

California Steelhead: Management, Monitoring and Recovery Efforts

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Steelhead Restoration
& Management Program

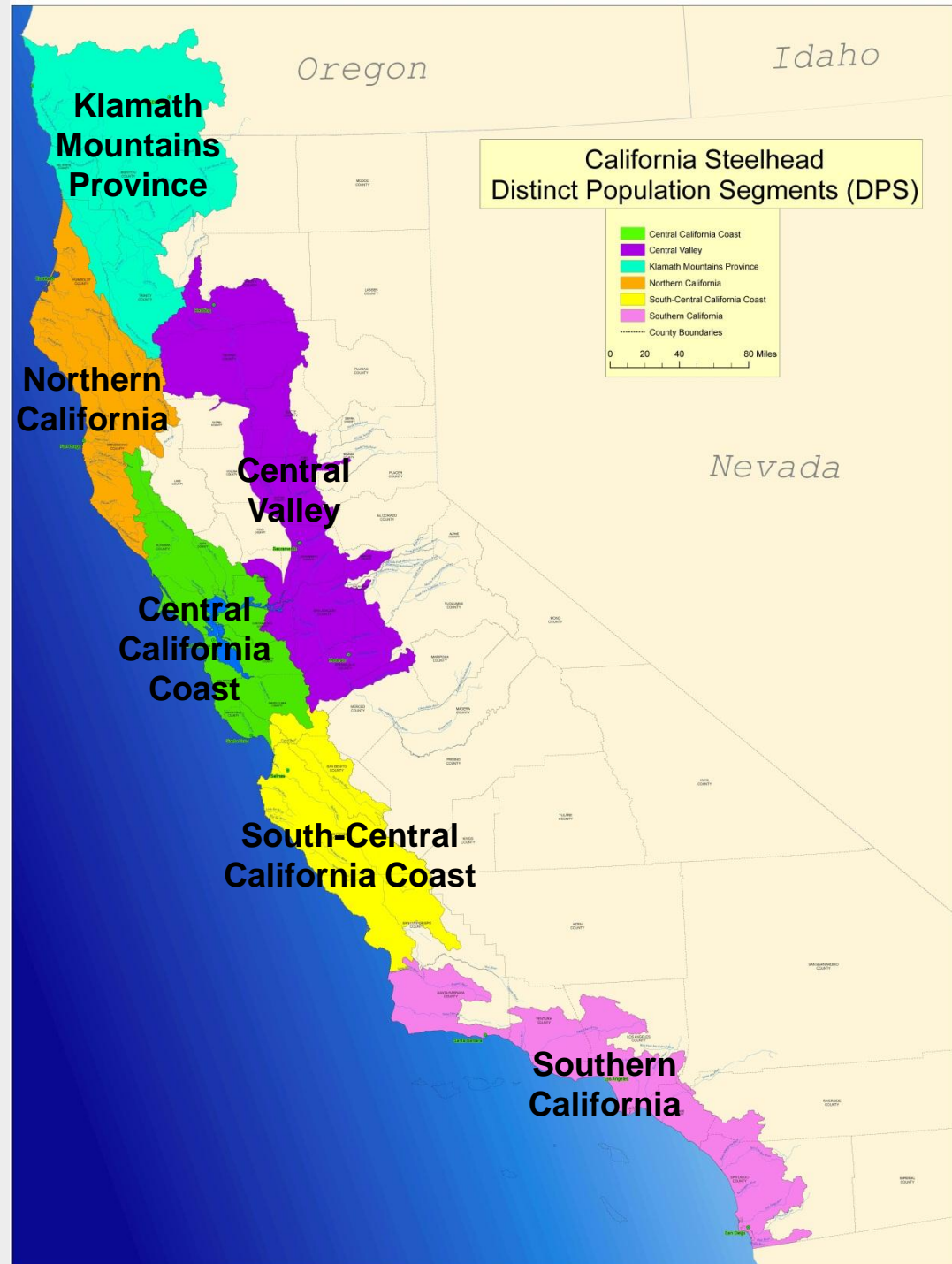


Oncorhynchus mykiss irideus



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)



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)**
 - **Public Draft 2009, Final Draft anticipated 2014**
- **Multi-species Recovery Plan for Steelhead and Chinook (NMFS)**
 - **Central California Coast and Northern California DPS/ESUs**
 - **Co-Manager Draft anticipated 2014**
- **California Hatchery Review Statewide Report – (California HSRG 2012)**
 - **Independent scientific review of anadromous hatchery management/protocols**

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:

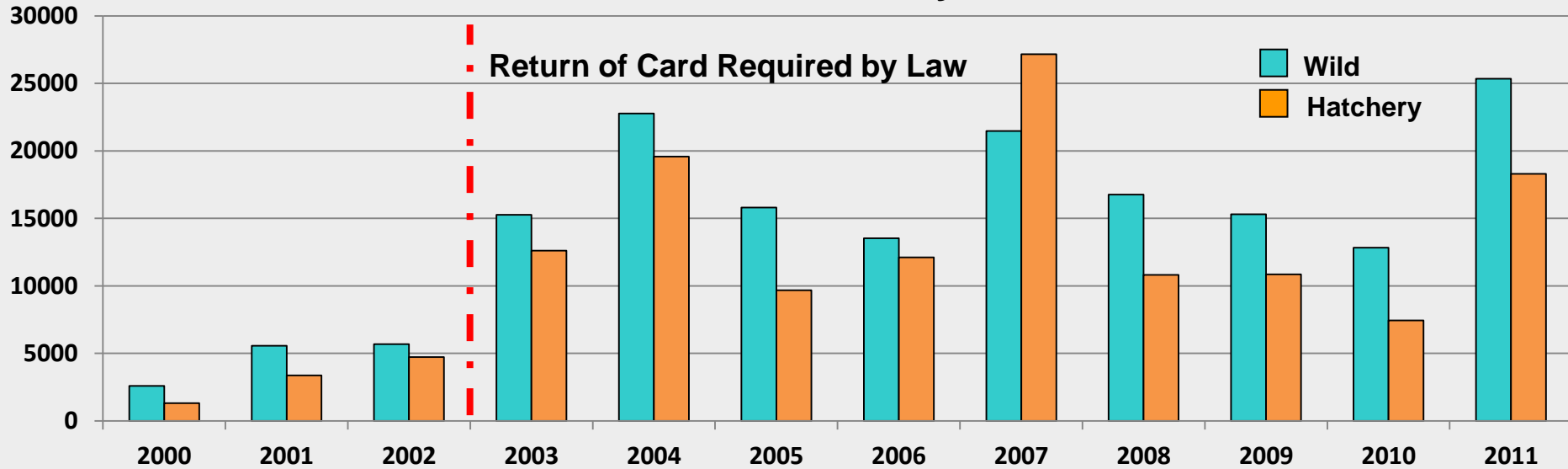
- Life Cycle Monitoring Stations
- VAKI and Video Stations
- Weirs and Fish Traps
- REDD Surveys
- Snorkel Surveys
- Acoustic Telemetry
- DIDSON Stations

California Steelhead Monitoring Programs

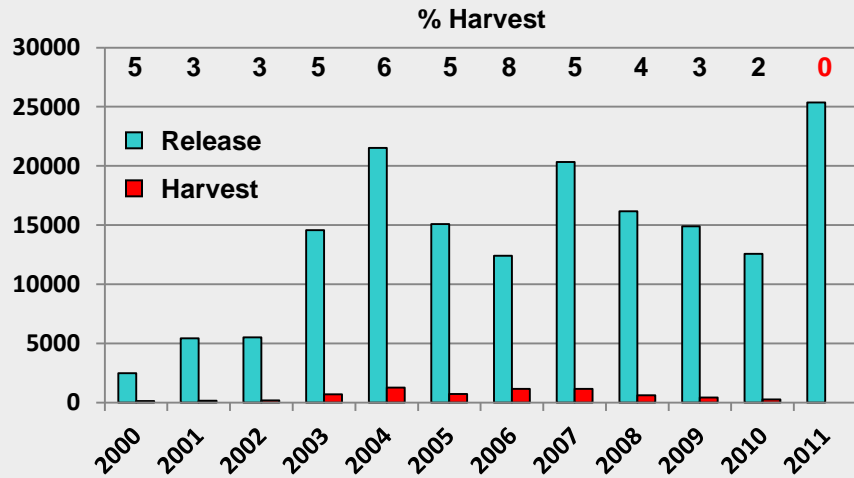


California Steelhead Report Card Data

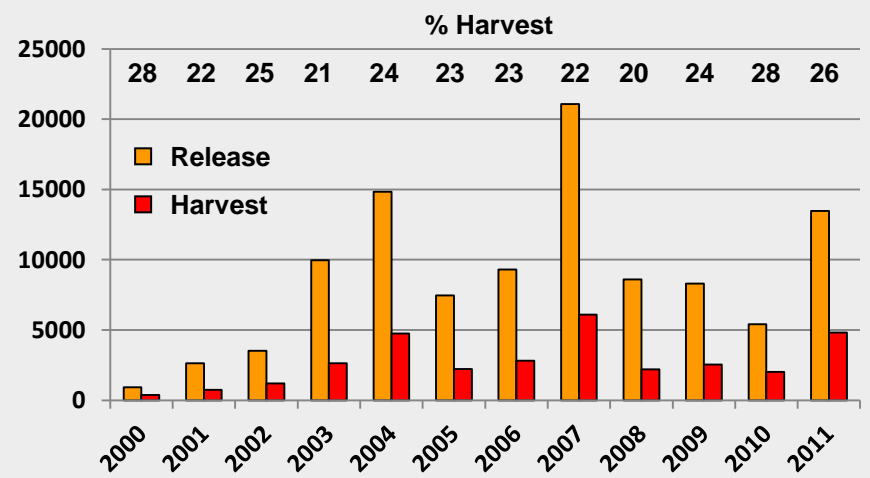
Annual Statewide Catch of *O. mykiss* (> 16") 2000-2011 Wild and Hatchery



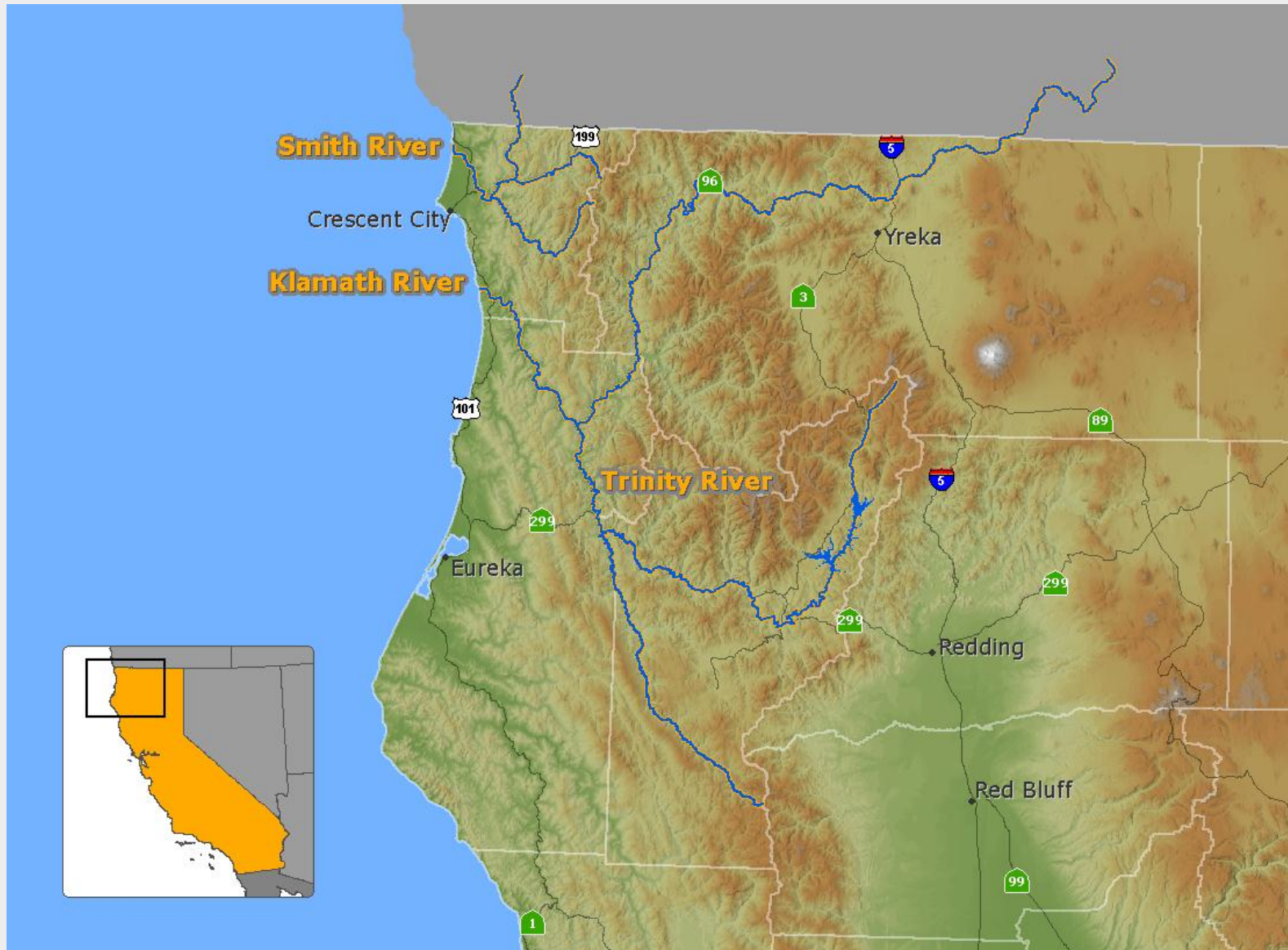
Wild *O. mykiss*: Release and Harvest



Hatchery *O. mykiss*: Release and Harvest



Klamath Mountains Province DPS

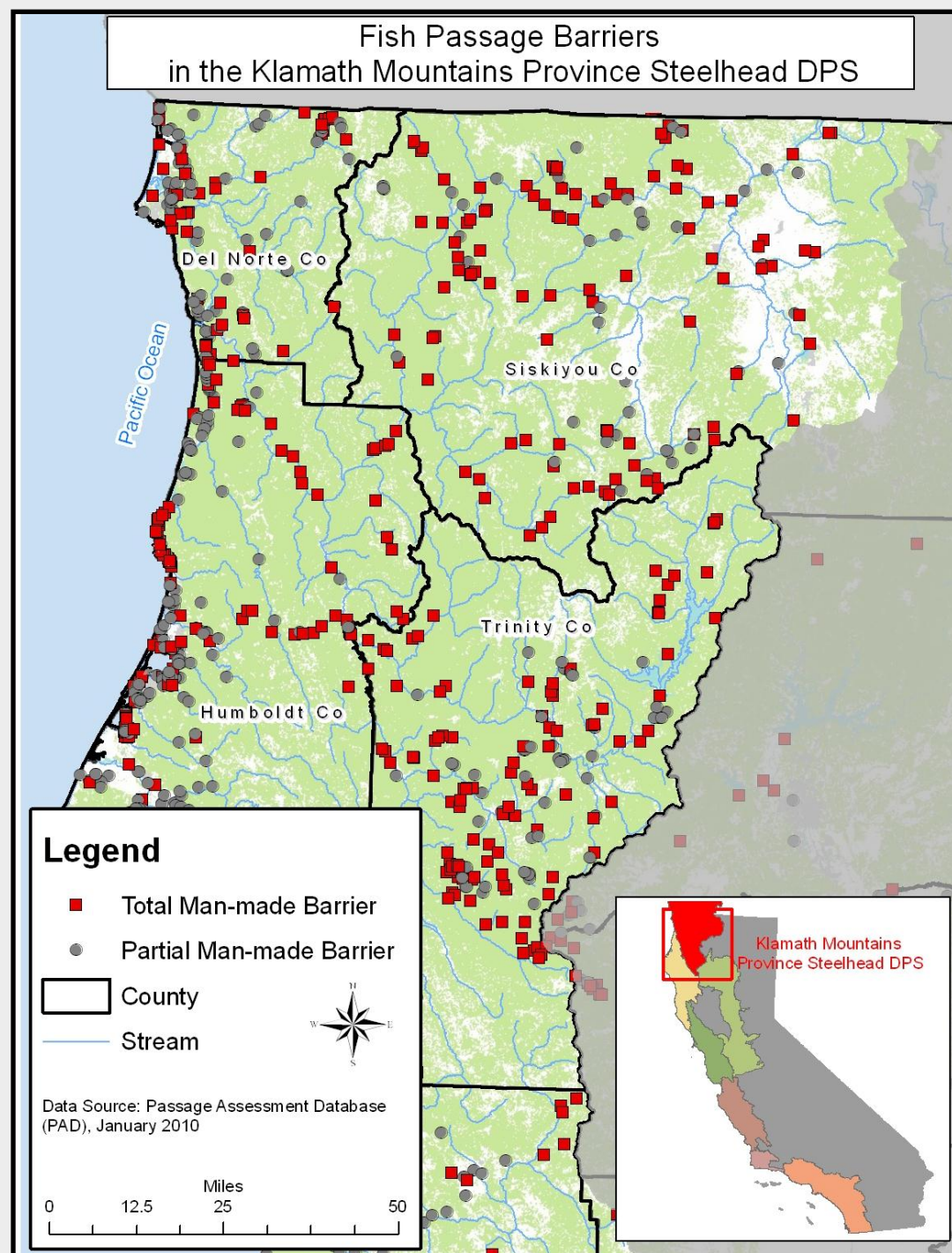


Klamath Mountains Province

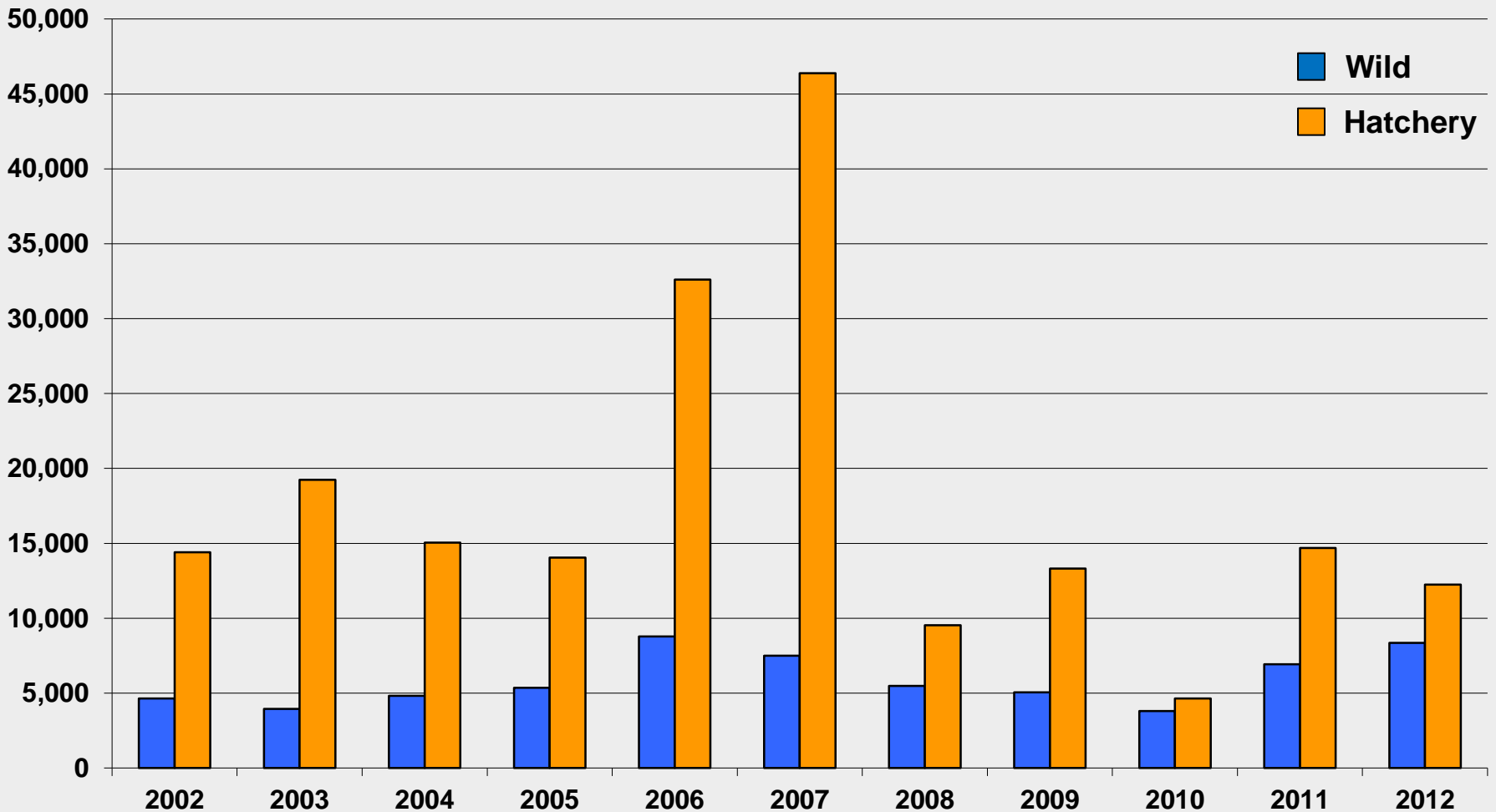
Status: Not warranted (2001)

DPS includes:

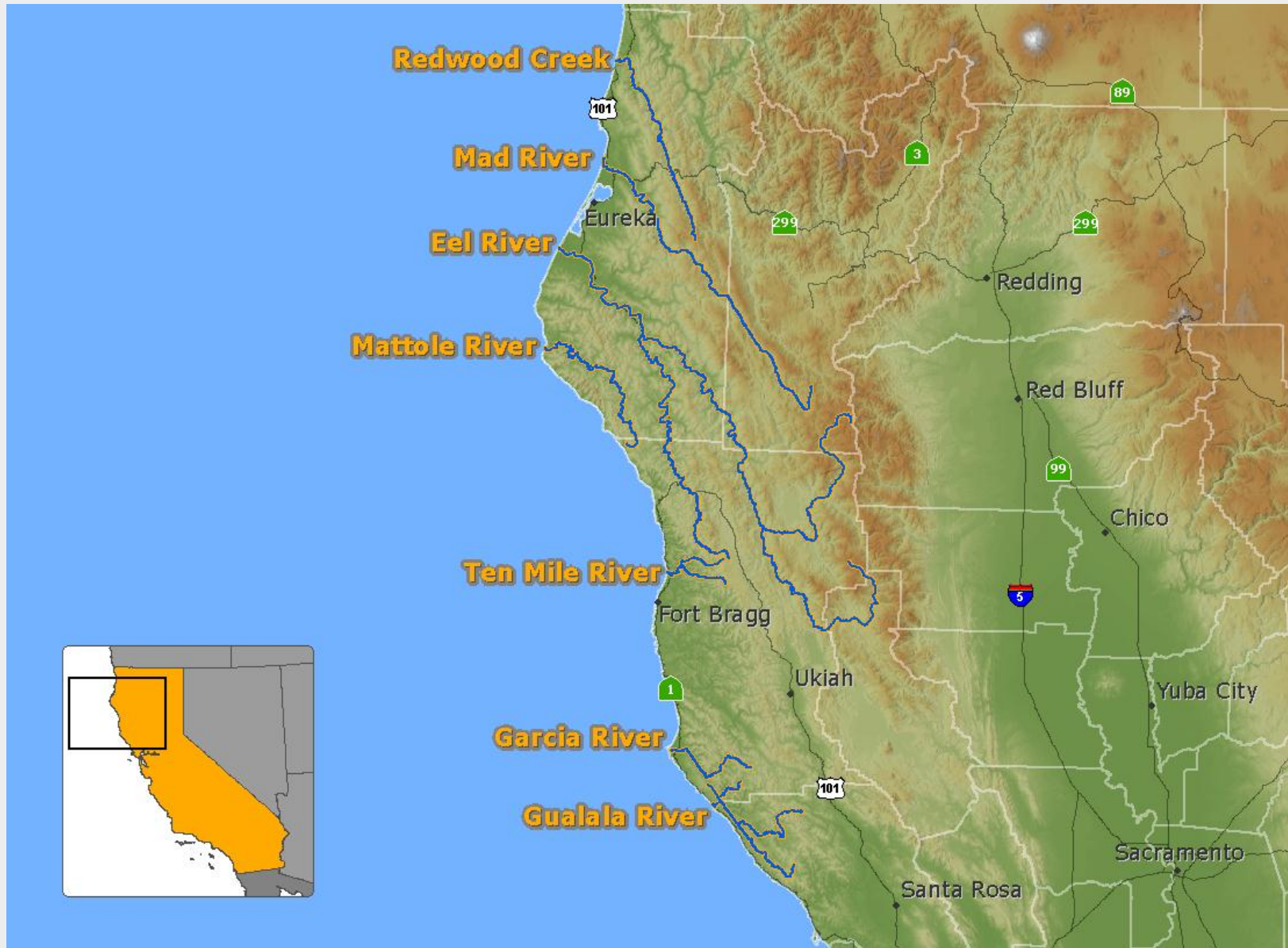
- **Winter Steelhead (ocean maturing)**
 - Stock appears to be stable
- **Fall Steelhead (stream maturing)**
 - Stock is stable
 - Linked to timing of hatchery run
- **Summer Steelhead (stream maturing)**
 - Stock is uncertain
 - May warrant future protection
- **“Half-Pounder” runs**
 - Unique to Northern Coastal range
 - Defined as sub-adults that have spent 2-4 months in estuary or nearshore before returning to the river to overwinter
- **Dam Removals on Klamath**
 - 4 dams and over 600 stream miles
 - Anticipated removal 2020
- **Restorations efforts in this DPS are key to ensure preventive declines in future populations**



Trinity River Fall Steelhead run-size Estimates 2002-2012 (above Willow Creek weir, Wild and Hatchery)



Northern California DPS



Northern California

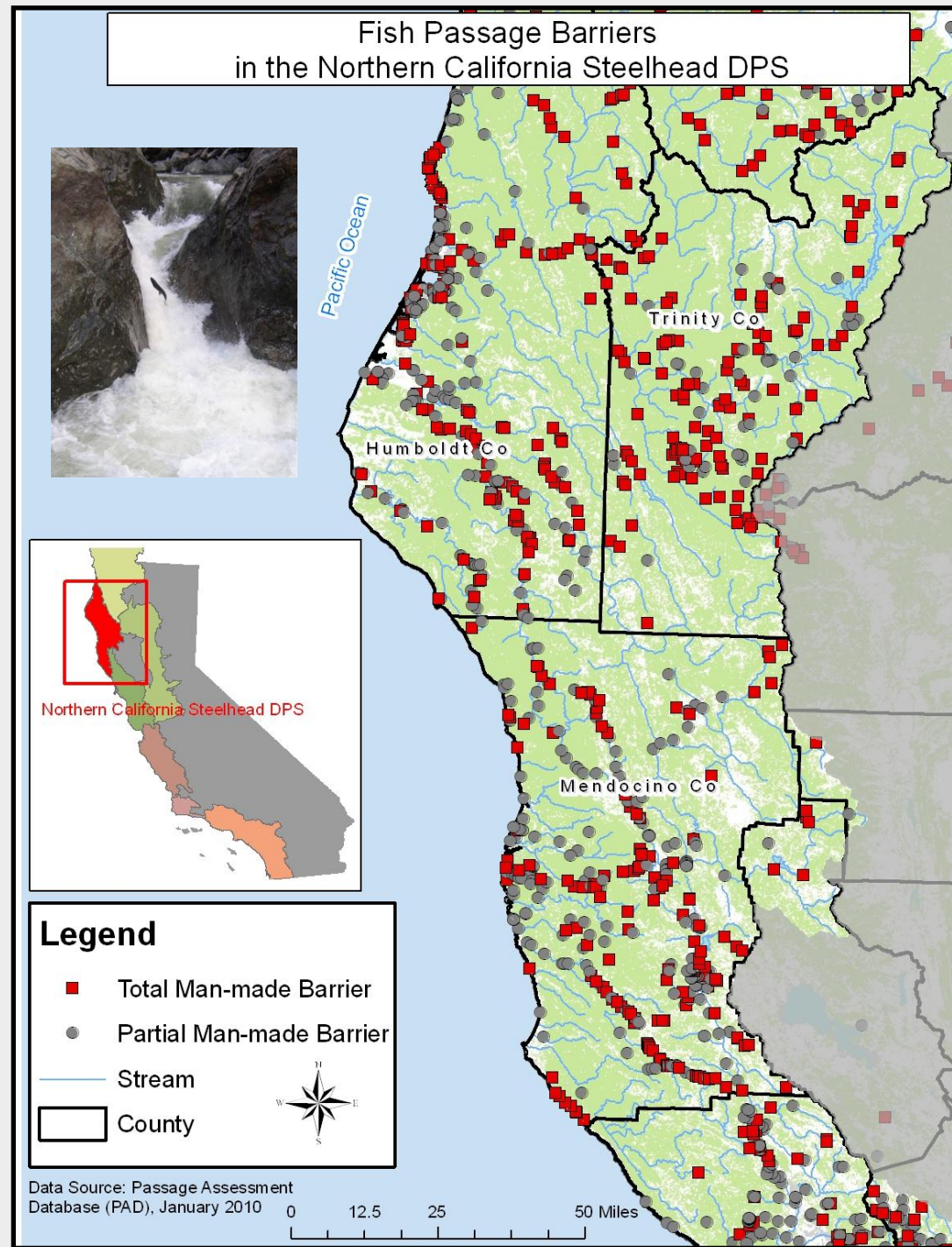
Status: Threatened (2000)

DPS includes:

- Winter Steelhead
 - Stocks stable to declining
- Summer Steelhead (Eel River)
 - Stock is uncertain
 - May warrant future protection
- “Half-Pounder” runs
 - Limited stream locations

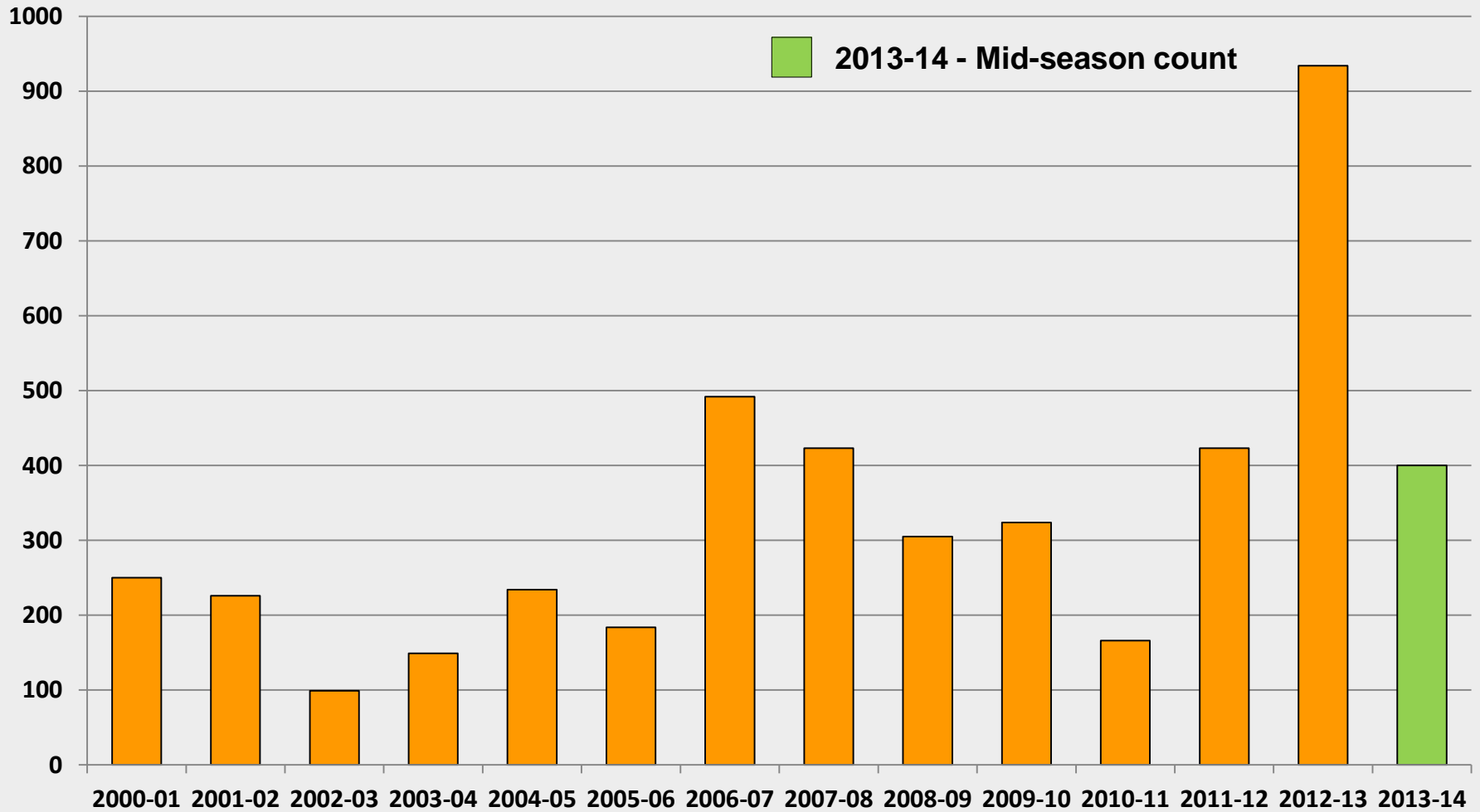
Primary Threats:

- Poor forest practices
- Poor land use practices
- Non-native predators
 - Sacramento Pikeminnow
- High water temperatures



Eel River Wild Winter Steelhead Counts 2000-2014

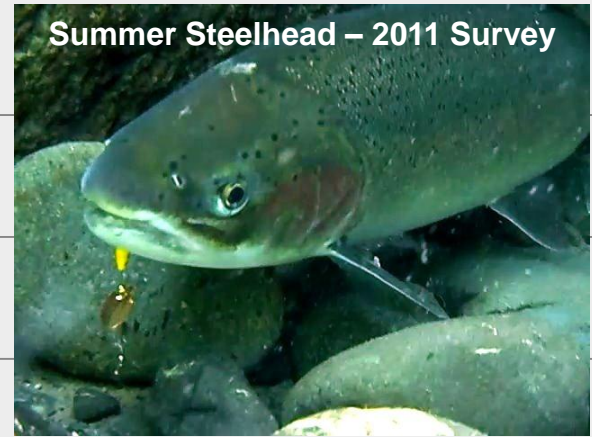
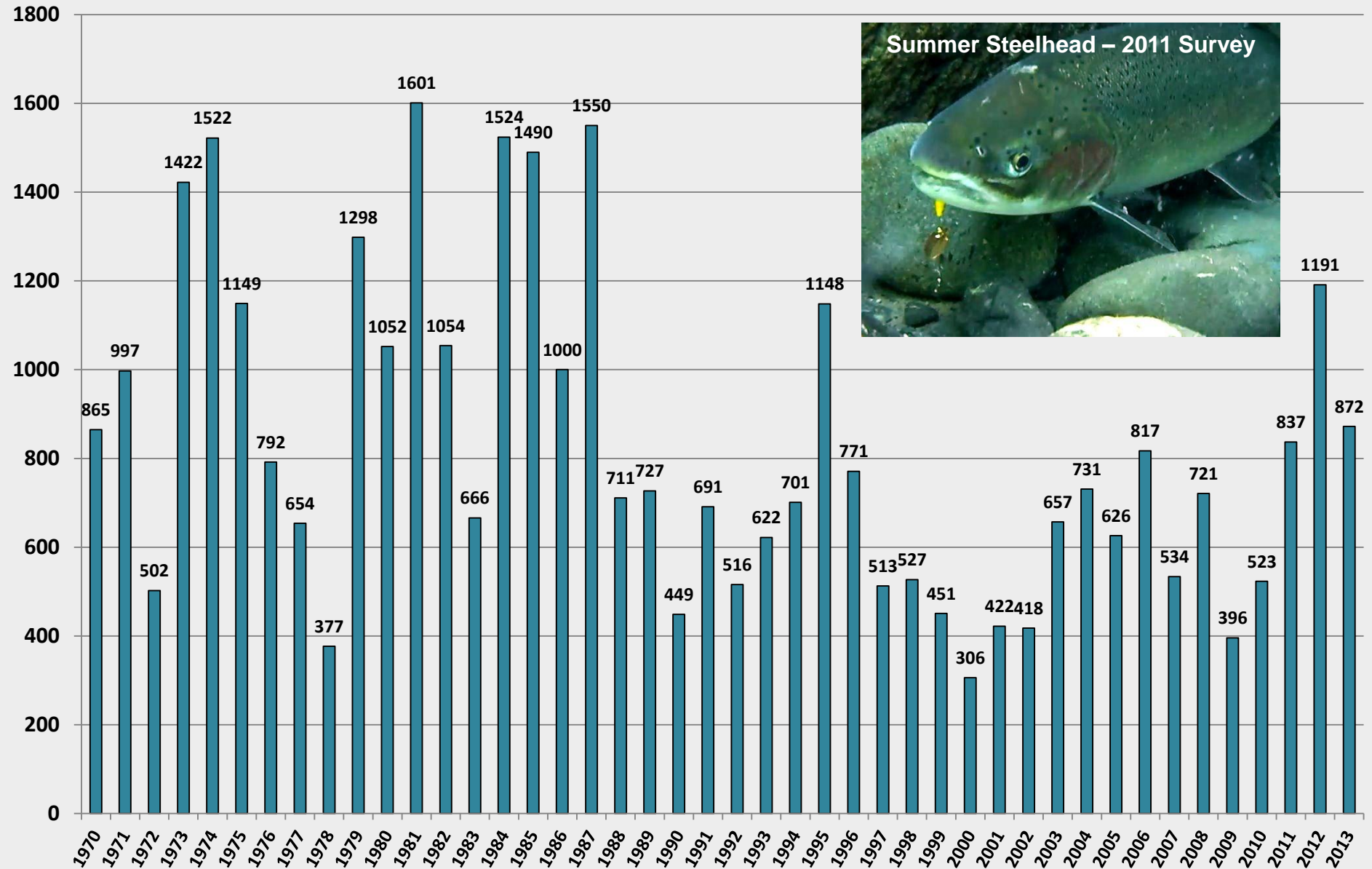
Van Arsdale Fisheries Station



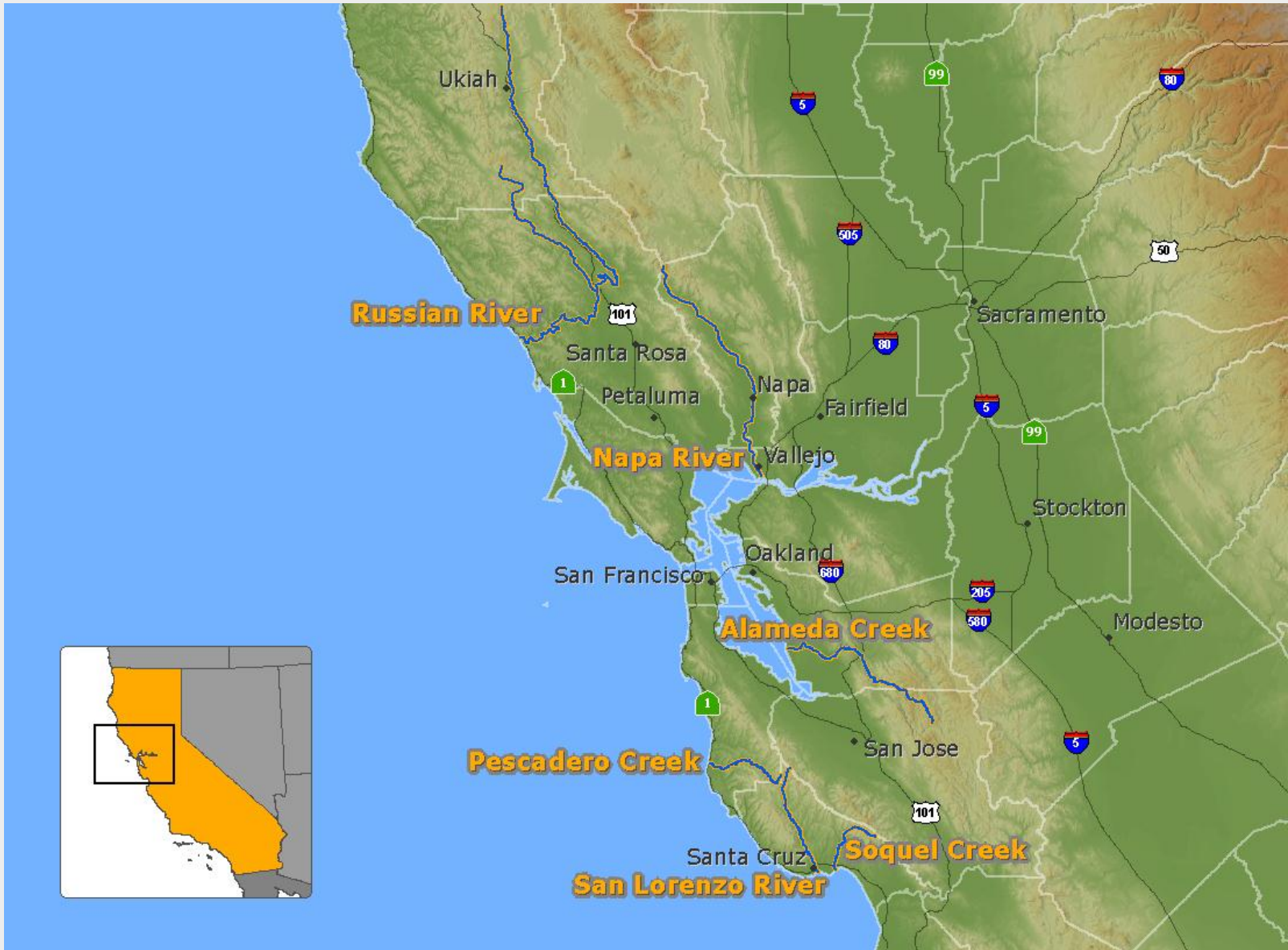
➤ **Average counts in 1940's ~ 4000 annually**

➤ **Sacramento Pikeminnow introduced in 1978/79**

Middle Fork Eel River Summer Steelhead Abundance 1970-2013



Central California Coast DPS



Central California Coast

Status: Threatened (1997)

DPS includes:

➤ **Winter Steelhead**

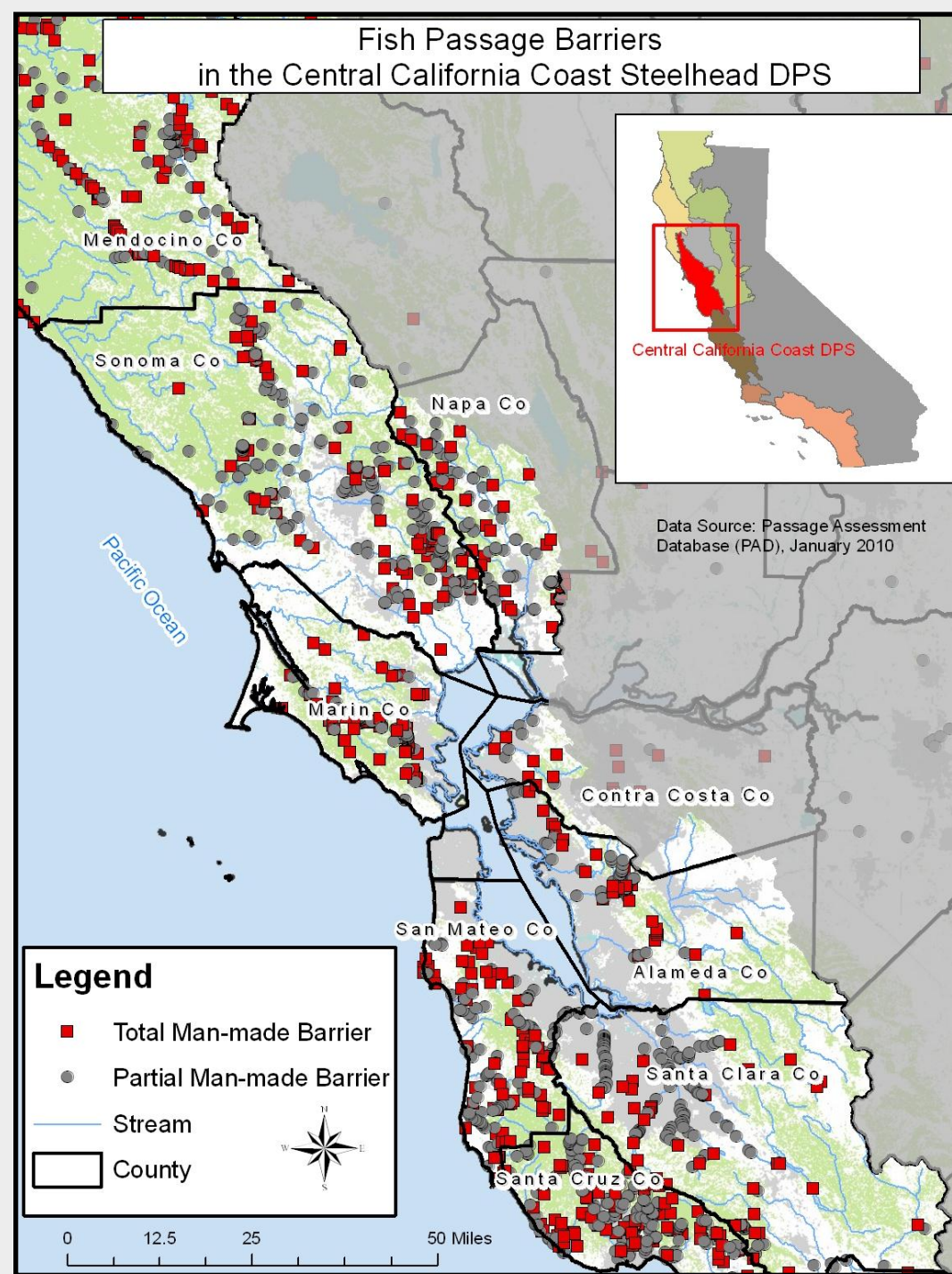
- Stocks continue to decline

Primary Threats:

- **Habitat blockages**
- **Habitat degradation**
- **Urbanization**
- **Dewatering from irrigation**
- **Lagoon breaching**

- **Russian River**
 - 1960's ~ 65,000 annually
 - 1990's < 5000 annually
 - ~ 500 licensed/permitted dams on tributaries

- **Restoration Projects Include:**
 - Estuary enhancements
 - Invasive plant removal
 - Predator removal
 - Riparian enhancement
 - Barrier removals



Central California Coast

Migratory Challenges

Alameda Creek – South Bay, San Francisco



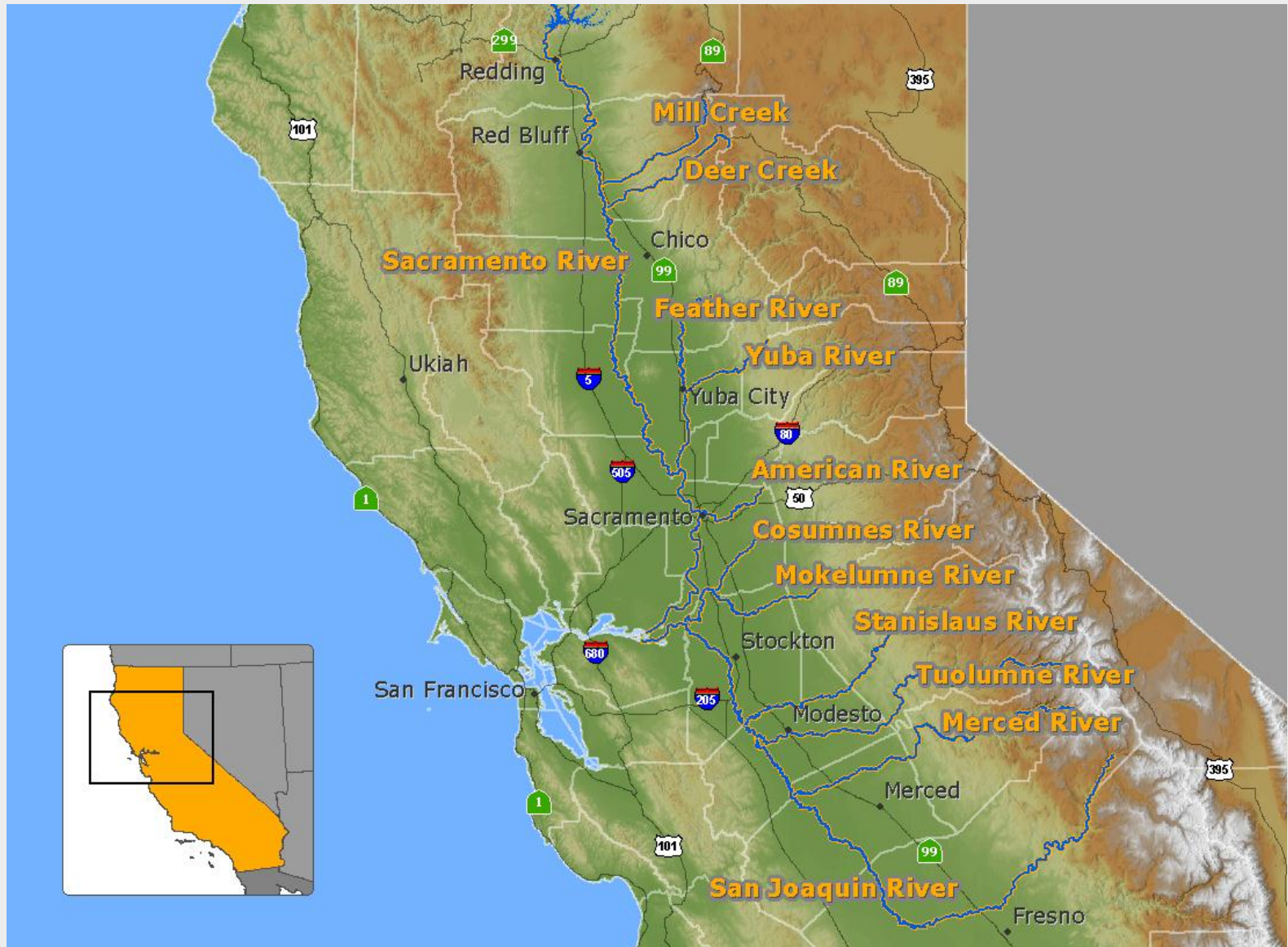
San Lorenzo River, Santa Cruz



Pescadero Lagoon



Central Valley California DPS

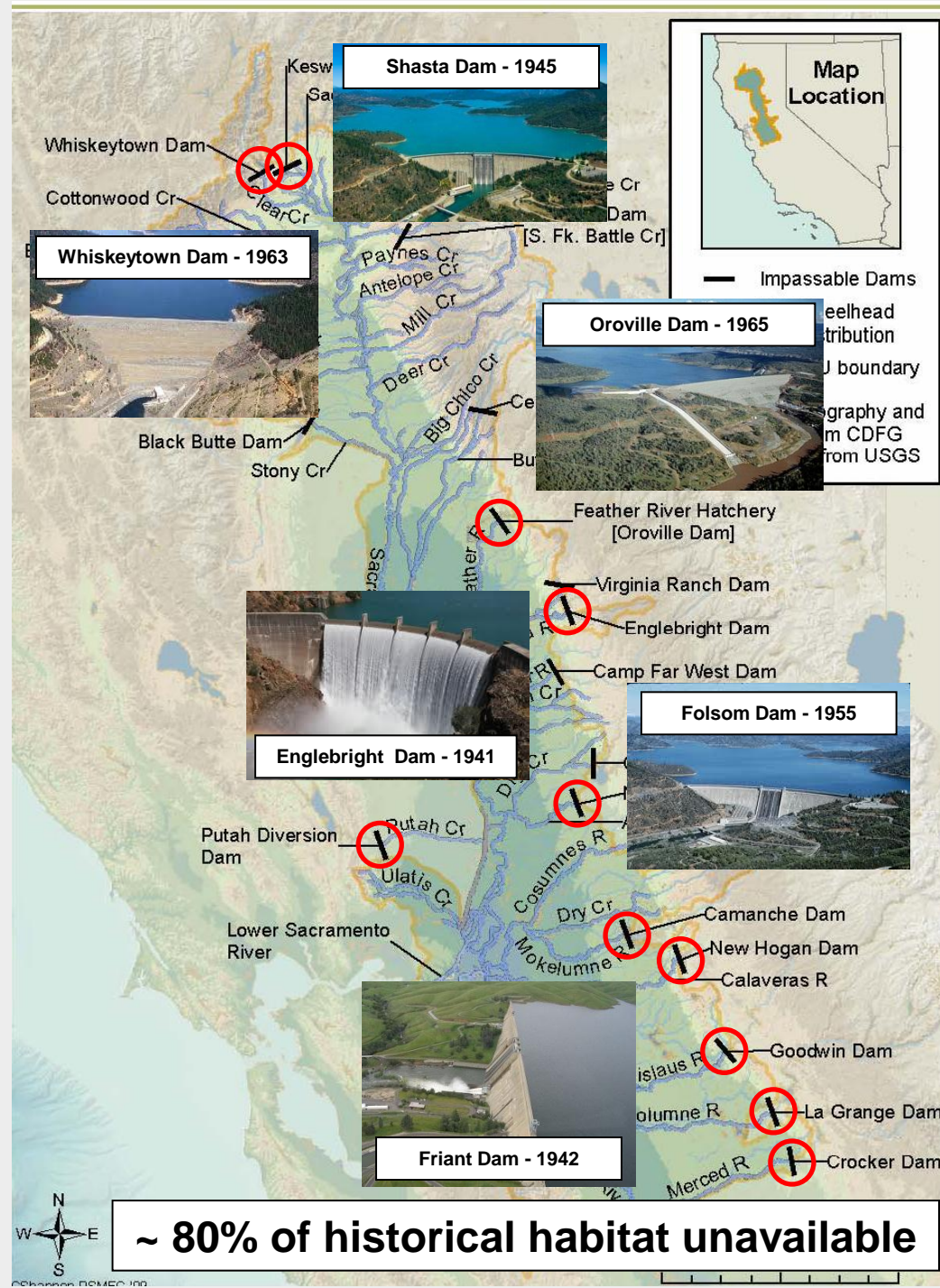


Central Valley

Status: Threatened (1998)

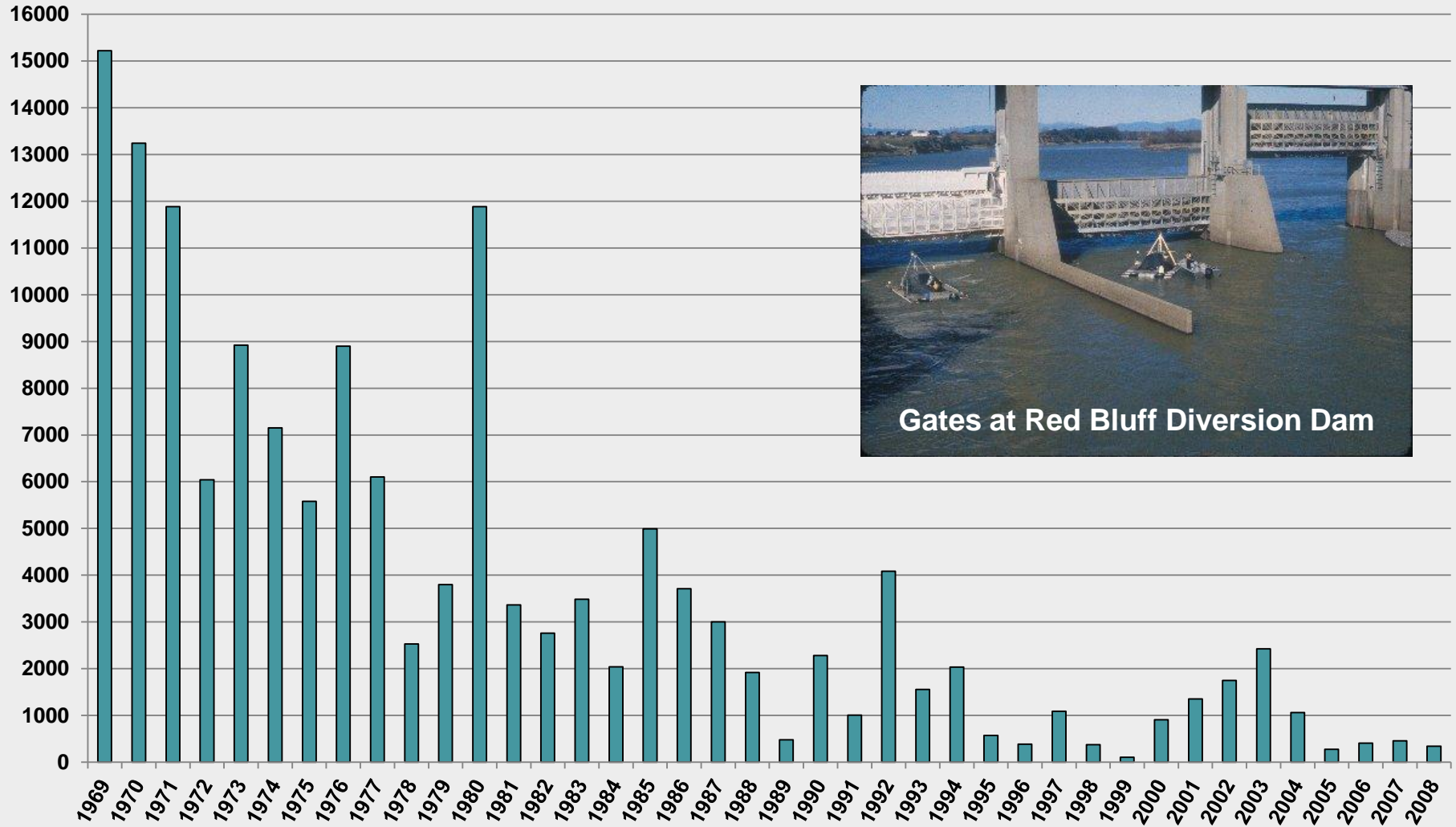
DPS includes:

- **Winter Steelhead**
 - Stocks stable to declining
- **Summer Steelhead (?)**
 - Presence suspected, unverified
- **Resident form *O. mykiss***
 - Many CV streams provide year round cold, food rich habitats that favor a resident life history
- **Run size estimates in Central Valley**
 - Early 1900's - 1 to 2 million SH
 - By 1960, ~ 40,000
 - 2014 – Estimates unavailable
- **Sacramento River and Tributaries**
 - Consistent low wild run sizes
- **San Joaquin River and Tributaries**
 - Wild run size unknown
 - Estimated very low to declining
- **Large hatchery SH influence in CV**
 - ~ 1 million smolts produced annually



~ 80% of historical habitat unavailable

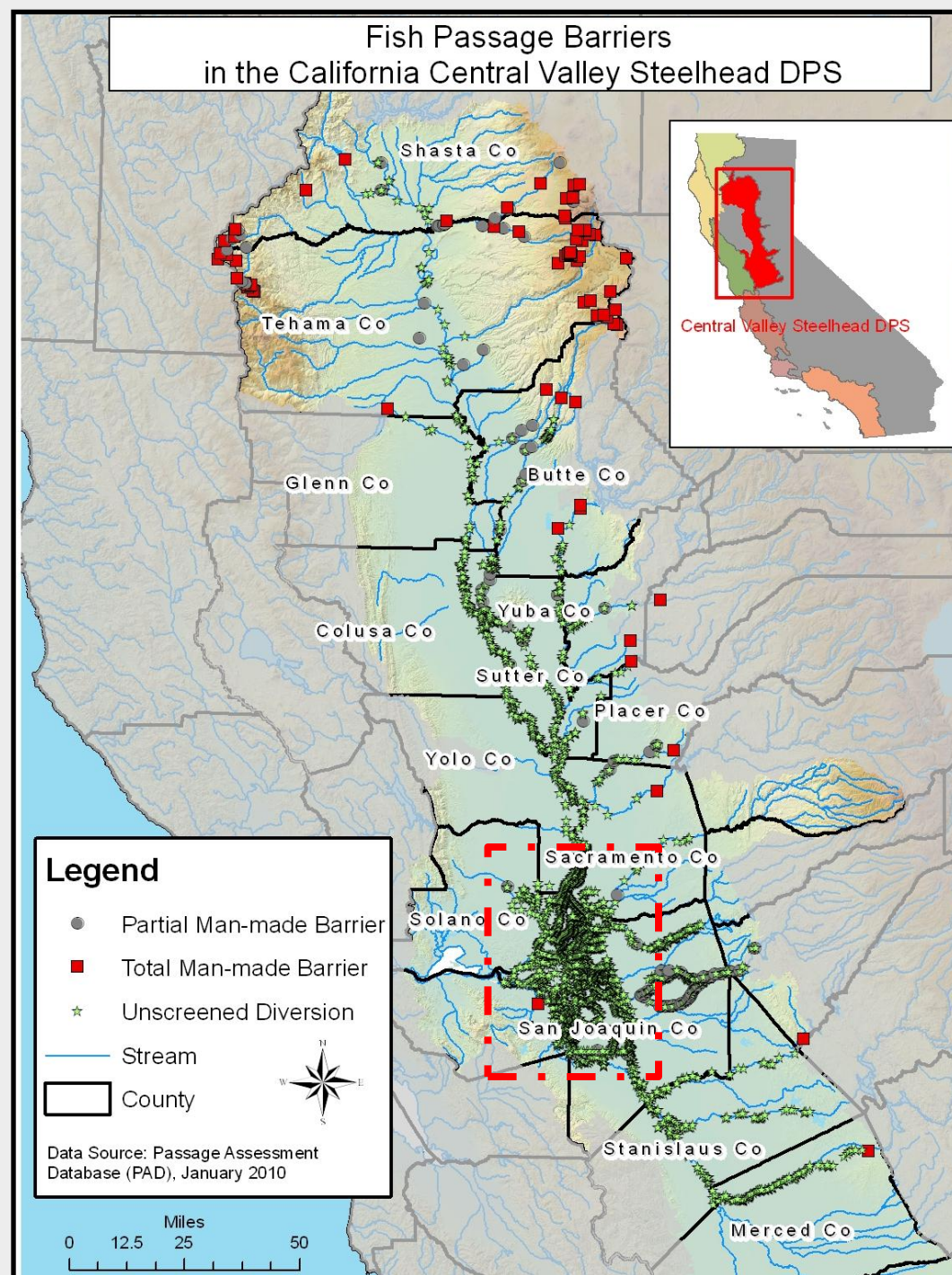
Red Bluff Diversion Dam, Upper Sacramento River



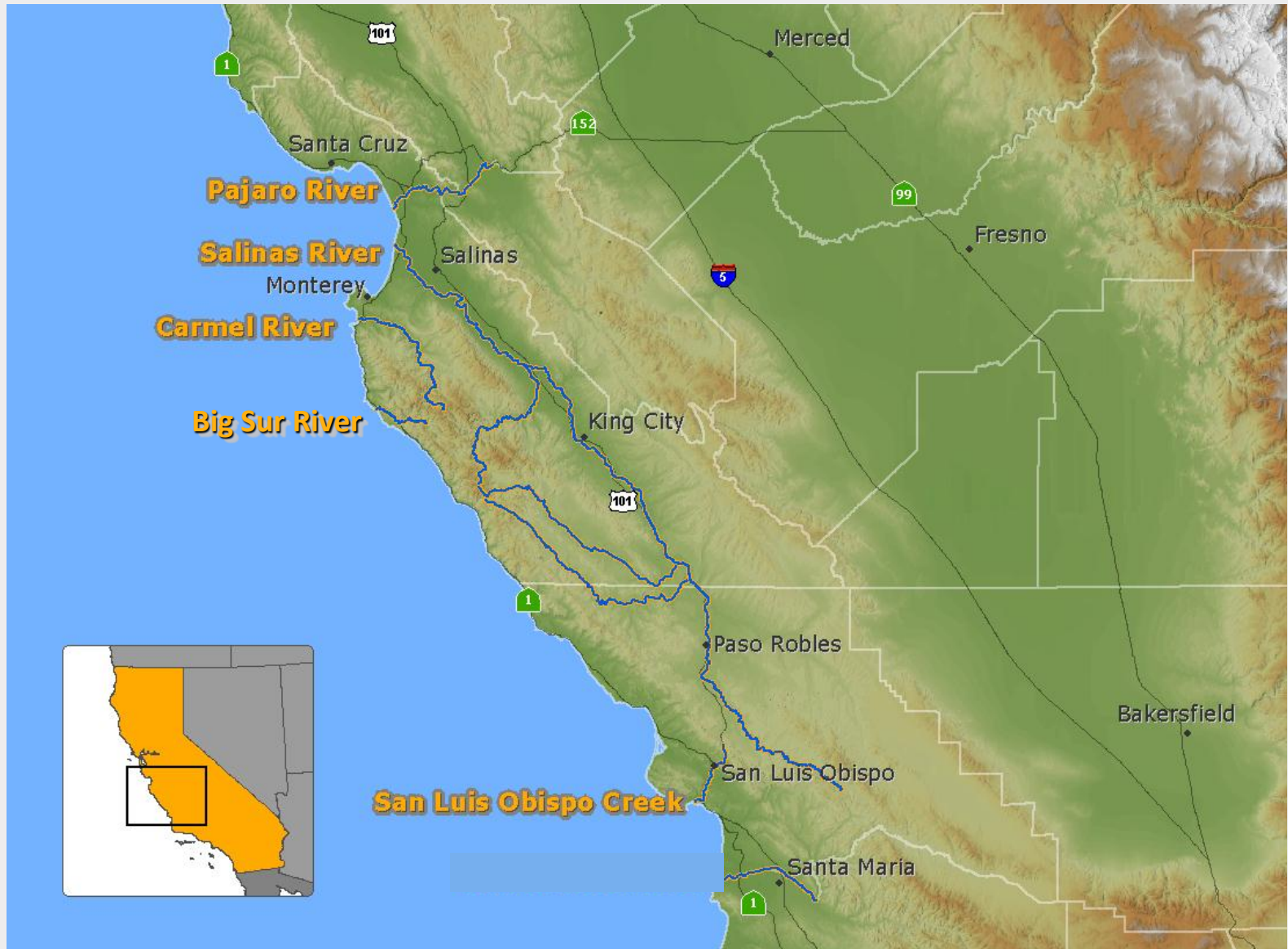
- As of 2009, accurate SH estimates are not available
 - SH counts ceased since gates are now raised through migration period
 - No evidence that low trend has changed

Primary Threats:

- **Dams**
 - **Habitat blockages and loss**
 - **Habitat degradation**
- **Water Management**
 - **Diversions and dewatering**
 - **Poor water quality**
- **Predation**
 - **(Striped Bass/Pikeminnow)**
- **Migration paths in Delta**



South-Central California DPS



South-Central California Coast

Status: Threatened (1997)

DPS includes:

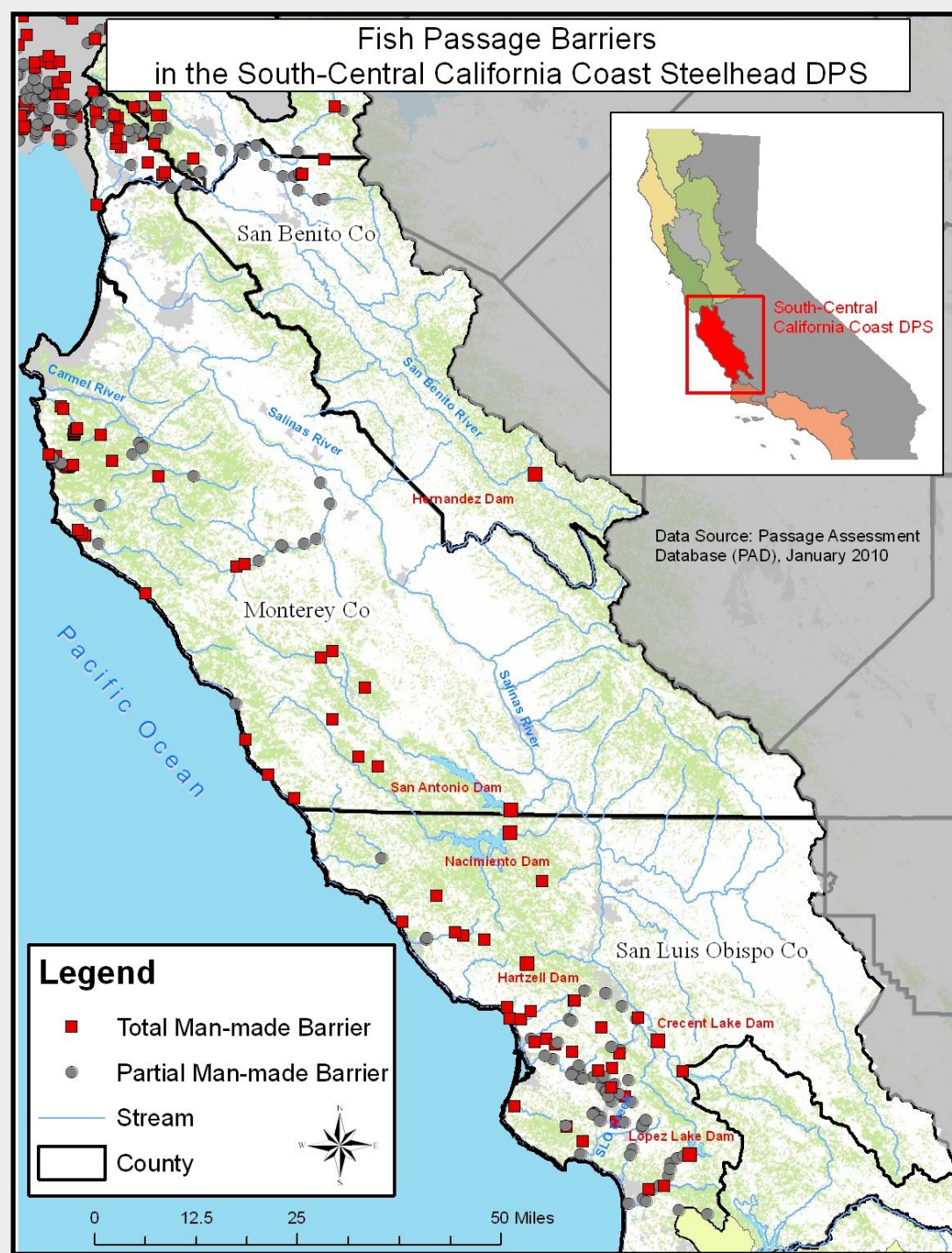
- Winter Steelhead
 - Stocks continue to decline

Primary Threats:

- Habitat blockages
- Habitat degradation
- Dewatering from irrigation
- Lagoon breaching
- High water temperatures
- Predation (Striped Bass/Pikeminnow)
- Invasive plant species

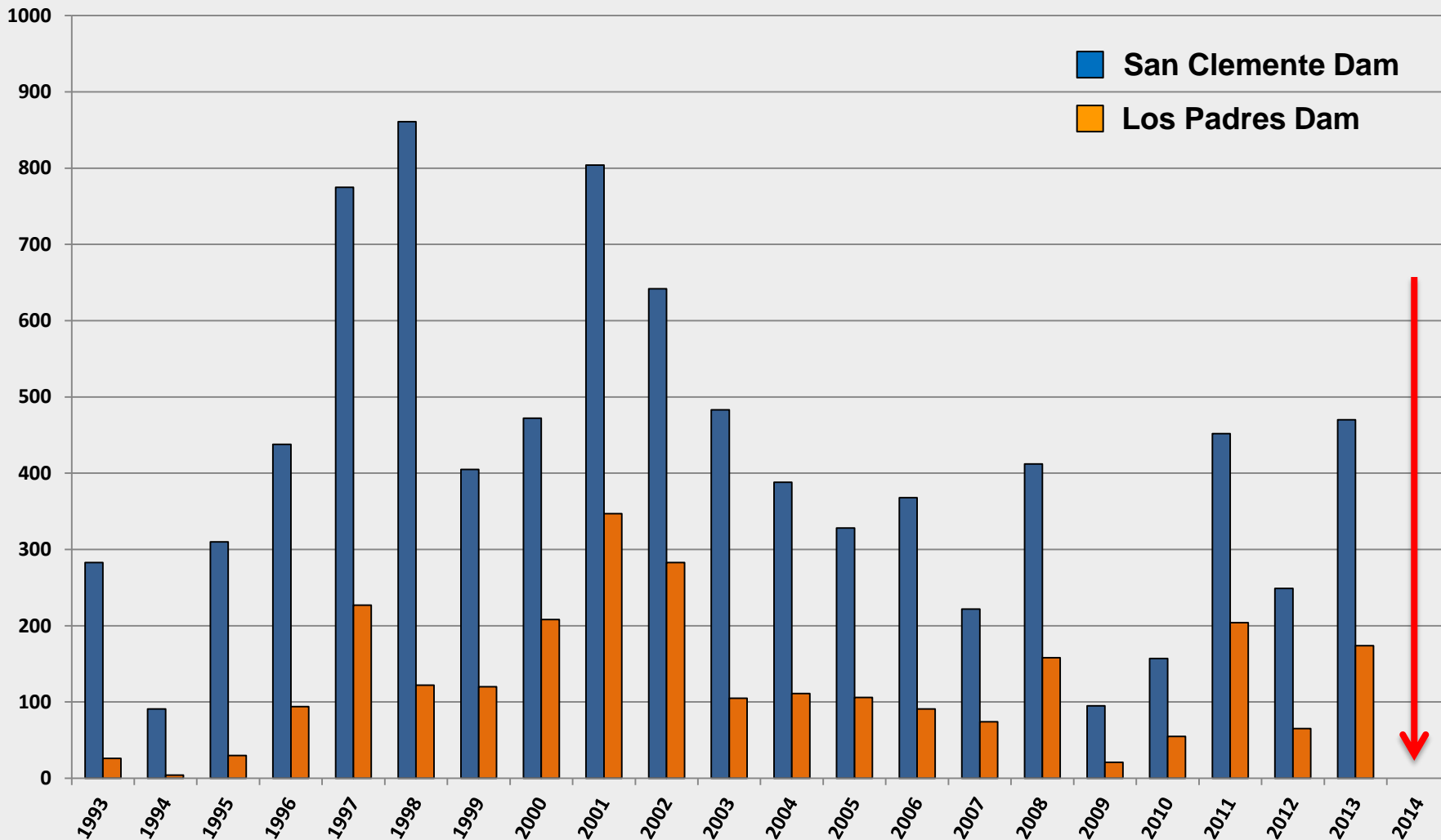
Restoration Projects Include:

- Estuary enhancements
- Invasive plant removal
- Predator removal
- Gravel augmentation
- Riparian enhancement
- Barrier removals



Carmel River Winter Steelhead Counts 1993-2013

San Clemente Dam Fish Ladder and Los Padres Dam Fish Trap



San Clemente Dam

- Removal logistics initiated - 2013
- ~ 8 River Miles to Los Padres Dam

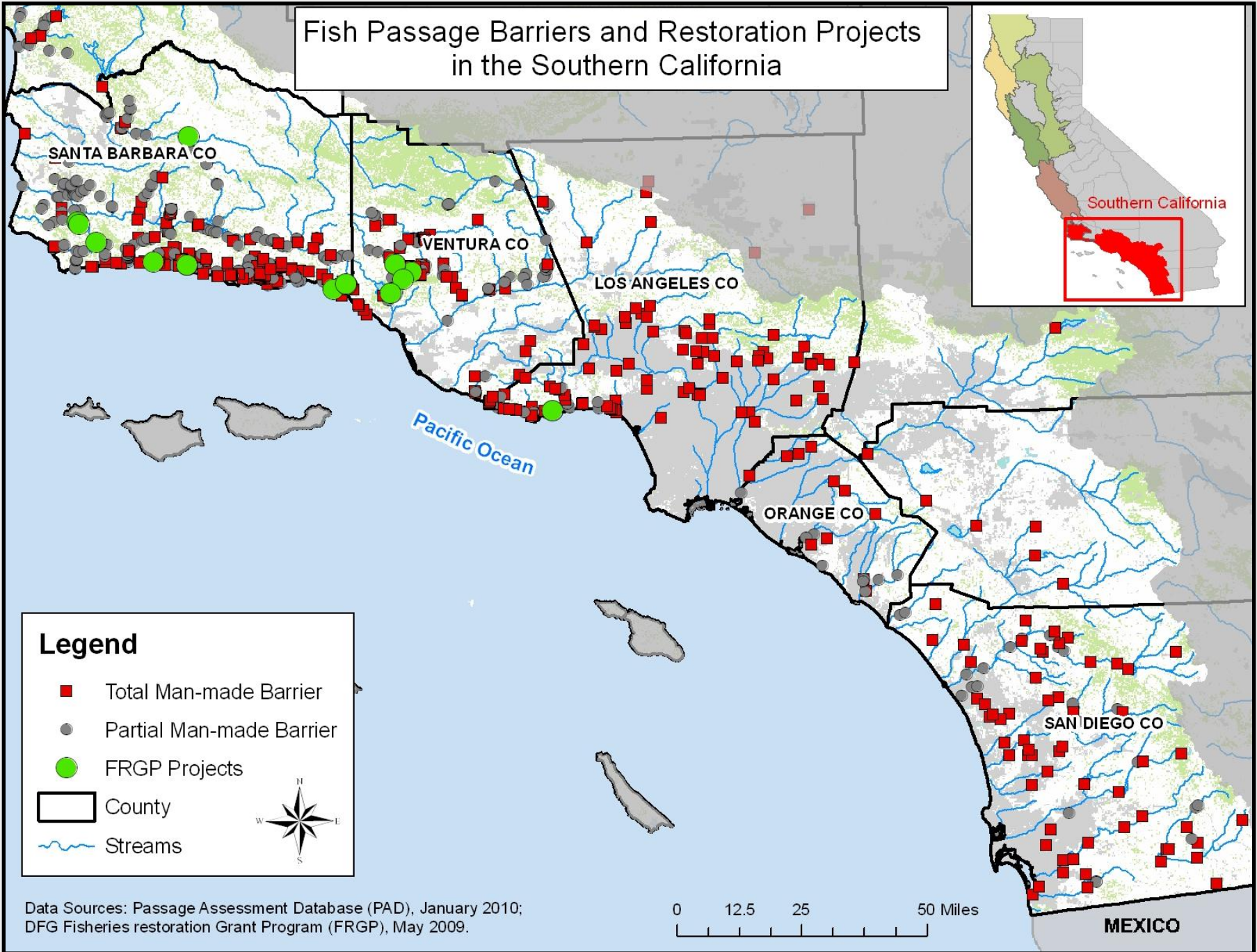
Los Padres Dam

- Adults trap and hauled above dam
- Proposed juvenile/kelt fish collector

Southern California DPS




Fish Passage Barriers and Restoration Projects in the Southern California



Legend

- Total Man-made Barrier
- Partial Man-made Barrier
- FRGP Projects
- County
- ~ Streams



Data Sources: Passage Assessment Database (PAD), January 2010;
DFG Fisheries restoration Grant Program (FRGP), May 2009.

0 12.5 25 50 Miles

MEXICO

Southern California

Status: **Endangered** (1997)

DPS includes:

- Winter Steelhead
 - Stocks continue to decline

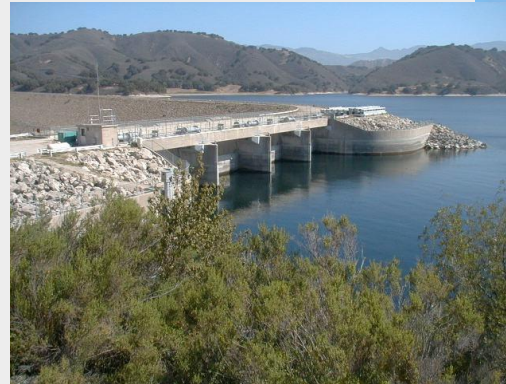
Primary Threats:

- Habitat blockages
- Habitat degradation
- Dewatering from irrigation
- Drought
- Urbanization
- Channelization
- High water temperatures
- Non-native fish
- Invasive plant species (Arundo)

- Restoration Projects Include:
 - Barrier removals
 - Stream channel enhancement
 - Invasive plant removal
 - Riparian enhancement
 - Water user agreements
 - Land acquisitions

Santa Ynez River, Bradbury dam

Historic Runs ~ 20,000



1953



Current Runs < 200

Mission Creek, Santa Barbara – 2008

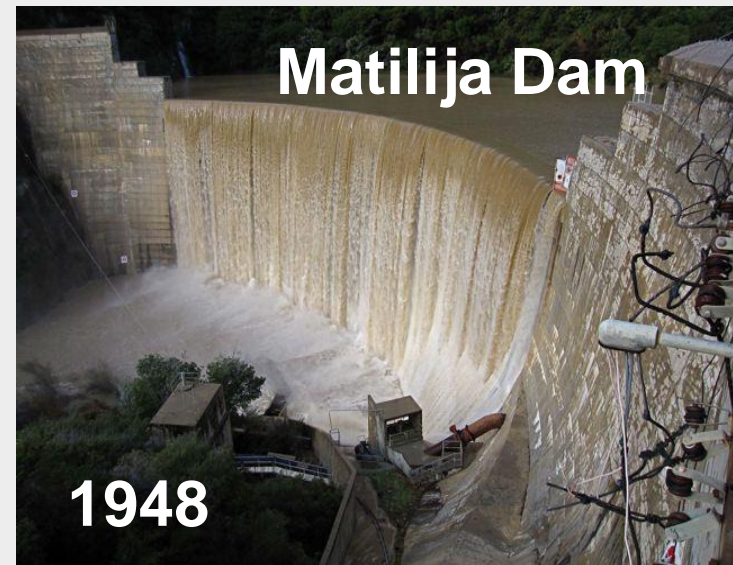


Ventura River



Historic Estimates = 4000 to 6000

Current Estimates < 100 annually



- ~ 50% historic spawning habitat upstream
- Scheduled for Removal in 2020



Fish ladder built 2005

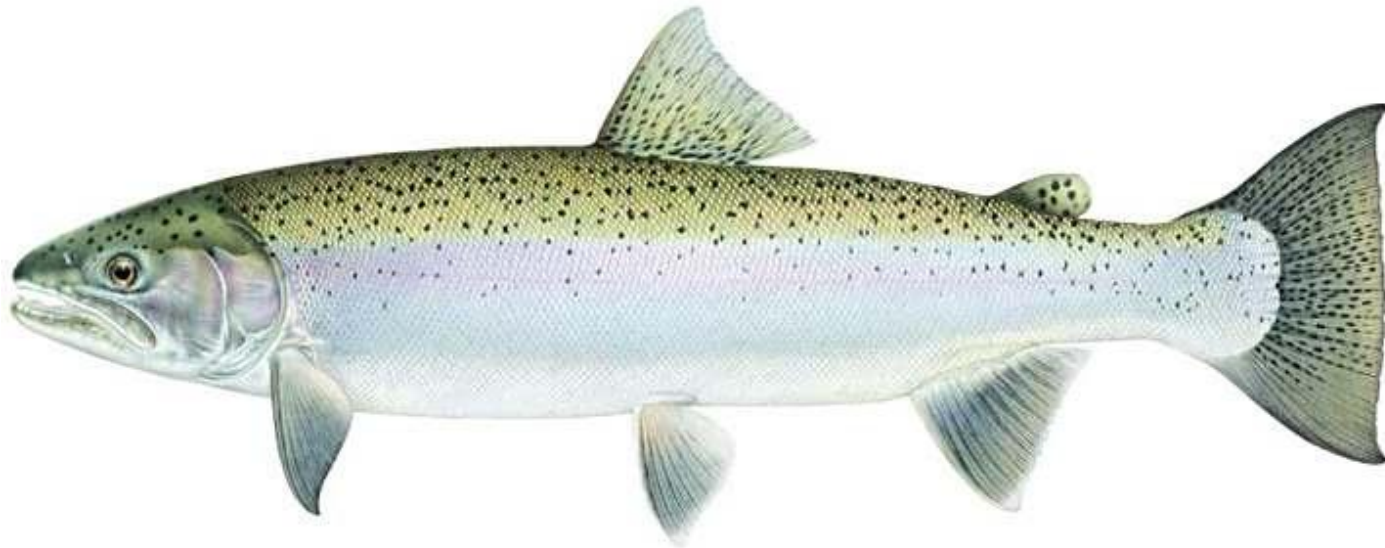


California Steelhead - Hot Topics

- **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**

SUMMARY

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



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