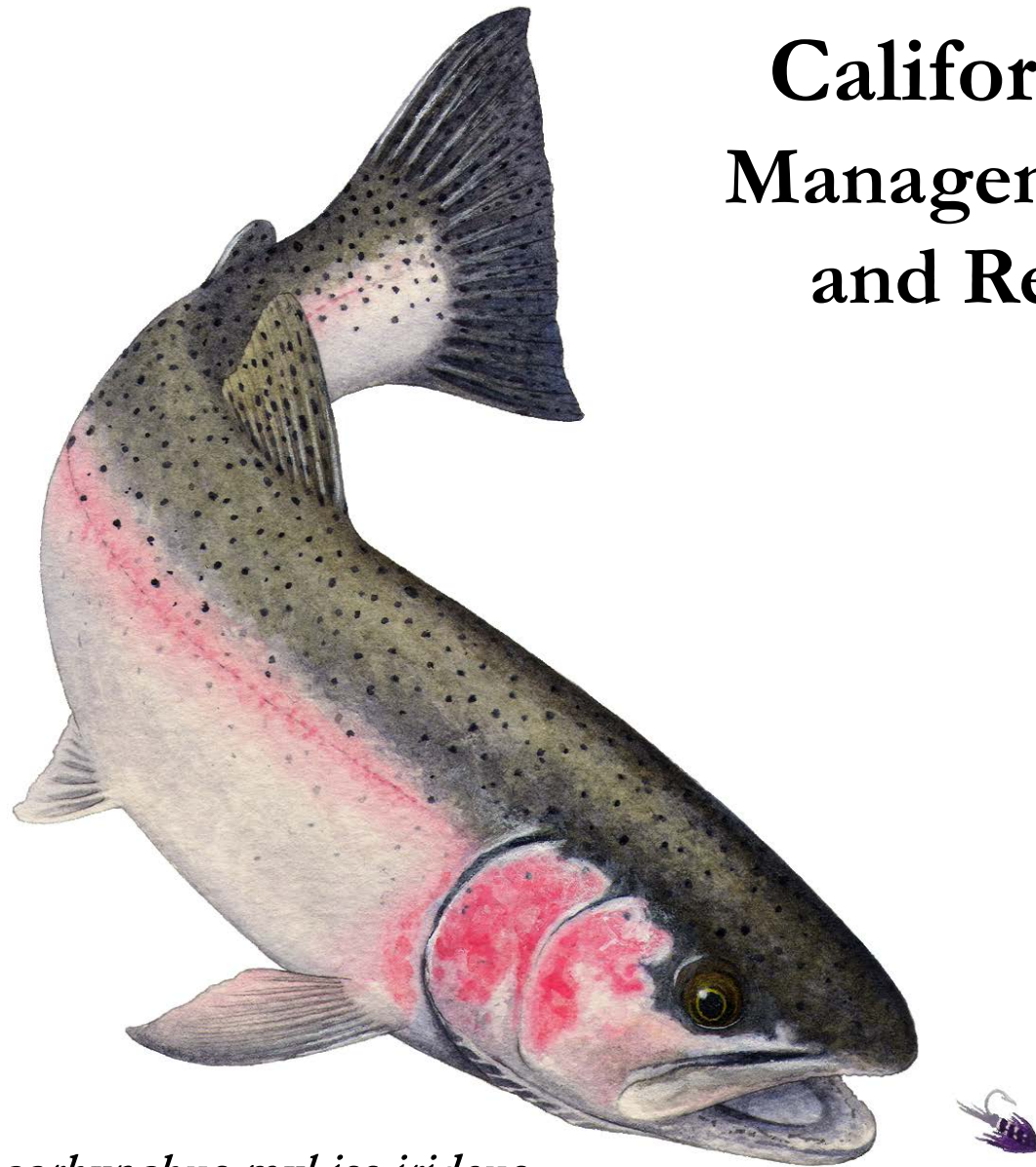


# California Steelhead: Management, Monitoring and Recovery Efforts

Jonathan Nelson

Steelhead Management,  
Research and Restoration  
Program



*Oncorhynchus mykiss irideus*

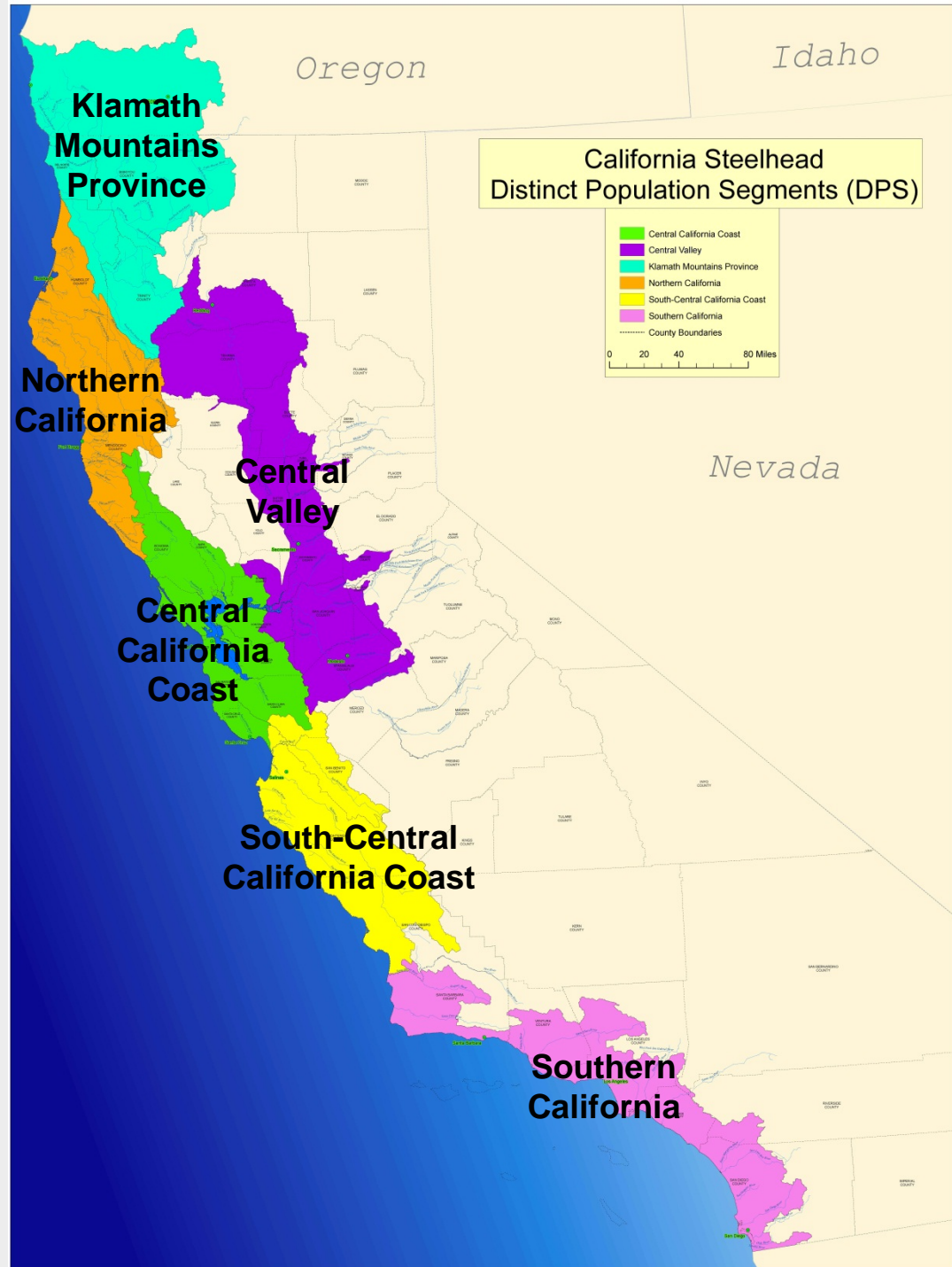


# **California Steelhead - Hot Topics**

- **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)

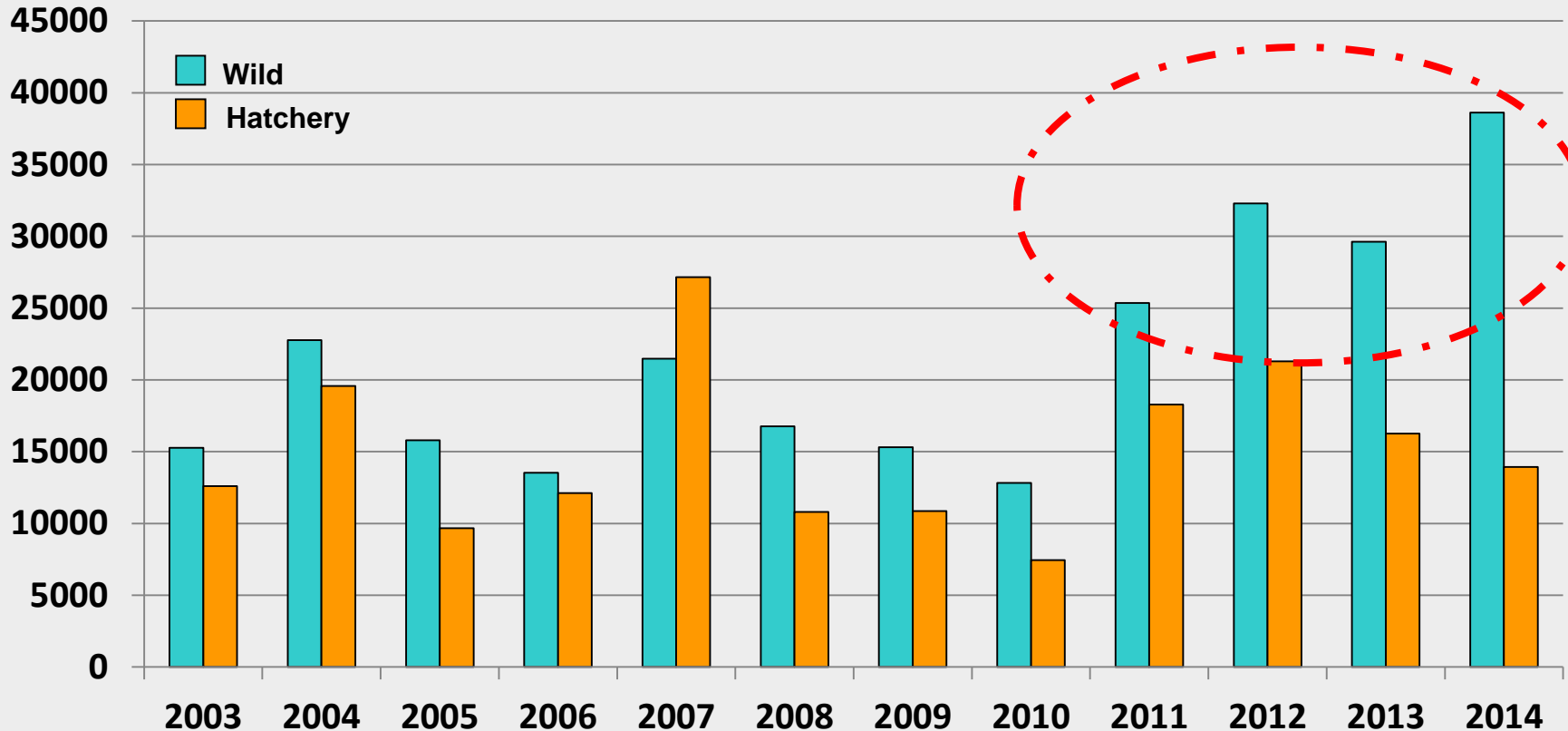


# **Steelhead Ecotypes in California Waters**

- **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

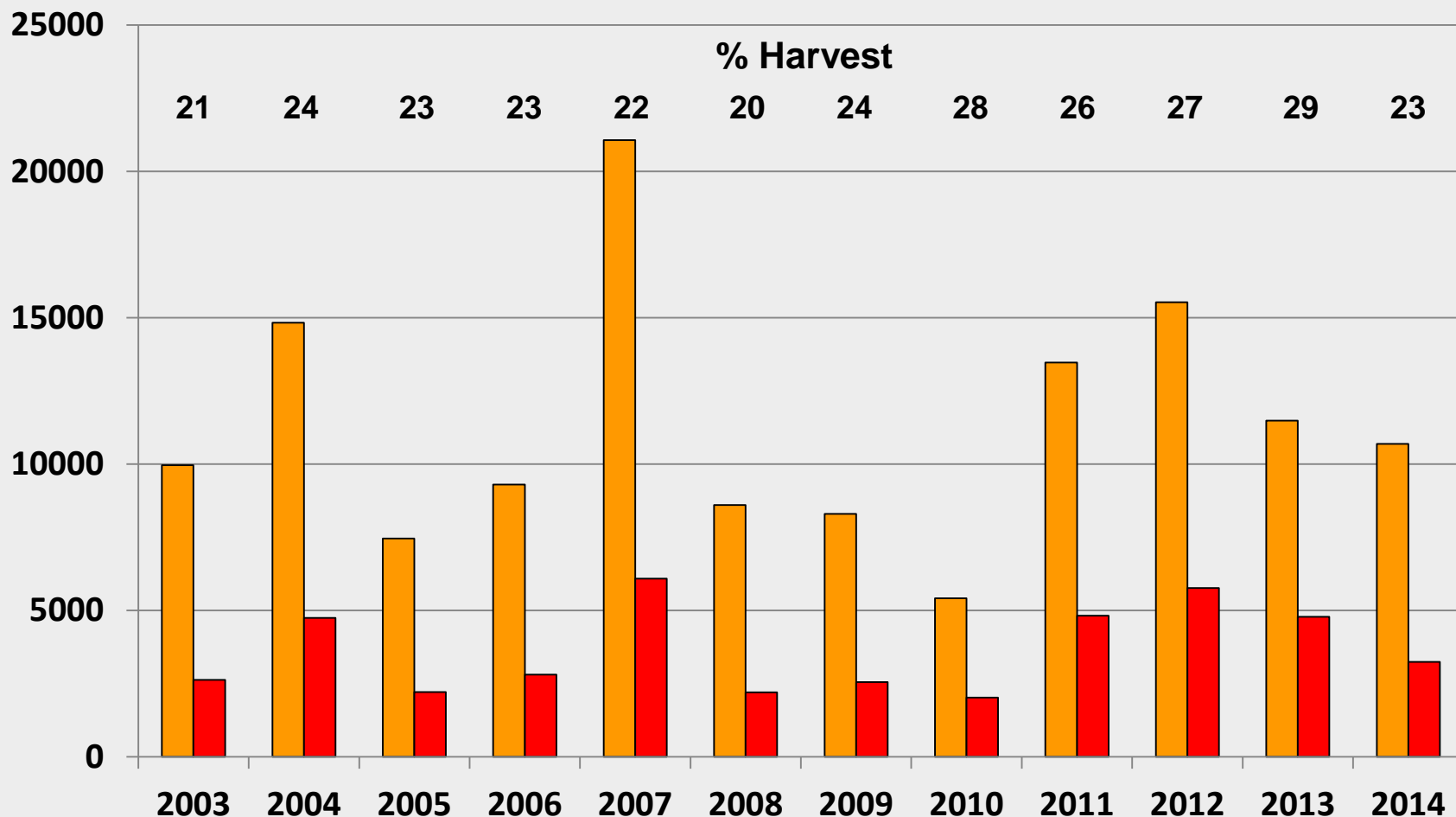
Annual Statewide Reported Catch of *O. mykiss* (> 16") 2003-2014  
Wild and Hatchery



- 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:

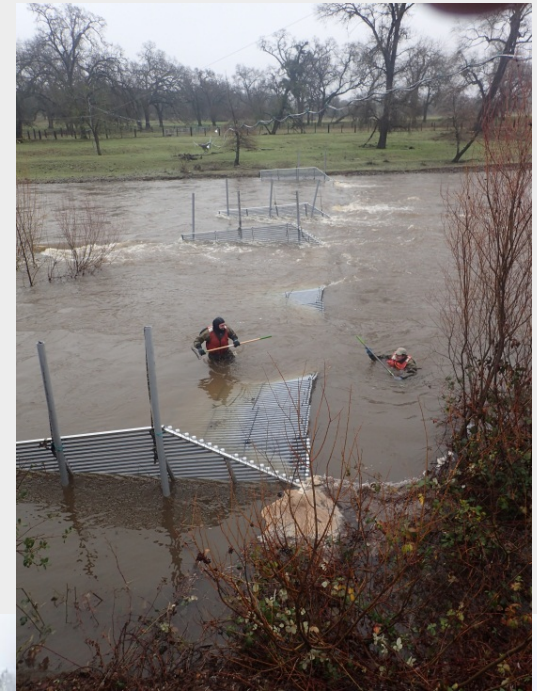
- **Life Cycle Monitoring Stations**
- **VAKI and Video Stations**
- **DIDSON Stations**
- **Weirs and Fish Traps**
- **REDD Surveys**
- **Snorkel Surveys**
- **Acoustic Telemetry**

## California Steelhead Monitoring Programs





# Fyke Trapping

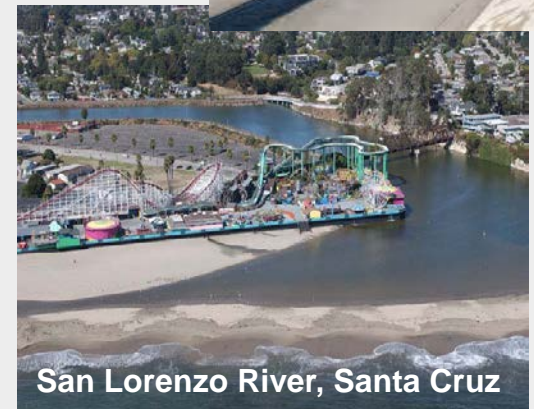


# Resistant Weirs

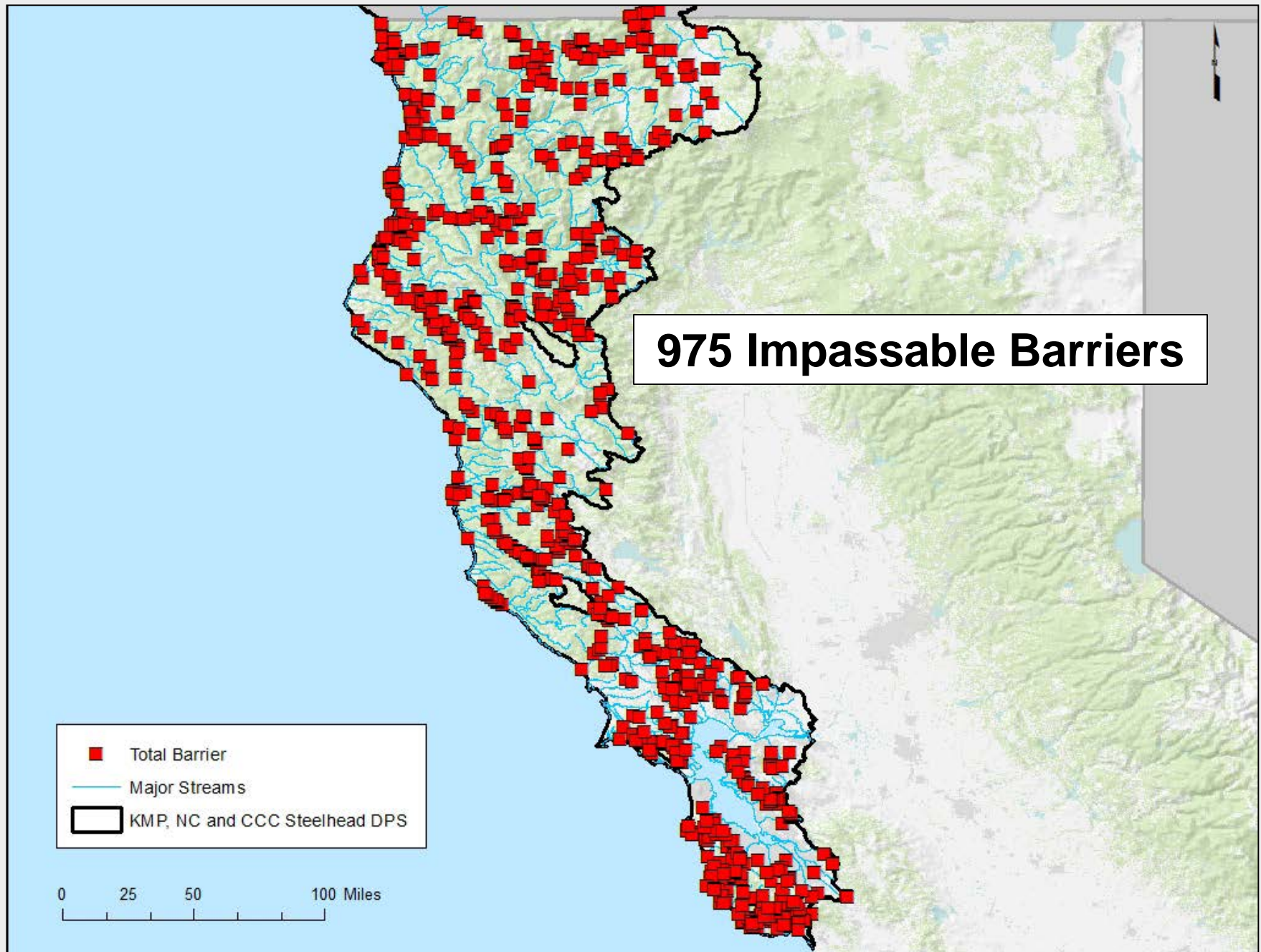


# Coastal Steelhead Populations Threats

- 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





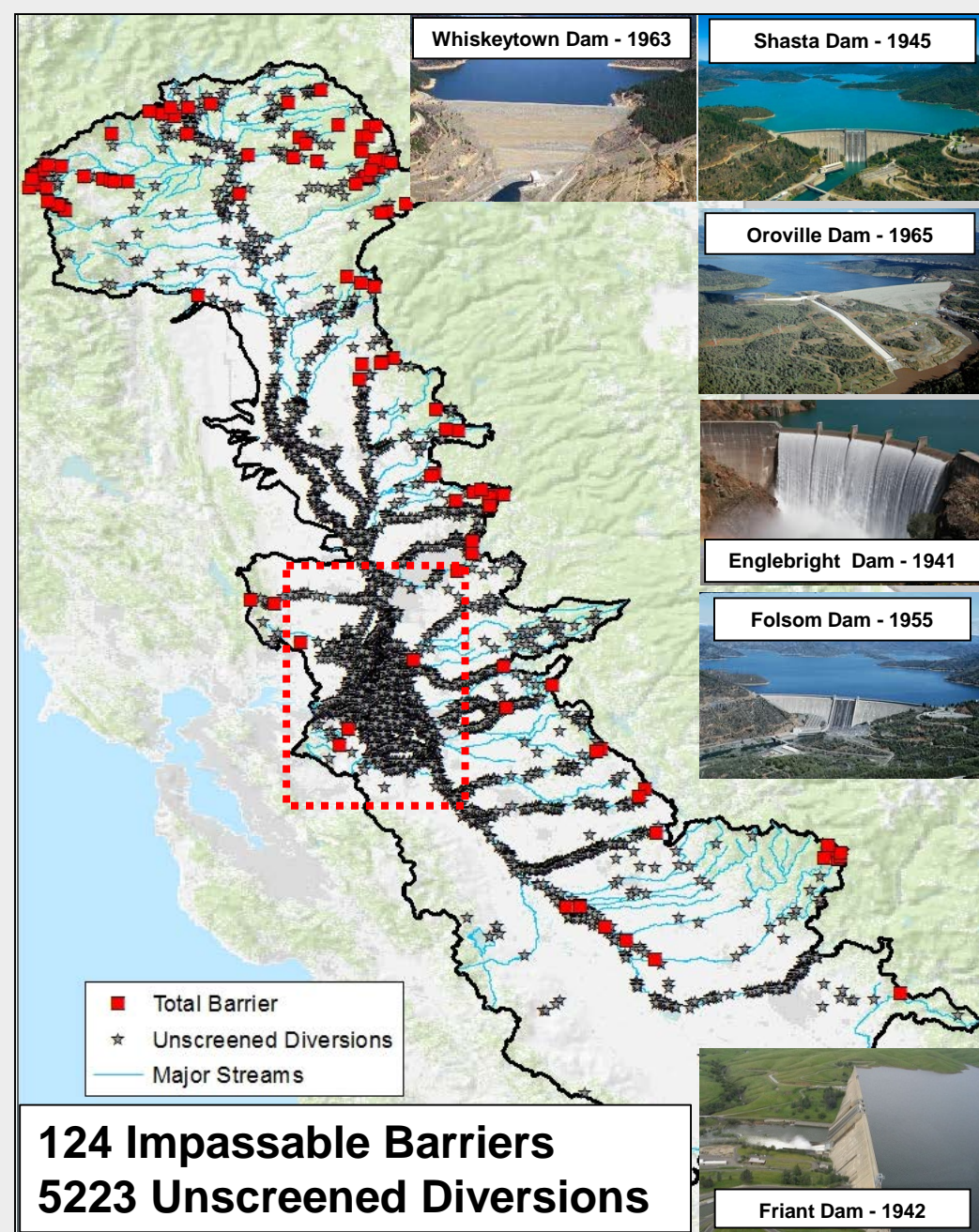
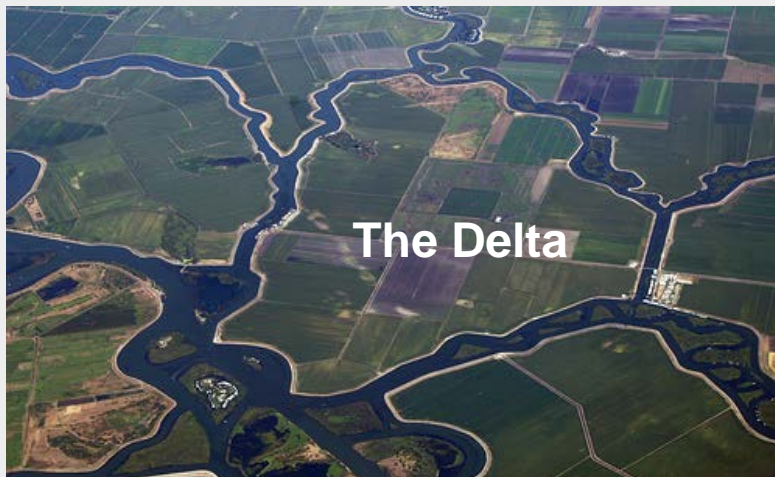
# Migration Barriers in the SCCC and SC Steelhead DPS





# 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**

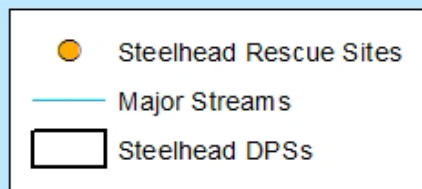


# **Drought in California**

- **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, 3<sup>rd</sup> 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

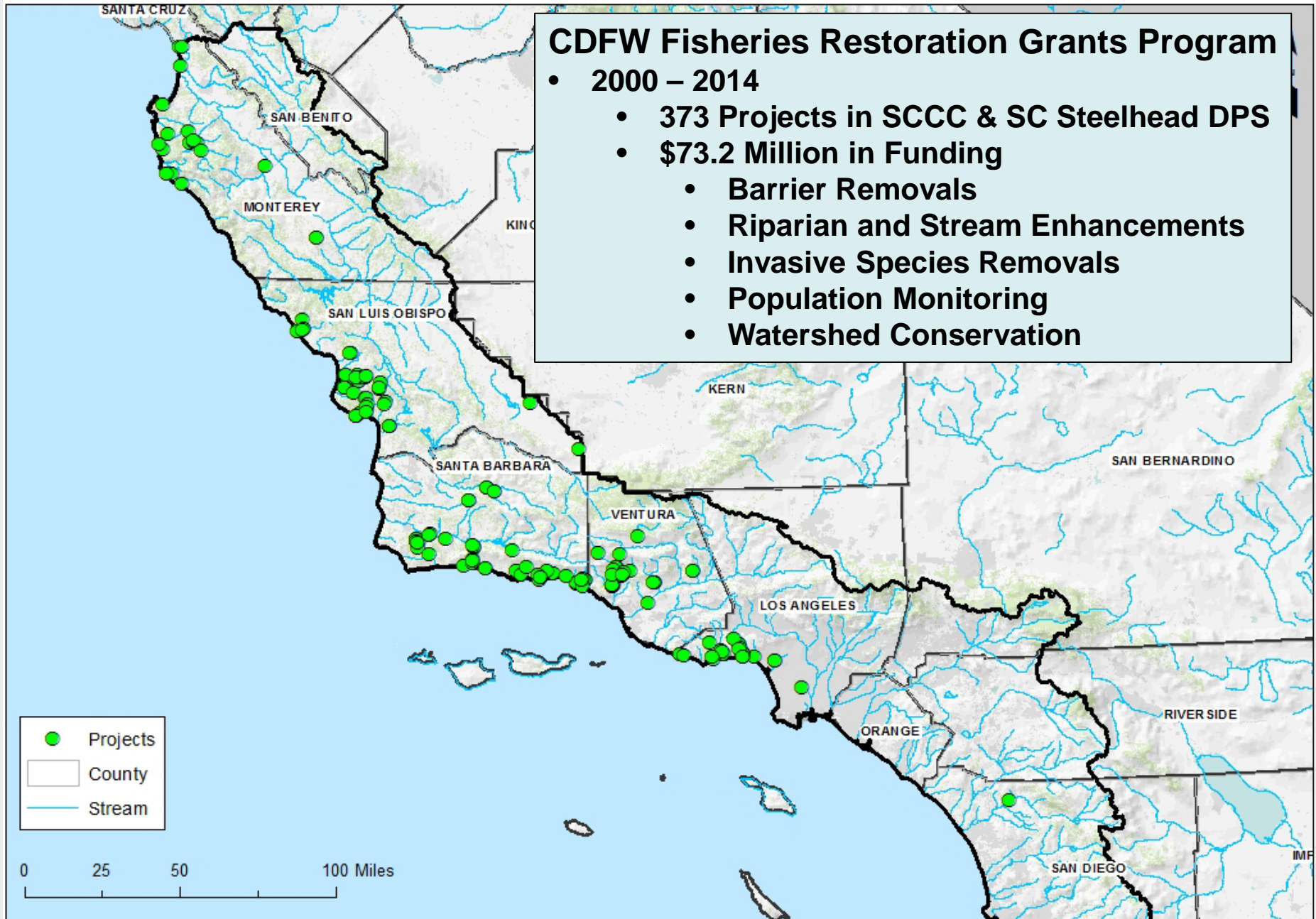


Santa Rosa Creek – San Luis Obispo County

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

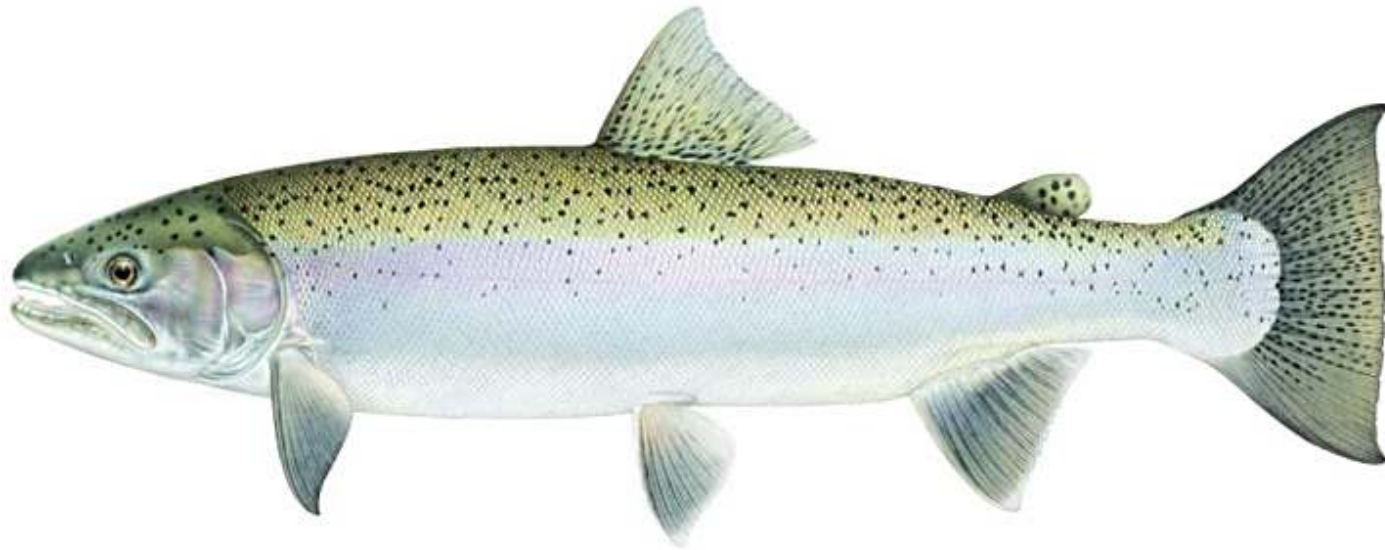


# Restoration Implementation Projects in South-Central and Southern California



# **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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