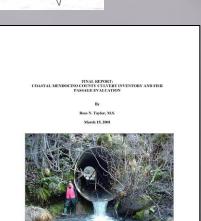


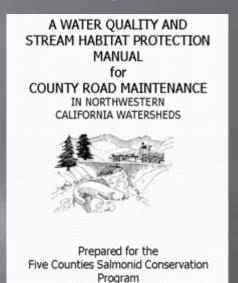


### Watershed Planning Tools

GPS EPE:



Migration
Barrier
Inventories
&
Prioritization





Pive Counties Salmonid Conservation Program 7.0. Box 2009

P.C. Box 2019 Westerville, CA 55010 (200, 429-4250 Bas 5 PAX (630) 429-4253 ernali miseratur (Sciniproscoping

#### Road Design Guidelines for Low Impact to Hydrology

I. Genera

Purpose and Intent. Provide Low Impact to Hydrology (LITH) Design Guidelines that one be considered for adoption as Coursy Road Design Standards where appropriate. In addition, LITH design guidelines can be cited for private roads that are not required to meet coursy read standards for year round access or subdivisions, but which must meet individual county grading cernitis. use remits, or other standards.

The 1998 University of Californis Cooperative Extension's "Effects of County Land Use Regulations and Menagement on Anadomous Salmonids and Their Habitus: Humboldt, Del Norte, Mendocion, Sildyrou and Trinity Counties," michald the following in Recommendation

"... Fish-friendly alternatives to generic CalTrans and ASHTO road standards should be developed."

During the UCCE successor process, it was determined that the road design standards for the counties were beard on convent or inside principals into disthes. Insolve disthes, in some instances on long or steep gradient analysis in entable soils can result in downstring and enlargement of disthes, acceleration of outbards encounts analyse plaging, and devenion across road. An additional road design to accommodate outslope road segments, was recognized as desirable. The design, however, would have to meet active, speed and topographic design.

The U.S. Forest Service, the National Park Service, the USDA Natural Resources Conservation Service, California Department of Forestry and Few Protection, and many fronts and mush landowners have all endorsed some form of the road design approach commonly referred to as "Low Impact to Hydrology" (LTIR). The goal of the LTIR design approach is to make a low dispatch of the Park Service Se

Howard Dashiell, CA Registered Civil Engineer (principal author) and Mark Lancaster, CA Registered Professional Forester

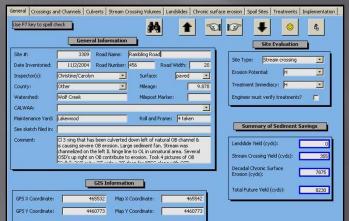
5C Road Design Guidelines for Low Impact to Hydrology

Page 1 of 9

#### LITH Standards

| Fig. | Color | Fig. | Fig. | Color | Fig. | Fig. | Color | Fig. |

#### **Roads Manual**



GPS DOP:

Addressing Road-Related
Sedimentation

5 Counties Salmonid
Conservation Program

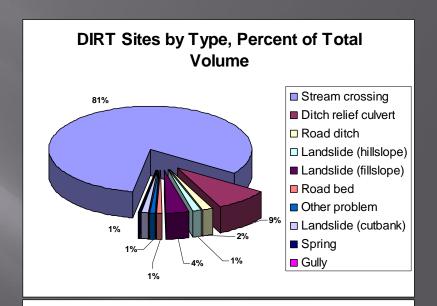
FUNDED BY
California Department of Fish & Game
Fisheries Restoration Grant Program

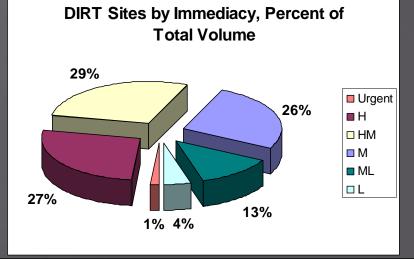
**DIRT Inventories & Prioritization** 

Workshops & Training Tools

# County Road Direct Inventory of Roads and Treatments (DIRT) Sediment Source Inventory

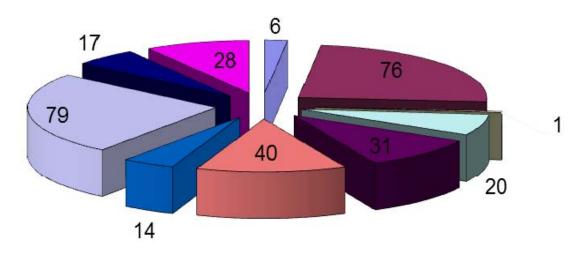
	Volume Yd <sup>3</sup>	Sites
Stream crossing	2,958,981	6299
Ditch relief culvert	315,775	2454
Road ditch	61,378	381
Landslide (hillslope)	44,385	24
Landslide (fillslope)	134,563	76
Road bed	31,593	217
Other problem	33,282	89
Landslide (cutbank)	36,490	32
Spring	7,249	80
Gully	2,511	9
Total	3,626,205	9,661





#### County Road Sediment Treatments

Figure 2. 2008-2010 Road Drainange Treatments 5C Counties

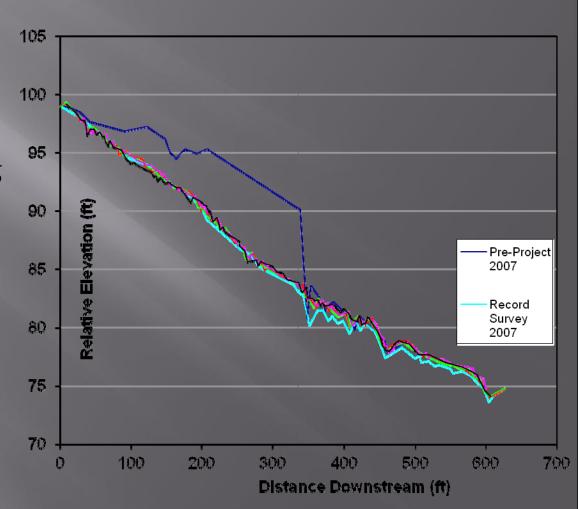


- New Culverts
- □Enmergency Overflow Culverts
- Critical Dips at Steam Crossings
- Outsloped Road
- ■Road Surfacing

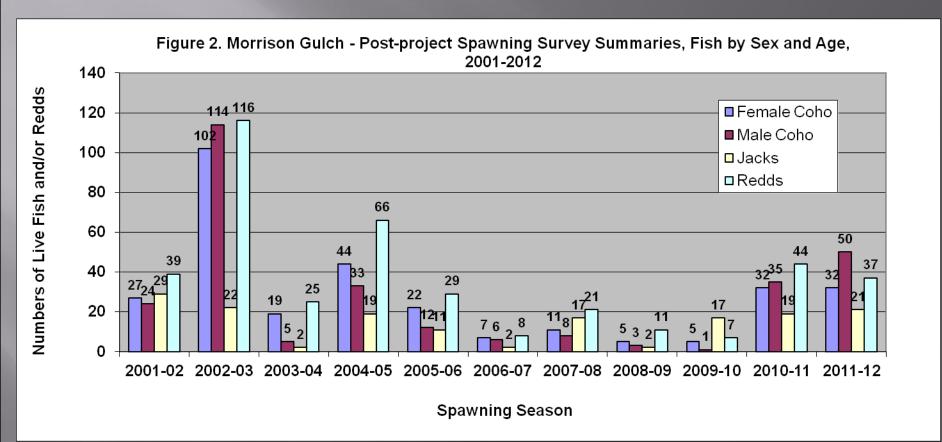
- Upgraded/Replaced Culverts
- □ Ditch Relief Culverts
- Other Stream Uprades
- ■Rolling Dips
- Excavtions (berms, slides, spoils)

# MONITORING

- Little Browns Creek Channel Adjustments
- Little Browns Creek
   Spawning Surveys & Fish
   Presence
- Morrison Gulch Spawning Surveys
- Ryan Creek Channel Adjustments
- Ryan Creek Spawning Surveys
- Conner Creek Channel Adjustments
- Conner Creek Fish Presence
- West Weaver Large Wood



### MONITORING



# MONITORING





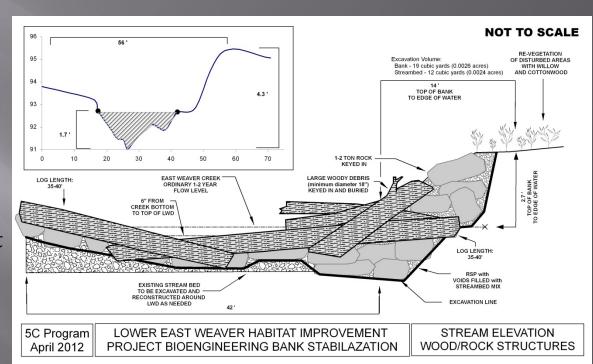






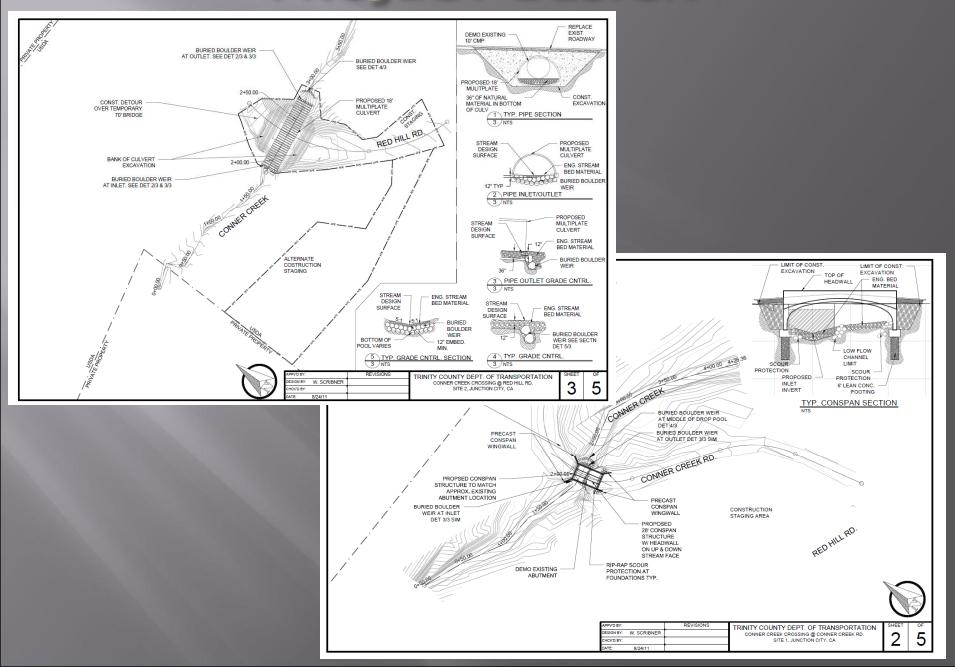
#### PROJECT DESIGN

- Conner Creek Barrier
- Lower East Weaver Habitat
- Sidney Gulch
  Channel/Floodplain Habitat
  Reconstruction
- McKinney Creek Barrier
- Francis Creek Barrier
- Telegraph Creek Barrier
- Dinner Creek Survey and Partial Design
- Bally Loop Barrier Partial Design





# PROJECT DESIGN



#### ENVIRONMENTAL & PERMITTING

- Conner Barrier Categorical Exclusion and Decision Memo
- Fish Rock Drainage Mitigated Negative Declaration
- Lower East Weaver Habitat
   Environmental Assessment and
   FONSI
- Summit Creek Low Water Categorical Exclusion and Decision Memo
- Del Norte Roads Environmental Assessment initiated
- Sidney Gulch Channel/Floodplain Habitat Reconstruction Specialty Reports initiated
- Patricks, French Hill, Low Divide,
   Major Moore, & Griffin Creek
   Specialty Reports initiated
- Bally Loop Barrier Specialty Reports initiated



## GRANT DEVELOPMENT

- NOAA American Rivers
- CDF&G FRGP
- Water Board (SEP)
- USFS RAC
- BoR TRRP
- USFWS
- NCIRWMP Prop 50 Revision
- Counties In-Kind

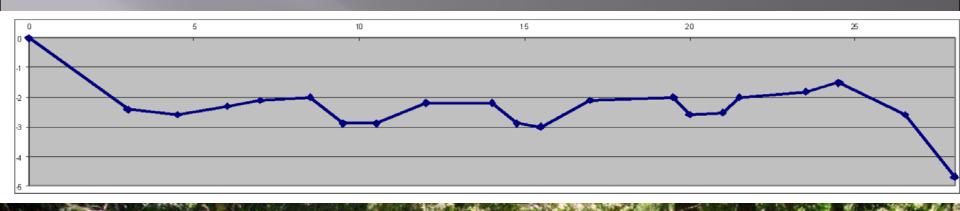
# ADVOCACY/EXPERTISE

- CA Coho Recovery Team
- CA Board of Forestry Section V Technical Advisory Committee
- Fish Passage Forum (FPF)
- FPF Engineering, Public Outreach & Education Sub-Committees
- North Coast Integrated Regional Water Management Plan
- Trinity River Watershed Council
- Trinity River Watershed Working Group
- Testifying about Marijuana Impacts on Water Quality and Fisheries
- Federal Coho Recovery Plan
- Regional Water General Discharge Waiver & Certification for Road Maintenance

# 2011-2012 RESTORATION PROJECTS

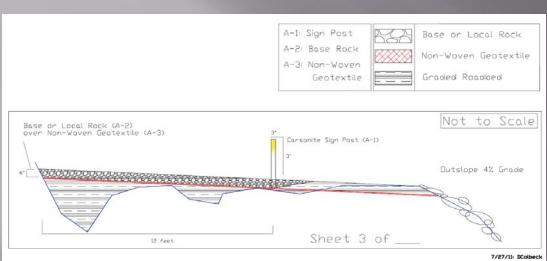
- Browns Private Road Inventory
- Fish Rock Road Drainage Upgrades
- Usal Road Drainage Improvement
- Showers Pass Road Drainage Improvement
- China Gulch Final Drainage Improvement
- Ryan Creek County Barrier Removal
- Ryan Private Large Wood Placement
- Conner Creek at Conner Creek Barrier Removal
- Conner Creek at Red Hill Barrier Removal
- West Weaver Wood Passage
- Others

# USAL ROAD





#### USAL ROAD AT WATERFALL GULCH



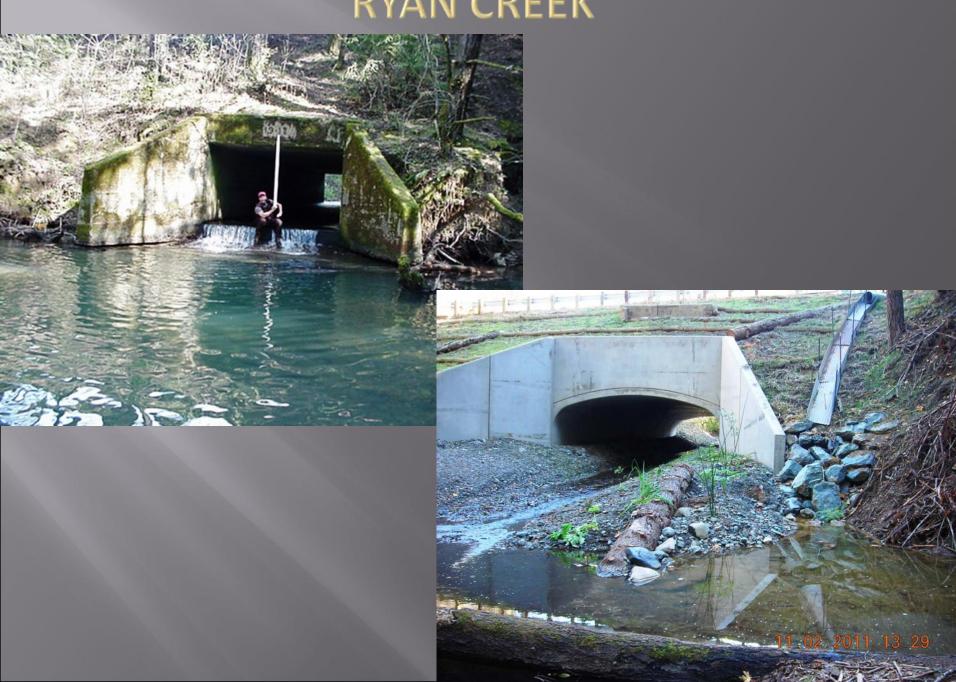




Fill the In Board Ditch, Outslope the Road, Remove the Berm, Breach the Berm, Add Geo Fabric & Rock Surface



# RYAN CREEK



# CONNER CREEK









