

Mokelumne River Joint Settlement Agreement: From litigation to collaboration to success



Jose Setka
EBMUD Fisheries & Wildlife Division

Objectives

- Lead up to litigation
- Settlement and collaboration
- Implementation
- Results
- Future



3444-457 Camanche Dam Outlet Works excavation as seen from downstream of the outlet structure. Gradall G-1000 fine grading conduit invert, high level outlet cleanup shown on left. (9/22/62)



Conditions in Late 1980s



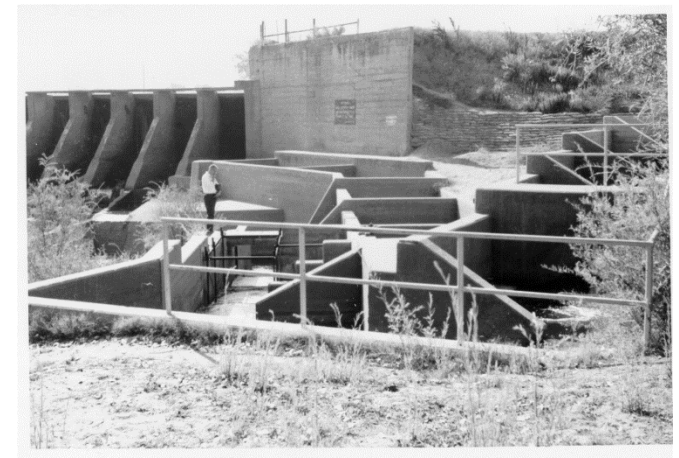
- Operating criteria not conducive to salmonid spawning/rearing
- Low Dissolved Oxygen
- Hydrogen sulfide
- Unscreened diversions
- Threats, litigation and dead fish
- District's view was move the fish rather than provide water



First MRTAC Jan 1989



- Sac Flows via DCC
- Poaching at WIDD
- Poor ladder configuration
- Flow patterns
- Export impacts to outmigrants
- DO Below Camanche
- Mining wastes
- Hatchery water supply
- Fish barrier (guidance) fence



EBMUD's Mokelumne River Fish Restoration Program



- Integrated approach to ecosystem management
- Codified in 1998 Joint Settlement Agreement
- 10-fold increase in dry-year flows from early 1990s
- A portion of newly acquired supplies provided to further increase Mokelumne flows
- *Formal collaboration with resource agencies and stakeholders to optimize river management*
- \$2 million Endowment for habitat improvements
- \$12.5 million in improvements to upgrade hatchery

Lower Mokelumne River Partnership



- CDFW and USFWS part of original agreement
- NMFS added as participant
- MRTAC, Partnership Coordinating Committee, Partnership Steering Committee
- Review monitoring results
- Adaptive management
- Approves funding requests
- Advocates
- Includes representatives from water agencies and NGOs



Sustainable winegrowing is the environmentally responsible way to make great wine.

Fish Passage and Video Monitoring at Woodbridge Irrigation District Dam



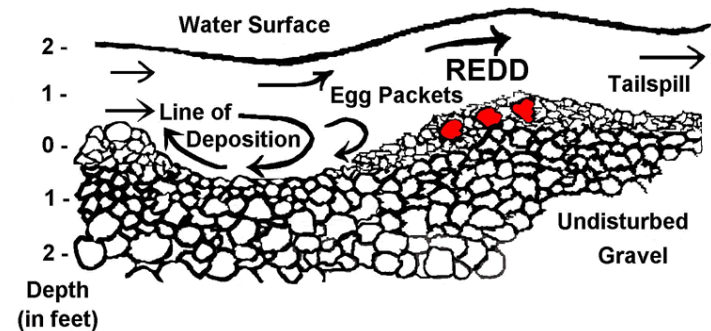
EBMUD has worked cooperatively with the downstream Woodbridge Irrigation District to improve fish passage in the lower Mokelumne River, helping to increase survival.



Spawning Habitat Restoration



- Since 1990, **65,432** tons of spawning gravel have been added to the LMR to improve spawning habitat for salmon and steelhead.
- Suitably sized spawning gravel is needed to help maintain adequate water temperatures, velocity, and dissolved oxygen levels for incubating salmon embryos.
- Funding from the LMR Partnership is used to support the planning and design phases.



Electrofishing/Predator Removal



North American Journal of Fisheries Management

Habitat Alterations and a Nonnative Predator, the Striped Bass, Increase Native Chinook Salmon Mortality in the Central Valley, California

Megan Sabal*

Institute of Marine Sciences, University of California, 100 Shaffer Road, Santa Cruz, California 95060, USA

Sean Hayes

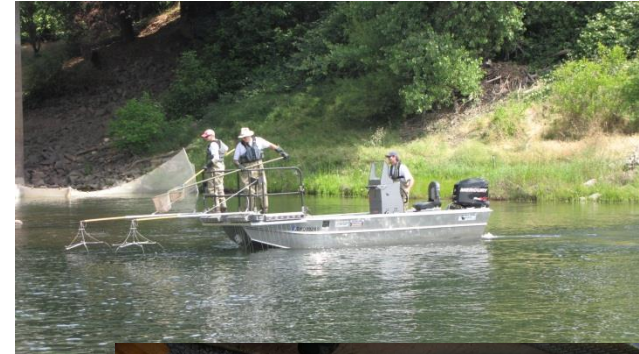
National Oceanic and Atmospheric Administration Fisheries, Southwest Fisheries Science Center, 110 Shaffer Road, Santa Cruz, California 95060, USA

Joseph Merz

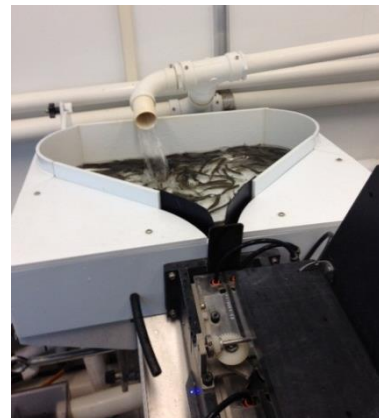
Institute of Marine Sciences, University of California, 100 Shaffer Road, Santa Cruz, California 95060, USA; and Cramer Fish Sciences, 13300 New Airport Road, Suite 102, Auburn, California 95602, USA

Jose Setka

East Bay Municipal Utility District, 500 San Pablo Dam Road, Orinda, California 94563, USA



Hatchery Management



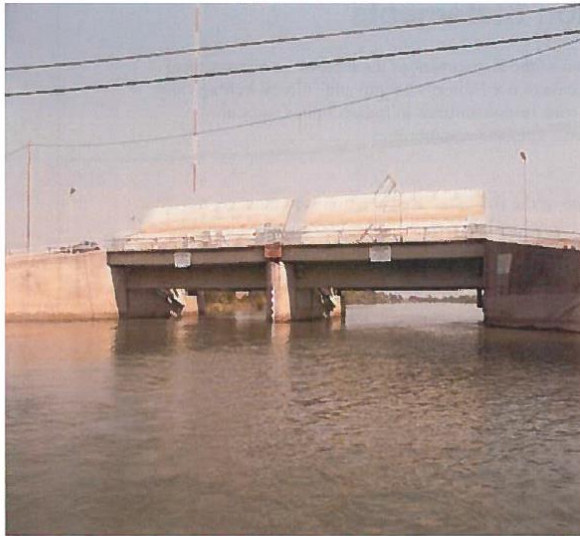
- Release timing and location
- Improved Feed
- Increased Tagging Rates
- Experimental Releases

DCC Closure Options



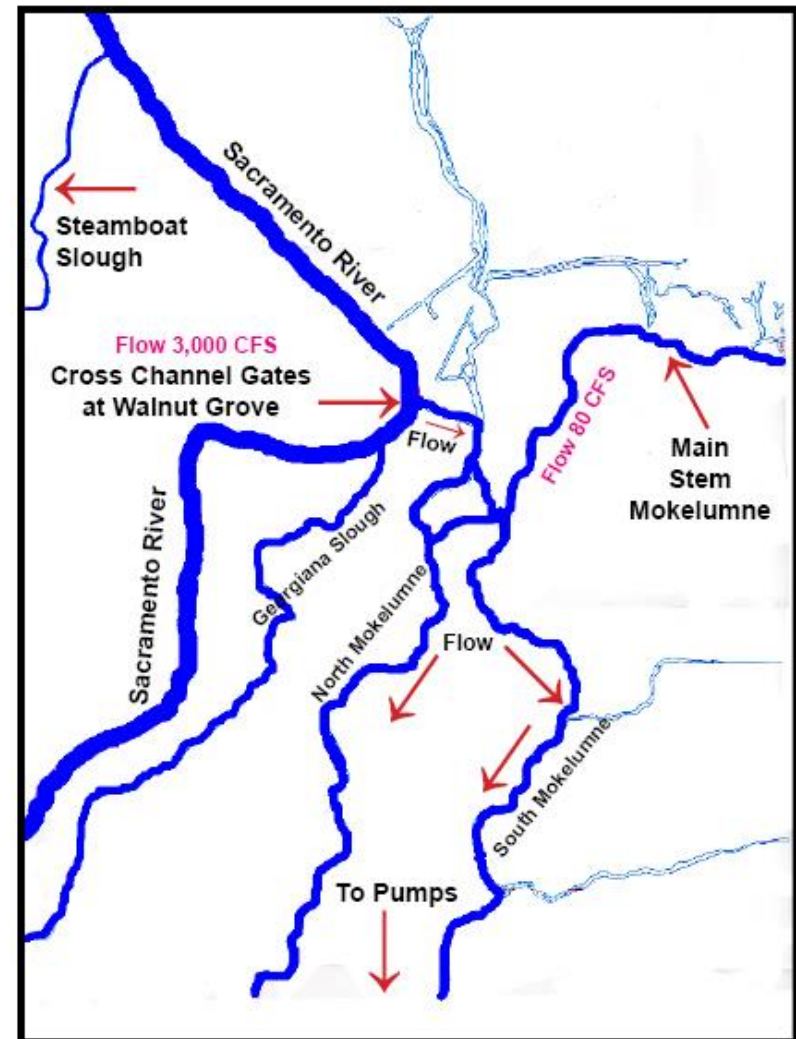
Delta Cross Channel Temporary Closure Multi-Year Study

FINAL ENVIRONMENTAL ASSESSMENT



U.S. Department of the Interior
Bureau of Reclamation

September 2012



Barging Study



Preliminary Results 2015 & 16 Returns

Method	MRFH Recoveries	Nimbus Recoveries	Feather Recoveries	SJ Recoveries
In-River	2	0	0	0
Trucked	29	12	1	8
Barged	192	37	2	25

- 3 year study
- MRFH Fish
- 100% Tagged
- 100K fish per year
- Proof of Concept



2010-2016 Pulse Summary



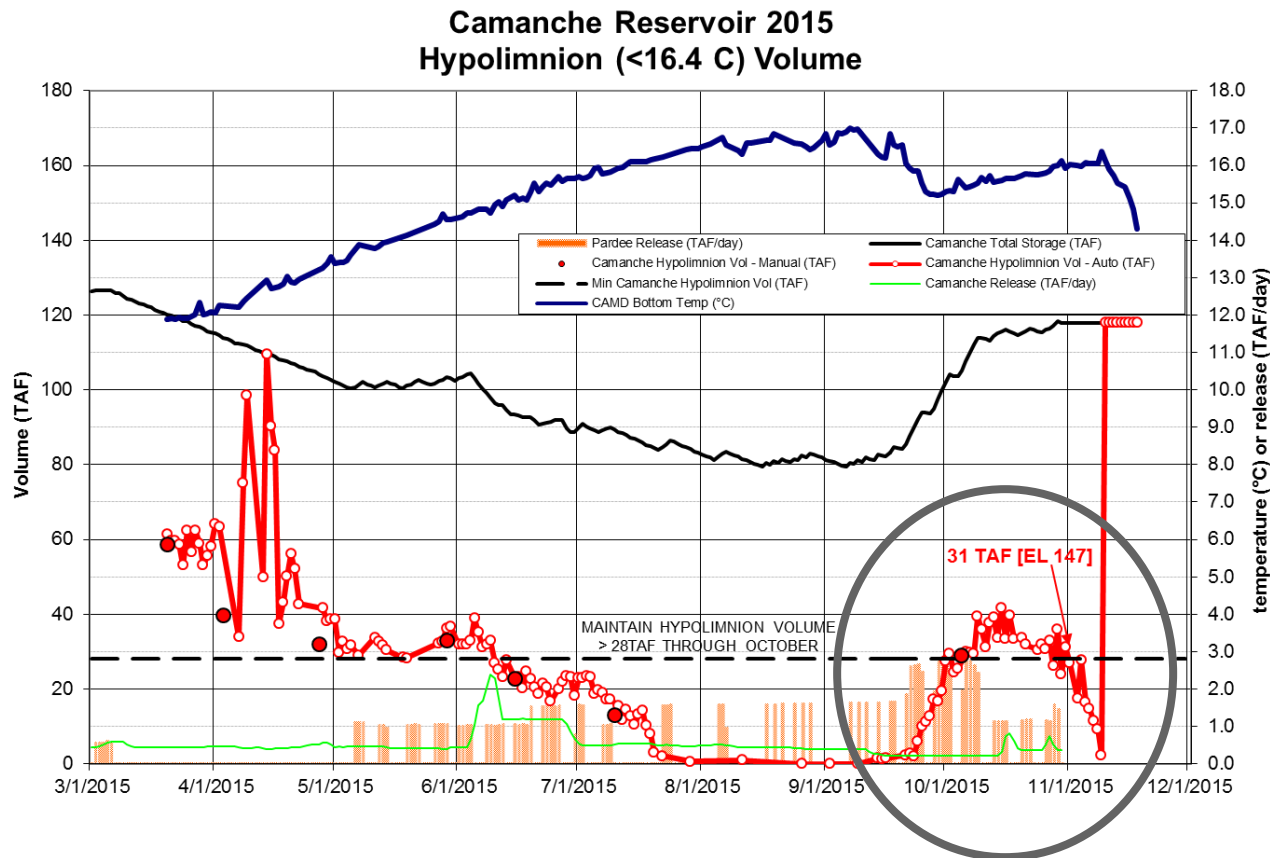
Fall Year	Number of pulses	Pulse Volume (Acre Feet)	Water Source
2010	3	58,000	flood control
2011	4	110,000	flood control
2012	6	4,500	adaptive management
2013	7 *	4,230	adaptive management
2014	6 (4)	4,689	AM/ gainshare
2015	7 (3)	9,340	gainshare
2016	7 (3)	9,261	gainshare/cpe



Drought Actions: Temperature Management



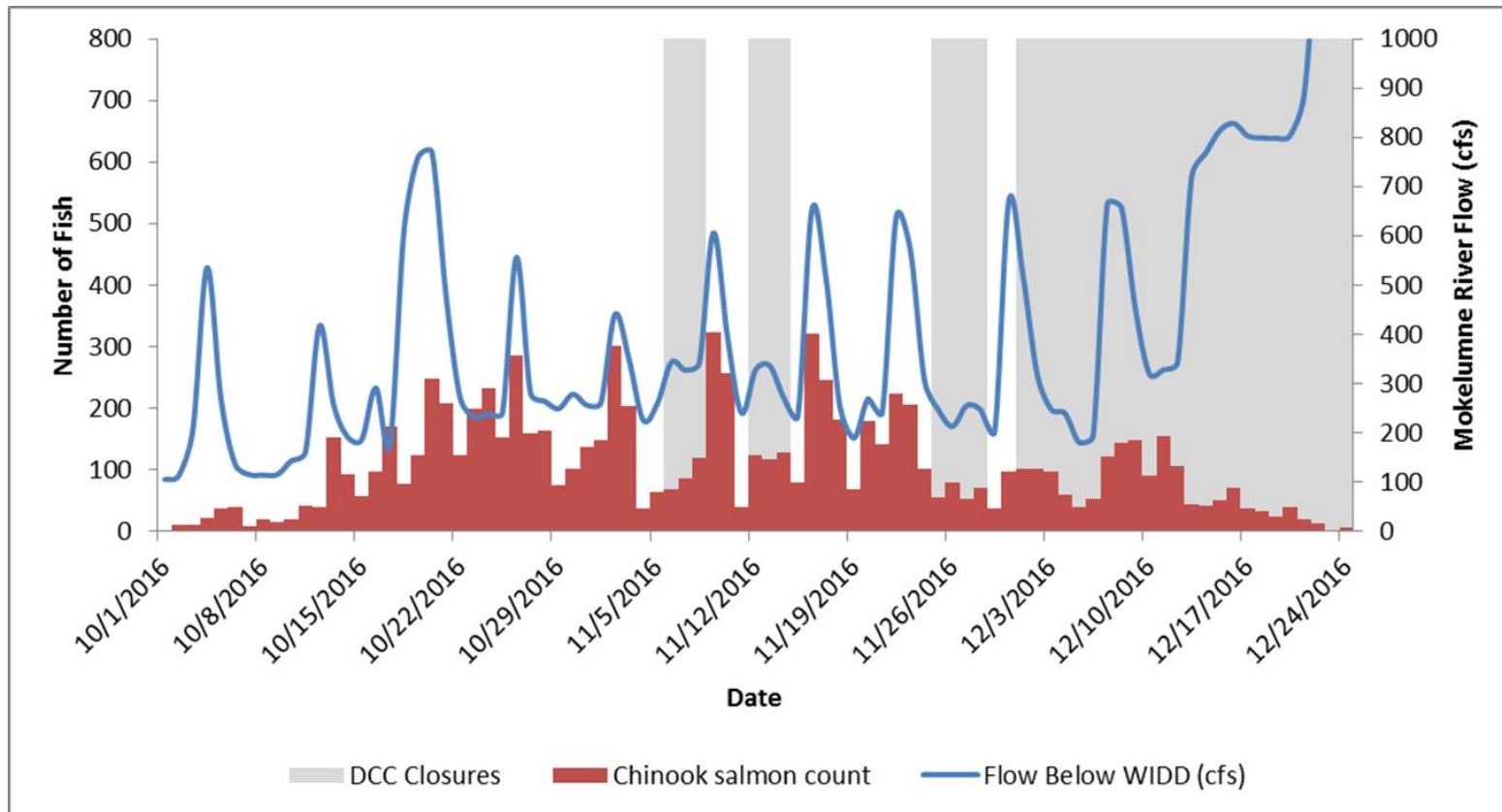
- Ensure adequate cold water supplies using reservoir operations



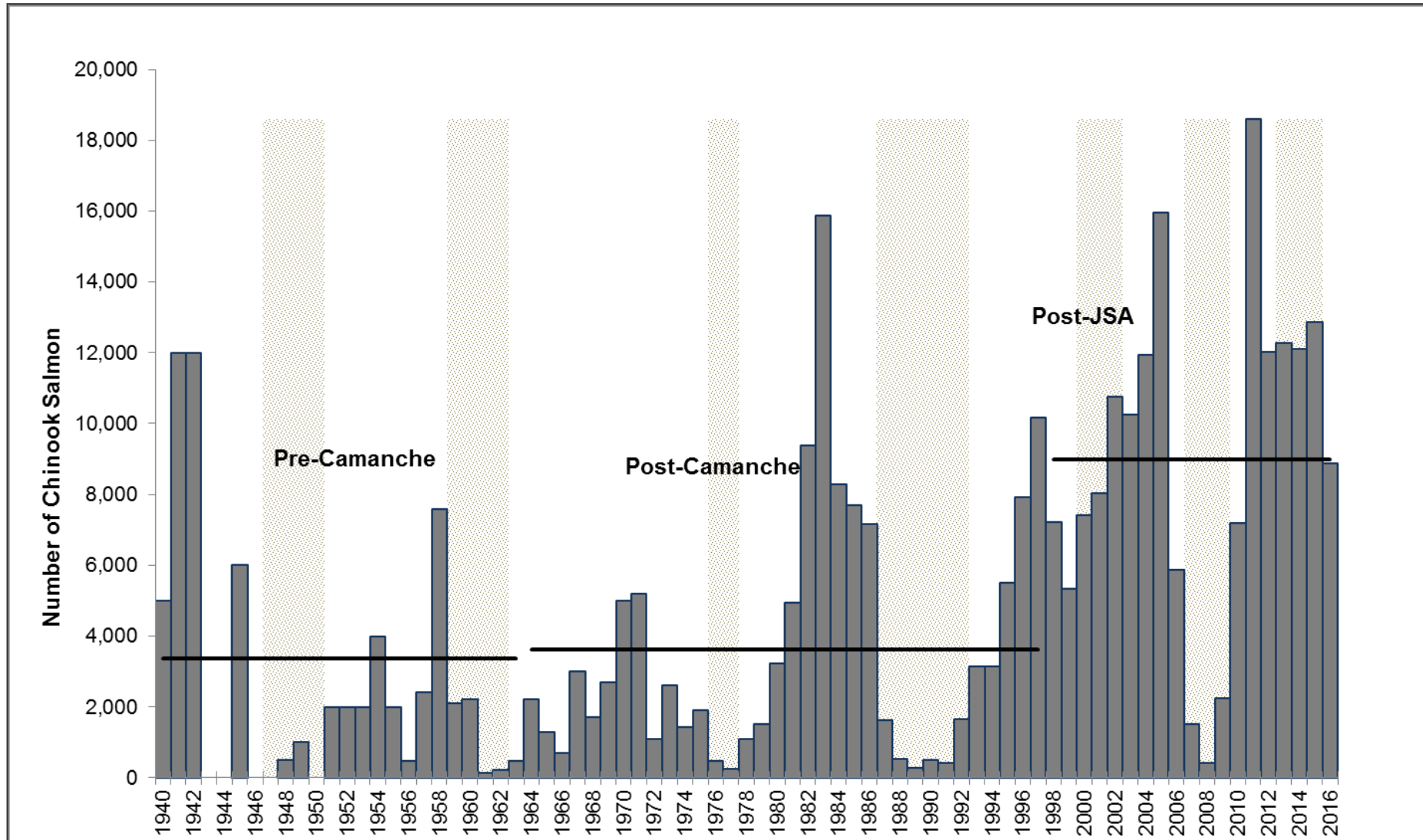
2016 Salmon Numbers and Flow



- Timed first pulse to precede SJR Trib pulses
- WID Support; Flood Control Releases



Adult Salmon Returns 1940 - 2016



Ocean Fisheries



Hatchery Contribution to 2016 CA Ocean Fisheries

Hatchery Chinook Stock	Recreational	Commercial
San Joaquin River Fall (primarily Moke)	19%	16%
Sacramento River Fall	79%	82%
Specific Sac Trib Contributions		
<i>Feather</i>	30%	31%
<i>Coleman</i>	35%	37%
<i>Nimbus</i>	14%	14%



Historic Habitat & Potential Access



Upper Mokelumne River Group

Foothill Conservancy

Fisheries Agencies

Tribes

Stakeholders

EBMUD

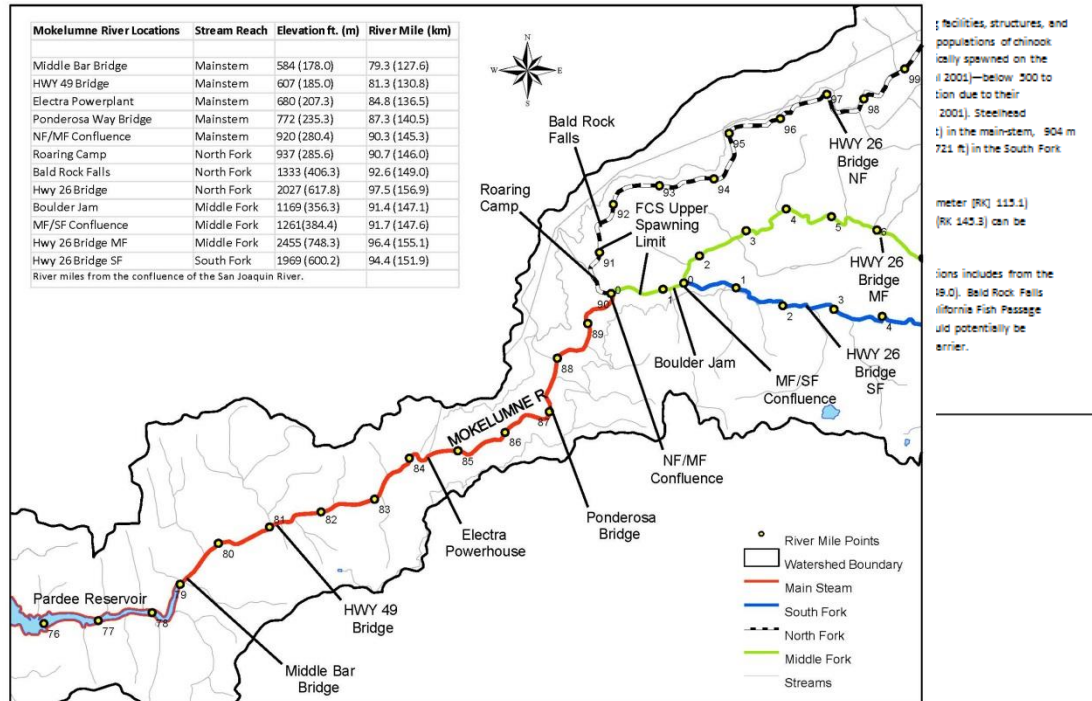
Upper Mokelumne River Anadromous Fish Restoration

Draft

Pilot Fish Reintroduction Project

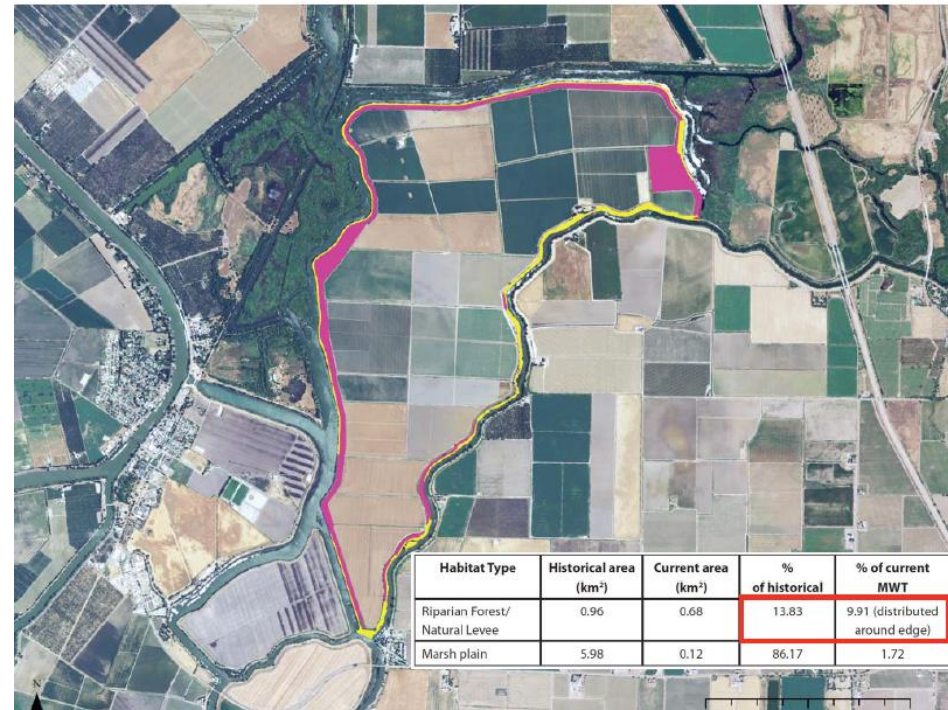
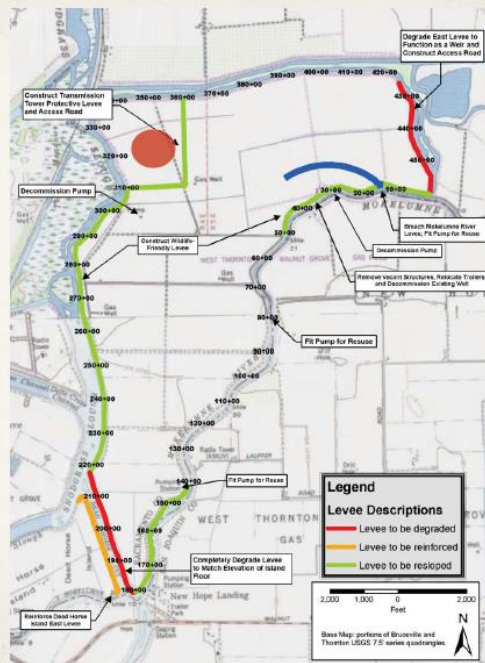
Introduction

The Upper Mokelumne River Anadromous Fish Restoration Workgroup has prepared a draft pilot project plan to determine the feasibility of moving anadromous fish from the lower Mokelumne River to the Mokelumne River between Middle Bar Bridge and the confluences of the North, Middle, and South Forks. The design is a prescriptively approached project to transport and study the reintroduction of anadromous fish from the Mokelumne River Fish Hatchery or Lower Mokelumne River into the Upper Mokelumne River above Pardee that can be implemented within a 1-5 year timeframe. Key aspects of the project are described below and include: a description and evaluation of the current physical environment and operation of both the upper and lower Mokelumne River reaches and associated reservoirs and facilities; potential sources of fish and appropriate species, numbers and methods to implement the project; and consideration of permitting/permissions required to achieve the goal.



✦ Constraints

- + Short term constraints
 - + *Flooding bottleneck*
- + Long term constraints
 - + *Radio tower, access*
 - + *Land ownership*



Julie Beagle, Alison Whipple, Robin Grossinger |
San Francisco Estuary Institute-Aquatic Science Center
Bay-Delta Science Conference, Sacramento, October 16, 2012

In Closing



- Lower Mokelumne River Partnership continues to provide leadership for the successful implementation of the JSA
- Significant improvement in habitat conditions
- Attainment of AFRP Doubling Goal
- Collaborative efforts behind science/research
- Broader scope
- Challenges remain



Partnership & Collaboration



Woodbridge Irrigation District
CDFW
USFWS AFRP
NMFS
USBR
Many Landowners Along Mokelumne
UC Davis
UC Santa Cruz
Golden Gate Salmon Association
California Sportfishing Protection
Alliance
Foothill Conservancy

