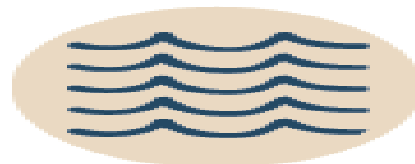
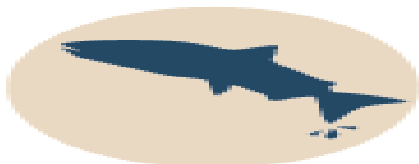




Anadromous Fish Screen Program (AFSP)

By Dan Meier
January 17, 2013

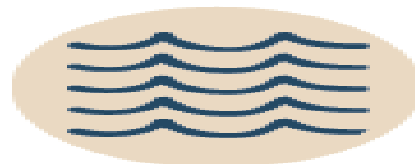
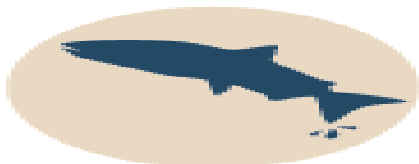


Central Valley Project Improvement Act



Presentation Outline

- Program Authority and Purpose
- Program Organization
- Coordination with the State of California
- Program Summary
- Recent & Current Projects
- Adaptive Management
- Questions

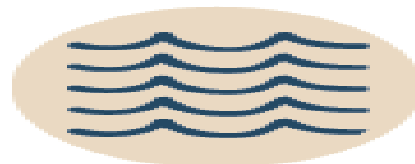
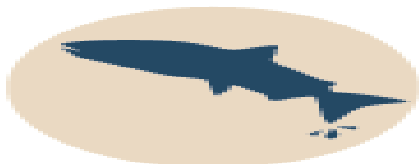


Central Valley Project Improvement Act



Program Authority

- CVPIA Section 3406 (b)(21) directs Interior to assist the State of California in efforts to implement measures to avoid losses of juvenile anadromous fish from diversions in Sacramento and San Joaquin watersheds and the Delta
- The AFSP was initiated in 1994
- The cost share from Interior shall not exceed 50% of total fish screen costs



Central Valley Project Improvement Act



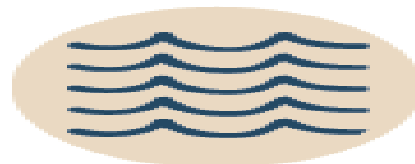
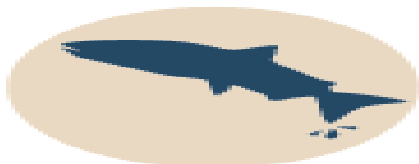
Program Structure

Program Leads are:

- Dan Meier, USFWS
- Tim Rust, Reclamation

AFSP Technical Team includes representatives from:

- California Department of Fish and Wildlife
- California Department of Water Resources
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- Bureau of Reclamation



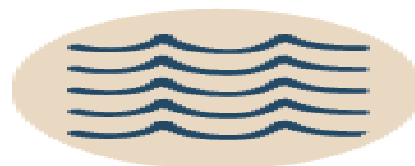
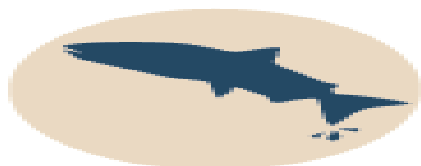
Central Valley Project Improvement Act



Coordination with State of California

The CALFED Ecosystem Restoration Program (ERP) during Phase I established the following fish screen priorities:

- M & T Ranch/Llano Seco (Sacramento) Complete (1997)
- Princeton-Cordora Glenn Provident (Sacramento) – Complete (1999)
- Hallwood-Cordua (Yuba River) – Complete (2000)
- City of Sacramento's diversions (American & Sacramento) – Complete (2004 & 2005)
- Sutter Mutual diversions (Sacramento) – Complete (2007, 2010 & 2011)
- RD-108 diversions (Sacramento) – Complete (2000, 2008 & 2011)
- Coleman NFH intakes (Battle Creek) – Partially Complete (2010)
- Pleasant Grove-Verona diversions (NCC) (Feasibility Study completed)
- **Meridian Farm diversions (Sacramento) Partially Complete (One of three intakes screened in 2009)**
- **Natomas Mutual diversions Partially Complete (Two of five intakes relocated and screened in 2012)**
- **RD 2035 (Sacramento) (Project at 100 % design)**



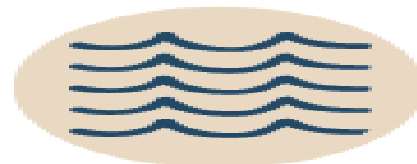
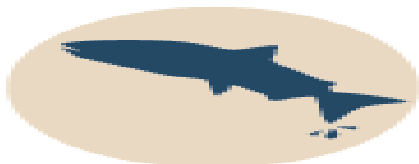
Central Valley Project Improvement Act



Coordination with State of California

The CALFED ERP Phase I Implementation Plan identified a critical need to conduct studies to assess the benefits of fish screening. Some key questions that were identified included:

- **Cost Benefits:** Is there a point at which screen additional diversions no longer provides population level benefits for the fish of interest? Are the cumulative benefits of screen projects known?
- **Selection Criteria:** Is it more beneficial to screen some diversions than others, based on size, location, and mode of operation?
- **Alternatives to Screening:** Are there alternatives to fish screens for many diversions?



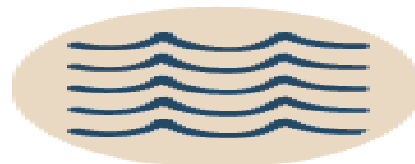
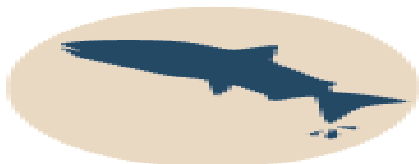
Central Valley Project Improvement Act



AFSP Projects Summary

- Sacramento River – 21 Projects = 4212 cfs
- Butte Creek – 4 Projects = 257 cfs
- Yuba River – 1 Project – 65 cfs
- American River- 1 Project = 310 cfs
- Delta – 6 Projects – 113 cfs
- San Joaquin River – 2 Projects – 455 cfs

35 Total Projects Thru FY 2012 = 5412 cfs



Central Valley Project Improvement Act



AFSP Key FY 2011 Accomplishments



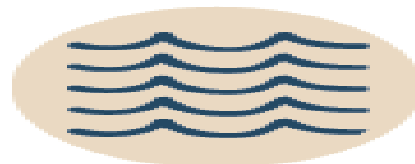
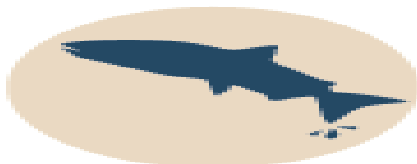
Patterson Fish Screen – 195 cfs

Key Partners:

- California Department of Fish & Wildlife
- National Marine Fisheries Service
- US Fish and Wildlife Service
- Bureau of Reclamation
- Patterson Irrigation District

Funding Sources:

- ERP (CDFW)
- AFSP (Reclamation)
 - CVPIA Restoration Fund
 - Water & Related
 - Bay Delta
- Patterson Irrigation District



Central Valley Project Improvement Act



AFSP Key FY 2011 Accomplishments

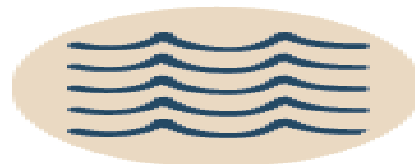
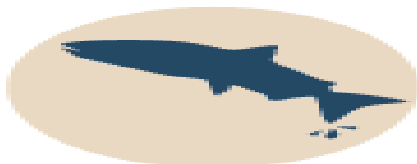
Sutter Mutual Portuguese Bend Fish Screen – 106 cfs

Key Partners:

- California Department of Fish & Wildlife
- National Marine Fisheries Service
- US Fish and Wildlife Service
- Bureau of Reclamation
- Family Water Alliance
- Sutter Mutual Water District

Funding Sources:

- ERP (CDFW)
- AFSP (Reclamation)
 - CVPIA Restoration Fund



Central Valley Project Improvement Act



AFSP Key FY 2012 Accomplishments

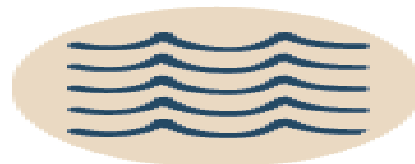
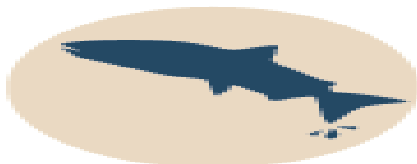
Bella Vista Fish Screen – 85 cfs

Key Partners:

- California Department of Fish & Wildlife
- National Marine Fisheries Service
- US Fish and Wildlife Service
- Bureau of Reclamation
- Family Water Alliance
- Bella Vista Water District

Funding Sources:

- ERP (CDFW)
- AFSP (Reclamation)
 - Water & Related



Central Valley Project Improvement Act



AFSP Key FY 2012 Accomplishments



On-going Projects

West Stanislaus Irrigation District (347 cfs)

- Feasibility Study Completed
- Supplemental Feasibility Study Completed

Meridian Farms Phase II (135 cfs)

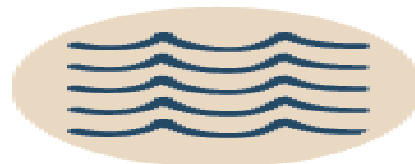
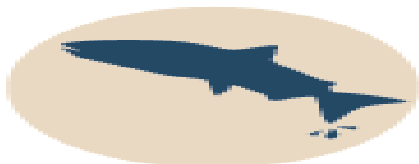
- Design
- Environmental
- Permitting

Yuba City (74 cfs)

- Design, Environmental and Permitting Completed
- Construction Initiated



Coffer Dam at Yuba City



Central Valley Project Improvement Act



AFSP Key FY 2012 Accomplishments

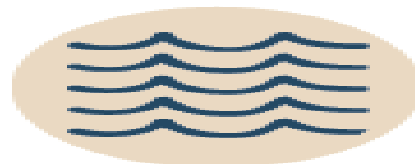
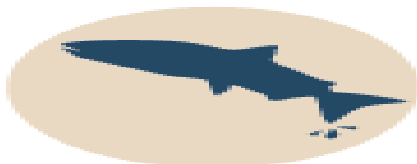


Natomas Mutual Phase I Sankey Fish Screen (389 cfs)

- Fish Screen (Substantially Complete Fall 2012)

Funding Sources:

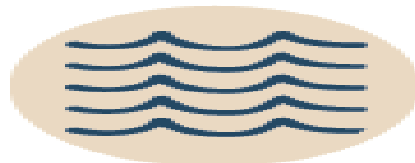
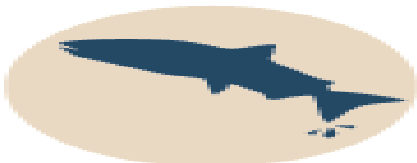
- ERP (CDFW)
- AFSP (Reclamation)
 - Bay Delta
 - CVPIA Restoration Fund
 - Water & Related



Central Valley Project Improvement Act



Sankey Fish Screen



Central Valley Project Improvement Act

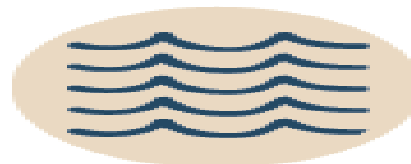
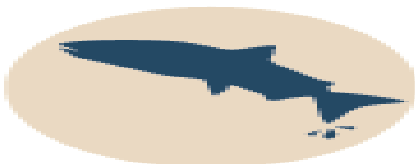
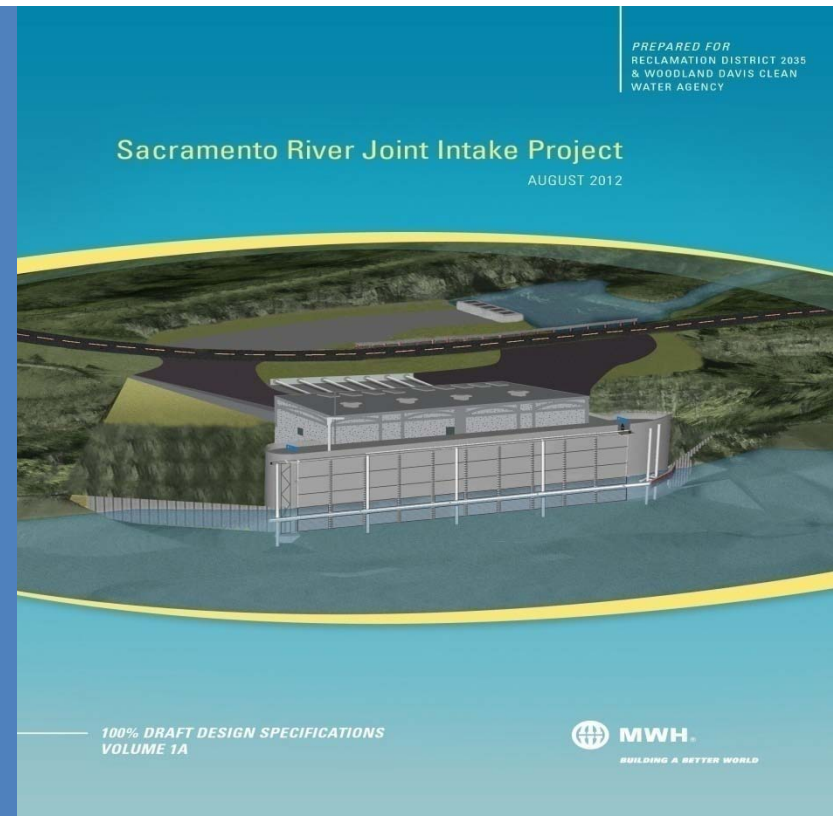


AFSP Key FY 2012 Accomplishments



RD 2035/WDCWA Joint Intake & Fish Screen (400 cfs)

- Design
- Environmental
- Permitting

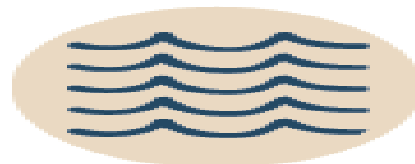
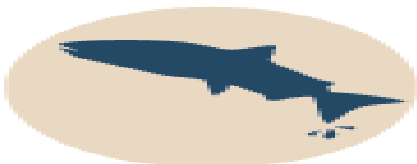


Central Valley Project Improvement Act



AFSP FY 2013 Project Funding

Project	Funding
RD 2035/WDCWA Joint Intake & Fish Screen (400 cfs) Construction	~ \$2 M
Fish Deterring Device Study at Sycamore Mutual	\$185 K
Fish Predation Study	\$50 K



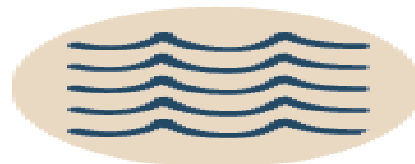
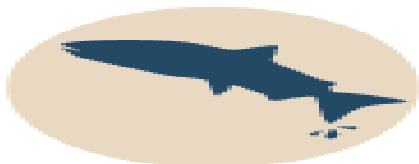
Central Valley Project Improvement Act



Adaptive Management

Adaptive Management: is a structured, iterative process of decision-making in the face of uncertainty, with an aim of reducing uncertainty over time using system monitoring.

- The AFSP in partnership with the ERP is using an adaptive management approach to assess the benefits of additional fish screens on the Sacramento River.
- The larger diversions over 150 cfs in size on the Sacramento mainstream have been screened or are currently proposed for screening.
- There are many smaller diversions on the Sacramento River that remain unscreened. There is uncertainty about both the benefits of additional fish screens on the mainstem, and which diversions should be the highest priority for screening.
- A fish entrainment monitoring program was implemented (2009-2012) to collect fish entrainment data at eleven Sacramento River diversion sites.
- This monitoring will provide important information on the effect of site-specific physical, hydraulic and habitat characteristics and will help assess the benefits and need for of future fish screening.

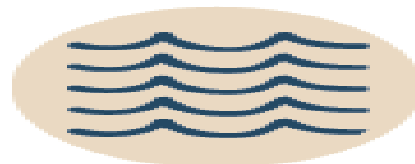
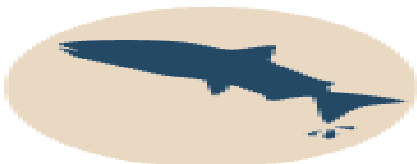


Central Valley Project Improvement Act



AFSP Key FY 2013 Activities

- Final Fish Entrainment Monitoring Report (2009-2012) Due in March 2013
- Five Fish Screens at Sacramento River Diversions (Totaling 202 cfs)
 1. Sanchez Farms
 2. Alamo Farms
 3. River Garden Farms #3
 4. Tisdale #2
 5. Cranmore Farms #2



Central Valley Project Improvement Act



Sycamore Ranch Monitoring Site 2009/2010





AFSP Key FY 2013/2014 Activities

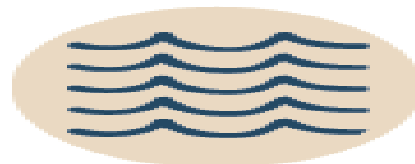
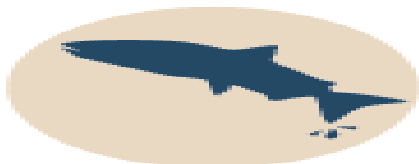
Construct Four Fish Screens (Totaling 220 cfs)

- Feather Water District North & South Diversions
- South Sutter #1
- Compton (CICC)

Funding Sources:

- ERP (CDFW)
- AFSP (Reclamation)
 - Water & Related

Implemented through Family Water Alliance and Subcontractors



Central Valley Project Improvement Act



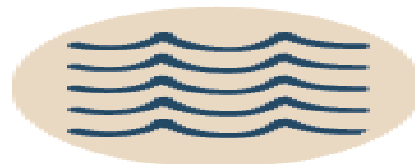
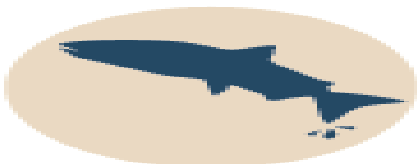
AFSP Key FY 2013 Activities

Complete Natomas Phase I Sankey Project (389 cfs)

- Removal of Natomas Cross Canal Pumping Plants & Seasonal Dam Planned for Spring 2013



Seasonal Verona Dam



Central Valley Project Improvement Act

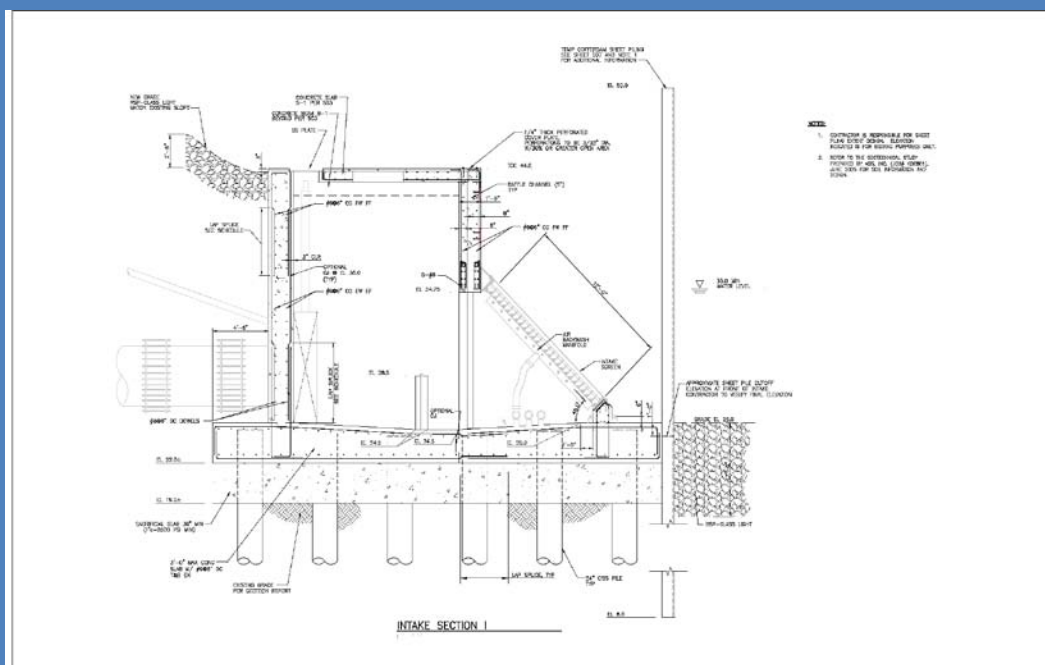


AFSP Key FY 2013 Activities

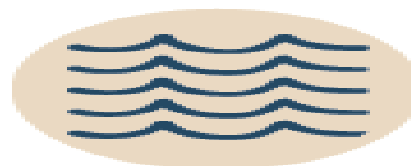
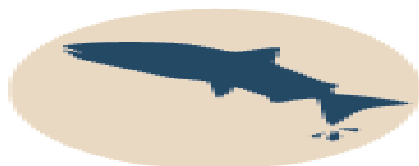
Complete Yuba City Construction (74 cfs)

Funding Sources:

- Yuba City
- ERP (CDFW)
- AFSP (Reclamation)
 - CVPIA RF



ICF Jones & Stokes



Central Valley Project Improvement Act

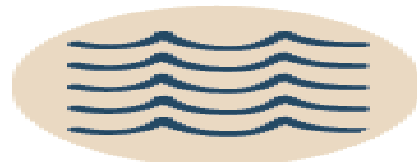
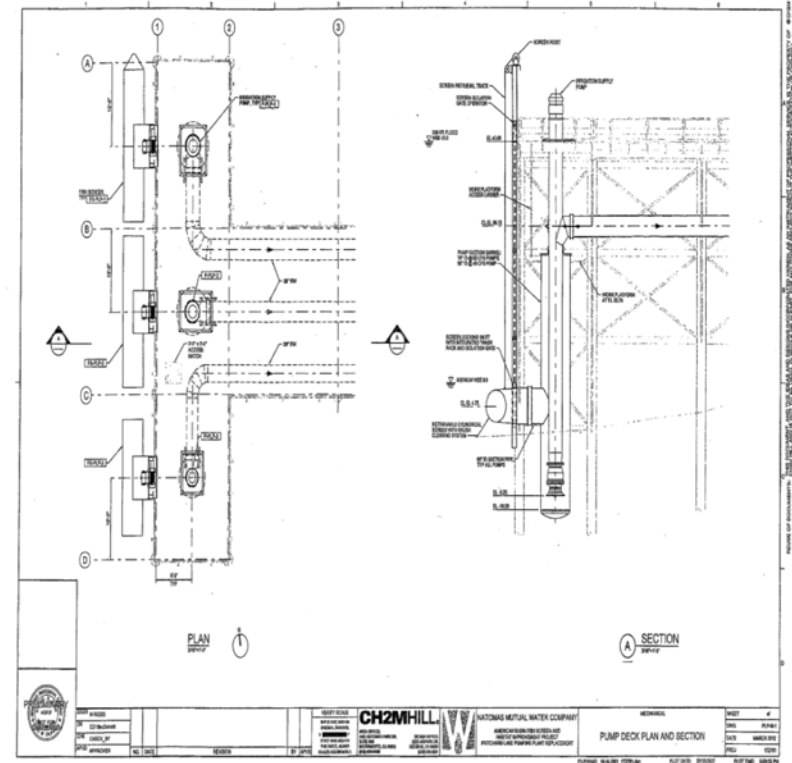


AFSP Key FY 2013/2014 Activities



Initiate Natomas Phase 2A Project Pritchard Lake (160 cfs)

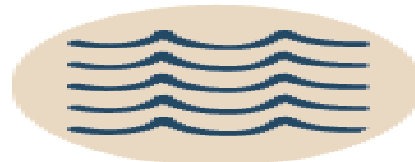
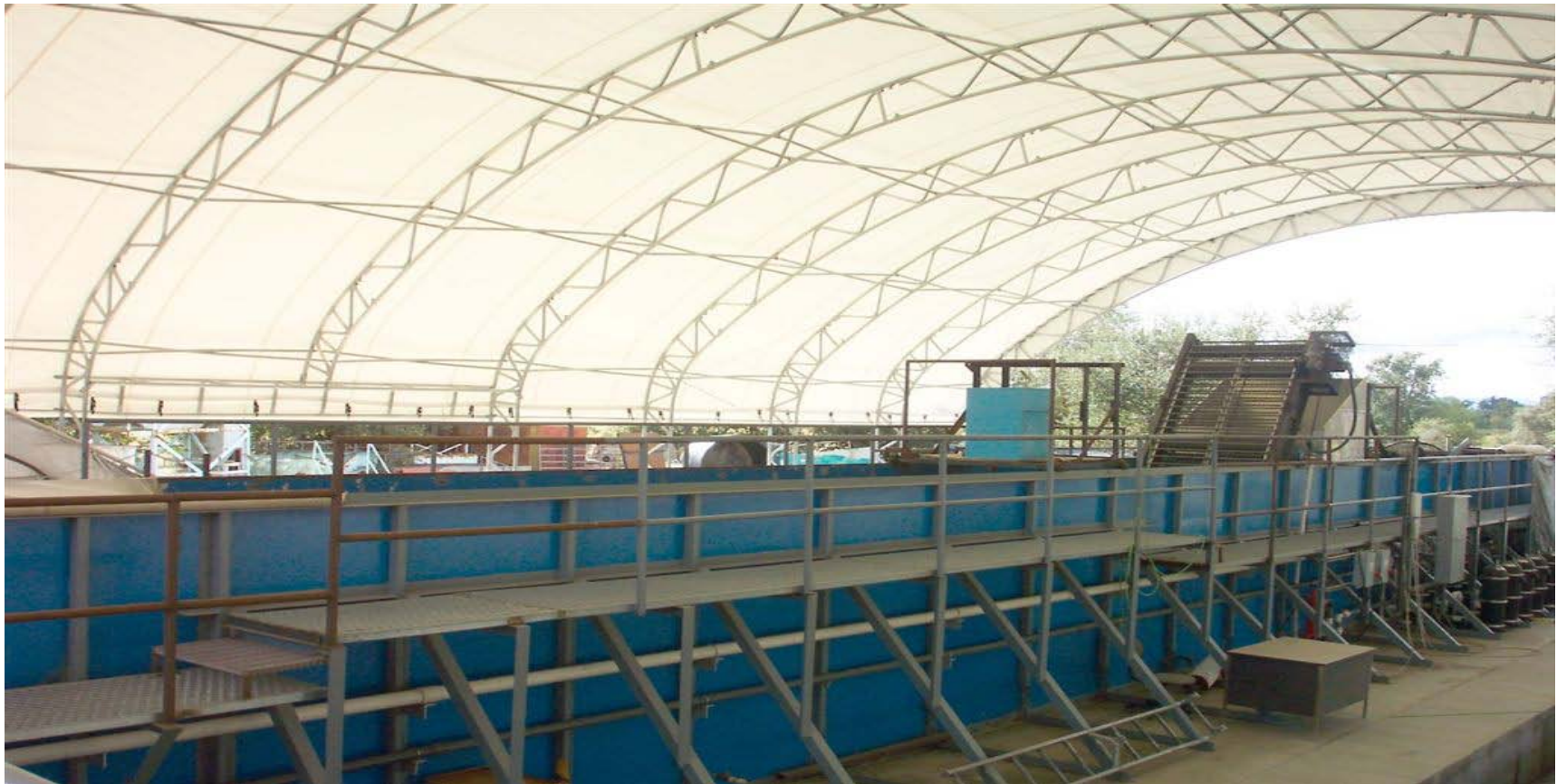
- Partners include SAFCA and CDFW



Central Valley Project Improvement Act

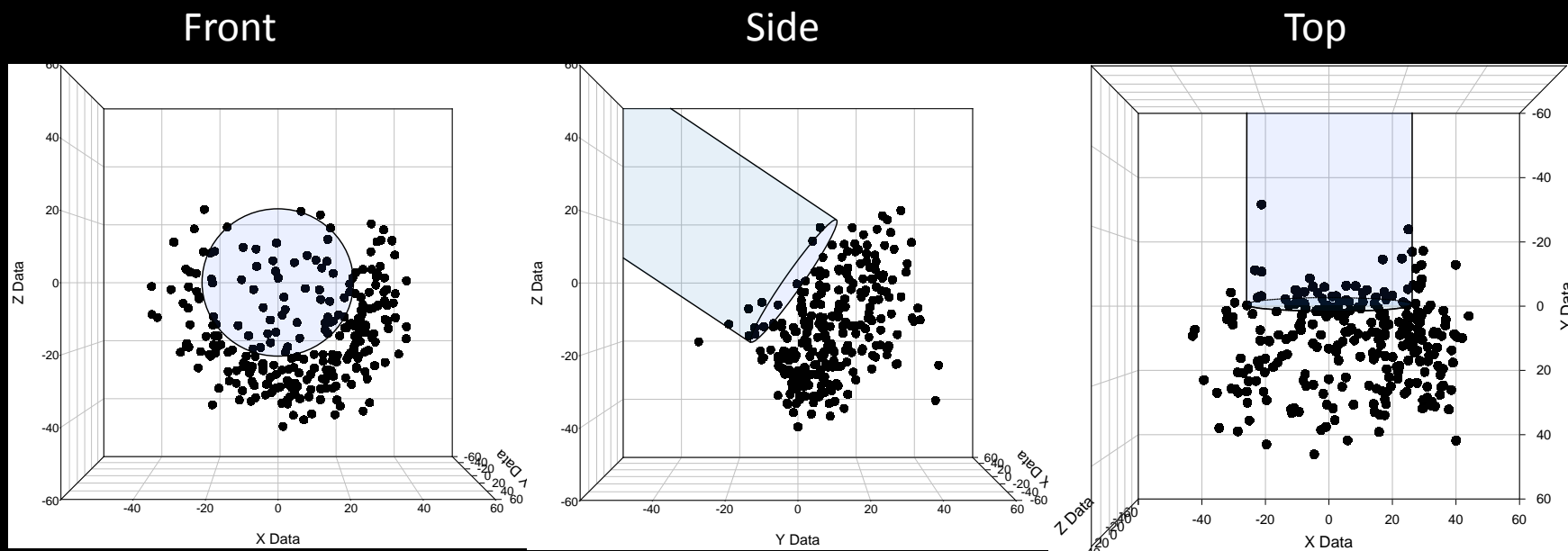


UC Davis Hydraulic and Fish Behavior Tests 2010-2012



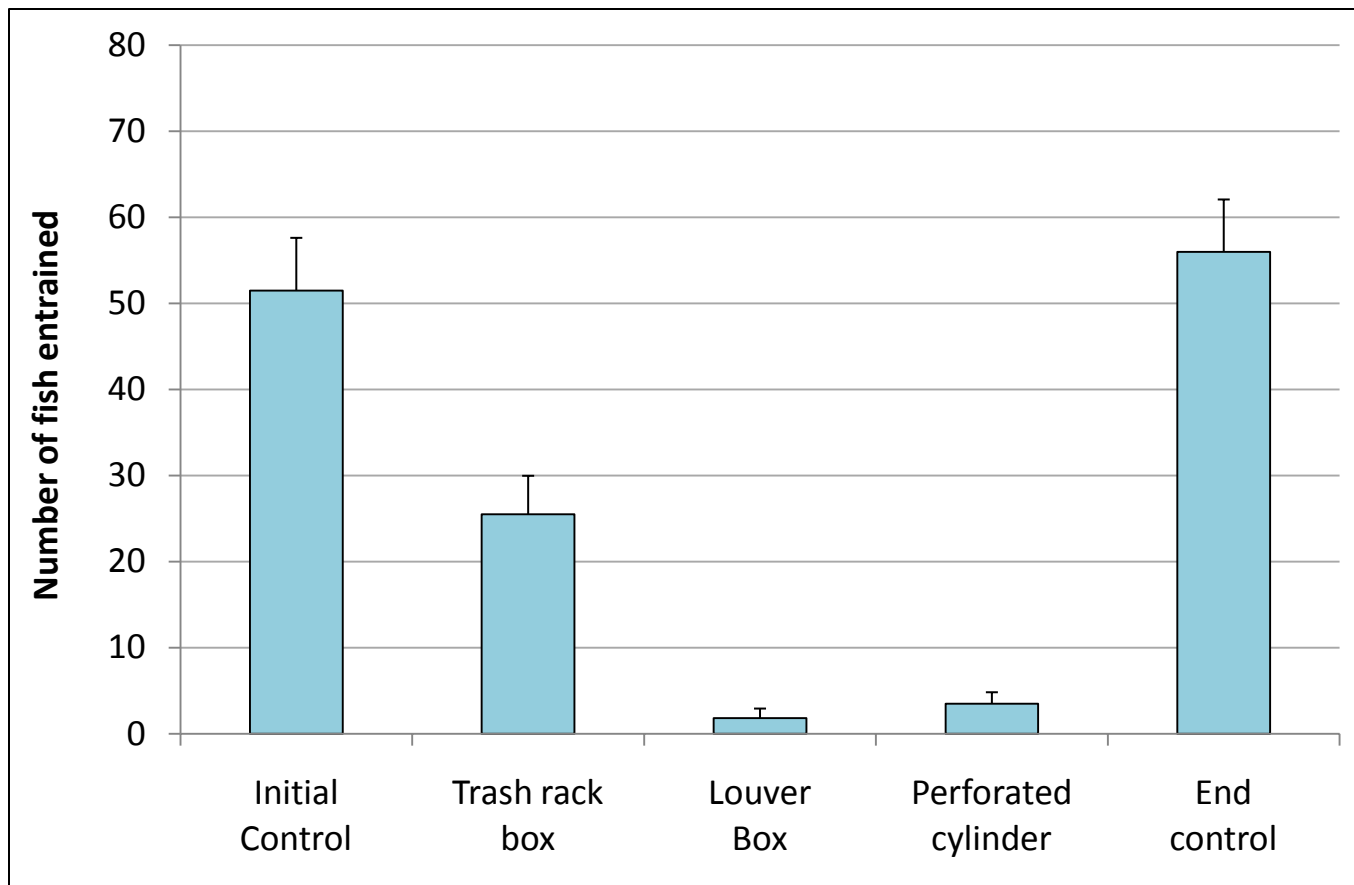
Central Valley Project Improvement Act

Chinook salmon entrainment starting locations 0.5 ft/s sweeping, 20 cfs pipe diversion (2011 preliminary results, UC Davis)



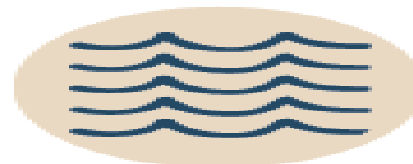
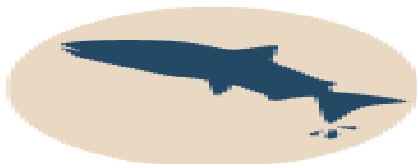
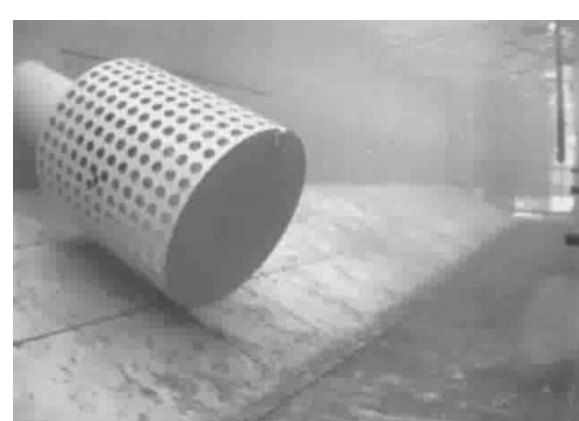
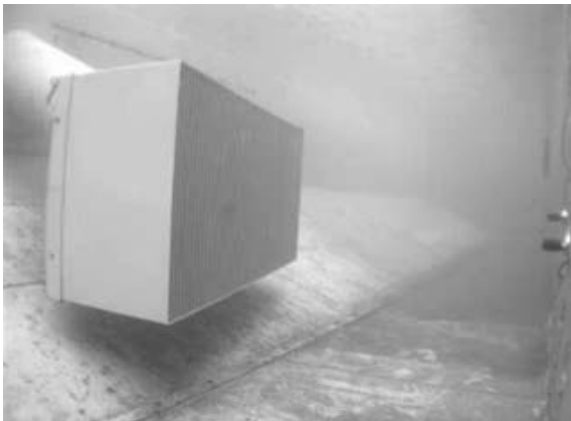
Mean distances from center of pipes inlet = 32.5 cm

**Day experiments, 0.5 ft/s and 20 cfs
80 fish tested, 2-h experiments, n = 6
(2012 preliminary results, UC Davis)**





2012 Fish Deterrence Tests UC Davis Hydraulic Lab



Central Valley Project Improvement Act

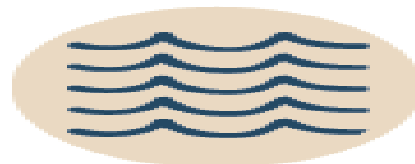
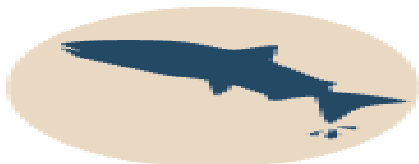


Presentation Questions?

AFSP Contacts:

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Tim Rust, Trust@usbr.gov, 916-978-5516



Central Valley Project Improvement Act