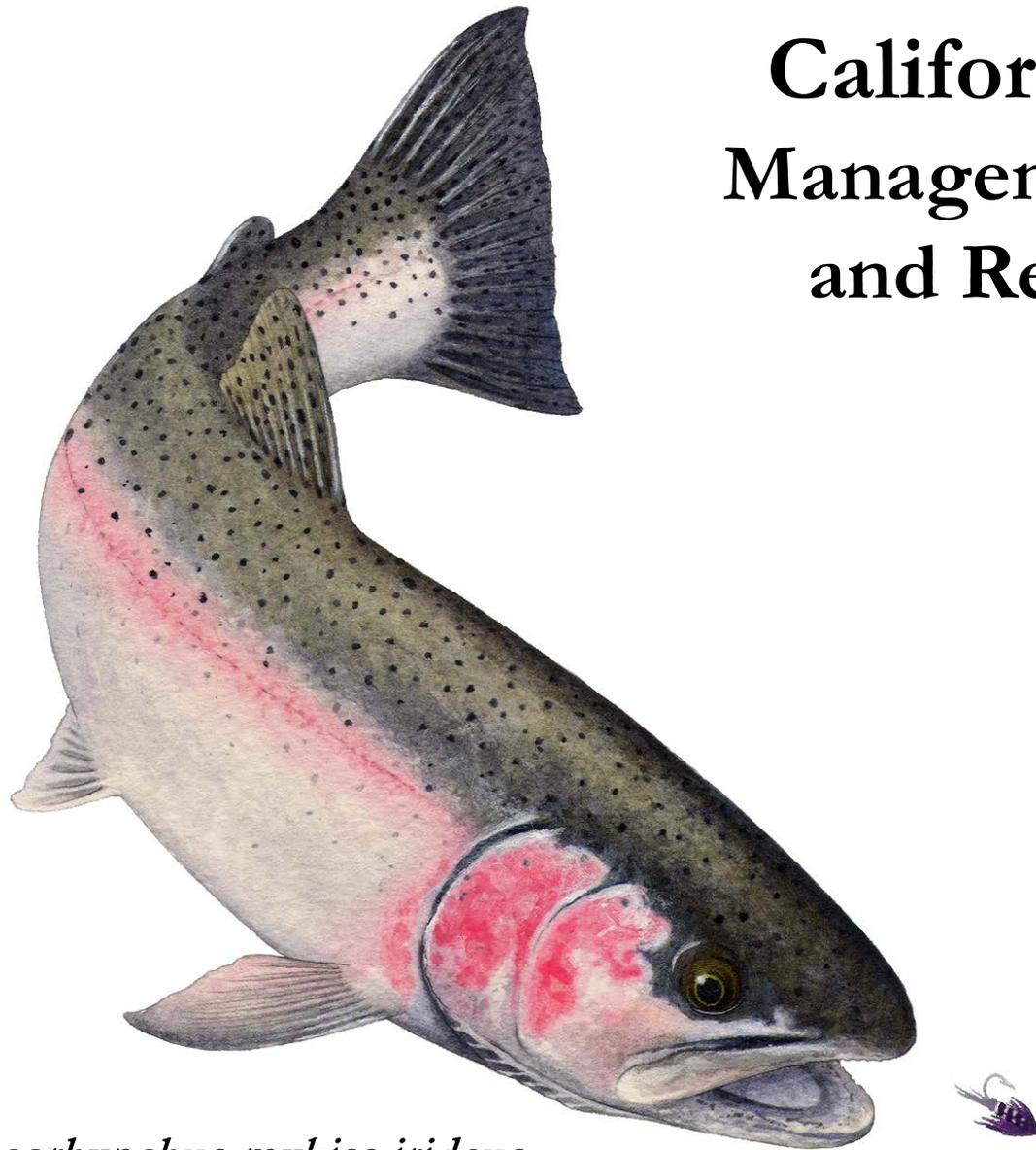


California Steelhead: Management, Monitoring and Recovery Efforts

Jonathan Nelson

Steelhead Management,
Research and Restoration
Program



Oncorhynchus mykiss irideus

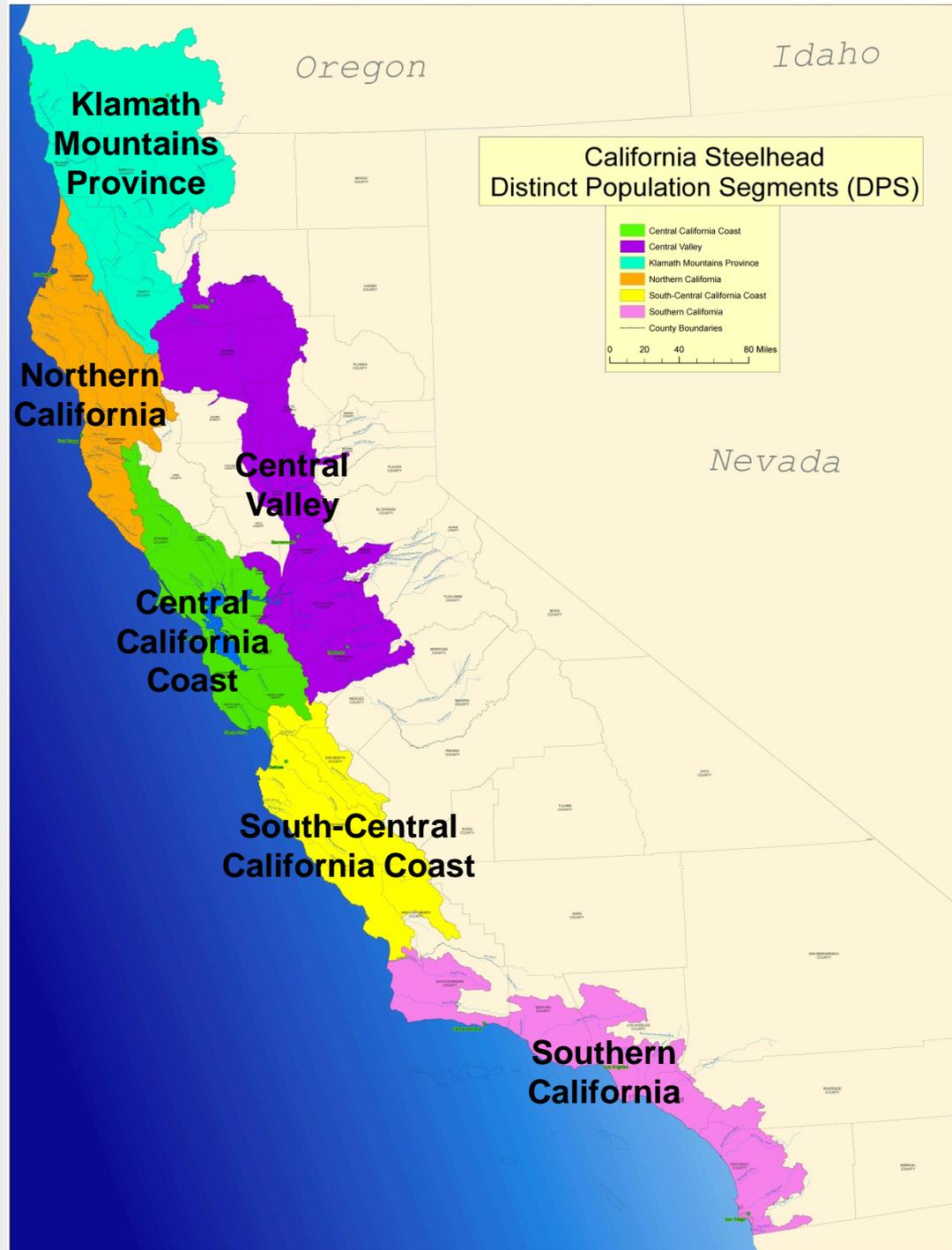


California Steelhead - Hot Topics

- **Implementation of monitoring and recovery plans**
- **Reintroduction above long standing barriers**
- **Angling regulations – harvest of hatchery fish**
- **Anadromous and resident form management**
- **Conservation hatcheries**
- **Drought related fish rescue**

California Steelhead Distinct Population Segments (DPS)

- **Klamath Mountains Province**
Status: Not warranted (2001)
- **Northern California**
Status: Threatened (2000)
- **Central California Coast**
Status: Threatened (1997)
- **Central Valley**
Status: Threatened (1998)
- **South-Central California Coast**
Status: Threatened (1997)
- **Southern California**
Status: **Endangered** (1997)

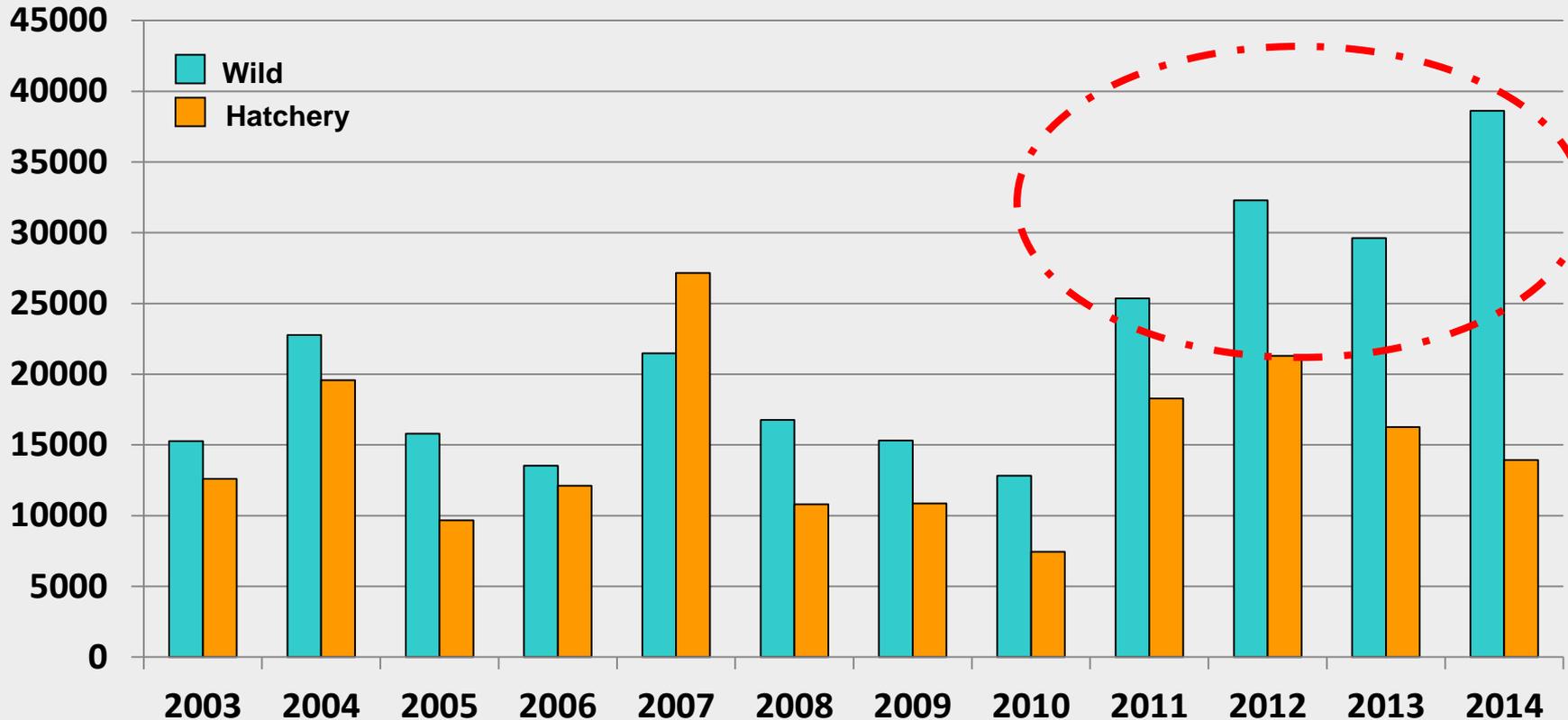


Steelhead Ecotypes in California Waters

- **Winter Steelhead** (ocean maturing)
 - Present in all California DPS
 - Predominant run observed throughout California
 - Enter freshwater in fall/winter and spawn within weeks to months upon entry
 - Status highly variable throughout the State
 - Most difficult run to monitor population due to seasonal water conditions
- **Fall Steelhead** (stream maturing)
 - Observed in Trinity & Klamath watersheds in the Klamath Mountain Province DPS
 - Enter freshwater in summer/fall and spawn late fall/winter
 - Stock appears to be stable
 - Run timing coincides with Trinity River Hatchery Steelhead
- **Summer Steelhead** (stream maturing)
 - 23 streams in the Klamath Mountains Province and Northern California DPS
 - Enter freshwater in spring and early summer, move to headwaters and hold over in deep pools and spawn late fall/winter
 - Overall stock status is uncertain, but several individual populations appear stable
 - This life history is prone to threats and should be evaluated for additional protection measures
- **“Half-Pounder” runs**
 - Observed in the Klamath Mountains Province and Northern California DPS
 - Defined as sub-adults that have spent 2-4 months in estuary or nearshore before returning to the river to overwinter

California Steelhead Report Card Data

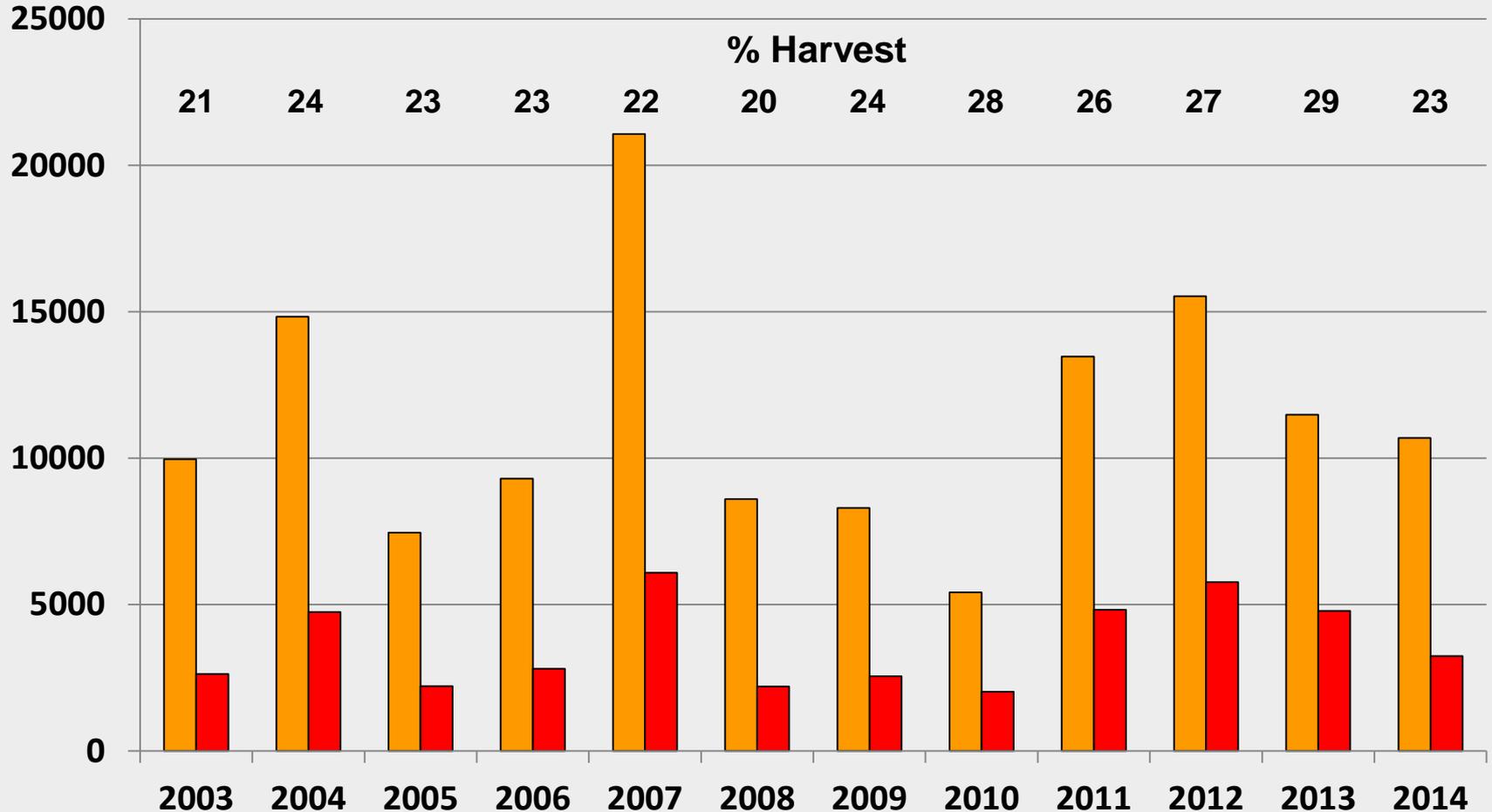
Annual Statewide Reported Catch of *O. mykiss* (> 16") 2003-2014
Wild and Hatchery



- **Mandatory return of Report Card required by law in 2003**
- **~25% of Report Cards are return annually**
- **Steady increase reported for catch of wild fish since 2011**
- **No correlation to increased sales and/or returns of Report Card**

California Steelhead Report Card Data

Annual Statewide Reported Catch of Hatchery *O. mykiss* (> 16") 2003-2014



- Statewide daily bag and possession limits are 2 and 4
- ~25% reported harvest of hatchery fish annually

California Steelhead

Monitoring Plans:

California Coast:

- **California Coastal Salmonid population Monitoring: Strategy, Design, and Methods.**
 - (CDFG Fish Bulletin 180, 2011)

California Central Valley:

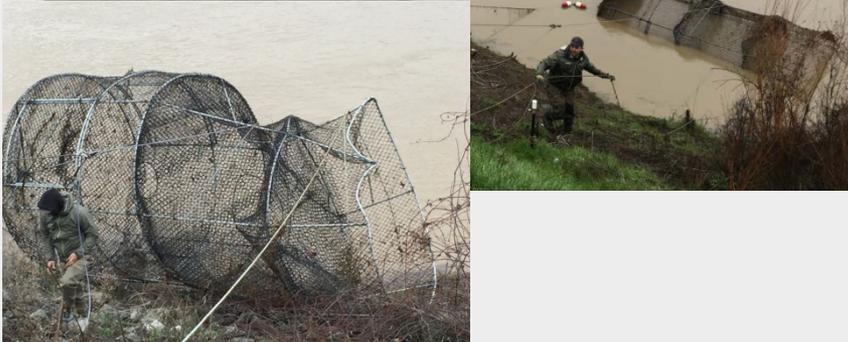
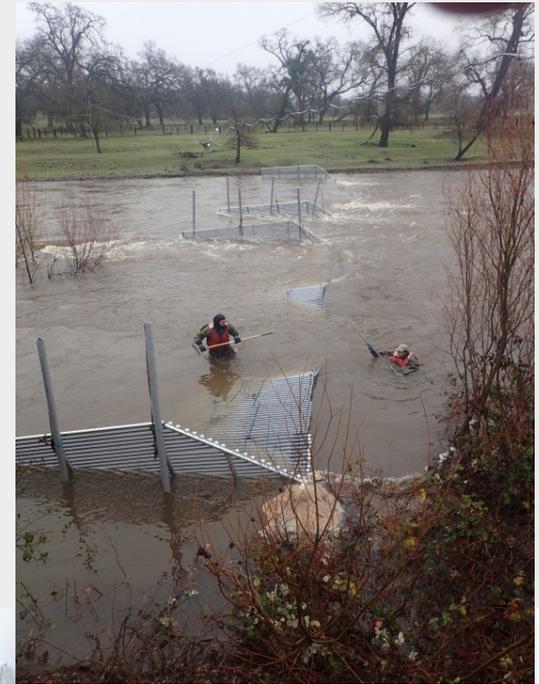
- **A Comprehensive Monitoring Plan for Steelhead in the California Central Valley**
 - (CDFG 2010)
- **Implementation Plan for the Central Valley Steelhead Monitoring Plan**
 - (CDFW 2014)

Monitoring Techniques:

- **Life Cycle Monitoring Stations**
- **VAKI and Video Stations**
- **DIDSON Stations**
- **Weirs and Fish Traps**
- **REDD Surveys**
- **Snorkel Surveys**
- **Acoustic Telemetry**



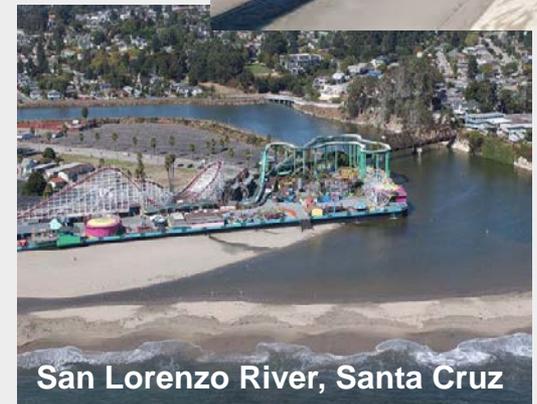
Fyke Trapping



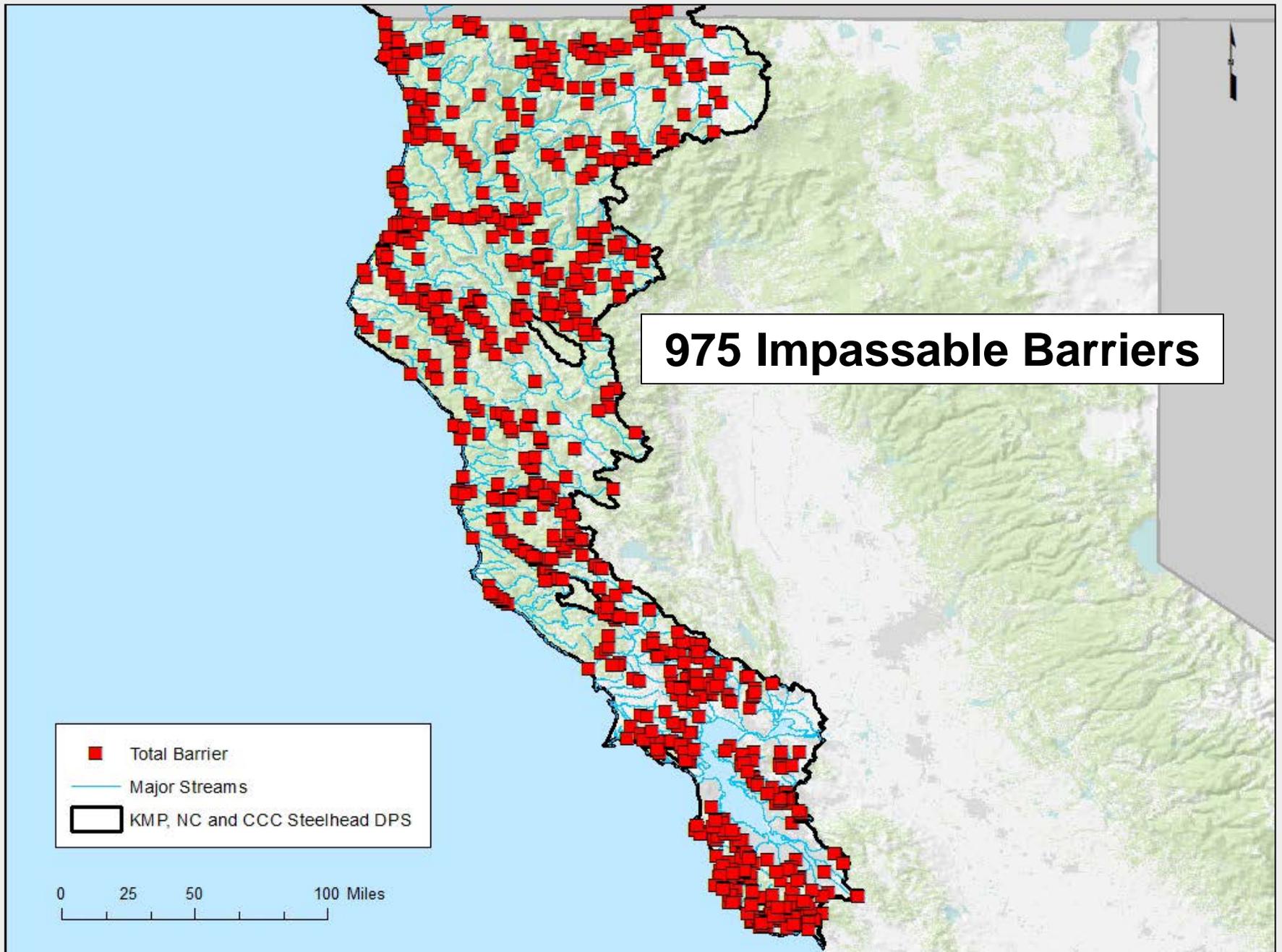
Resistant Weirs

Coastal Steelhead Populations Threats

- Poor forest and land use practices
- Habitat blockages and degradation
- Passage barriers – Dams and diversions
- Elevated water temperatures
- Dewatering from irrigation
- Lagoon breaching
- Invasive plant species
- Urbanization and channelization
- Fish predation
- Non-native fish competition
- Drought



Migration Barriers in the KMP, NC and CCC Steelhead DPS

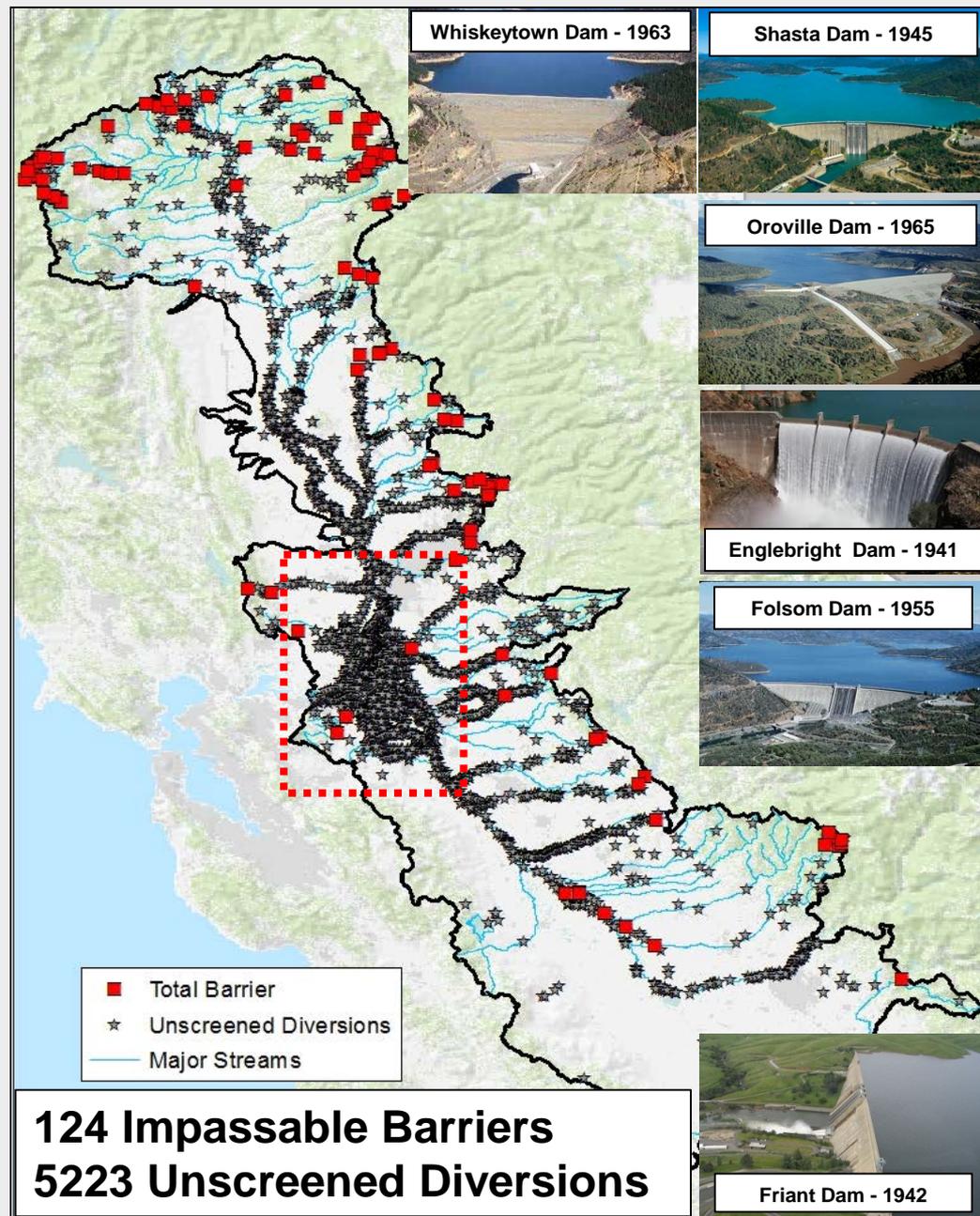


Migration Barriers in the SCCC and SC Steelhead DPS



Central Valley Steelhead Population Threats

- **Dams (13 major reservoirs)**
 - Habitat blockages and loss
 - Habitat degradation
- **Water Management**
 - Diversions and dewatering
 - Poor water quality
- **Predation**
- **Migration paths in Delta**
- **Drought**



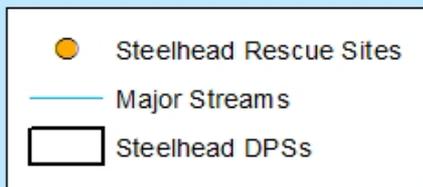
~ 80% of historical habitat unavailable

Drought in California

- **California has been experiencing extremely dry conditions for a fourth consecutive year**
- **Governor Brown has declared a drought State of Emergency and has issued an executive order that directs CDFW to take certain actions to respond to drought conditions**
- **~\$35 million allocated from the State for fisheries related actions, including:**
 - **Water quality monitoring**
 - **Baseline fish population monitoring**
 - **Fish stressor monitoring**
 - **Fish rescue**
- **CDFW has developed criteria to determine if angling closures and associated reopening is warranted based on evaluation of these conditions:**
 - **Water temperature, dissolved oxygen, fish passage, water levels and adult population levels**

Steelhead Rescues

- As of January 2014:
 - ~75,000 steelhead
 - 38 watersheds
 - 16 counties



0 80 160 Miles

California Steelhead Recovery and Management Resources

RECOVERY AND MANAGEMENT PLANS

- **Steelhead Restoration and Management Plan for California (CDFG 1996)**
 - **Currently being updated and revised**
- **Southern California Steelhead Recovery Plan (NMFS 2012)**
- **South-Central California Coast Steelhead Recovery Plan (NMFS 2013)**
- **Central Valley California multi-species Salmonid Recovery Plan (Steelhead, Winter and Spring Chinook) (NMFS 2014)**
- **Multi-species Recovery Plan for Steelhead and Chinook (NMFS)**
 - **Central California Coast and Northern California DPS/ESUs**
 - **Public Draft released October 2015 for review and comment**
- **California Hatchery Review Statewide Report – (CA HSRG 2012)**
 - **Independent scientific review of anadromous hatchery management/protocols**
- **Fish Species of Special Concern in California, 3rd Edition (CDFW 2015)**
 - **Klamath Mountain Province Steelhead**

Restoration Efforts for Steelhead in California

- **Restoration actions include:**
 - Estuary enhancements
 - Invasive plant removal
 - Predator removal
 - Riparian enhancement
 - Barrier removals
 - Gravel augmentation
 - Stream channel enhancement
 - Water user agreements
 - Land acquisitions

Barrier Removal Project



Jordan Creek - Del Norte County

Dam Removal Project



San Clemente Dam – Carmel River

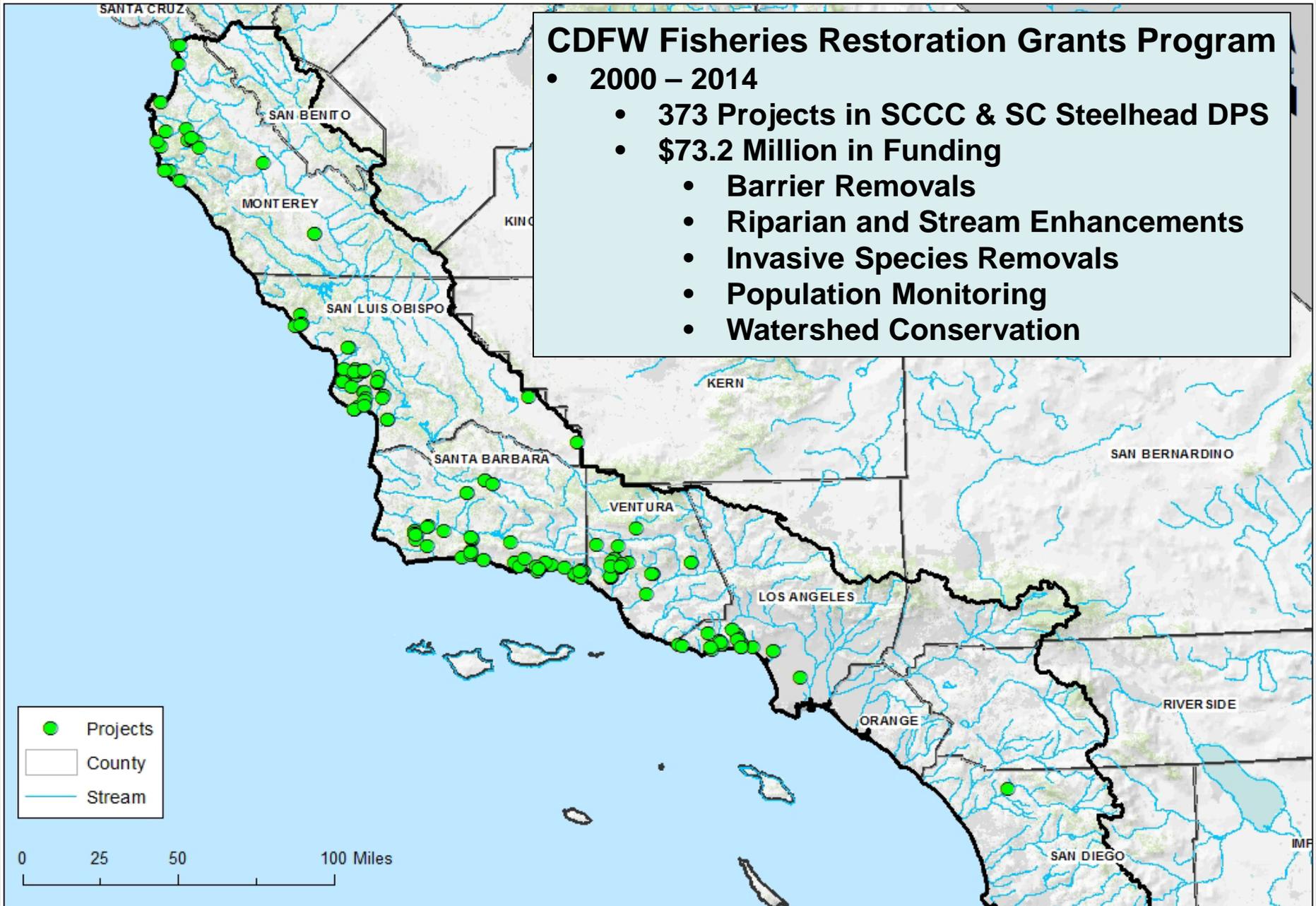
Bank Stabilization Project



Santa Rosa Creek – San Luis Obispo County

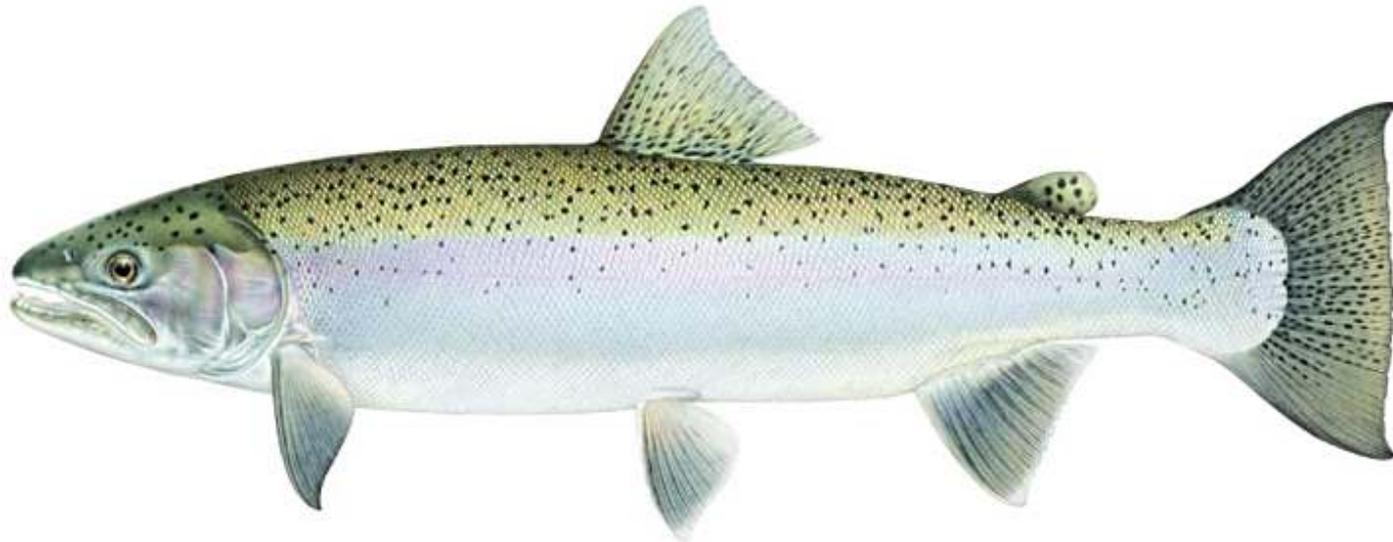
- **Primary funding source:**
 - CDFW Fisheries Restoration Grant Program

Restoration Implementation Projects in South-Central and Southern California



CALIFORNIA STEELHEAD SUMMARY

- **Steelhead stocks in California appear to be stable to declining**
- **Need consistent water supply and unimpeded passage**
- **Need to implement identified recovery actions**
- **Need implementation of monitoring programs & data collection**
- **Need to continue to address & alleviate threats**
- **Need baseline funding for population assessment and restoration**



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