

# Water Education Foundation's Bay-Delta Tour

## The EBMUD Bay-Delta Nexus



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WATER EDUCATION  
FOUNDATION



# Presentation Outline

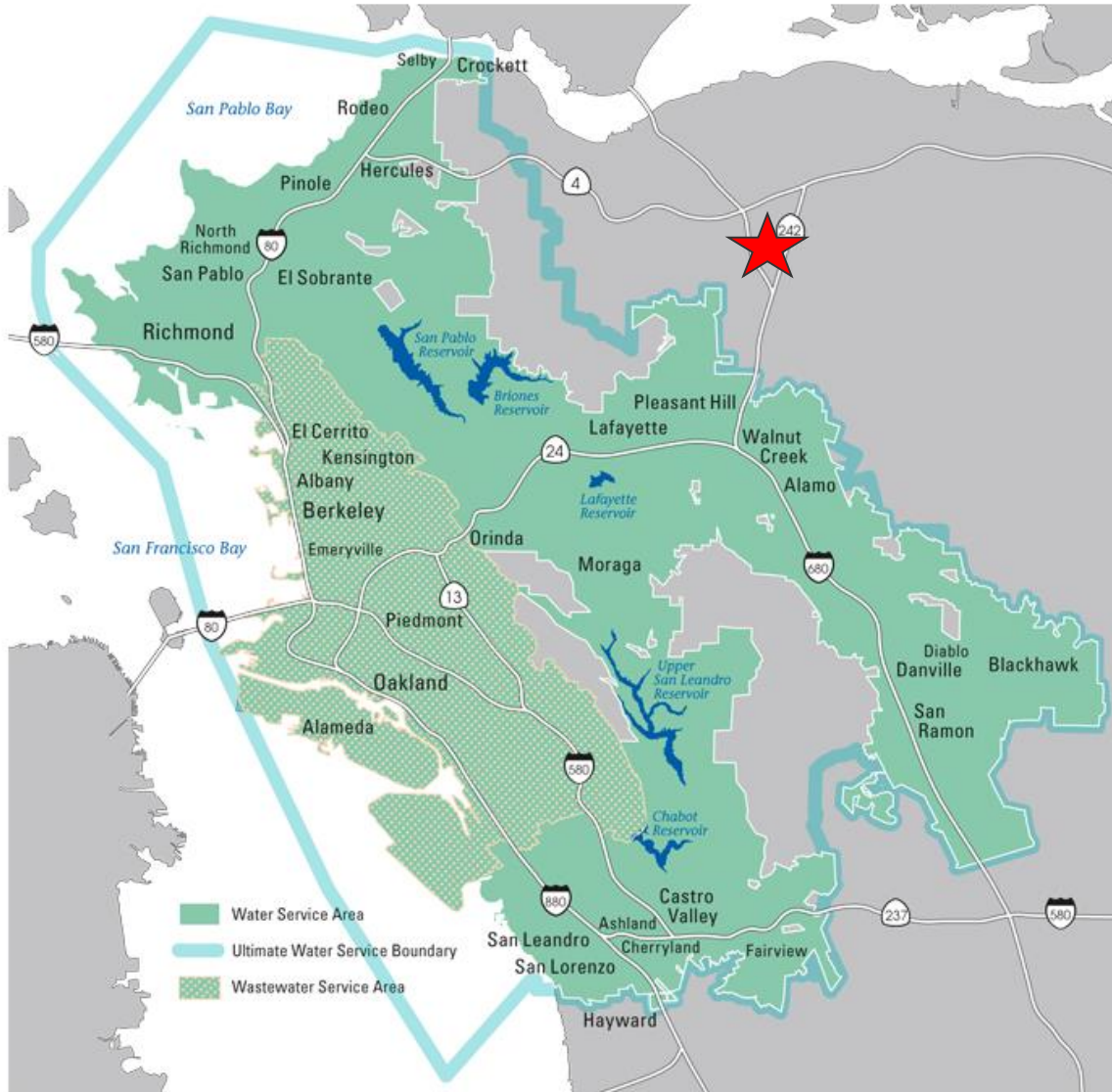


- EBMUD Water and Wastewater System Overview
- Water Supply Considerations
- EBMUD Mission



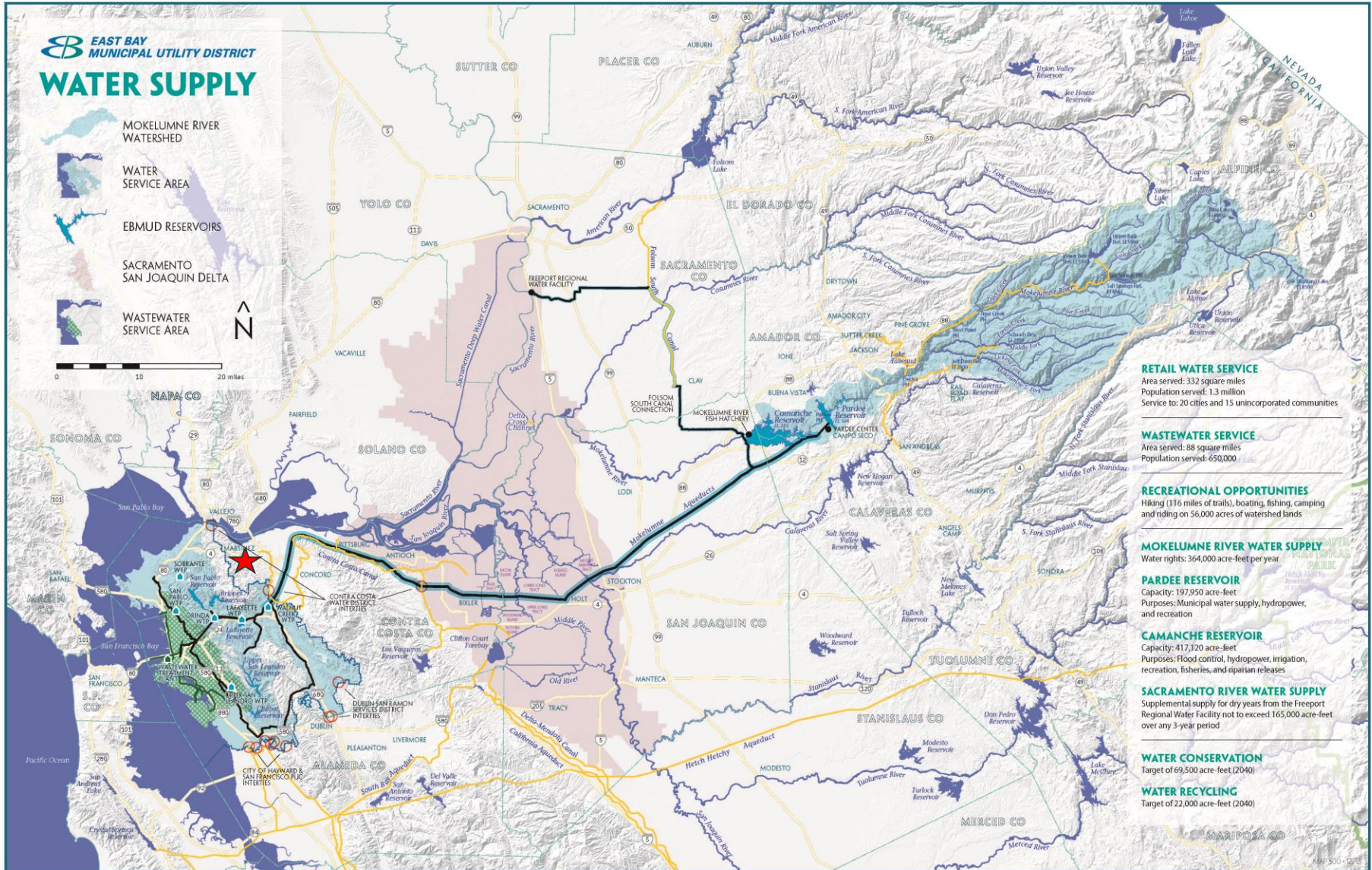
Mokelumne  
Aqueducts

# Who We Are



- Water & Wastewater Services
- Water service to 1.4 million people
- Wastewater service to 685,000 people
- Westside:  
Crockett to San Lorenzo
- Eastside:  
Walnut Creek to San Ramon

# A Little Bit About the East Bay Municipal Utility District (EBMUD)



## EAST BAY MUNICIPAL UTILITY DISTRICT WATER SUPPLY

- MOKELUMNE RIVER WATERSHED
- WATER SERVICE AREA
- EBMUD RESERVOIRS
- SACRAMENTO SAN JOAQUIN DELTA
- WASTEWATER SERVICE AREA

**RETAIL WATER SERVICE**  
 Area served: 332 square miles  
 Population served: 1.3 million  
 Service to: 20 cities and 15 unincorporated communities

**WASTEWATER SERVICE**  
 Area served: 88 square miles  
 Population served: 650,000

**RECREATIONAL OPPORTUNITIES**  
 Hiking (116 miles of trails), boating, fishing, camping and riding on 56,000 acres of watershed lands

**MOKELUMNE RIVER WATER SUPPLY**  
 Water rights: 364,000 acre-feet per year

**PARDEE RESERVOIR**  
 Capacity: 197,950 acre-feet  
 Purposes: Municipal water supply, hydropower, and recreation

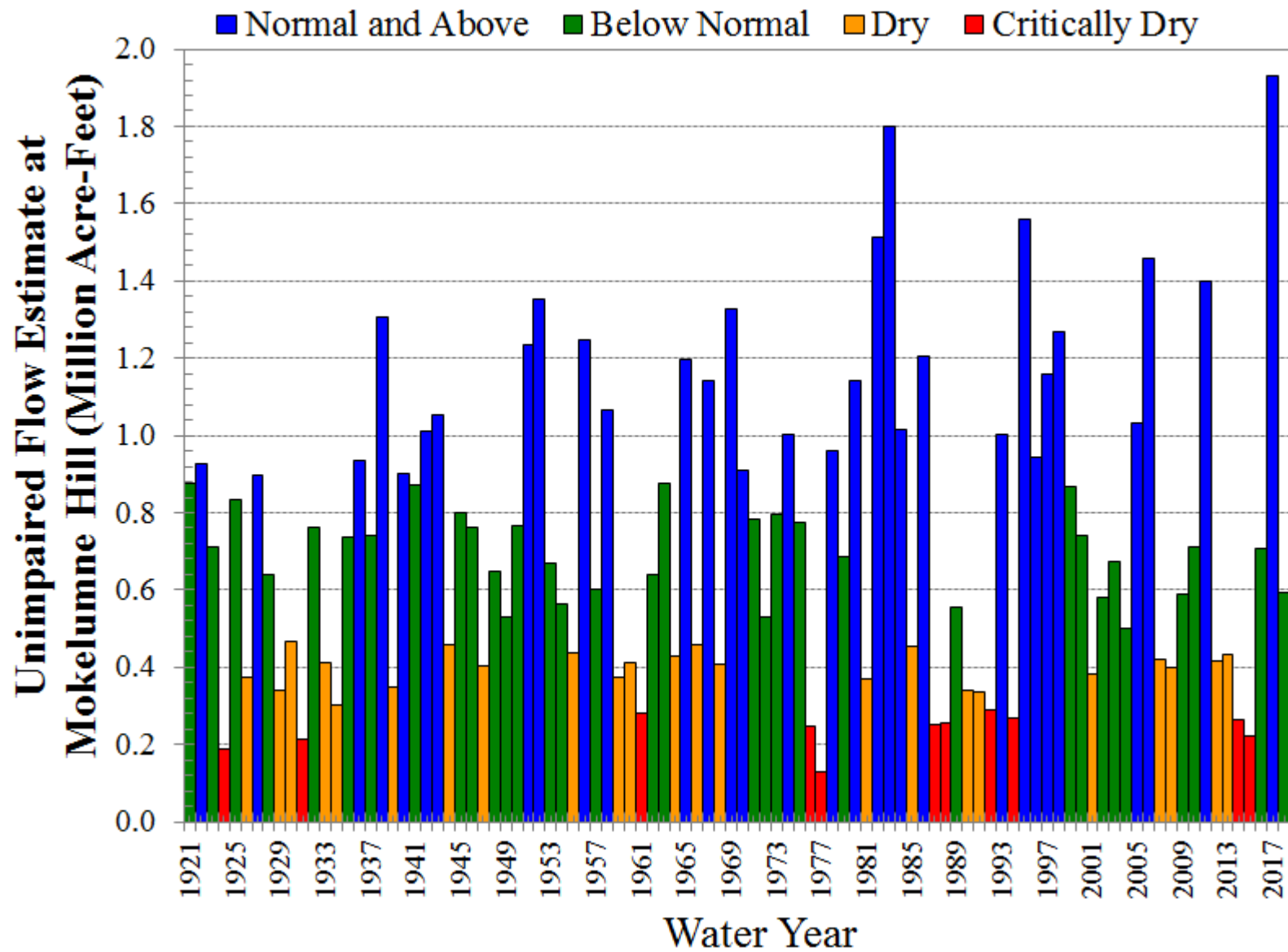
**CAMANCHE RESERVOIR**  
 Capacity: 417,120 acre-feet  
 Purposes: Flood control, hydropower, irrigation, recreation, fisheries, and riparian releases

**SACRAMENTO RIVER WATER SUPPLY**  
 Supplemental supply for dry years from the Freeport Regional Water Facility not to exceed 165,000 acre-feet over any 3-year period

**WATER CONSERVATION**  
 Target of 69,500 acre-feet (2040)

**WATER RECYCLING**  
 Target of 22,000 acre-feet (2040)

# Mokelumne Watershed Unimpaired Runoff

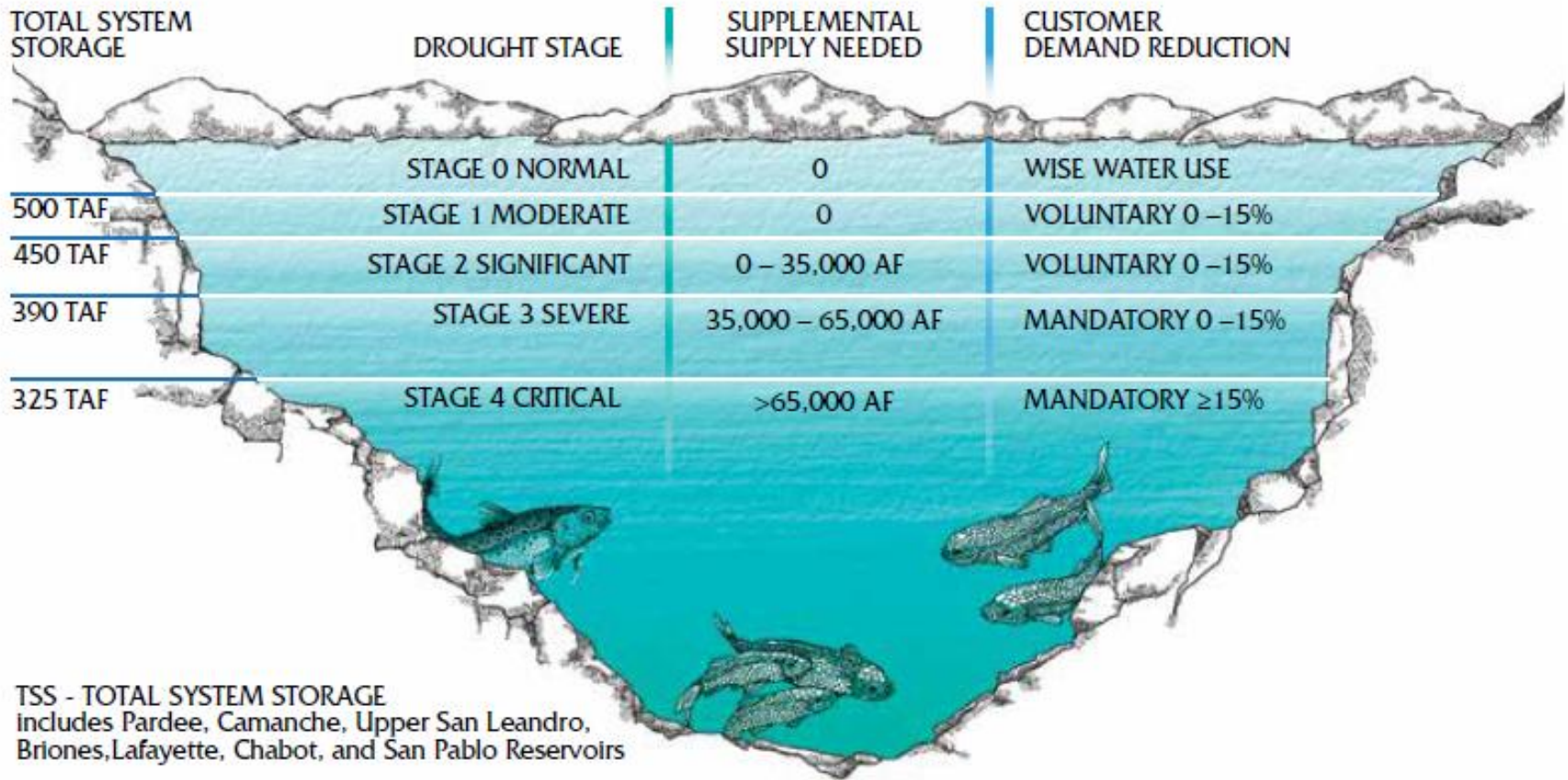


# Drought Management Program



FIGURE 3-2

DROUGHT MANAGEMENT PROGRAM GUIDELINES



# Freeport Regional Water Project (FRWP)



FRWA INTAKE

## Partners

- Freeport Regional Water Authority (FRWA)
- Sacramento County Water Agency (SCWA)
- East Bay Municipal Utility District (EBMUD)
- US Bureau of Reclamation (USBR)

## Project

- 185 MGD Regional Facility
  - 100 MGD EBMUD
  - 85 MGD SCWA
- 3 Pumping Plants
- 36 miles of transmission pipelines
- Project complete Nov. 2011



...BASED ON A TRUE STORY



# Historical Context



**1987 - Critically Dry Water Year**

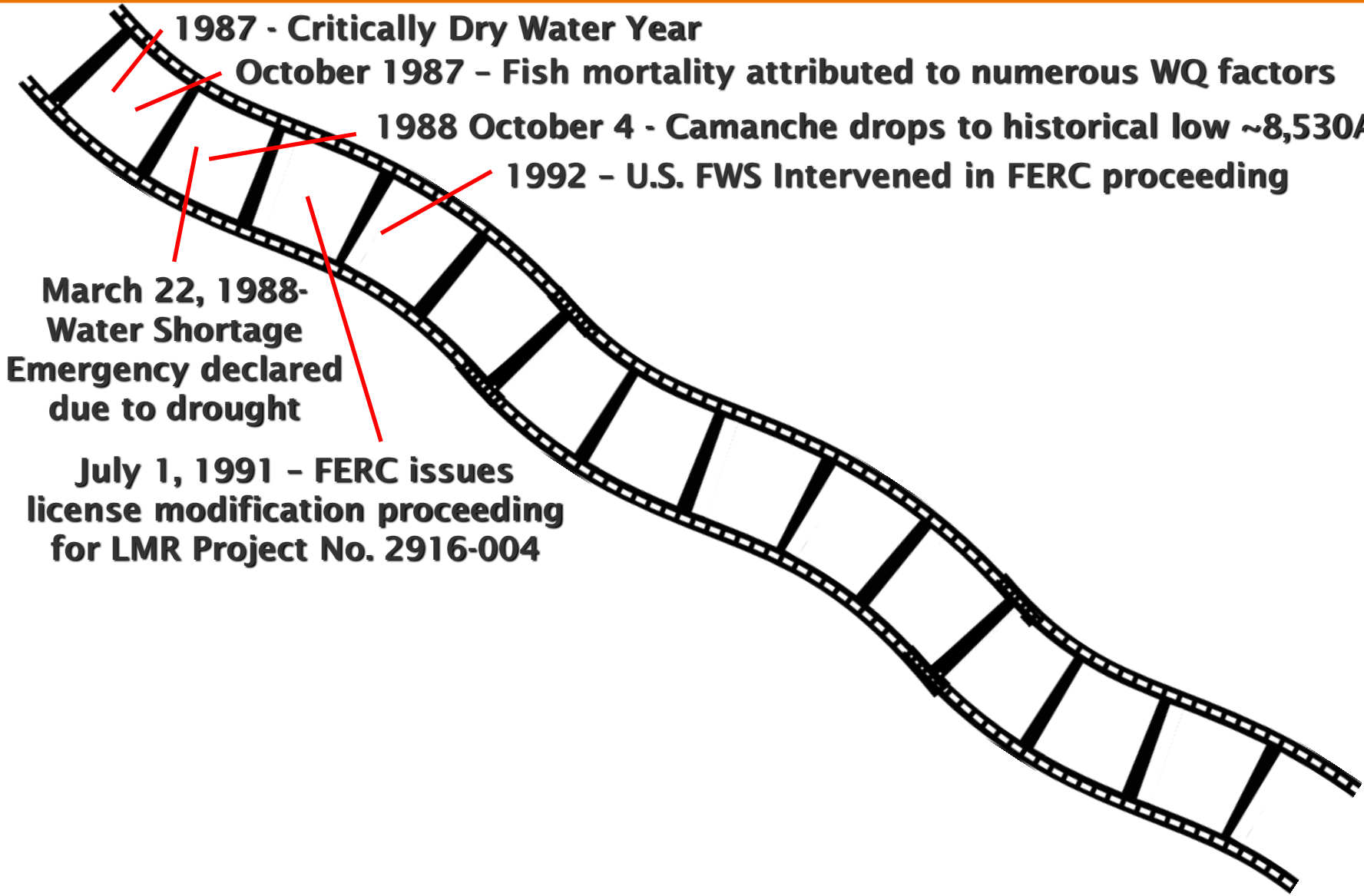
**October 1987 - Fish mortality attributed to numerous WQ factors**

**1988 October 4 - Camanche drops to historical low ~8,530AF**

**1992 - U.S. FWS Intervened in FERC proceeding**

**March 22, 1988-  
Water Shortage  
Emergency declared  
due to drought**

**July 1, 1991 - FERC issues  
license modification proceeding  
for LMR Project No. 2916-004**



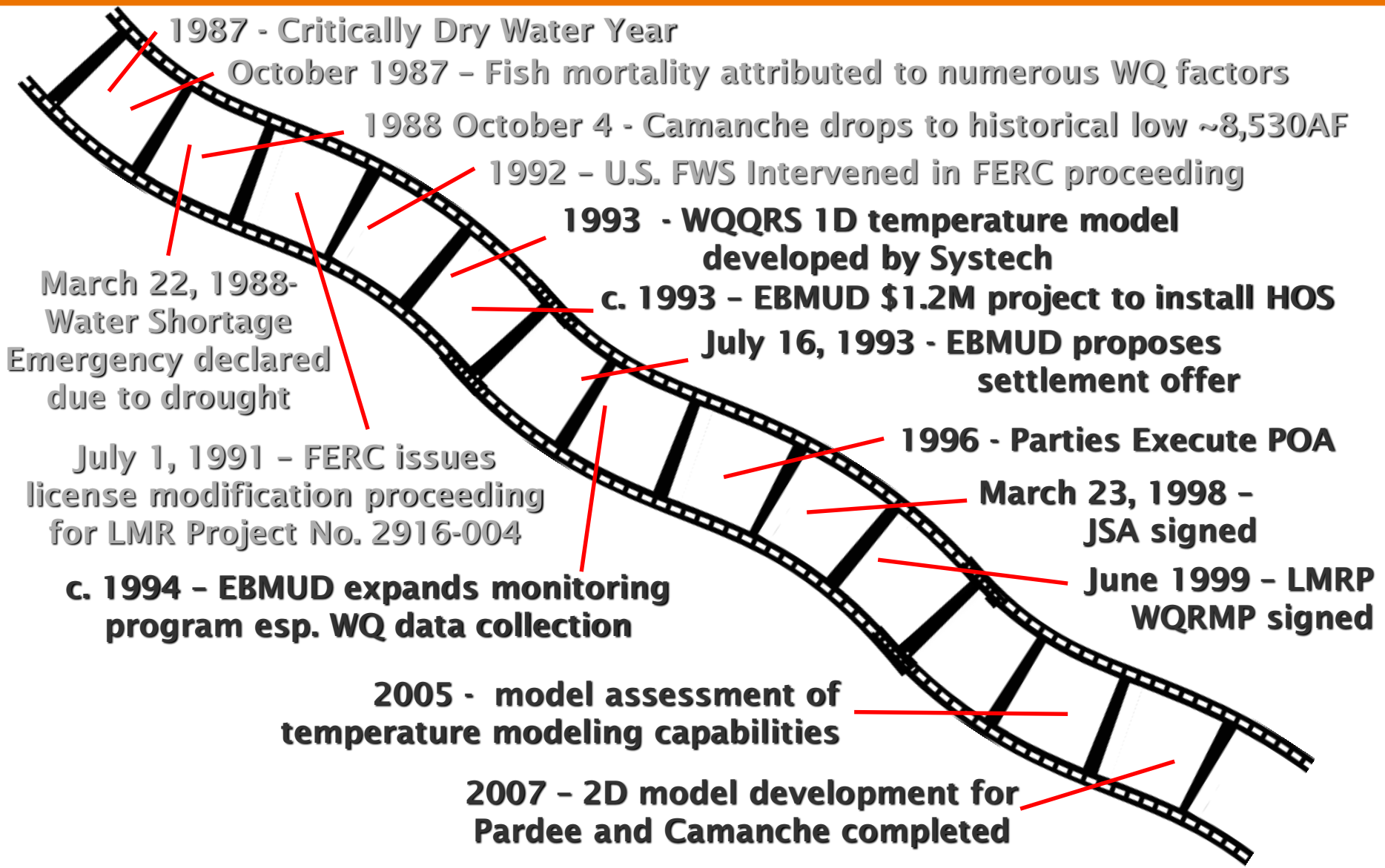
# EBMUD Mission Statement



To manage the natural resources with which the District is entrusted; to provide reliable, high quality water and wastewater services at fair and reasonable rates for the people of the East Bay; and to preserve and protect the environment for future generations.

(c. 1991)

# Historical Context



# Release Criteria: Joint Settlement Agreement



- In February 1996, EBMUD, USFWS, and CDFG reached consensus on Principles of Agreement that were the foundation for the 1998 Joint Settlement Agreement (JSA)
- The JSA established a set of minimum flow criteria
- The JSA Established Water Quality requirements as well for Public Trust Resources
- JSA also has clauses establishing Adaptive management & Gainsharing for supplemental supplies

## LOWER MOKELUMNE RIVER PROJECT

FERC Project No. 2916-004

## JOINT SETTLEMENT AGREEMENT

### LOWER MOKELUMNE RIVER PROJECT

#### *WATER QUALITY AND RESOURCE MANAGEMENT PROGRAM*

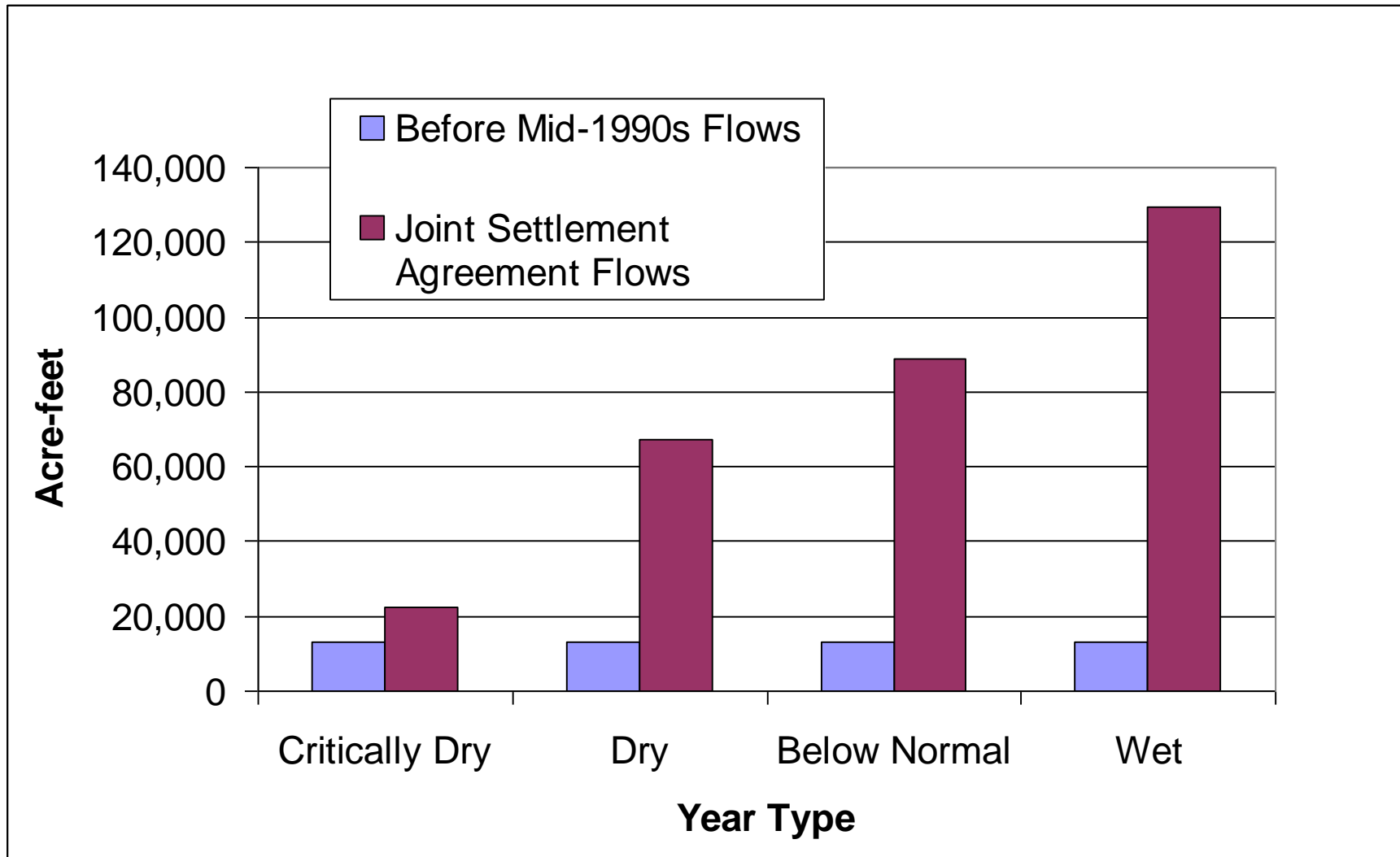
##### BACKGROUND

The Federal Energy Regulatory Commission (FERC) November 27, 1998 Order Approving Settlement Agreement and Amending License approved the June, 1997 offer of settlement (Agreement) filed by the East Bay Municipal Utility District (EBMUD), U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) in June 1997. Under the terms of the Agreement, EBMUD, USFWS and CDFG established a Lower Mokelumne River Partnership, the objectives of which included:

- Protection and enhancement of the anadromous fishery;
- Protection and improvement of the Mokelumne River ecosystem;
- Encouragement of stakeholder participation and cooperation; and
- Integration of Mokelumne River strategies with the Bay Delta Accord, CVPIA implementation, or similar measures.

The Partnership Steering Committee, composed of one representative each from CDFG, USFWS and EBMUD, developed this Water Quality and Resource Management Program (Program) to define reasonable goals, measures, performance criteria and responsive actions associated with the implementation of the Agreement. To enhance the Program and to have the ability to adapt to changing conditions, the Program may be modified by the Partnership. Any such modification must be made by unanimous written approval of EBMUD, USFWS and CDFG. Progress will be assessed annually at the Mokelumne River Symposium. Ten years after the effective date of the Agreement (November 1998), the committee will cooperate in the preparation of a report that describes the successes and failures of achieving the goals identified in the Agreement.

# Water Release *Pre* vs. *Post* JSA



# Release Criteria: JSA *Contd.*



		Year Type and Releases							
		Normal and Above Normal		Below Normal		Dry		Critically Dry	
		Camanche Release (cfs)	Below Woodbridge Dam <sup>b</sup> (cfs)	Camanche Release (cfs)	Below Woodbridge Dam <sup>b</sup> (cfs)	Camanche Release (cfs)	Below Woodbridge Dam <sup>b</sup> (cfs)	Camanche Release (cfs)	Below Woodbridge Dam <sup>b</sup> (cfs)
Period	Life Stage								
Oct 1-15	Adult migration	325	100	250	100	220	80	100	15
Oct 16-31	Spawning/incubation	325	100	250	100	220	80	130	75
Nov 1-Mar 31 <sup>a</sup>	Spawning—fry rearing	325	100	250	100	220	80	130	75
Apr 1-30	Fry rearing	325 <sup>c</sup>	150	250 <sup>c</sup>	150	220	150	130	75
May 1-31	Fry and juvenile rearing	325 <sup>c</sup>	300	250 <sup>c</sup>	200	220	150	100 <sup>d</sup>	15
Jun 1-30	Outmigration	325 <sup>c</sup>	300	250 <sup>c</sup>	200	100 <sup>d</sup>	20	100 <sup>d</sup>	15
Jul 1-Sep 30	Oversummer	100	25	100	20	100	20	100	15

<sup>a</sup> Approximate period when Woodbridge Irrigation District (WID) dam (Woodbridge Dam) boards are out and Lodi Lake is empty

<sup>b</sup> When WID board dams are out, it is expected that flow downstream of Woodbridge Dam will be at least as high as the value shown, but East Bay Municipal Utility District (EBMUD) would not be required to release more than the specified amount from Camanche Reservoir. During the other periods, Camanche releases must be sufficient to meet the specified flow below Woodbridge Dam

<sup>c</sup> For normal, above normal, and below normal years, extra flows will be released from Camanche Reservoir during April-June depending on the combined Pardee and Camanche storage for the end of the prior month as follows:  
 < 10 thousand acre feet (TAF) below maximum allowable storage (BMAS), additional release is 200 cfs for subsequent month.  
 10 TAF <= BMAS < 20 TAF, additional release is 150 cfs for subsequent month.  
 20 TAF <= BMAS < 30 TAF, additional release is 100 cfs for subsequent month.  
 30 TAF <= BMAS < 40 TAF, additional release is 50 cfs for subsequent month.

<sup>d</sup> Outmigrating smolts will be trapped, tagged, and transported around the Sacramento-San Joaquin River Delta.

# Water Supply Operations Criteria



Pardee and Camanche Reservoirs are operated in an integrated manner to meet and balance a myriad of obligations:

- Water supply
- Fishery Requirements
  - Joint Settlement Agreement (FERC)
  - SWRCB D-1641
- Water rights & obligations to downstream diverters
- Flood control
- Hydropower generation
- Recreation



# Lower Mokelumne River Fall-Run Chinook Salmon Annual Escapement, 1940-2018 and Contribution to Ocean Fisheries



Year	Actual Mokelumne Fall-Run Chinook Returns	CVPIA Goal	In-River Spawning	Mokelumne Fishery's Share of Total California Off-Coast Catch	
				Commercial	Recreational
2017	19,954 fish	9,300 fish	5,635 fish	20%	35%
2018	17,474 fish	9,300 fish	10,194 fish	43%	33%

