Fish Passage & the California State Highway System

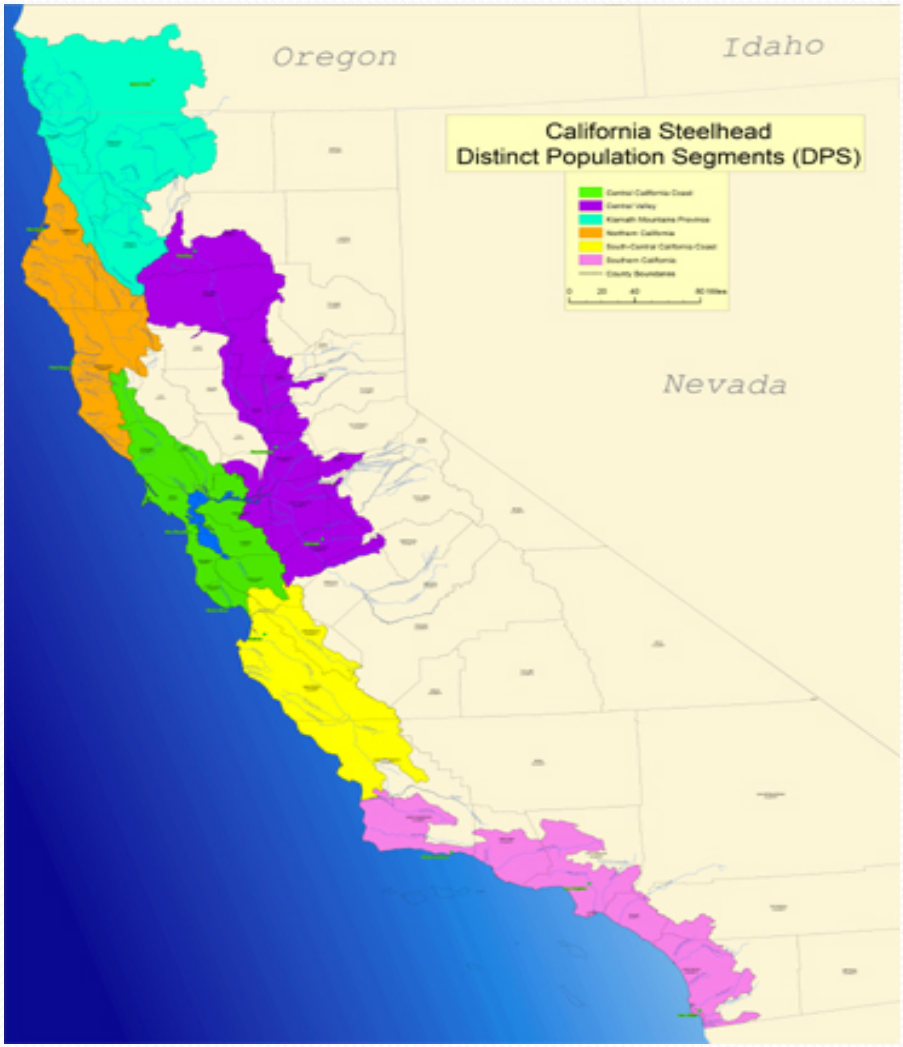
Roadways, Watersheds & Engineering

- Approximately **15,181 miles** of California State Highway.
- Perpendicular orientation of streams and road crossings equate to many intersections.
- Both systems are at risk of disruption from one another.

Salmon & Steelhead in California

- Coho Salmon
- Chinook Salmon
- Steelhead - Coastal Rainbow trout
- Coastal Cutthroat trout

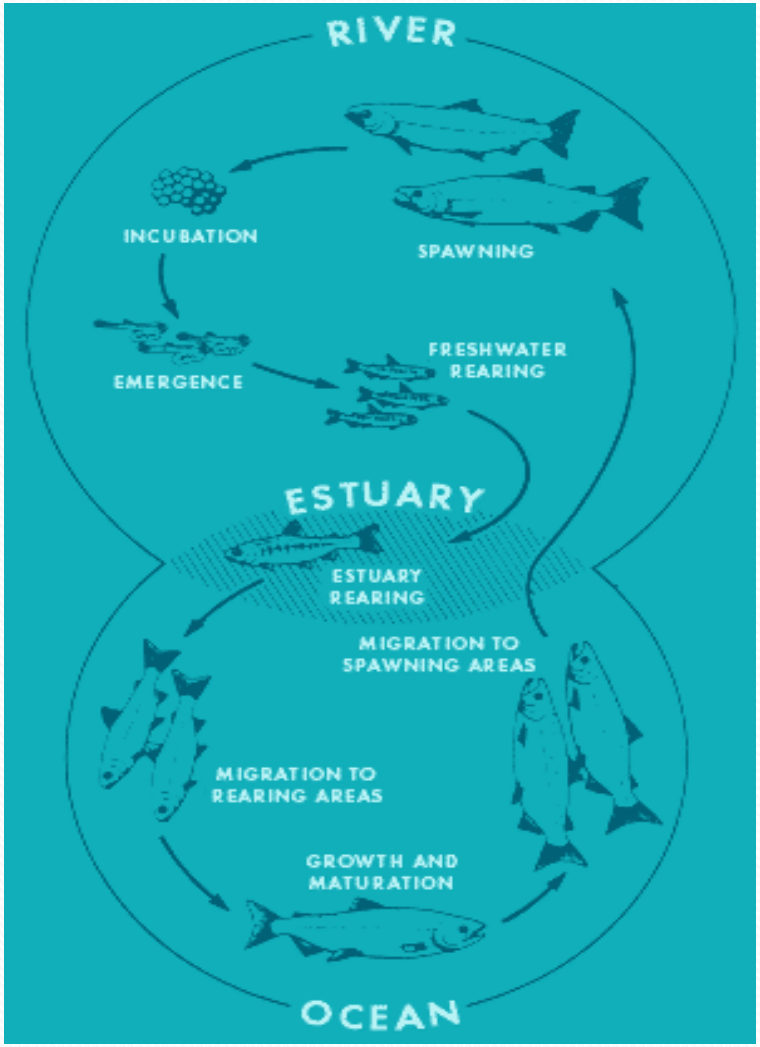
Steelhead Range in California



- Klamath Mountains Province
- Northern California
- Central CA Coast
- Central Valley
- Southern Central California Coast
- Southern California

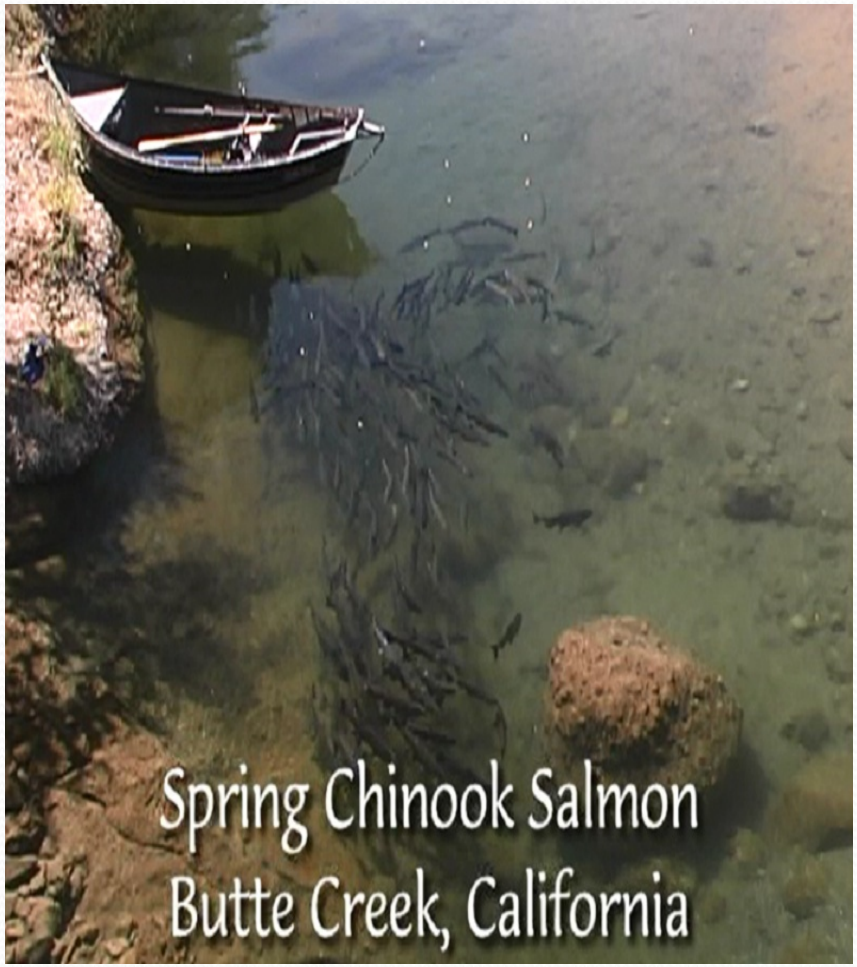
Anadromous Life History

- Adult fish spawn in fresh water river systems
- Eggs develop in the river gravel & fry live on egg yolk
- When yolk gone, tiny Fry leave gravel & feed (insects, etc.)
- Juveniles migrate downstream & grow in estuaries (brackish)
- Year-old salmon spend 2+ years in ocean to mature
- Adults return to home rivers to spawn



SB 857 - Sec 3. Article 3.5 (Streets & Highways Code)

- Prohibits actions that would extend the life of a culvert or bridge that is identified as a barrier to anadromous fish passage.
- Requires Caltrans to construct projects that are not barriers to fish.
- Fish Passage engineering plans & details are approved by CDFW & NMFS during the permitting process.



Legislative Interest

- Legislature has increased interest in fish passage remediation efforts.
- Director Dougherty has asked HQ to work with Districts to find opportunities to fund high priority barrier locations.

Fish Passage Assessments, Reporting, and Coordinators

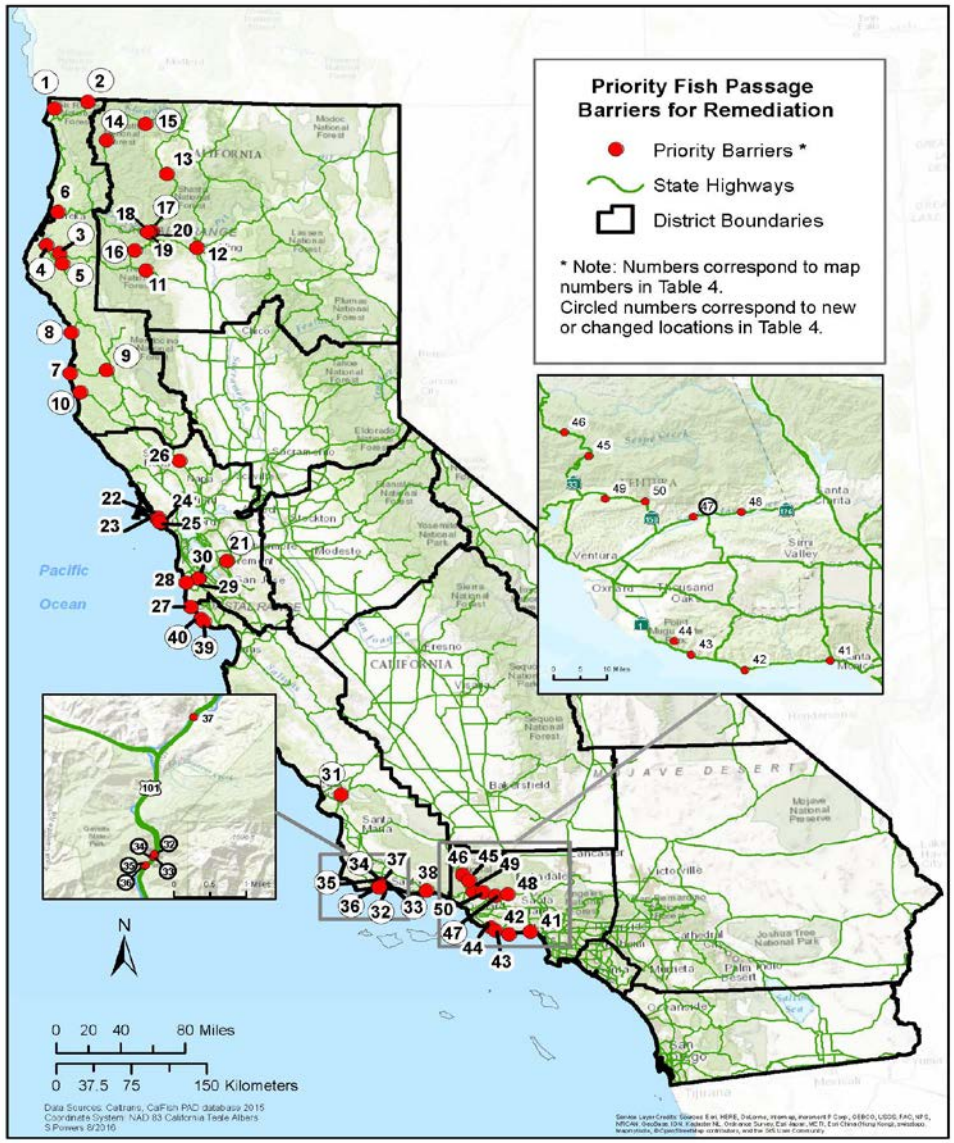
- Caltrans has surveyed approx. **5,500** potential barriers to anadromous fish since 2006.
- Approx. **530** barriers are currently known on the State Highway System.
- Each District with current or historic anadromy has a biology point of contact.

District	Coordinator
1- Eureka	Susan Leroy
2- Redding	Brendan Barney
3- Marysville	Brooks Taylor
4- Oakland	John Yeakel
5- SLO	Mitch Dallas
6- Fresno	Christina Anderson
7- Los Angeles	Peter Champion
10- Stockton	Christene Coffman
11- San Diego	Rush Abrams
12-Orange	Chris Waterston
HQ- Sac	Melinda Molnar 707-445-6627

Current Fish Passage Barriers - SHS

- +/- 530 known barriers
- Barriers remediated (Full & Partial), since 2006 = 39
- Active Fish Passage Projects = 40
- (15/16)Assessments = 659
  - New Barriers = 25

Fish Passage Priorities



- 62 Priority Locations
- Identify potential funding for priority locations.

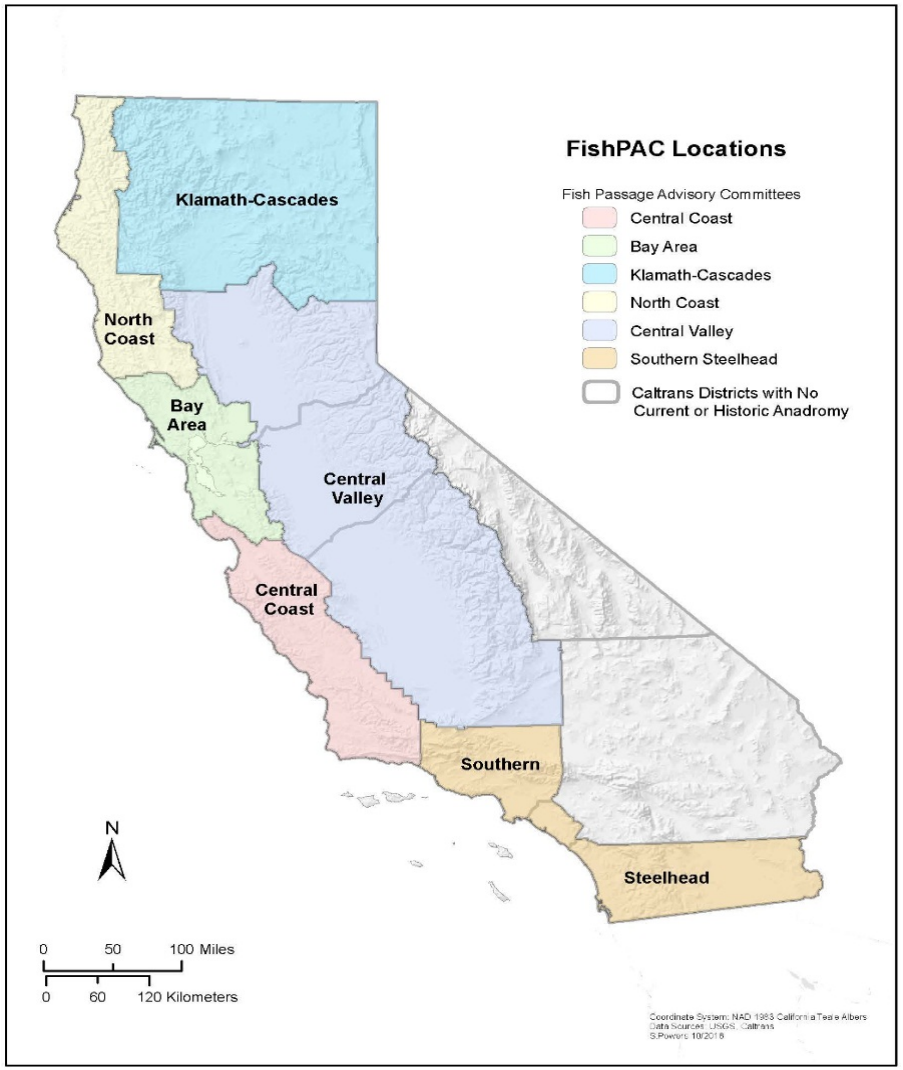
2016 Active (funded) Locations

- 40 Active projects
  - 22 Locations funded in 2015/16
  - 5 Locations funded in 2016/17

Remediation Locations

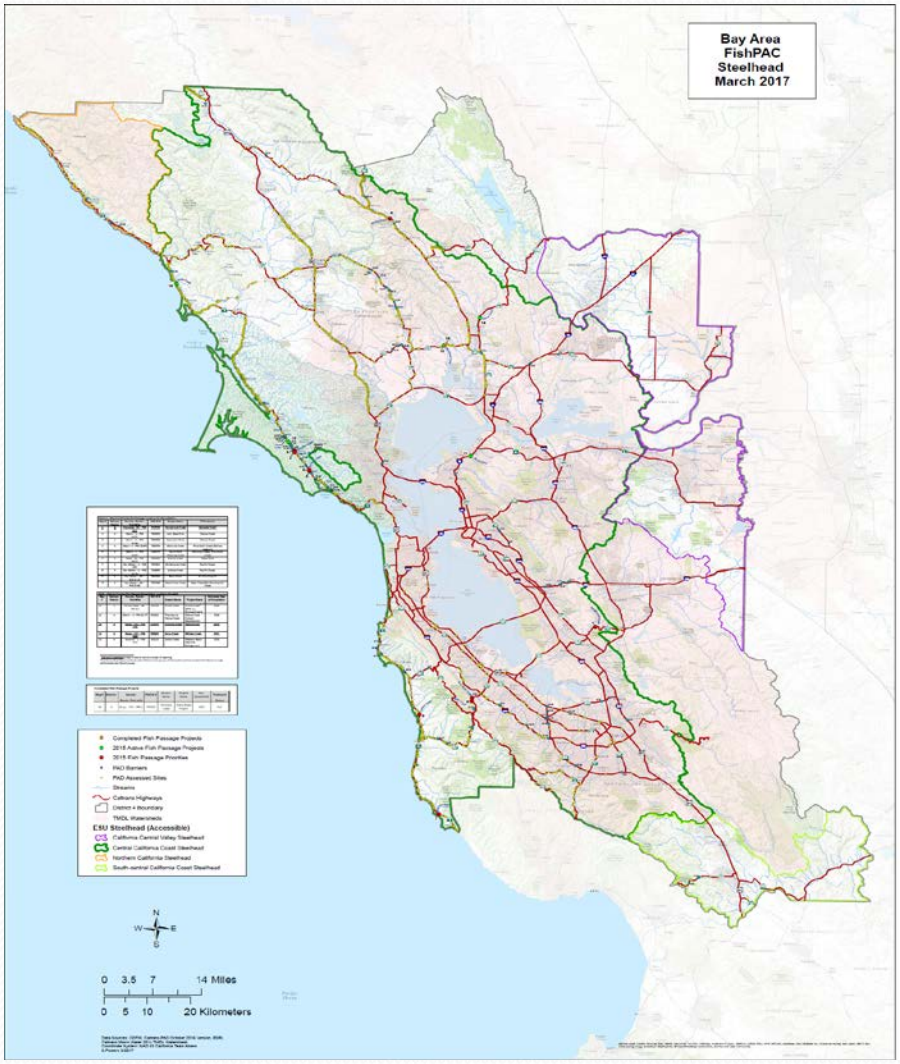
- From 2006 to 2016;
  - 32 partial remediations
  - 7 full remediations
- Partial remediation locations require long-term monitoring and maintenance
  - Annual inspections
  - Cleaning out debris
  - Addressing damaged fish facilities (baffles, weirs, etc.)

Fish Passage Advisory Committees



- Existing FishPAC's
  - D1 – North Coast
  - D2 – Klamath-Cascade
  - D4 – Bay Area
  - D7, D11, D12 – Southern Steelhead
- Planned FishPAC's
  - D5 – Central Coast
    - Aug 15, 2017
  - D3, D6, D10 – Central Valley

FishPAC's

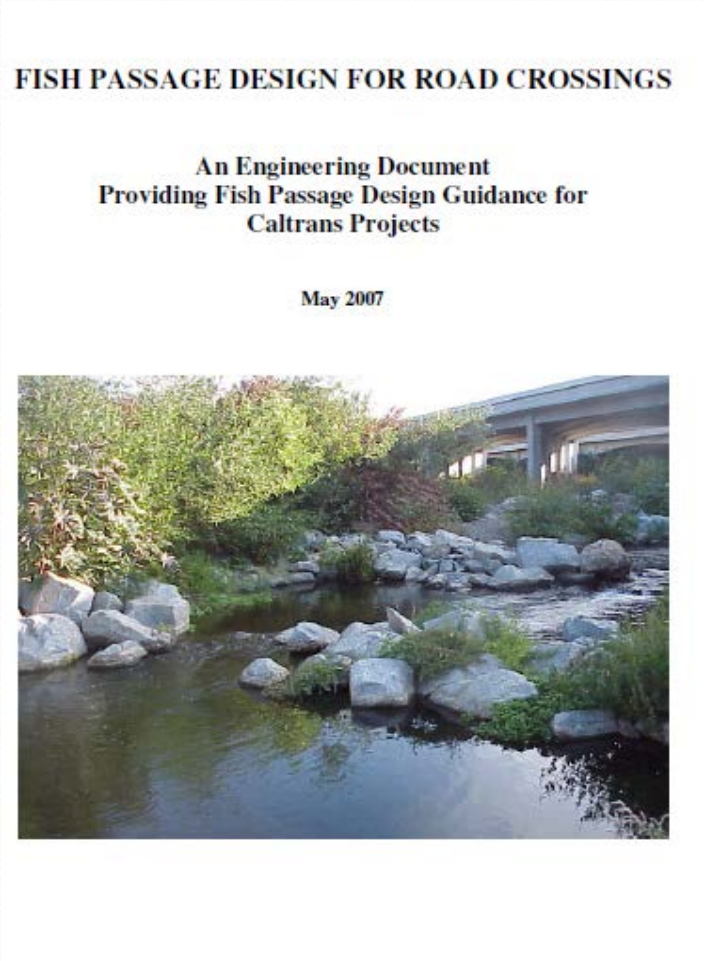


- Members; Caltrans, NMFS, CDFW, USFWS, CalTrout.
  - Some FishPAC's include SCC, counties, tribal, etc.
- Share information, support remediation projects & improve;
  - Science & Data,
  - Engineering, and
  - Permitting

Biological Prioritization of Barriers

- Caltrans coordinates with CDFW, NMFS & other partners to prioritize locations based on biological significance;
  - Presence or historic presence
  - Diversity of anadromous species
  - Suitable upstream habitat (quality & quantity)
  - Thermal refugia (cool H2O)
  - Knowledge of expert & local professionals.

Caltrans - Fish Passage Design Manual



- Design Hydraulics
- Work with CDFW & NMFS to update guidance and ongoing engineering coordination.

Full Solutions
Bridges & Properly Sized Culverts

- **The solution for a majority of under-sized barriers are small bridges.**
- **Structures is working on standard plans for <u>small bridges</u> (20-80 ft).**
- **Design hydraulics is working on standard solutions for large culverts and guidance for cost effectiveness of partial solutions.**

Fish Passage – Engineering Expertise

- Monthly meetings - Interagency Fish Passage Engineering Group.
  - Caltrans HQ OC Design Hydraulics, Maintenance, Structures, Districts 1, 2, 4, 5 & 7 Hydraulic engineers.
  - CDFW & NMFS fish passage engineers.
- Items currently addressing;
  - Standard Inspection forms for Hydraulic (partial) solutions,
  - Guidance & modeling for hydraulic (partial) solutions,
  - Information sharing & education.

Typical Highway Fish Barriers

Typical Highway **Full** Fish Remediations

Typical Hydraulic - **Partial** Remediation

Fish Passage Partnering; Caltrans, CDFW, USFWS, USFS, NMFS, 5 Counties, CalTrout

D2 - Fort Goff Creek, constructed 2014

After 1 season, 64 Chinook spawning sites were surveyed upstream of the new bridge

Dunn Creek, MEN 1 - Barrier Inlet/Outlet (D1)

Barrier related to depth of culvert & pool, velocity, slope,

Dunn Creek – Post Construction

Sultan Creek
DN 197, PM 5.0

Species: Coho, Chinook, steelhead, coastal cutthroat

Habitat: 4,500 ft. (.85 miles)

Culvert outlets

Little Mill Creek - Before

Little Mill Creek – DN 197

Little Mill Creek (cont.)

Chadd Creek -HUM 101, PM 40.7

- Barrier related to jump, pool depth at outlet and in culvert

Chadd Creek – Isolate & Dewater

- Isolate work area to block species from coming back in.
- Qualified or permitted biologists relocate fish & amphibians from area.
- Dewater – clean water diversion to maintain species in downstream areas.

Dewatered & Demo Complete

Chadd Creek - After

Juvenile and adult fish have been observed above the barrier, since remediation

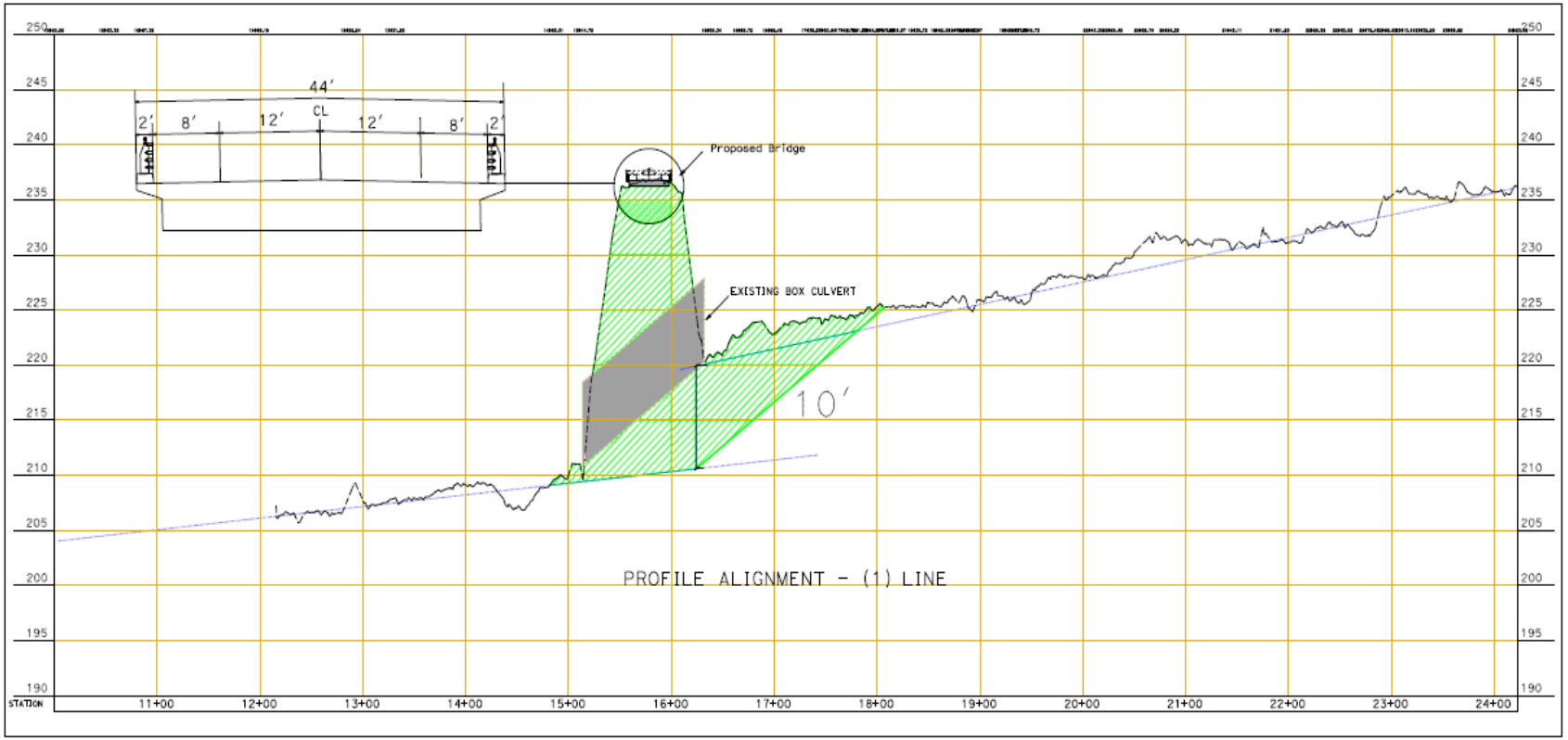
Fish Creek – HUM 254 pm 4.18

- Avenue of the Giants, tributary to Eel River
- Number 1 Priority for D1
- CalTrout secured $1.4M grant funding but the design was determined infeasible.
- CDFW & Caltrans agree that the solution is a bridge.
- HQ, District 1 & Storm Water Implementation - partnering to fund bridge solution.

Fish Creek (cont.)

Fish Creek – Outlet Scour

Channel Restoration – Sediment Accumulation



Other Wildlife Benefits

Thank You