping hazards.



Allow for Recovery- Protect Refugia

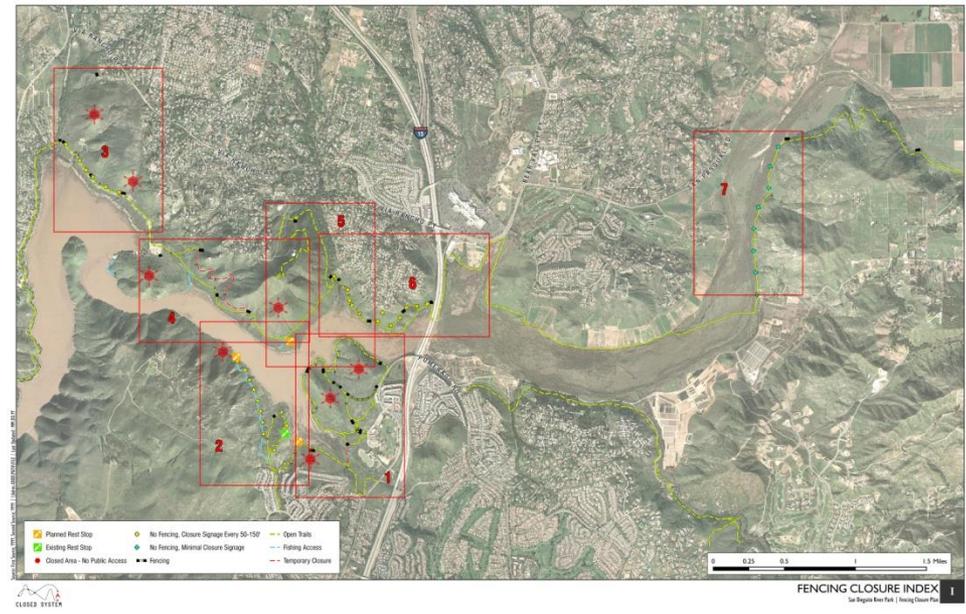


Post-fire Emergency Actions Needed for Recreational Access and Habitat Preservation

“We are facing the very real potential for local extirpation of populations of gnatcatchers and cactus wrens, 2 of the 3 focal species initially prioritized by the State of California’s Natural Community Conservation Program (NCCP) in Southern California. In addition to this area’s importance to gnatcatchers and cactus wrens, the Lake Hodges/San Pasqual Valley area represents one of the largest continuous blocks of habitat in the MSCP area and provides habitat for 27 MSCP target species”
- *Conservation Biology Institute.*

- Multiple Agencies
- Site Assessment
- Habitat Assessment
- Mapping





Typical mapping used to identify initial management strategies. Park Rangers implemented projects with CDF inmate crews and Urban Corps of San Diego.

Institutional memory played an important role in planning and implementation.

Maps produced by a volunteer!

Establish Criteria: Before a trail can be opened, the following actions should be completed:

- Evaluate public safety of trail and surrounding area.
- Determine if the use of the trail will affect the natural processes and cause further habitat damage, and take necessary steps to alleviate that impact.
- Fence unauthorized trails and install erosion control measures as needed.
- Post the trail area with basic signage that informs trail users of the need to stay on designated trails and out of recovering habitat.

Permanent Closure of Unsustainable Trails



Trails targeted to be *opened* include:

- Non-designated trails that are sustainable and have less than 10% slope for most of their length, as long as their use will not adversely affect habitat recovery.
- Trails that provide access to the shoreline of Lake Hodges and are sustainable.
- Previously designated and maintained trails: North Shore, Piedras Pintadas, Mule Hill Historic, San Pasqual Valley, Highland Valley, Bernardo Mountain, Santa Fe Valley, Del Dios Gorge.

Trails targeted to be *closed* include:

- Trails that bisect areas that contain/contained healthy stands of native vegetation or cultural resources and for which management of trail use would be complicated and costly.
- Trails where bridges burned.
- Unsustainable trails that exceed 10% slope for most of their length.



Post-fire Emergency Actions Needed for Recreational Access and Habitat Preservation

A Plan will provide a frame work for the overwhelming amount of work that needs to occur.



Erosion Control

Erosion control should occur in the following locations:

- Closed trails that exceed 10% slope for most of their length.
- Drainages that intersect trails.
- Disturbed areas where erosion is exacerbated by fire damage.
- Around burned features where pollution may enter the water source.



One Year after the Fire: Over 40 Miles of Trails Open.

- ✓ Restoration - \$250,000
- ✓ Impatient public
- ✓ Cloverdale Creek Mitigation
- ✓ Office Reconstruction
- ✓ New Coastal Park



Unknown dump sites and uneducated neighbors caused delays.

Restoration Efforts

- Most of Bernardo Mountain burned including
 - California gnatcatcher occupied habitat
 - oak woodlands
 - riparian forests
 - warty steamed ceanothus



Comprehensive Team

- Developed Action Plans to Restore, Protect & Re-open
 - SDRP staff and Rangers
 - SDRVC staff
 - Conservation Biology Institute
 - Fire expert Rick Halsey
 - Invasive species specialist Mike Kelly

Sources of Funding

- Federal Emergency Management Agency (FEMA) – Urban Corps of San Diego County
- National Emergency Grant (NEG)- Erosion Control – Urban Corps of San Diego County
- Foundation Grant – Coast Sage & Cactus Scrub habitat – Urban Corps of San Diego County

Primary Goals

- Preserve, protect, and enhance habitat & species:
 - California gnatcatcher
 - Coastal cactus wren
- Prohibit further disturbance of natural fire recovery process



Prevention of Further Problems

- Additional habitat loss for sensitive species of focus
 - Gnatcatcher
 - CA Coastal Cactus Wren,
 - Least Bell's Vireo
- Burned non-native invasives don't die
 - lepidium, arundo & tamarisk
- Annuals, such as mustard and thistle can take the place of burned habitat.
- Erosion

Site Evaluation

- The project area, and adjacent open space, was comprehensively evaluated to determine the effects of the fire.
- Site selection: determine areas that will not recover on own
- Focus on habitat adjacent to areas that did not burn and contain one or both of the **species of focus**.



Site Selection Process

- Map areas of unburned and partially burned native habitat
 - Using aerial photography
 - Witch fire perimeter
 - Within/adjacent to the San Dieguito River Park (SDRP)
- GPS locations
 - Completely burned areas
 - Partially burned and unburned patches
 - *potential refugia = must have living native vegetation and be greater than or equal to 1-2 acres in size*
- Identify locations for future field assessment - focal species occurrence
 - Additional areas appropriate for restoration & active management.
- Characterize dominant vegetation species & degree of burn
 - Document any wildlife species observed in patch
 - Identify potential sources for irrigation.

Erosion Control





Drainages

- Drainages that intersected the trail were stabilized using weed free straw wattles and bales, plants, rock, and jute netting.







Seeding

- Seed was scattered in open areas
- In drainages along with straw wattles and bales
- Restoration Areas



Wattles

- Standard Straw Wattle/fiber rolls pose a hazard to snakes and other wildlife that may get entangled in the plastic mesh that holds the material together.



Better Alternative Wattles

- Biodegradable sediment control products made from natural fibers, including coir (coconut fiber)
- Wrapped in strong coir twine, netting has 2 in. x 2 in openings that are designed to avoid trapping or injuring wildlife.



Cactus Wren (*Campylorhynchus brunneicapillus couesi*)

- California State Species of Special Concern
- Same mate for life
- Fragmentation-sensitive resident
- Cactus Wrens may have difficulty re-colonizing burned areas of CSS
 - Species requires cactus of at least 3-ft tall & cactus recovery after a fire can be slow.
- Juveniles are driven off by the adults
 - Relocate a short distance from natal territory



CA Gnatcatcher

- Threatened California Gnatcatchers were observed and documented after the fires.



Habitat Restoration

- Significant Goal:
 - Link remaining, isolated patches of coastal sage scrub so native wildlife can escape danger (future fire) & find food, shelter and mates

Cactus Scrub Habitat pre-fire

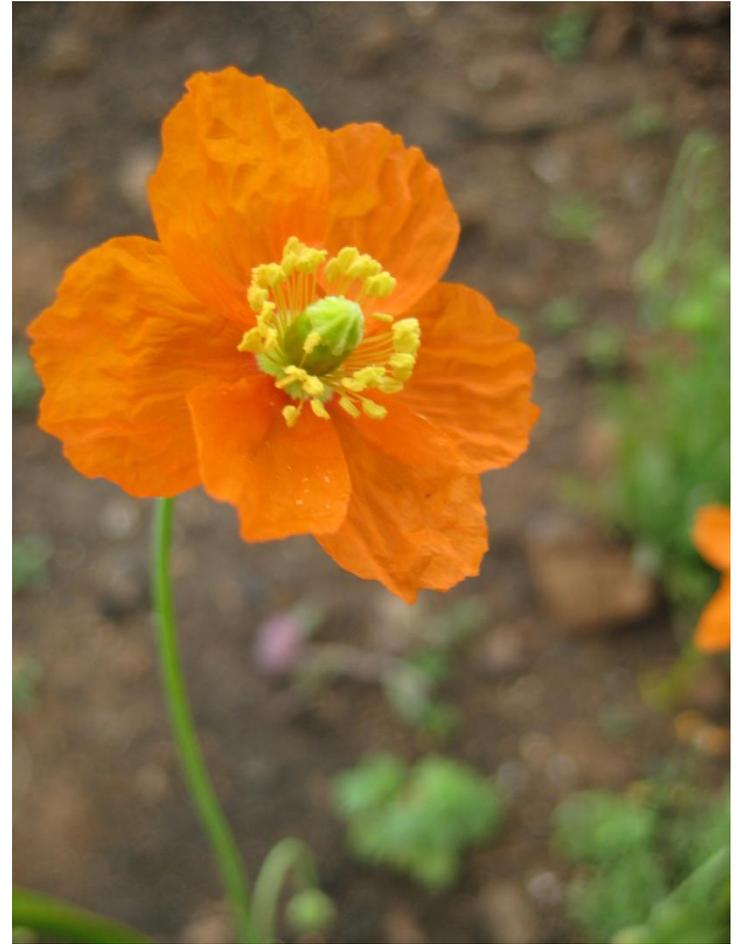


Habitat - Resiliency & Self Recovery

- Areas that did recover on their own:
- Fall 2007
- Spring 2013



Habitat - New Species



Mowing & Dethatching Annual Mustard



Temporary Office Site

- Material Storage & Plant Nursery



Restoration

- Winter 2008



- Spring 2013



Coastal Sage & Cactus Scrub Restoration

- Coastal Sage & Cactus Scrub Restoration
 - Habitat restoration projects covered ~100 acres of coastal sage scrub
 - Over 12,000 1-gal containers planted
 - Harvested cacti and seed for dispersal throughout the sites



Planting Techniques & Demonstrations



Habitat Restoration

- Post Fire

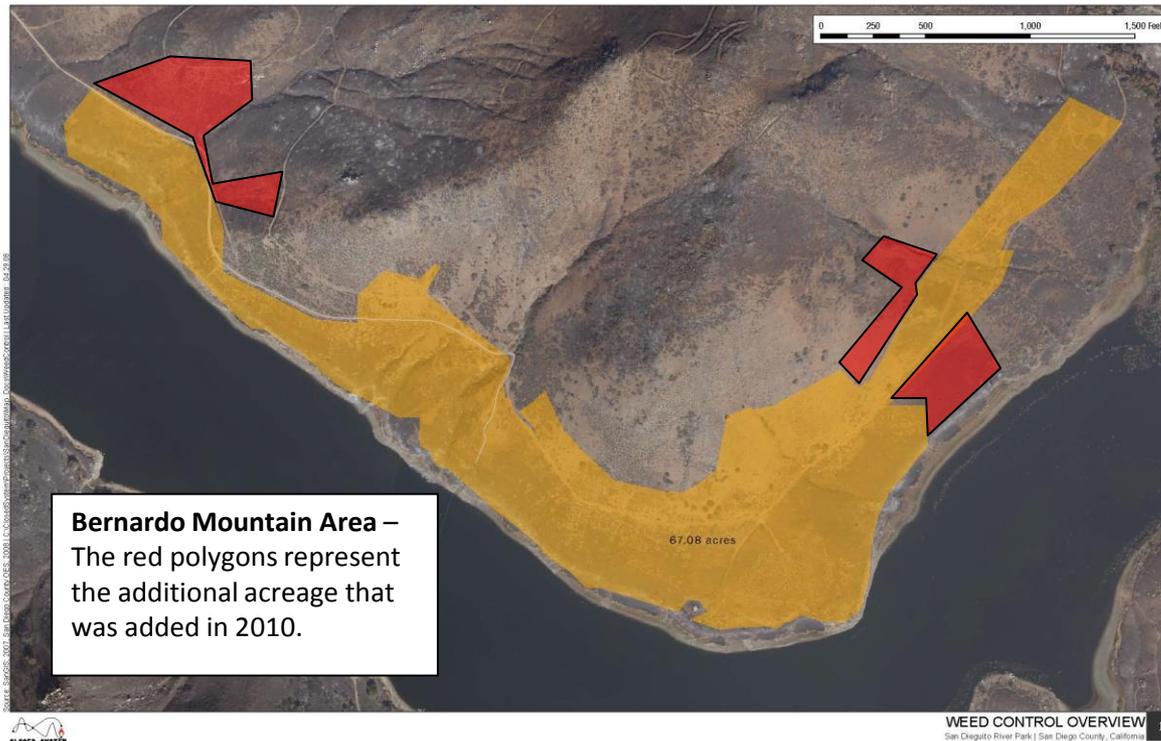


- Post Restoration



Invasive Species Management

- The area of control included all of the unburned areas that contained coastal sage scrub as well as newly planted areas
- Weeds were controlled with herbicide and applied by a reputable weed control contractor



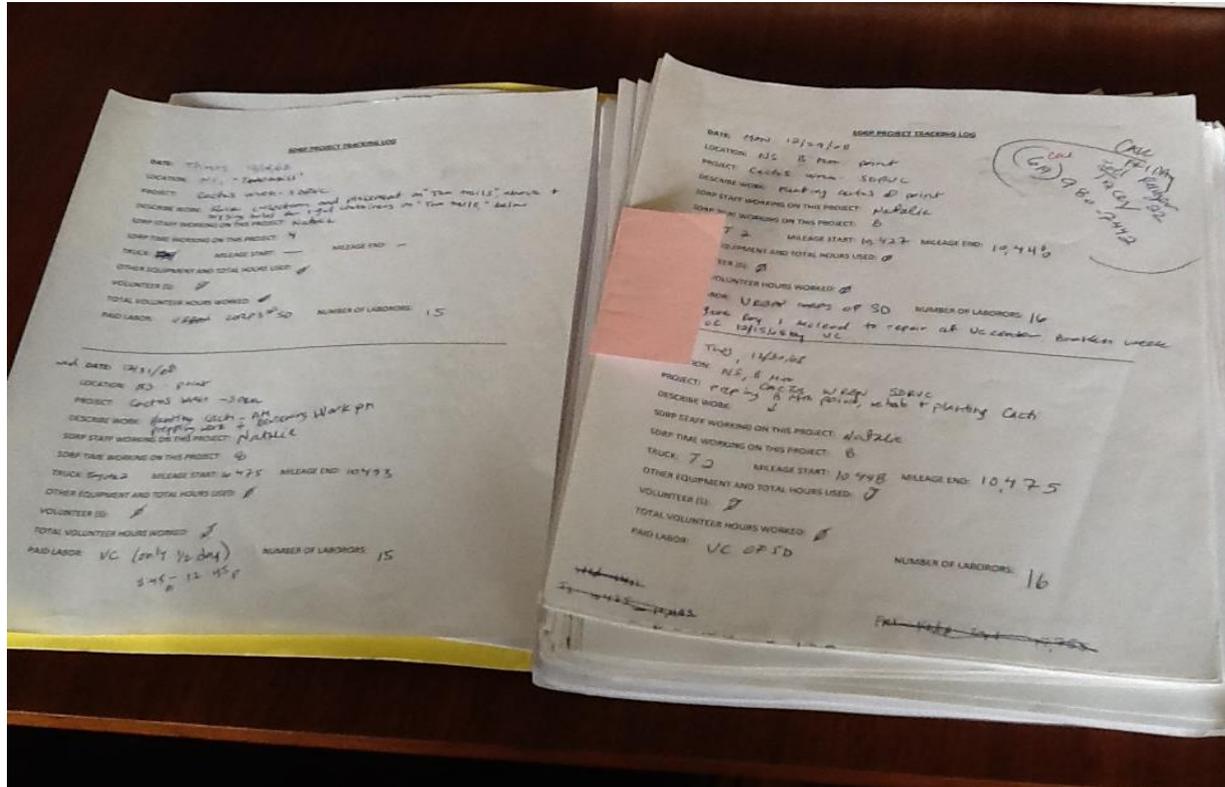
Managing Crews

- Work with groups like Urban Corps and Cal-fire inmates
- 8 crews



Record Keeping and Logs

- Essential to document all activities for reimbursement including mileage, type of project and time



Other Recovery Items

- Upgrading facilities to mitigate against future fire damage (steel bridge supports)



Future Habitat Maintenance

- Watering
- Weeding

