



RESTORATION OPPORTUNITIES SPURRED BY STEELHEAD RECOVERY IN SOUTHERN CALIFORNIA

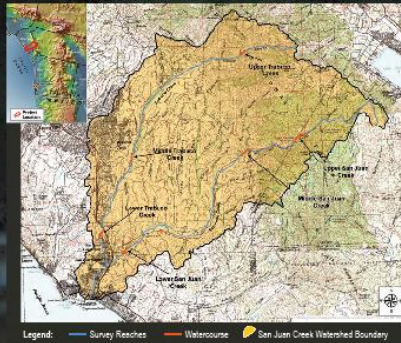
CDM



Wendy Katagi, C.E.P.

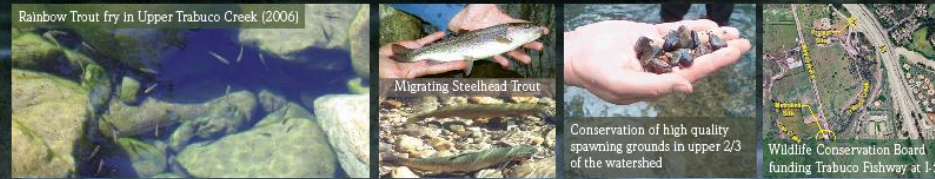
SAN JUAN AND TRABUCO CREEKS

Steelhead Recovery Watershed Management Plan (2007)

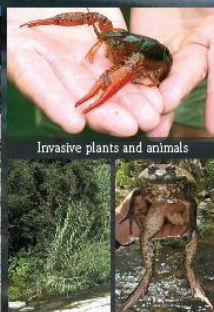
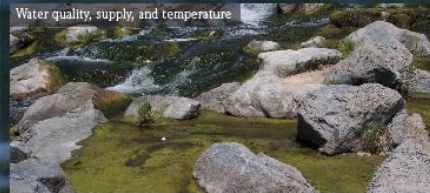


San Juan and Trabuco Creeks Steelhead Recovery Watershed Management Plan (Orange County, CA)

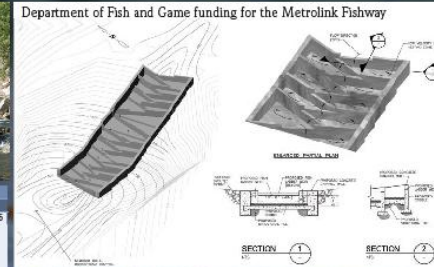
Factors Conducive to Steelhead Trout Recovery



Factors Limiting to Steelhead Trout Recovery



Take Action! Become a Partner

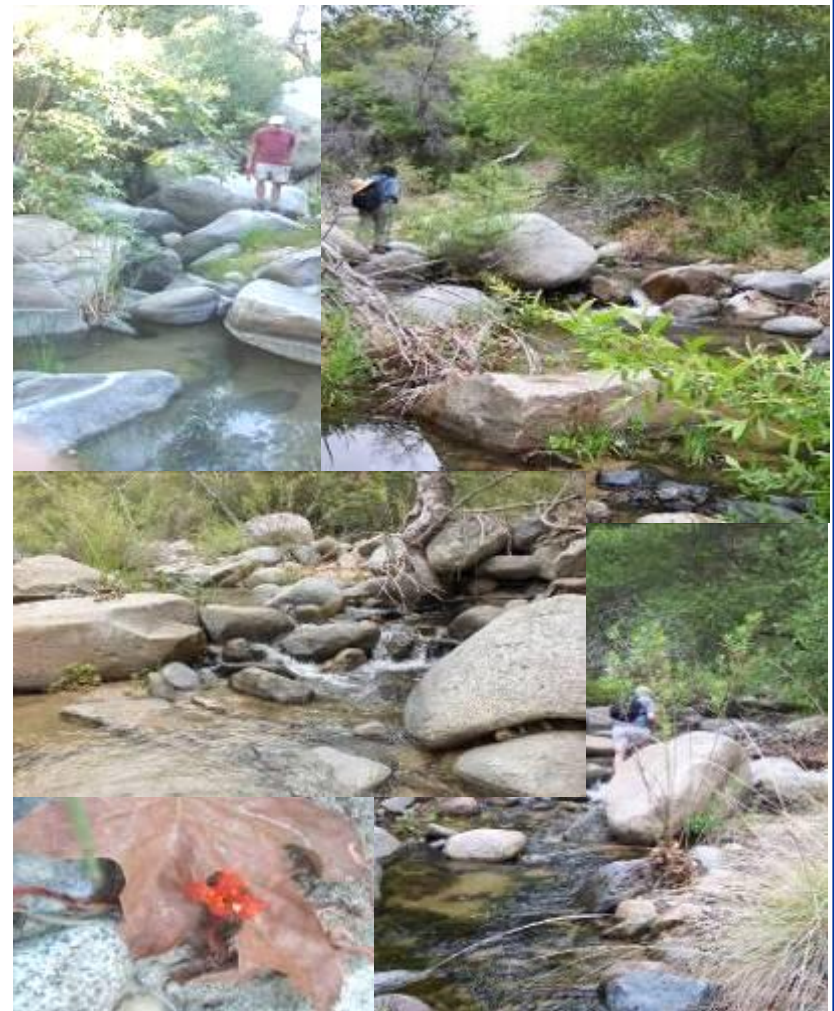


Implementation Schedule Project	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Water Quality Monitoring											
Water Quantity/Flow Monitoring											
Benthic Macroinvertebrate Study											
Arundo Removal											
Additional Migration Barrier Study											
Trabuco Creek I-5 Crossing											
Metrolink Drop Structure											
Grouted Riprap Grade Control Structure											
Upper Trabuco Creek Stream Crossings											
Upper San Juan Main-Made Dams											
Lower San Juan Creek Aquatic Habitat Enhancements											

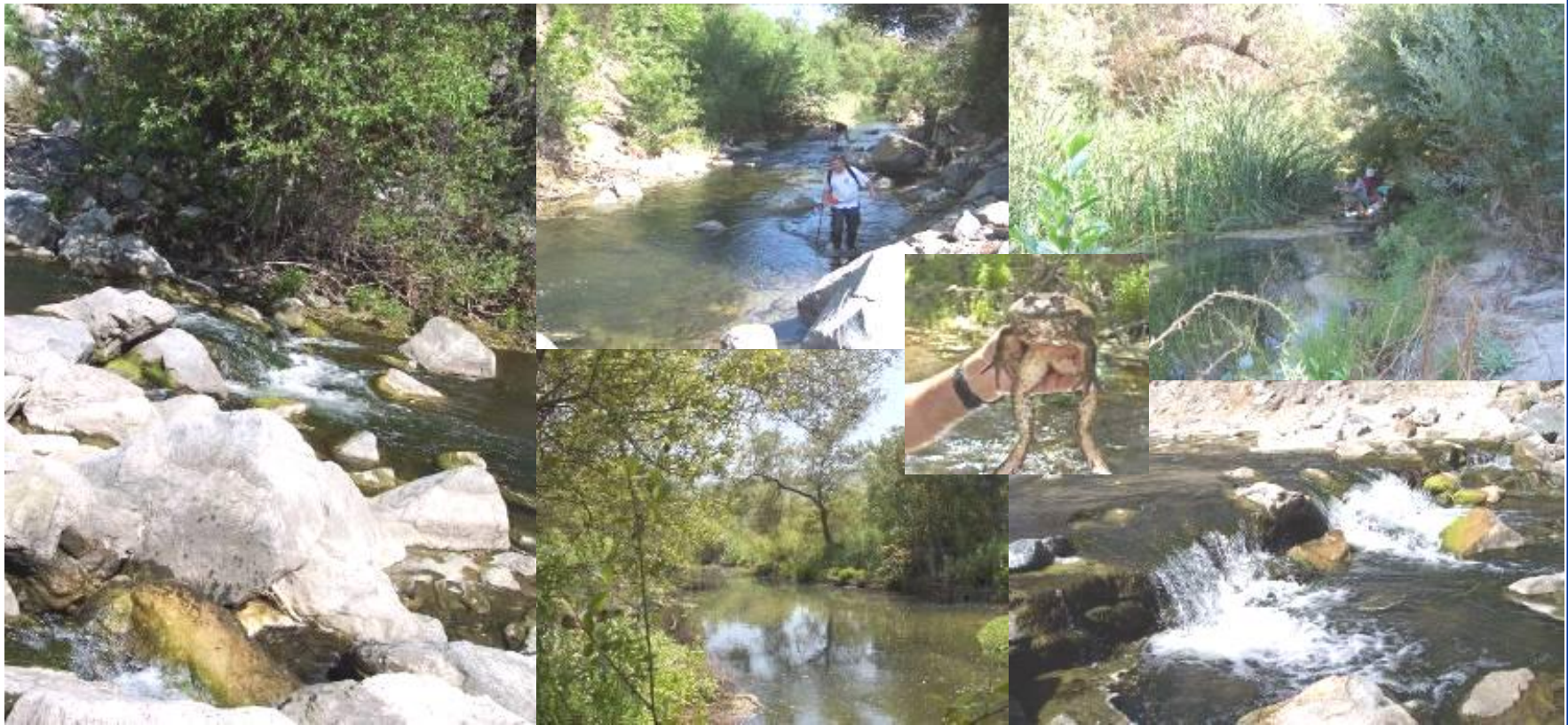
Over \$13 million in capital projects have been identified



Upper Watershed Suitable for Spawning



Lower Watershed Degraded



Locations of Fish Passage Barriers



Trabuco Fishway at I-5

Helping out trout

Barriers inside Trabuco Creek are preventing steelhead trout from migrating upstream to spawn. The latest design to help in the fish's journey is a fish bypass, which is a series of small pools so the trout can jump its way up a steep slope near Camino Capistrano. Here's a look at the design proposal:

Rainbow trout

- PRONOUNCED SPOTS
- RAINBOW COLORED SIDES



Same fish, different name

In rocky pools along freshwater streams, they're known as rainbow trout, but when they migrate to the ocean, gradually acquire a silvery skin, they're called steelhead trout.

Steelhead trout

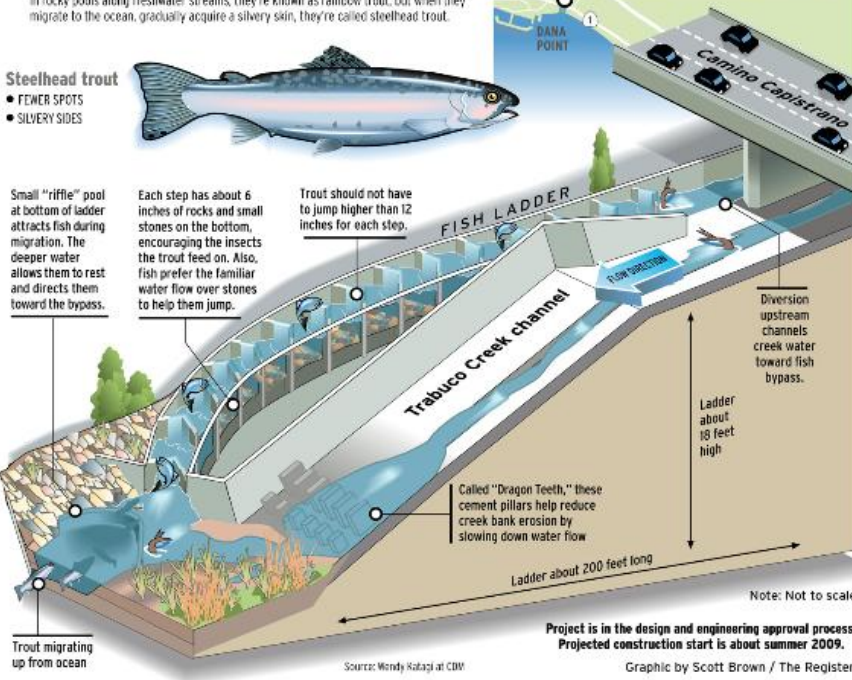
- FEWER SPOTS
- SILVERY SIDES



Small "riffle" pool at bottom of ladder attracts fish during migration. The deeper water allows them to rest and directs them toward the bypass.

Each step has about 6 inches of rocks and small stones on the bottom, encouraging the insects the trout feed on. Also, fish prefer the familiar water flow over stones to help them jump.

Trout should not have to jump higher than 12 inches for each step.

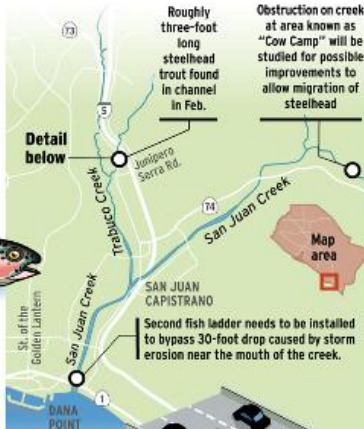


Trout migrating up from ocean

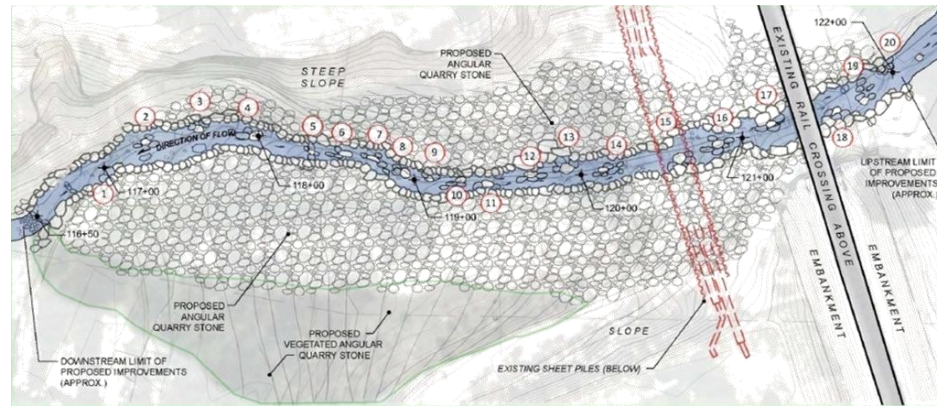
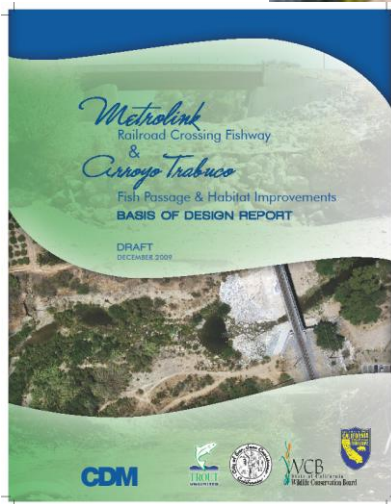
Source: Wendy Nazajal at CDM

Project is in the design and engineering approval process. Projected construction start is about summer 2009.

Graphic by Scott Brown / The Register



Trabuco Creek Fishway at Metrolink



Invasive Removal Watershed-wide

- Mapped locations of invasives
- Permits secured for removal
- Seeking funding
- Integrating with other restoration projects

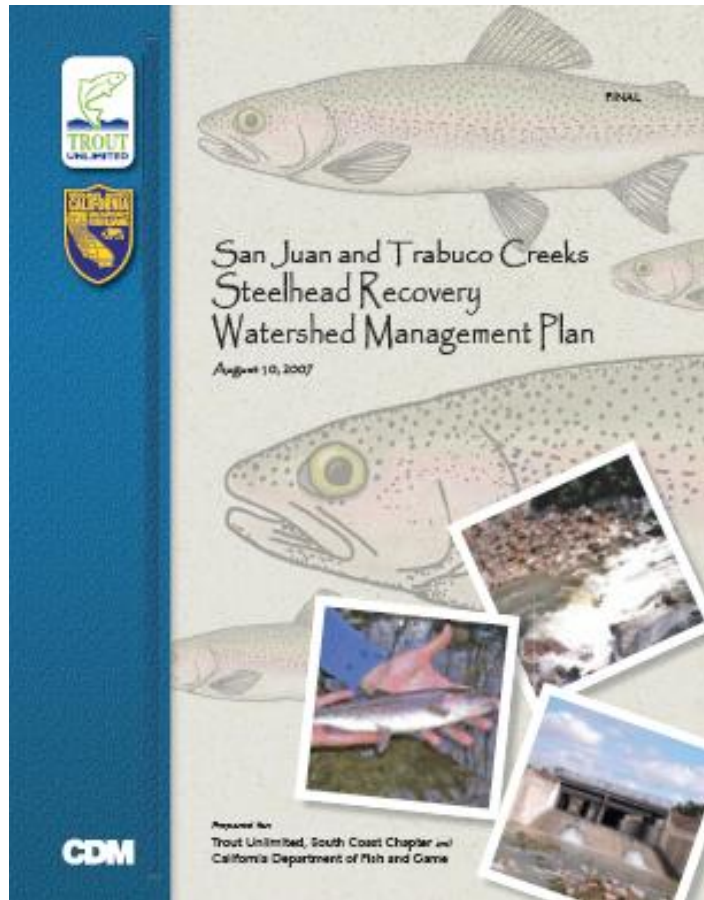


San Juan Estuary Assessment

- Tidewater goby, steelhead, and other species
- Highly impacted by sediment
- Lacks vegetation and woody debris
- Altered tidal flushing
- Water quality
- NMFS and DFG working with stakeholders

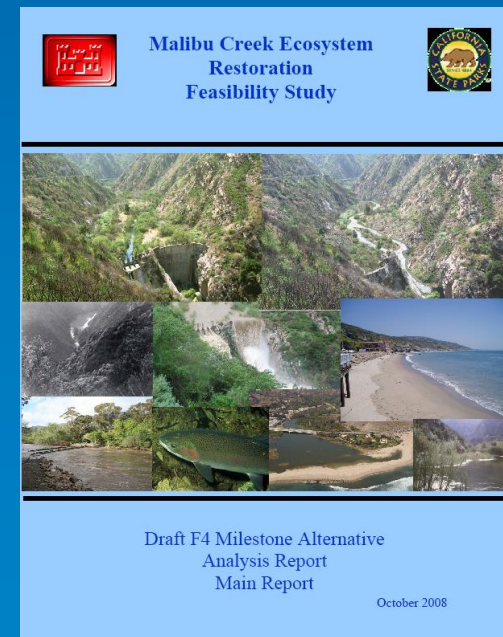


Other Watershed-wide Improvements, Monitoring, and Studies



- Coordination with Corps on alternative development for San Juan Creek Feasibility Study
- Water quality monitoring targeting pollutants of concern
- Special Area Management Plan (SAMP)
- USFS road crossing projects
- Sediment Management
- Fluvial Geomorphology Studies

MALIBU CREEK



An aerial photograph of a dam on Malibu Creek. The water is turbulent and white with foam as it flows over the dam structure. The surrounding area is rocky and has some green vegetation. The text is overlaid on the image.

MALIBU CREEK Ecosystem Restoration Feasibility Study

**F4 Milestone
Conference
February 25, 2009**

Planning Objectives

- Reconnect the Malibu Creek watershed aquatic and riparian corridor to provide access to upstream spawning and rearing habitat to aquatic and riparian species.
- Restore aquatic habitat of sufficient quality to sustain or enhance indigenous aquatic populations, particularly near migratory barriers.
- Restore a more natural sediment transport regime throughout the watershed.
- Beneficially reuse sediment for beach nourishment.
- Improve educational, recreational, and aesthetic opportunities associated with Malibu Creek.

Steelhead Recovery Opens Doors for Improved Connectivity and Habitat Improvement

- Southern Steelhead
- Tidewater Goby
- Arroyo Chub
- California Red-legged Frog
- Southwestern Pond Turtle
- Western Snowy Plover
- California Gnatcatcher
- Least Bell's Vireo
- Arroyo Toad
- California Least Tern
- Golden Eagle
- California Brown Pelican
- Braunton's Milkvetch
- Malibu baccharis



Barrier locations were surveyed and prioritized for removal



LEGEND

- Man-made Barrier
- Removed Barrier
- Natural Barrier
- Major Road
- Malibu Creek Watershed
- Project Streams
- Other Streams
- County Boundary
- Water Bodies

ID Codes

- MC - Malibu Creek
- CC - Cold Creek
- DC - Dark Canyon Creek
- SC - Stokes Creek
- LV - Las Virgenes Creek
- LVT - Las Virgenes Tributary
- LC - Liberty Canyon Creek
- NA - Not Applicable

Priority	ID	Name
1	MC1	Ringge Dam
2	LV1	Cross Culvert
3	LV2	White Oak Dam
4	CC1	Pluma Culvert
5	CC2	Malibu Meadows Road Stream Crossing
6	CC3	Grater Camp Crossing
7	CC4	Cold Creek Barrier
8	CC5	Cold Canyon Road Culvert
9	CC7	Cold Creek Check Dam
10	CC8	Blunt Road Culvert
11	LV3	Lost Hills Road Culvert
12	LV4	Meadow Creek Lane
13	LV5	Agora Road Concrete Channel
14	LV6	101 Concrete Channel
15	LV7	Mureau Road Buried Channel
16	LV8	Upstream Dam
17	MC3	Century Dam
18	LVT1	Road Crossing
19	LVT2	Road Crossing
20	DC1	Van Velsir Drive Culvert
21	DC2	Willow Drive Culvert
22	SC1	Malibu Creek Entry Road Crossing
23	SC2	District Office Road Crossing
24	SC3	Las Virgenes Road Culvert
25	SC4	Stream Crossing
26	SC5	Concrete Channel
27	SC6	Stokes Canyon Road Culvert
28	SC7	Stream Crossing
29	LC1	Liberty Canyon Culvert
30	MC4	Malibu Lake Dam
NA	MC2	Tunnel Falls
NA	CC5	Large Waterfall
NA	CC9	Large Waterfall
NA	CC10	Large Waterfall
NA	CC11	Large Waterfall
NA	CC12	Large Waterfall
NA	DC3	Hona Stepa Cascade

Barrier and Habitat Assessment of Upstream Tributaries to Malibu Creek
Figure 1
 Barrier Locations in the Malibu Creek Watershed

Source: CDM 2008. Topographic contours with National Geographic TOPO® culture.

Rindge Dam (Existing Condition)



Rindge Dam – Mid-Construction



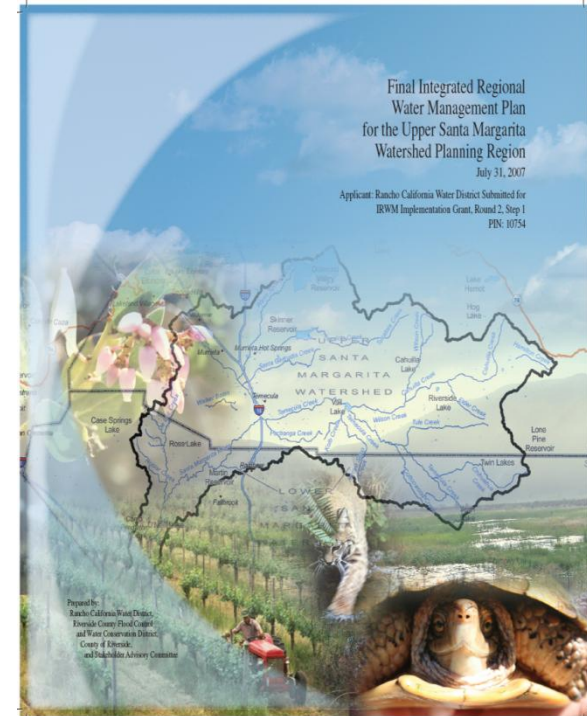
Rindge Dam – Post Construction



SANTA MARGARITA RIVER

Vision Embraces Ecosystem Restoration Opening Doors for Integration

“The IRWM Plan will take a balanced and consensus-based approach that will provide for the protection and sustainability of the Upper Santa Margarita Watershed’s water resources, natural resources, and habitats.”



Integrating NMFS Southern Steelhead Recovery Plan

- Stream restoration in the Santa Margarita River drainage, including assessment of limiting factors for Steelhead, habitat restoration projects to include invasive removal, in-stream and riparian restoration to provide habitat, BMPs and water quality monitoring
- Leveraging dedicated support and funding commitment from NOAA, DFG, USFWS. and others building partnership opportunities with non-profits

Restoration Projects Spurred by Steelhead Recovery

- San Mateo Creek Fish Habitat Restoration (EMARCD, \$250k, implementation)
- San Mateo Creek Education of HOAs and Homeowners on Impacts of Invasive Species in Ponds (EMARCD, \$11k outreach)
- San Mateo Invasive Species Removal (Trout Unlimited, \$150k implementation)
- Santa Margarita Stream Restoration for Steelhead Trout (Trout Unlimited, \$125k planning)
- Riverside County BMP and Hydromodification Program; promotion of Property Retrofit with Water Quality/Water Conservation Measures (\$200k/\$400k, match/request, planning and implementation)

Summary



Questions

