Finding Balance through a Habitat Conservation Plan for Endangered Steelhead and Water Resources Management along the Santa Clara River

Riparian Summit 2017
UC Davis
October 18, 2017

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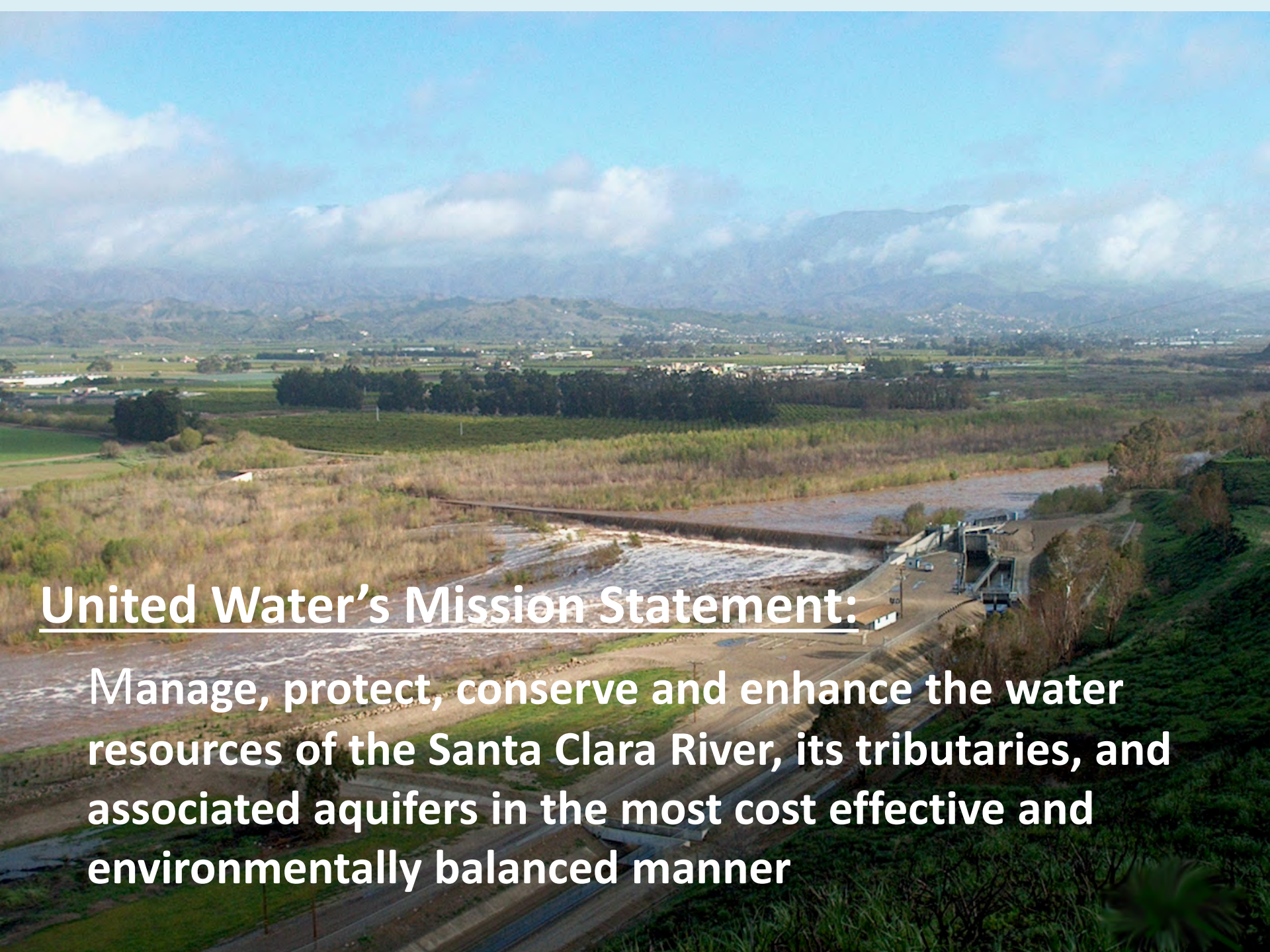
Outline

- What is United Water Conservation District?
- What are the endangered species and water resources management challenges?
- How can a habitat conservation plan lead to a balanced solution?
- Conclusions - Is it possible to resolve these issues?



United Water's Mission Statement:

Manage, protect, conserve and enhance the water resources of the Santa Clara River, its tributaries, and associated aquifers in the most cost effective and environmentally balanced manner

Imported Water vs. Local Water

Surface Water

80% water created in north

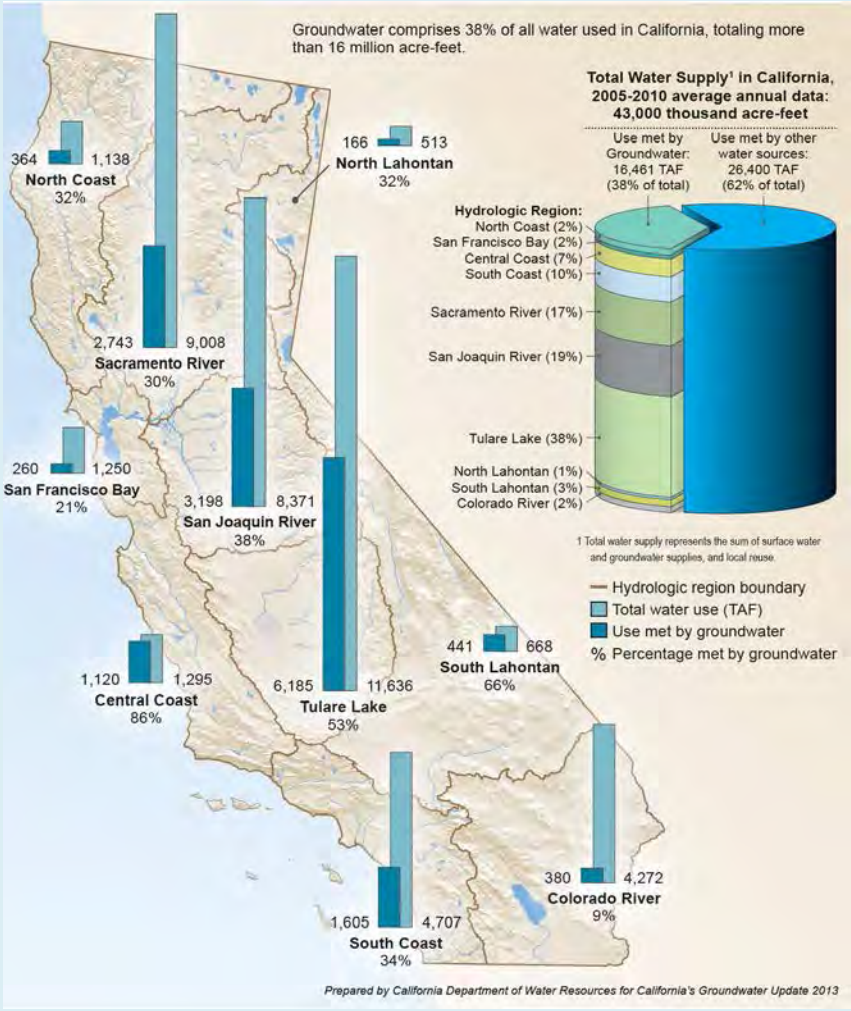
60% demand is in south

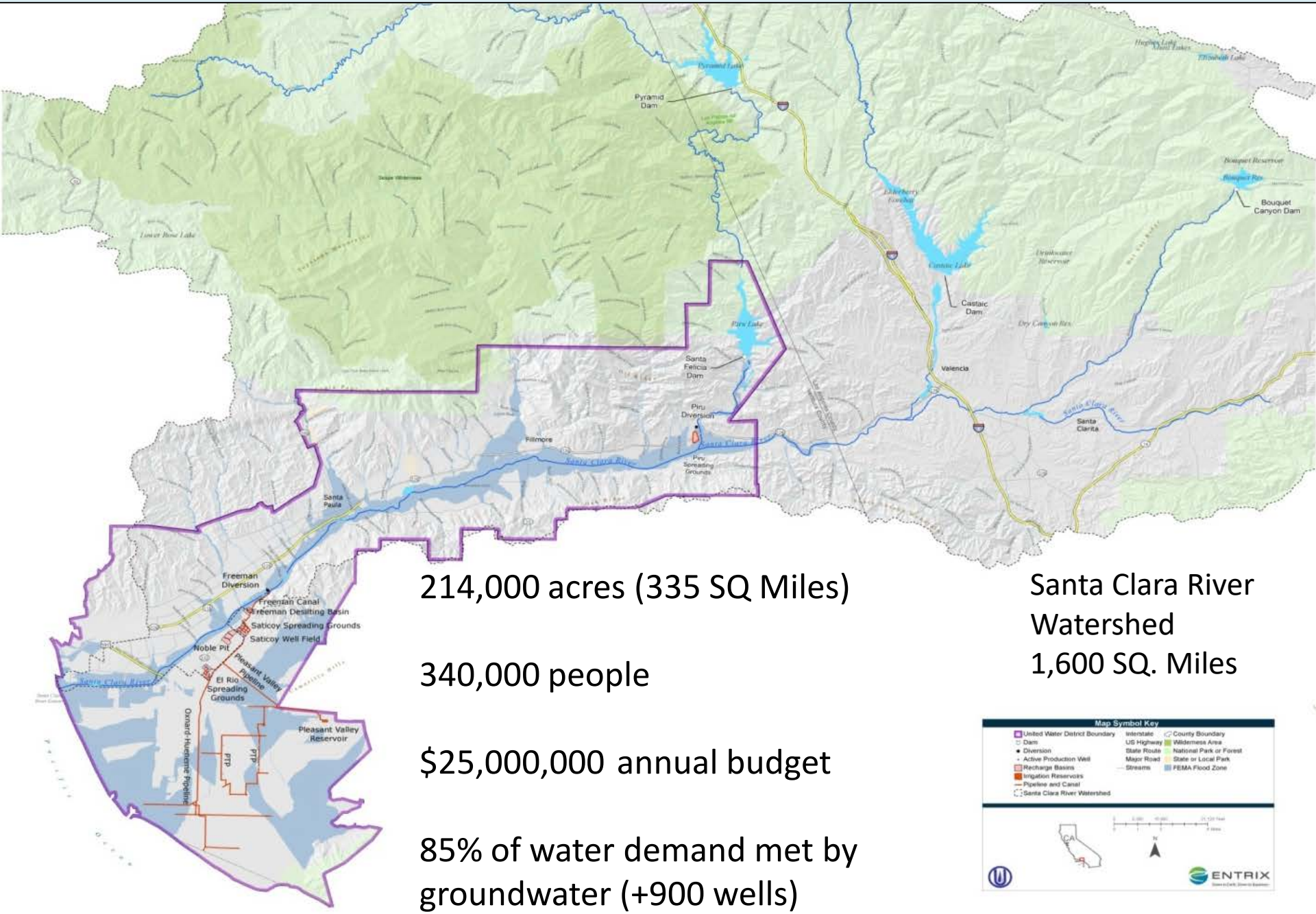
Groundwater

Sustainable Groundwater Management Act 2014

California Water Action Plan 2016

"…encourage local governments to adopt or amend local ordinances that **enhance local water supply reliability and conservation**, such as ordinances that establish minimum requirements for **infiltration of water into the groundwater table**…"





214,000 acres (335 SQ Miles)

340,000 people

$25,000,000 annual budget

85% of water demand met by groundwater (+900 wells)

Santa Clara River Watershed
1,600 SQ. Miles

Water Usage

- Overall Water Usage
  - 75% Agricultural
  - 25% Municipal & Industrial
- Significant overdraft of groundwater
  - 150,000 AF/Year agricultural pumping
  - 50,000 AF/Year municipal and industrial pumping

Freeman Diversion

Freeman Diversion

Constructed in 1990

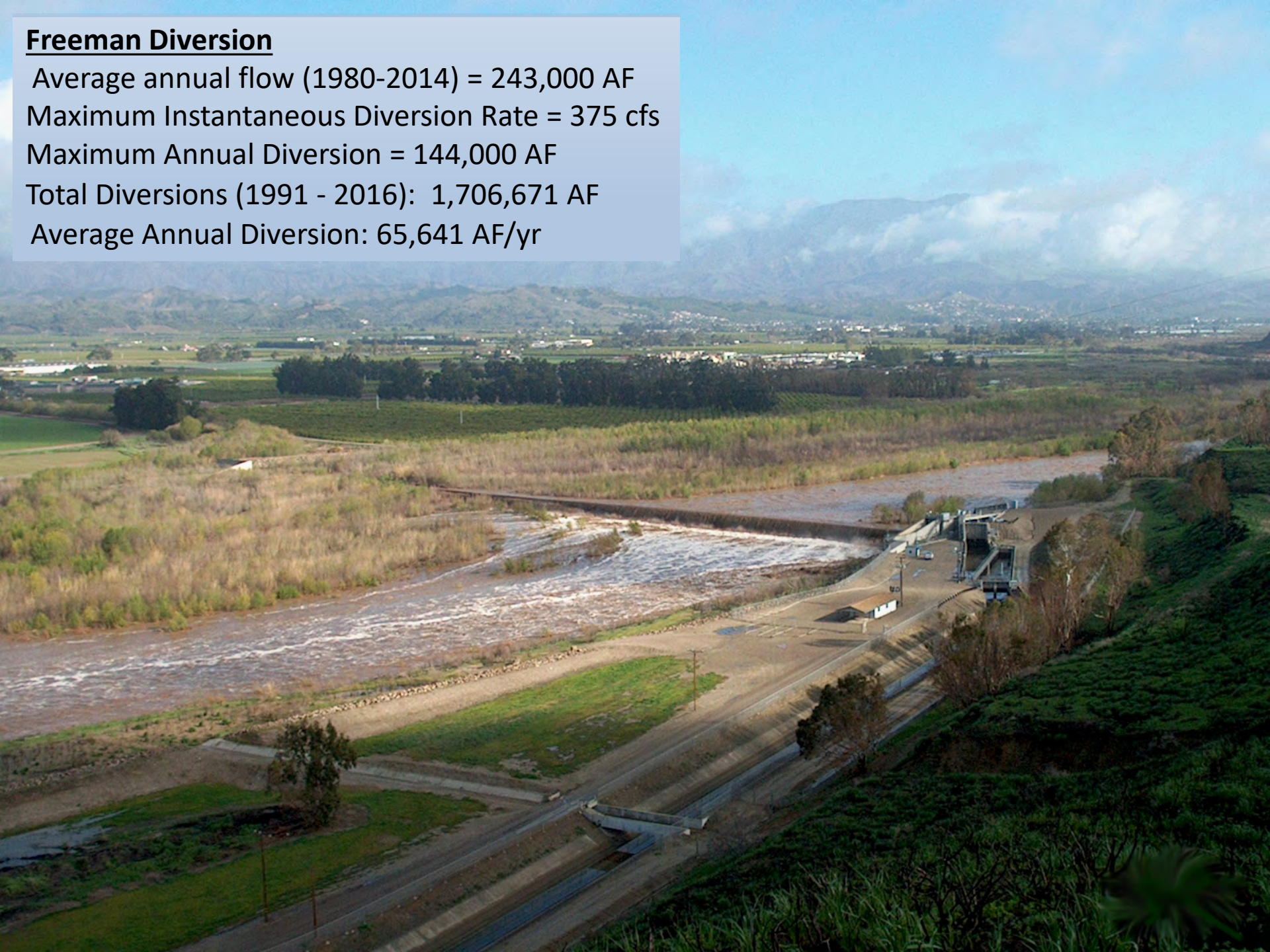
Grade stabilization structure

1200 ft wide

25 ft tall

Fish ladder

Instream flows for fish migration



Freeman Diversion

Average annual flow (1980-2014) = 243,000 AF

Maximum Instantaneous Diversion Rate = 375 cfs

Maximum Annual Diversion = 144,000 AF

Total Diversions (1991 - 2016): 1,706,671 AF

Average Annual Diversion: 65,641 AF/yr

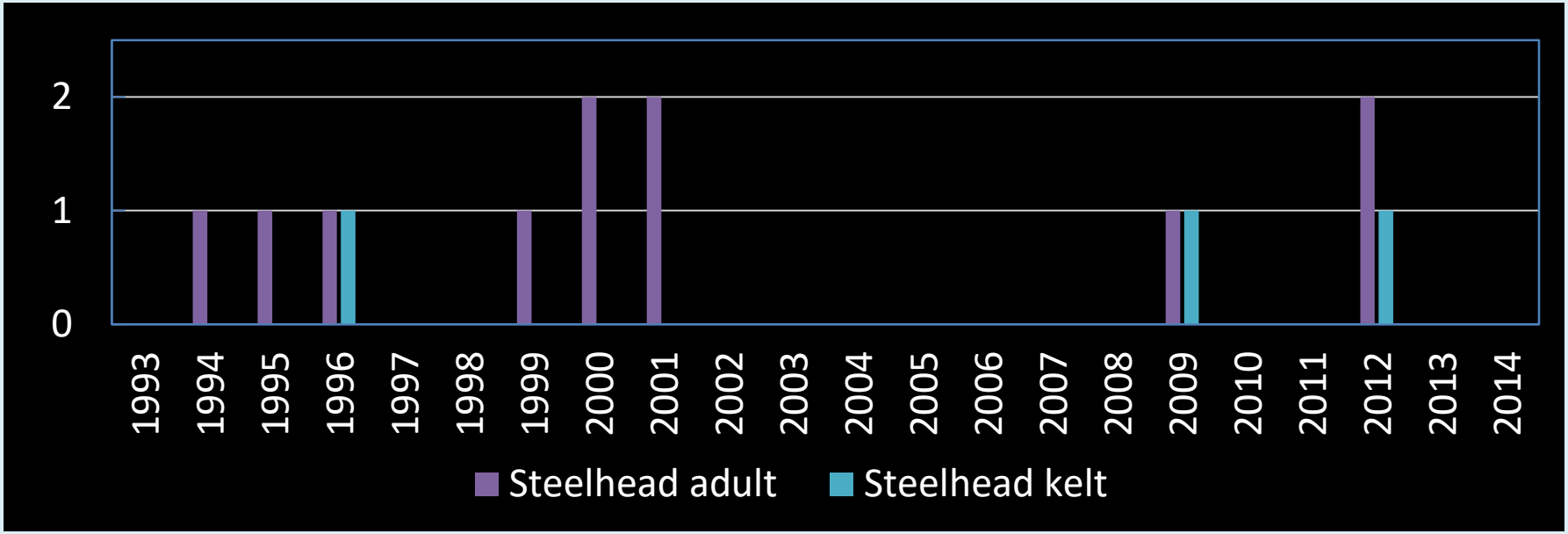
Endangered Species Act

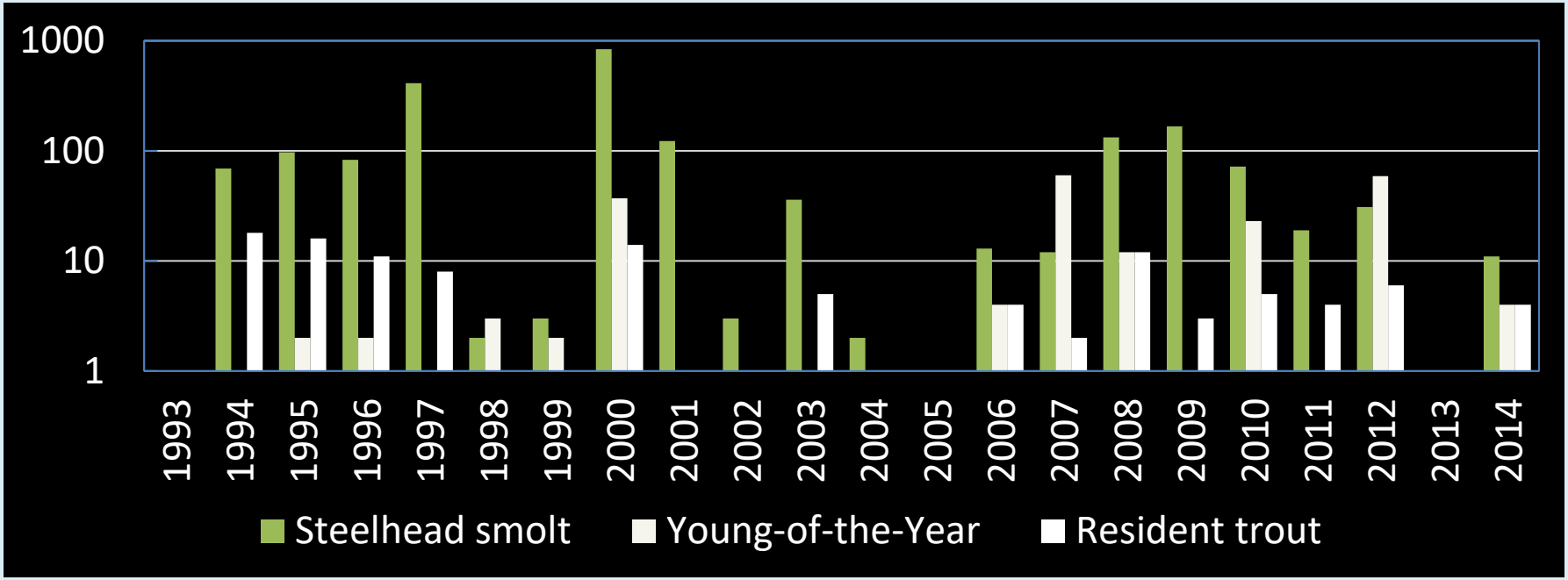
- 1997 – Southern California steelhead listed as endangered DPS
- Section 10 of ESA – projects undertaken by private entities, states, local governments without federal nexus; incidental take permit
- Habitat conservation plan (HCP) – applicant must prepare an HCP to obtain a section 10 incidental take permit

Summary of United's HCP

- Admin draft HCP October 2016
- 11 covered species
  - 4 Fish, 5 riparian birds, 2 reptiles
- Main effects addressed in United HCP
  - Fish passage
  - Instream flows
- Conservation measures
  - New fish passage (Construction and O&M will have effects)
  - Modified diversions for instream flows
  - Mitigation

Steelhead 1993-2014 –Freeman Diversion





HCP Biological Goal and Objectives

Goal 1 - Promote upstream and downstream passage of southern California steelhead and Pacific lamprey in the Santa Clara River watershed to contribute to their recovery.

Objective 1.1 – Create conditions to promote natural rates of migration for steelhead and lamprey at the Freeman Diversion for instream flows between 45 cfs and 6,000 cfs through the construction, operation, and maintenance of a fish passage facility for the term of the permit. (Steelhead recovery action #SCR-SCS-4.1)
Objective 1.2 – Provide a pattern and magnitude of instream flows downstream of the Freeman Diversion for steelhead and lamprey migration through implementing specific instream flow operations during the permit term. (Steelhead recovery action #SCR-SCS-4.2).

2005 Flood Event (130,000 cfs)

"Typical" Storm Event

Low Flow

New Fish Passage - 6% HARDENED RAMP

60% Hydraulic Design

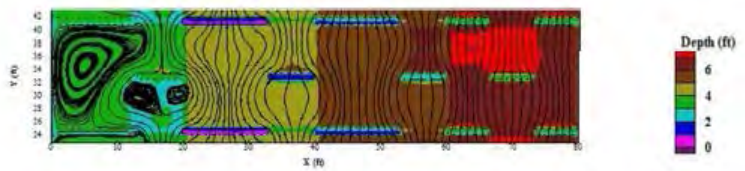


Figure 5-23 Flow depth contours and stream traces in wetted portion of ramp with total flow of 1,300 cfs through ramp with 6% slope and intermediate baffles

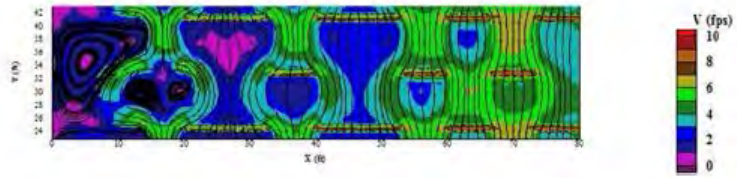


Figure 5-24 Flow velocity contours and stream traces in wetted portion of ramp with total flow of 1,300 cfs through ramp with 6% slope and intermediate baffles

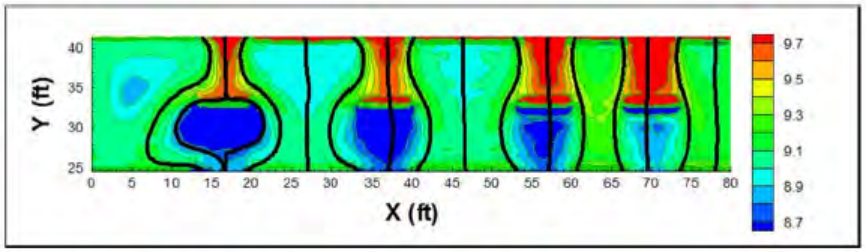


Figure 5-28 EGE contours for total flow of 1,300 cfs through ramp with 6% slope and intermediate baffles (contour units are feet)

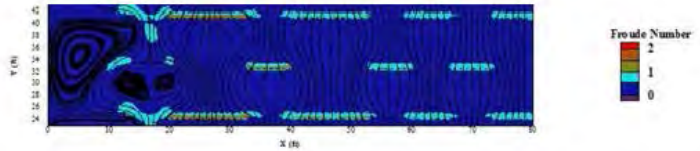


Figure 5-25 Froude number contours and stream traces in wetted portion of ramp with total flow of 1,300 cfs through ramp with 6% slope and intermediate baffles

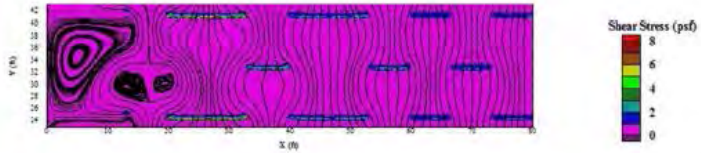


Figure 5-26 Shear stress contours and stream traces in wetted portion of ramp with total flow of 1,300 cfs through ramp with 6% slope and intermediate baffles

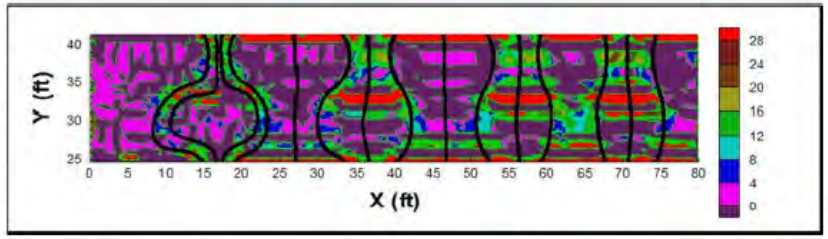
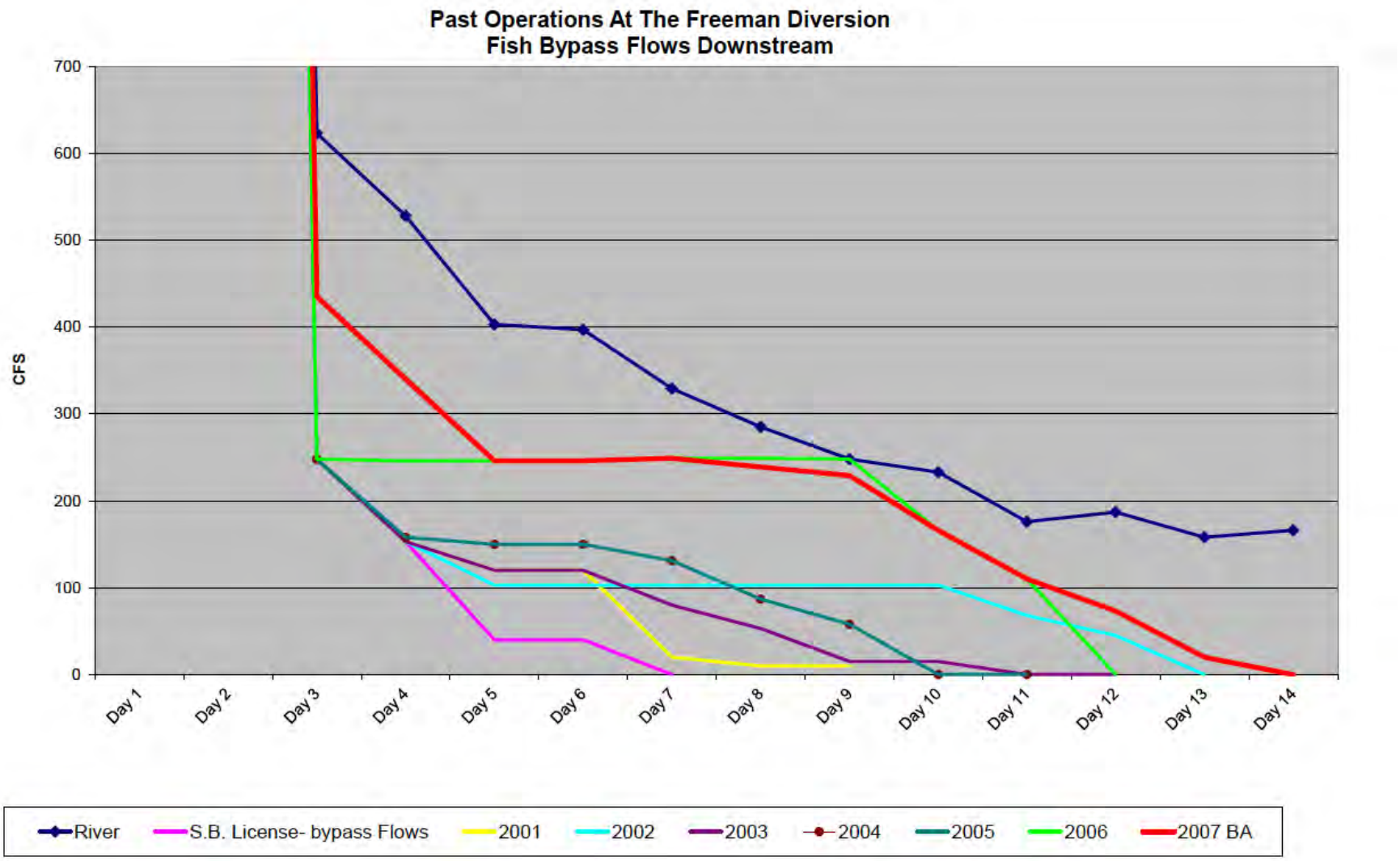


Figure 5-29 EDF contours for total flow of 1,300 cfs through ramp with 6% slope and intermediate baffles (contour units are ft-lb/s/ft^3)


Past Operations At The Freeman Diversion
Fish Bypass Flows Downstream
CFS
700
600
500
400
300
200
100
0
Day 1
Day 2
Day 3
Day 4
Day 5
Day 6
Day 7
Day 8
Day 9
Day 10
Day 11
Day 12
Day 13
Day 14
River
S.B. License- bypass Flows
2001
2002
2003
2004
2005
2006
2007 BA

Take Home Points

- Santa Clara River is at the intersection of water resources management and species/habitat conservation.
- Flashy, sediment-heavy, riparian system of Santa Clara River presents unique challenges
- Making decisions given uncertainties
- How does society balance
  - Protection of environmental health and biodiversity
  - Economics and land use
  - Human health and safety
- Solutions require
  - Compromise
  - Creativity
  - Adaptation
  - Trust and cooperation among stakeholders
  - Best science available