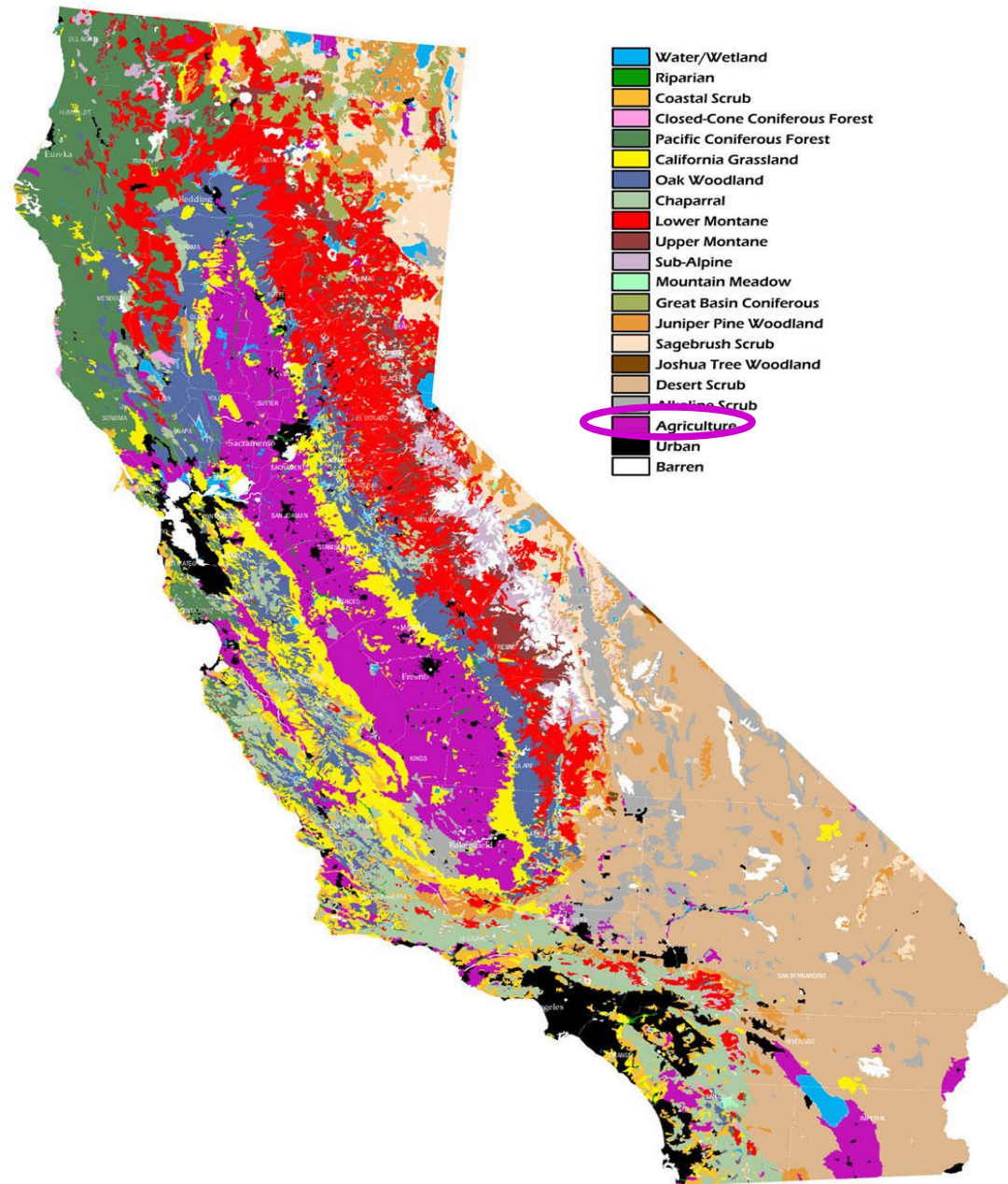


California has a variety of climate and land use zones

- Natural diversity allows diverse agriculture to thrive
- A relatively small share of the total land mass is suitable for high-productivity irrigated crops

California Vegetation/Wildlife Habitat Regions

© 2004 Jeremiah Easter



Major Water Projects

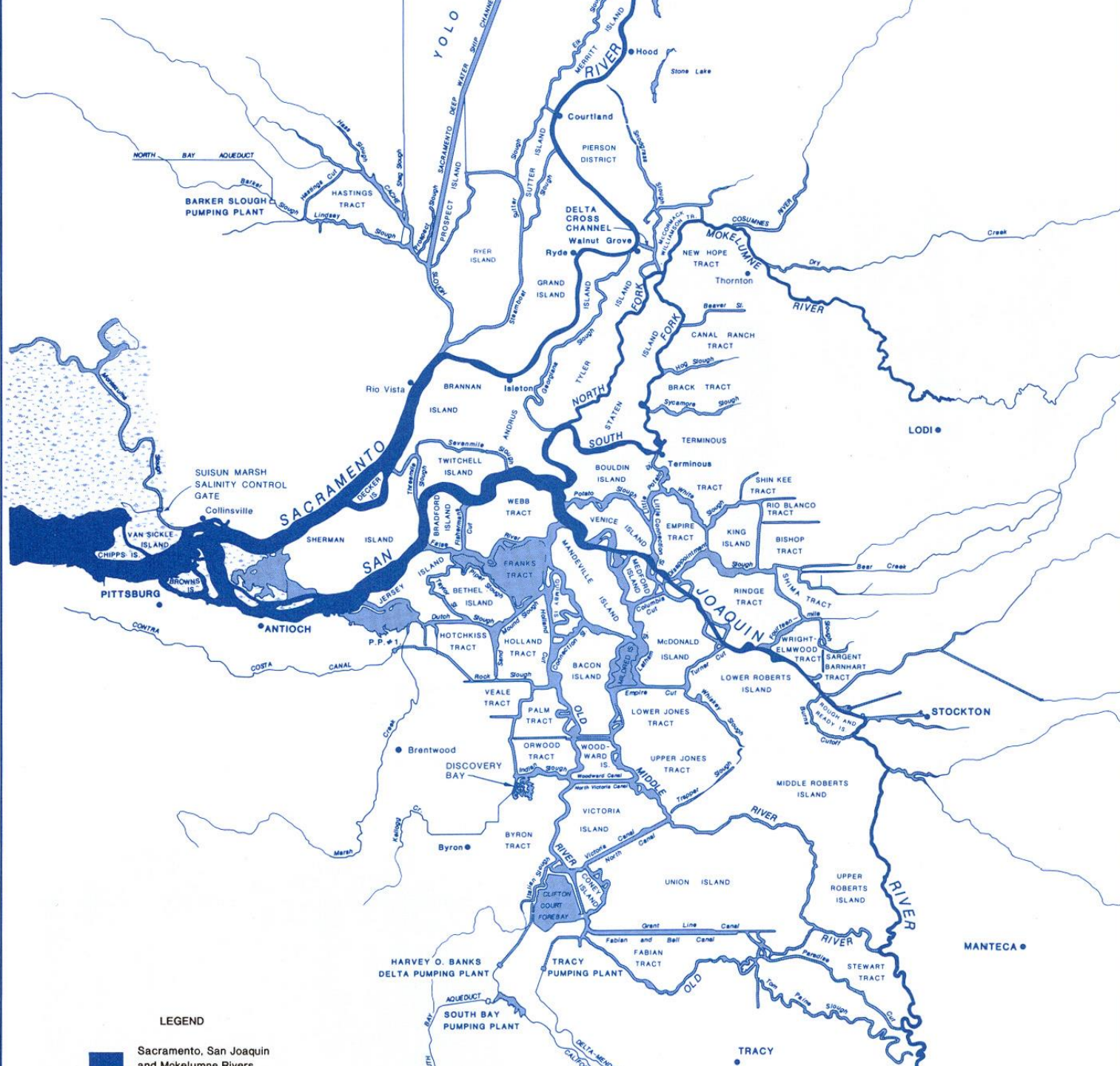
💧 Federal – Central Valley Project (CVP)

💧 State – State Water Project (SWP)

💧 Local – Many smaller projects throughout state





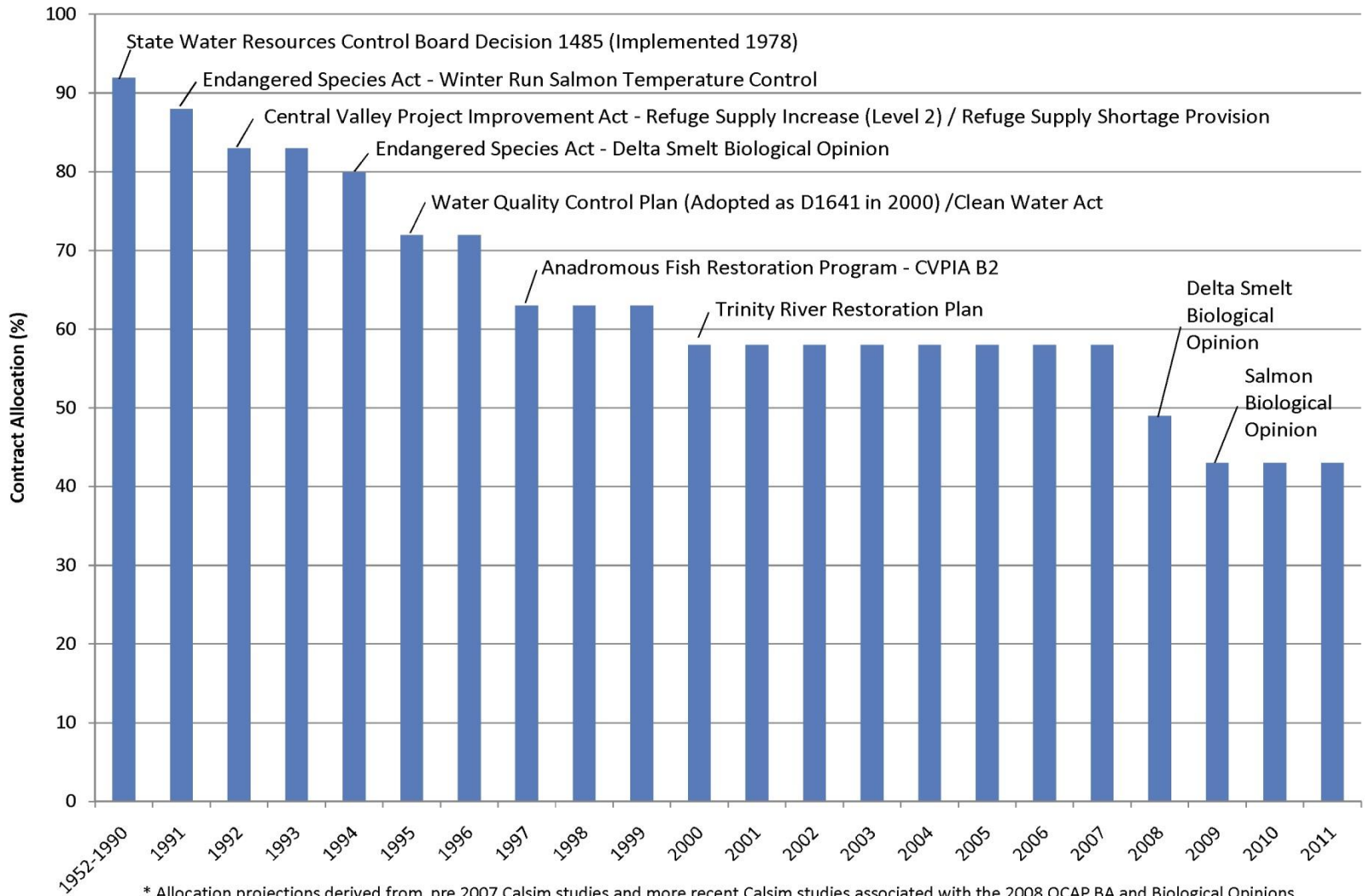


LEGEND

Sacramento, San Joaquin
and Mokelumne Rivers

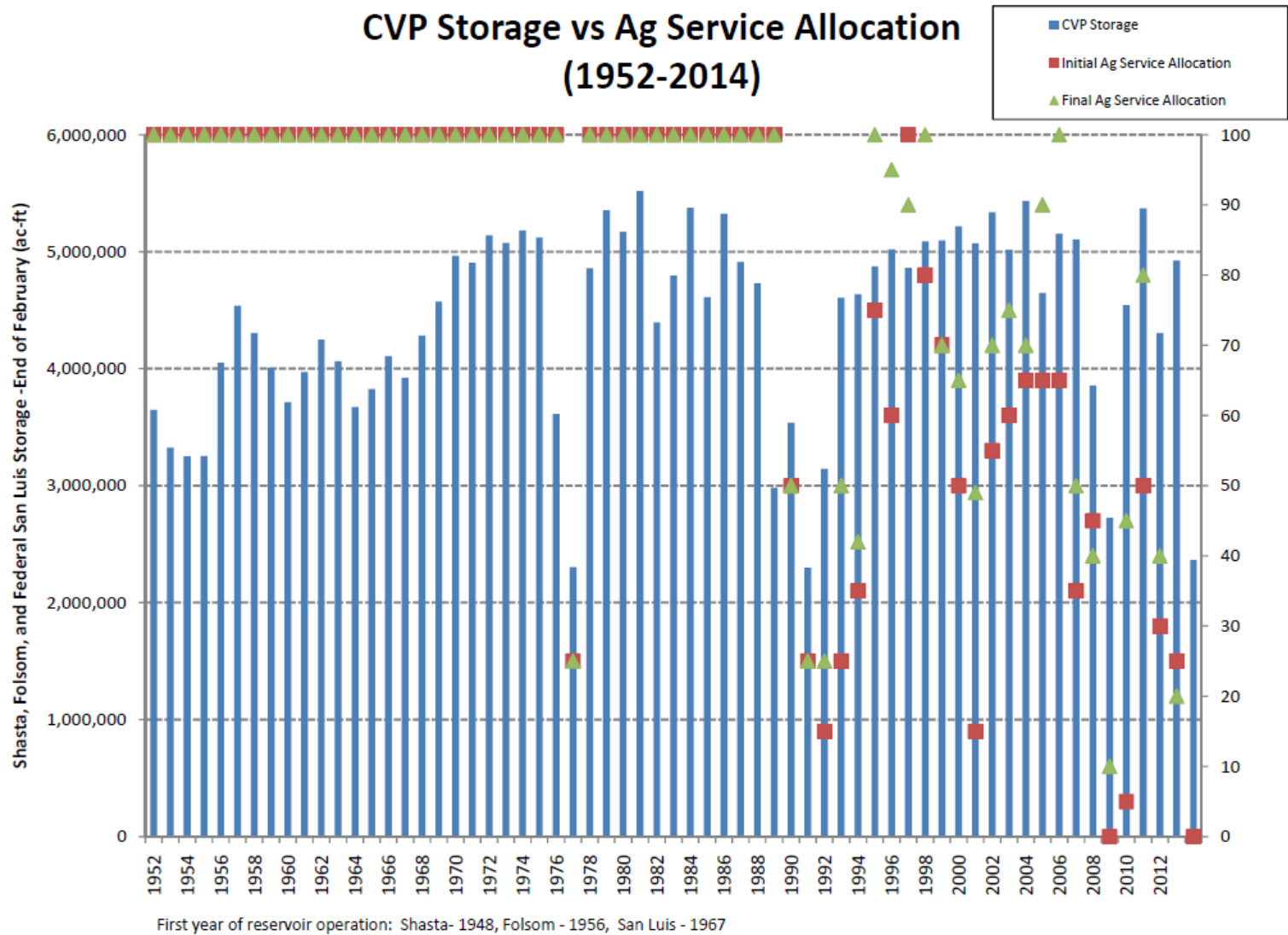


Long Term Average, CVP S. of Delta Ag Service Contract Allocation

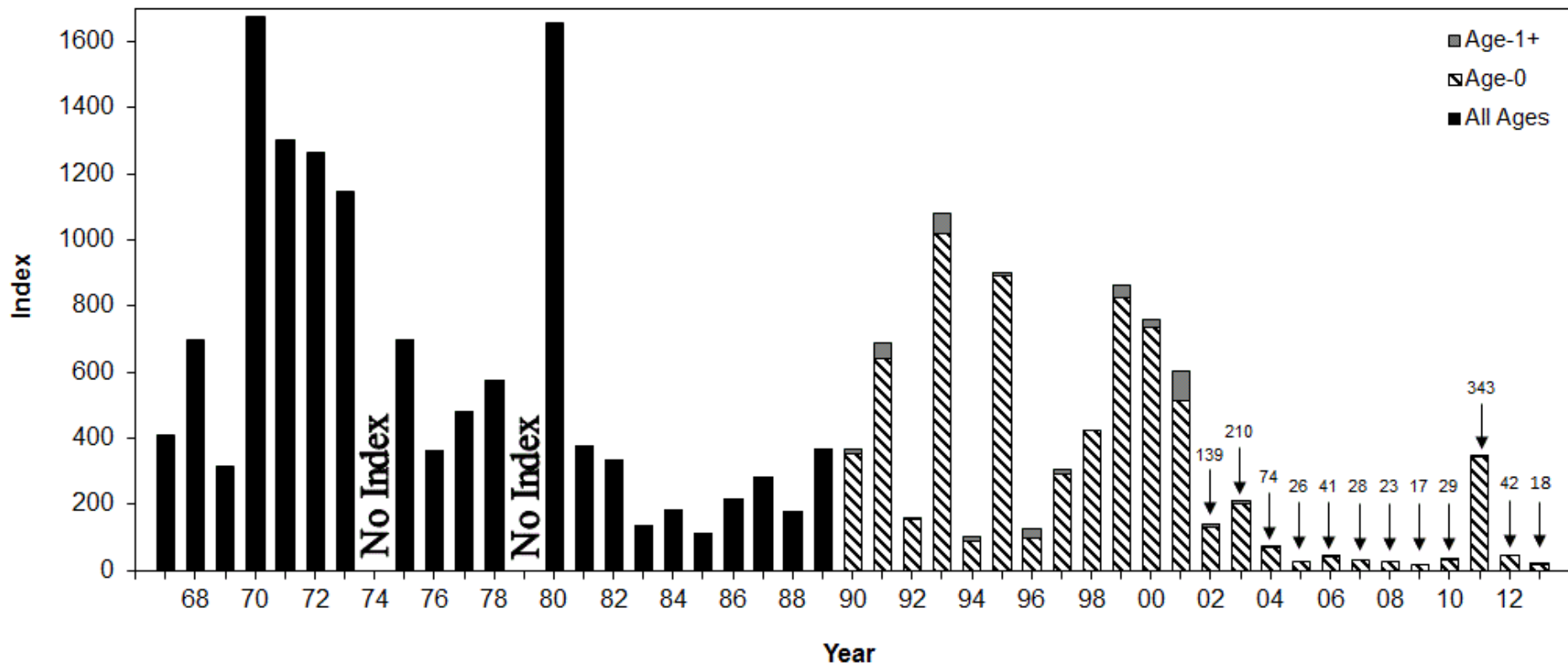


* Allocation projections derived from pre 2007 Calsim studies and more recent Calsim studies associated with the 2008 OCAP BA and Biological Opinions

CVP Storage vs Ag Service Allocation (1952-2014)

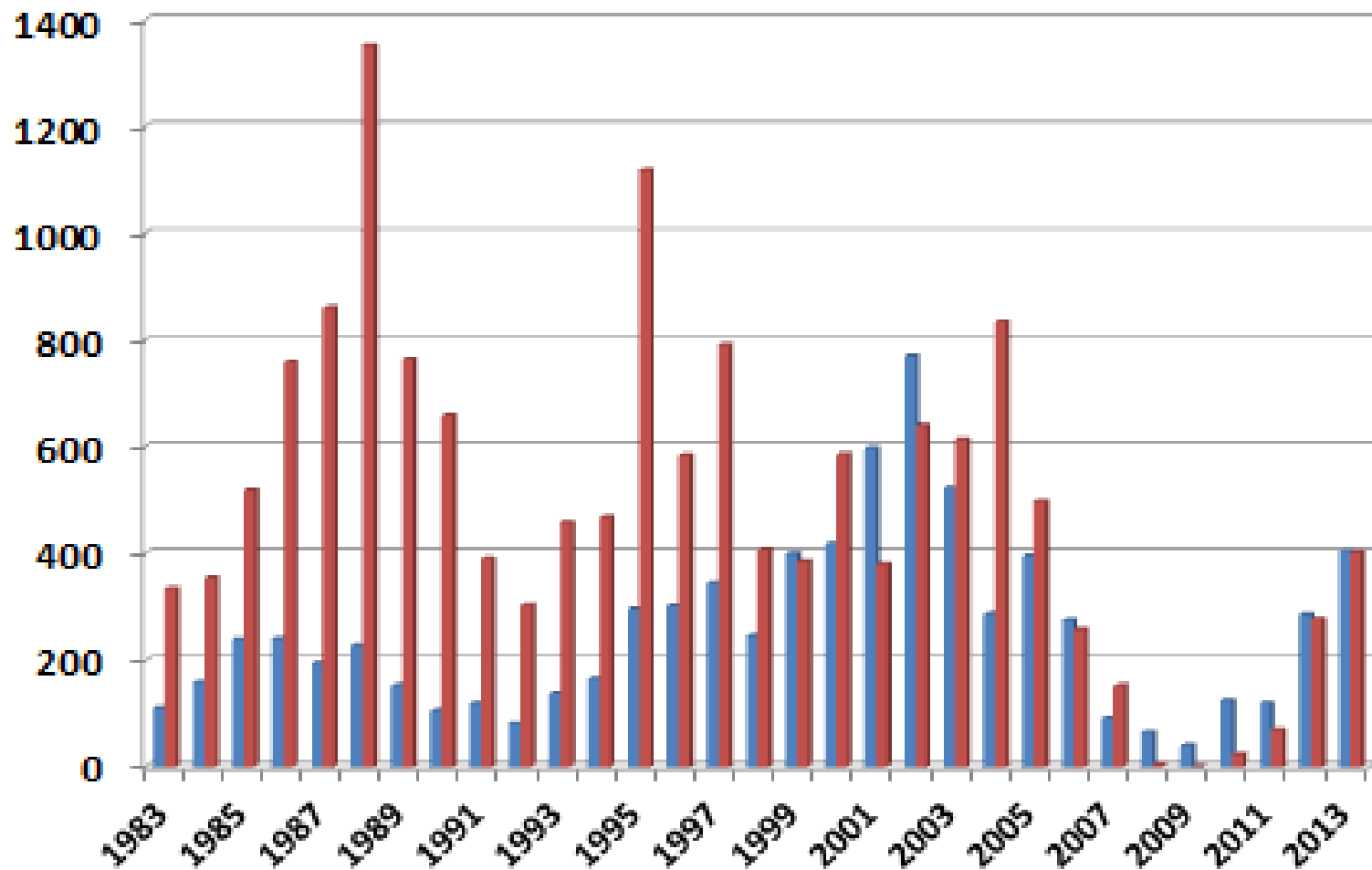


Delta Smelt Indices From 1967-2013

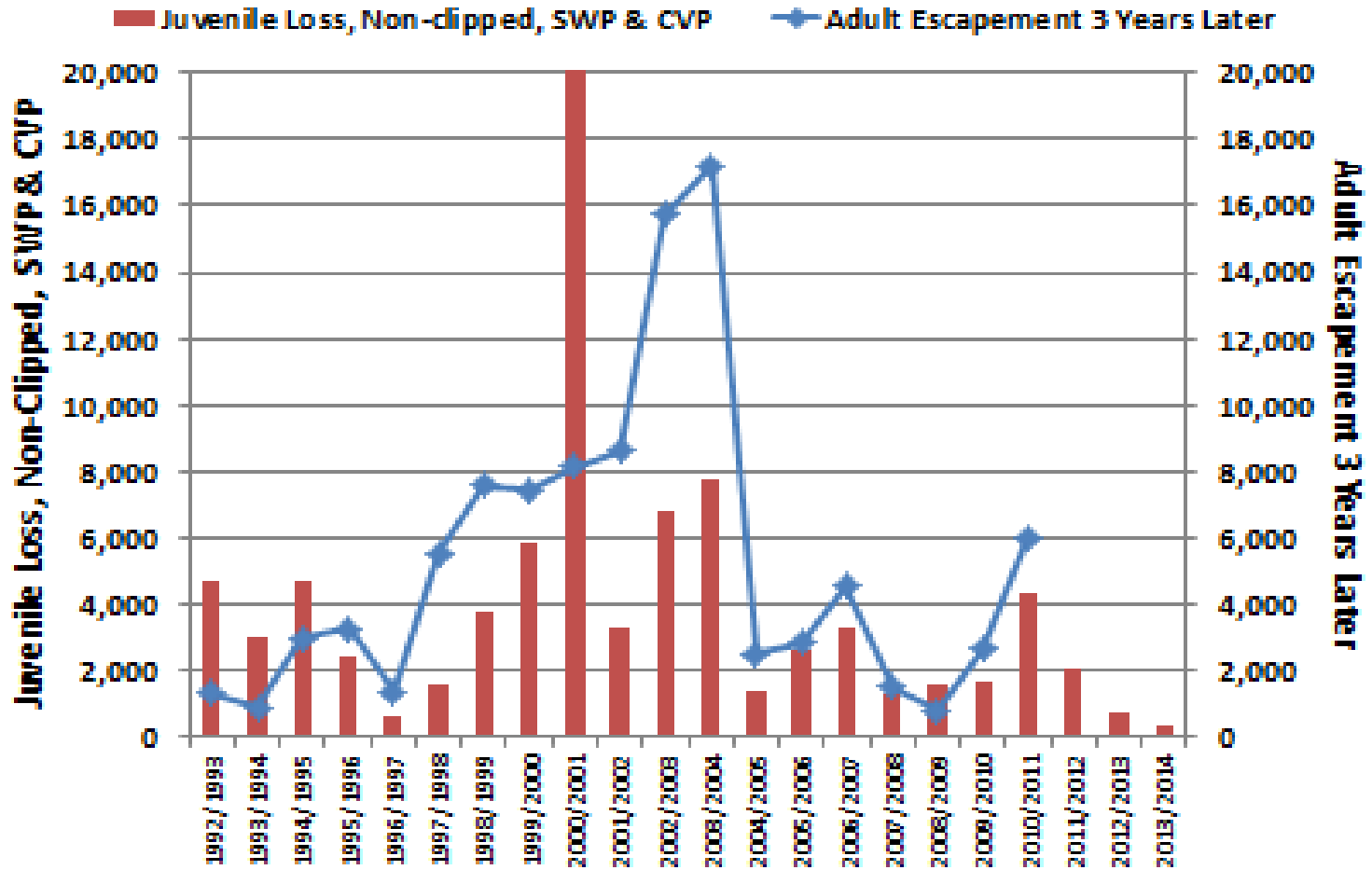


Sacramento River Fall Run Chinook

■ Spawning Escapement ■ Ocean Harvest

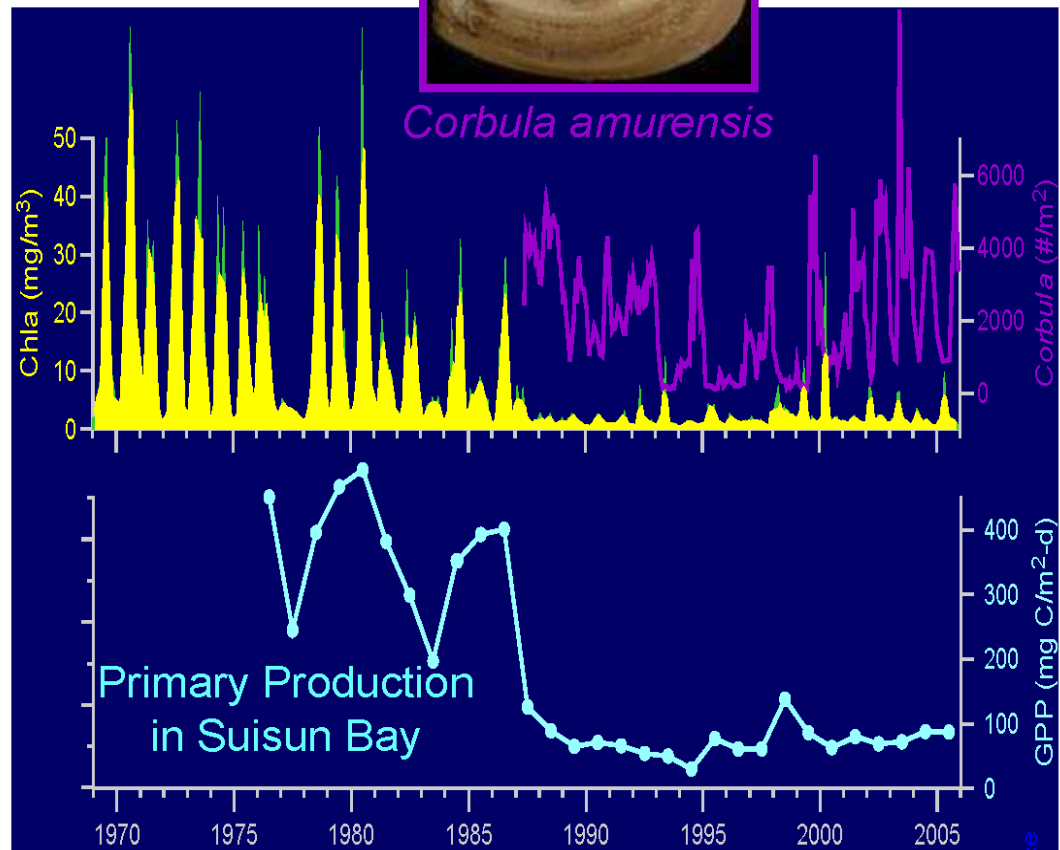
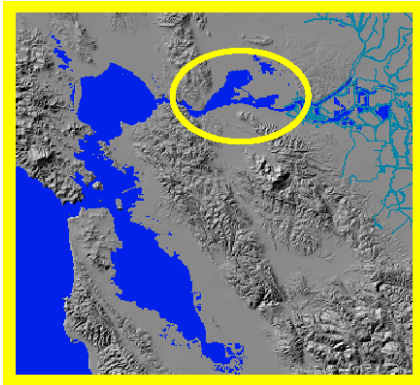


WINTER RUN CHINOOK



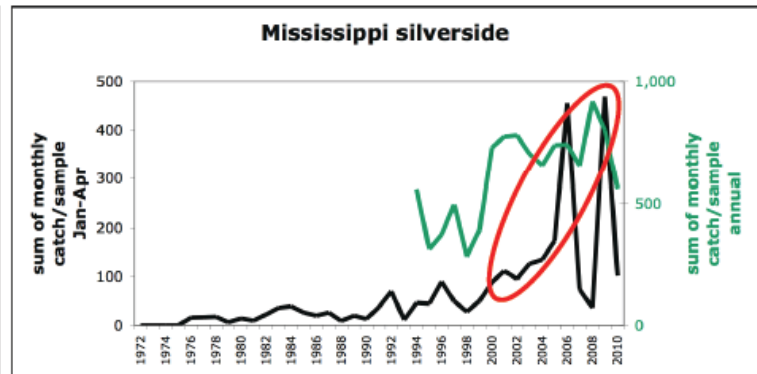
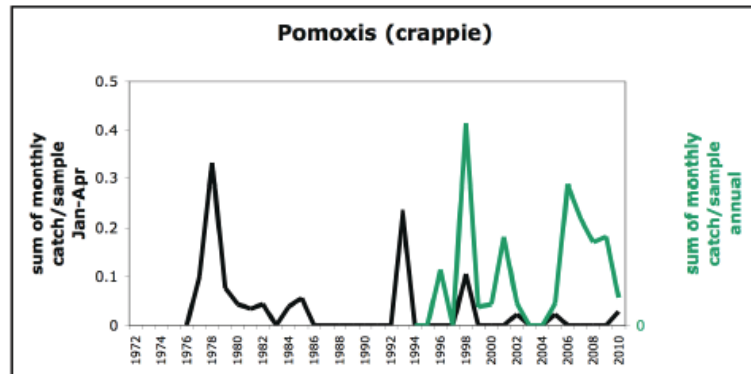
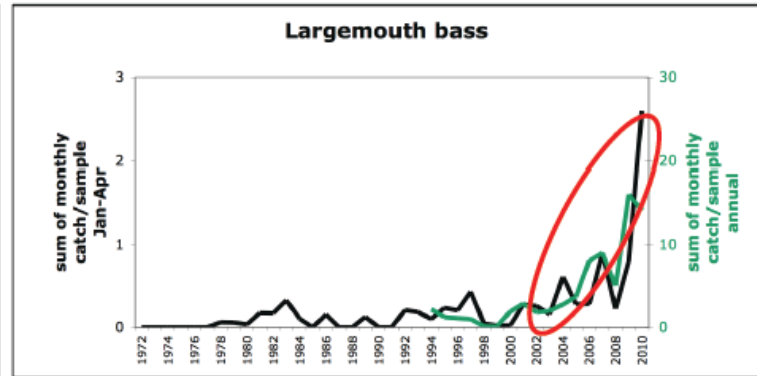
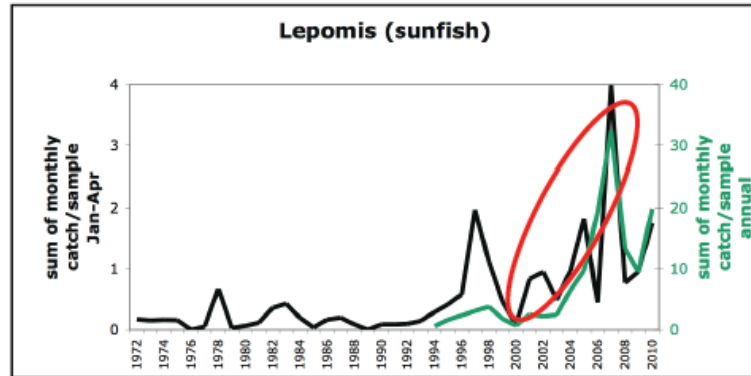
Phytoplankton Primary Production

... CRASHED in Suisun Bay right after the 1987 *Corbula* invasion



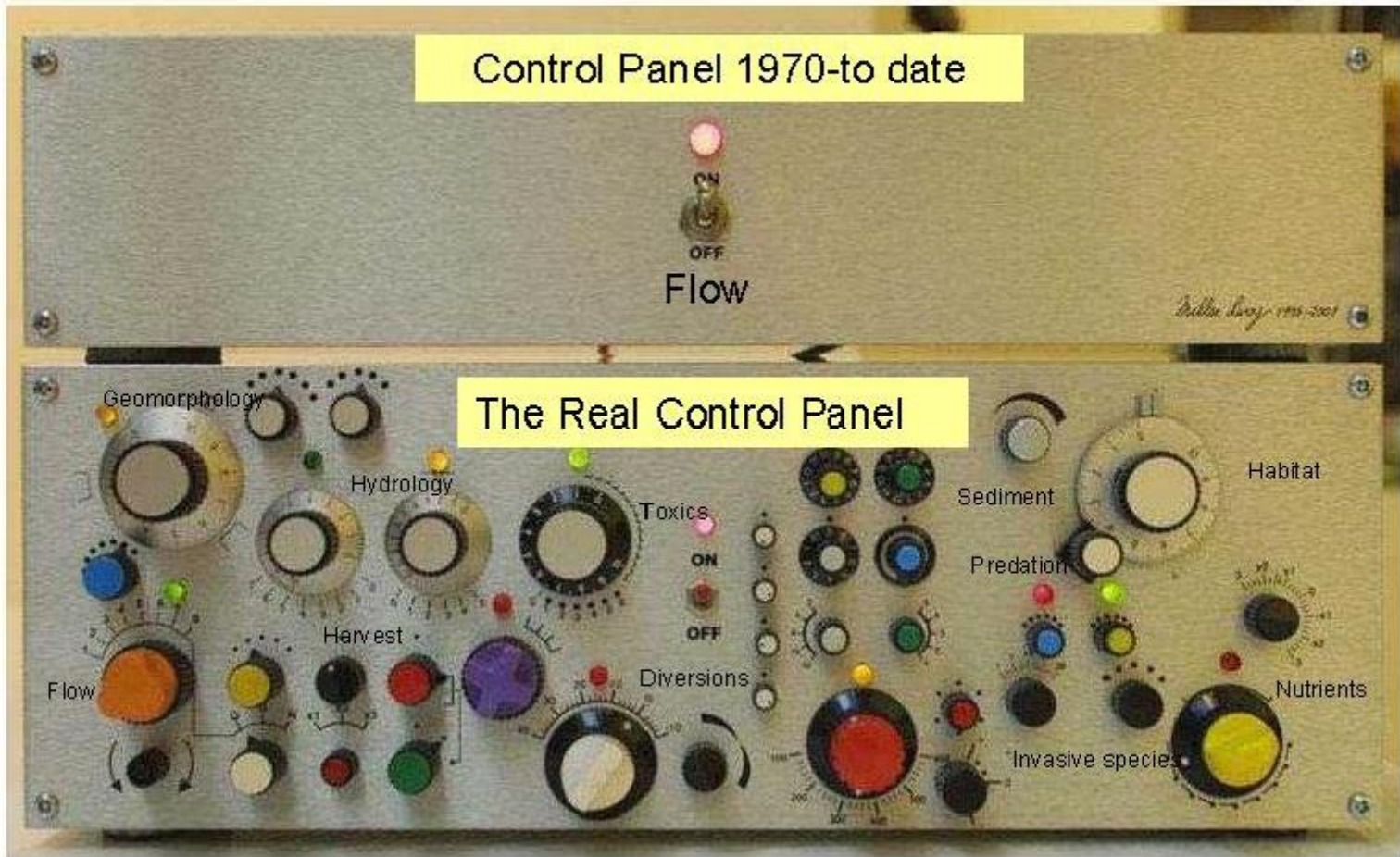
Source: J. Cloern (USGS): Oral presentation at the 2007 Annual IEP Workshop, Asilomar, CA

Predators of Pelagic Fish



data: Beach Seine catch/tow

Delta Ecosystem Management



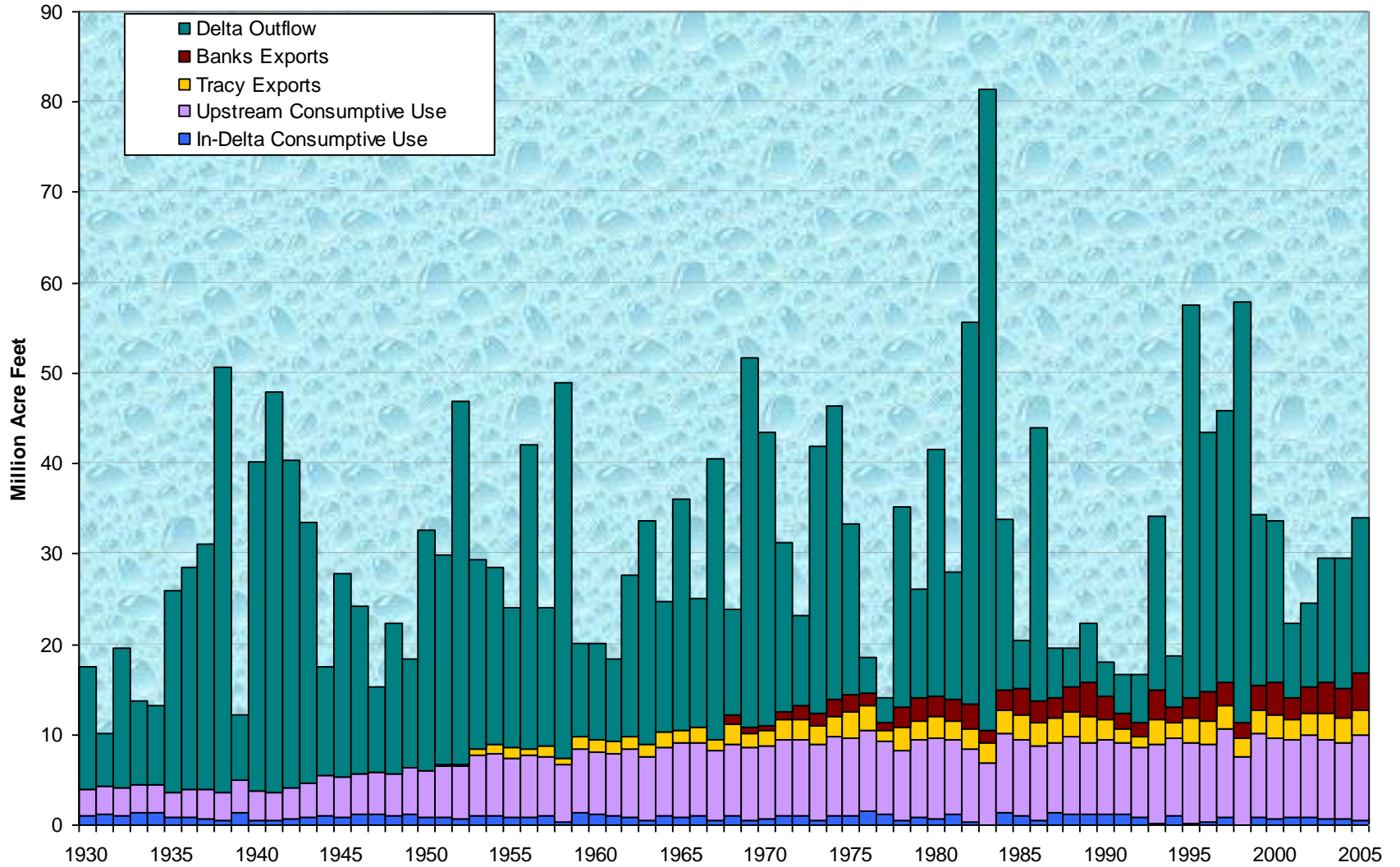
Winter-run Chinook Salmon Stressor Matrix

Population	Pop Weight (0-1) Sum to 1	Life Stage	Life Stage Weight (0-1) Sum to 1	Primary Stressor Category	Primary Stressor Weight (0-1) Sum to 1	Specific Stressor	Specific Stressor Weight (0-1) Sum to 1	Composite Weight (X100)	Number of Specific Stressors	Normalized Weight (Composite * # of specific stressors)	Overall Ca
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	Keswick/Shasta Dam	0.650	2.763	6	16.58	
Sacramento River	1	Spawning	0.325	Barrier	0.350	Keswick/Shasta Dam	1.000	11.375	1	11.38	
Sacramento River	1	Embryo Incubation	0.25	Flow Conditions	0.250	Flow Fluctuations in upper Sacramento River	1.000	6.250	1.00	6.25	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Natural Morphologic Function	0.150	Loss of Natural Morphologic Function in the Delta	0.300	1.463	4	5.85	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Natural Morphologic Function	0.150	Loss of Natural Morphologic Function in the lower Sacramento River	0.300	1.463	4	5.85	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Riparian Habitat and Instream Cover	0.125	Loss of Riparian Habitat and Instream Cover in the Delta	0.350	1.422	4	5.69	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Riparian Habitat and Instream Cover	0.125	Loss of Riparian Habitat and Instream Cover in the lower Sacramento River	0.350	1.422	4	5.69	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the Delta	0.225	1.097	5	5.48	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the lower Sacramento River	0.225	1.097	5	5.48	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the middle Sacramento River with emphasis on anthropogenically-created predation opportunities at GCID, RBDD and other structures	0.225	1.097	5	5.48	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Predation	0.150	Predation in the upper Sacramento River with emphasis on anthropogenically-created predation opportunities at ACID and other structures	0.225	1.097	5	5.48	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Changes in Delta Hydrology	0.250	1.016	5	5.08	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Diversion into Central Delta	0.250	1.016	5	5.08	
Sacramento River	1	Embryo Incubation	0.25	Short-term Inwater Construction	0.200	Sedimentation, turbidity, acoustic effects, hazardous spills, physical disturbance	1.000	5.000	1.00	5.00	
Sacramento River	1	Embryo Incubation	0.25	Water Quality	0.200	Water Pollution in upper Sacramento River	1.000	5.000	1.00	5.00	
Sacramento River	1	Embryo Incubation	0.25	Water Temperature	0.200	Water Temperature in upper Sacramento River	1.000	5.000	1.00	5.00	
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Natural Morphologic Function	0.150	Loss of Natural Morphologic Function in the upper Sacramento River	0.250	1.219	4	4.88	
Sacramento River	1	Spawning	0.325	Spawning Habitat Availability	0.150	Habitat Suitability in in upper Sacramento River	1.000	4.875	1	4.88	
Sacramento River	1	Spawning	0.325	Water Temperature	0.150	Upper Sacramento River	1.000	4.875	1	4.88	
Sacramento River	1	Adult Immigration and holding	0.1	Harvest/Angling Impacts	0.100	Ocean	0.700	0.700	6	4.20	

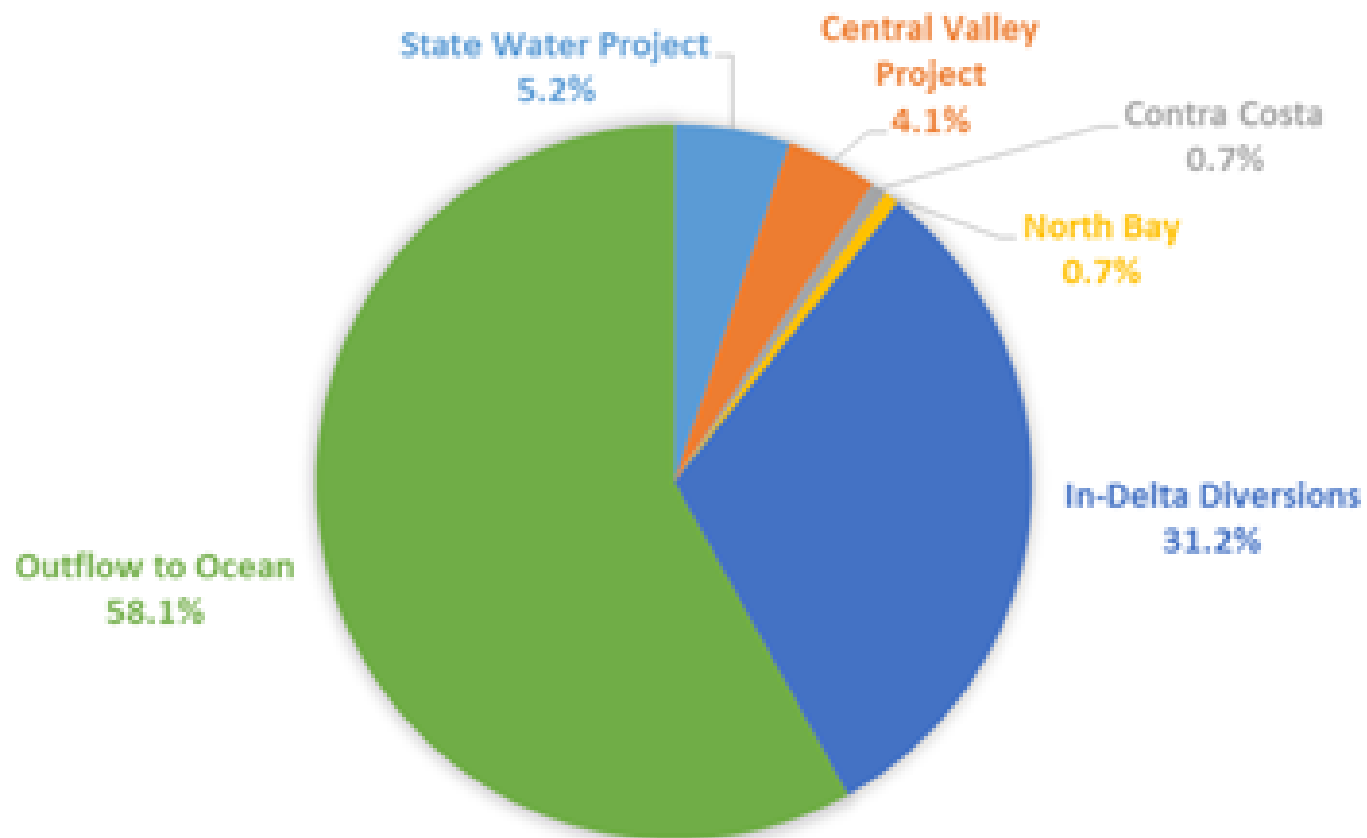
Winter-run Chinook Salmon Stressor Matrix

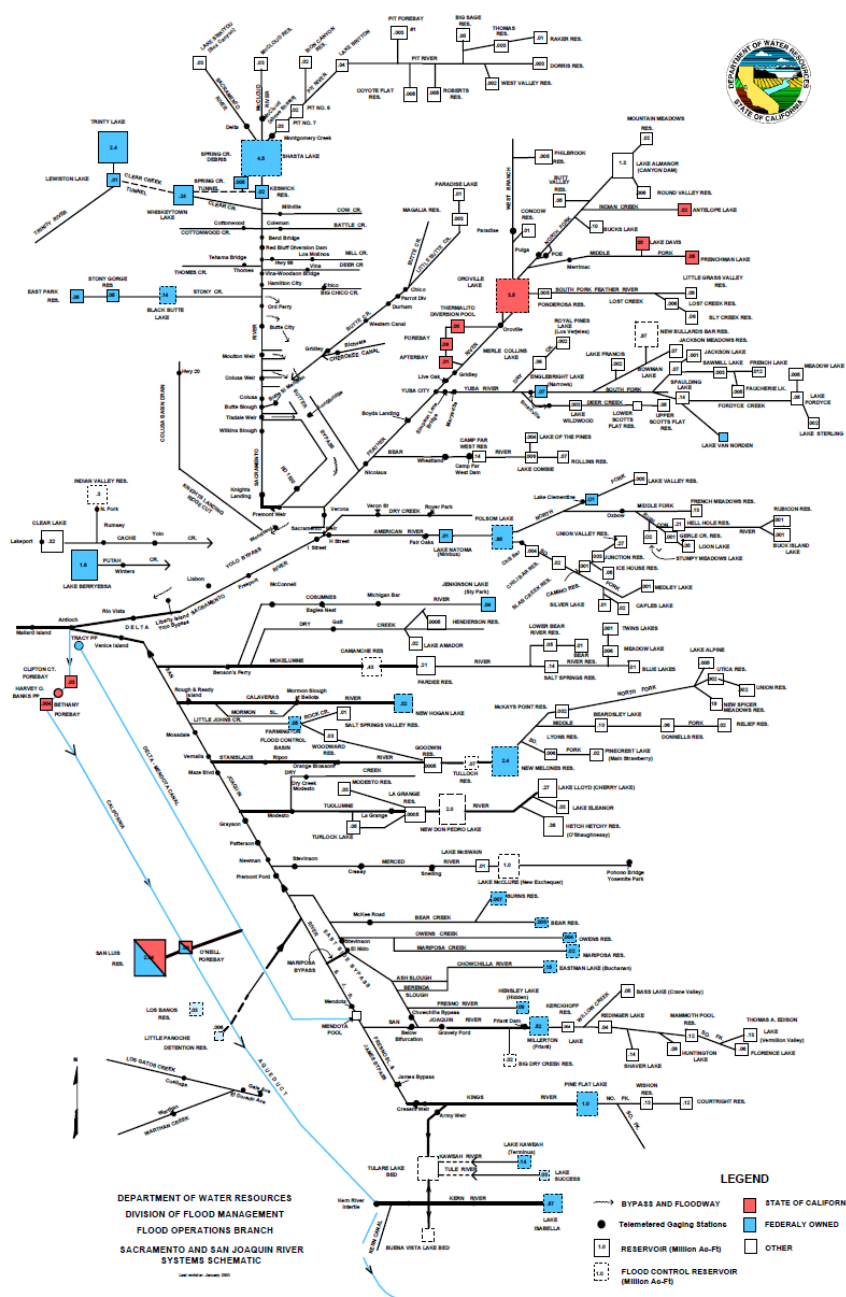
Population	Pop Weight (0-1) Sum to 1	Life Stage	Life Stage Weight (0-1) Sum to 1	Primary Stressor Category	Primary Stressor Weight (0-1) Sum to 1	Specific Stressor	Specific Stressor Weight (0-1) Sum to 1	Composite Weight (X100)	Number of Specific Stressors	Normalized Weight (Composite * # of specific stressors)	Overall Cat
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Flow Dependent Habitat Availability in the lower Sacramento River	0.200	0.813	5	4.06	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Individual Diversions in the Delta	0.225	0.548	7	3.84	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Jones and Banks Pumping Plants	0.225	0.548	7	3.84	V
Sacramento River	1	Adult Immigration and holding	0.1	Passage Impediments/Barriers	0.425	Red Bluff Diversion Dam	0.150	0.638	6	3.83	V
Sacramento River	1	Embryo Incubation	0.25	Harvest/Angling Impacts	0.150	Redd disturbance in upper Sacramento River	1.000	3.750	1.00	3.75	V
Sacramento River	1	Adult Immigration and holding	0.1	Flow Conditions	0.200	Low Flows - attraction, migratory cues AND Flood Flows - non-natal area attraction in Lower Sacramento River	0.600	1.200	3	3.60	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Floodplain Habitat	0.075	Loss of Floodplain Habitat in the Delta	0.350	0.853	4	3.41	V
Sacramento River	1	Spawning	0.325	Flow Conditions	0.100	Flow Fluctuations in upper Sacramento River	1.000	3.250	1	3.25	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Riparian Habitat and Instream Cover	0.125	Loss of Riparian Habitat and Instream Cover in the upper Sacramento River	0.200	0.813	4	3.25	V
Sacramento River	1	Spawning	0.325	Physical Habitat Alteration	0.100	Limited Instream Gravel Supply in upper Sacramento River	1.000	3.250	1	3.25	V
Sacramento River	1	Spawning	0.325	Short-term Inwater Construction	0.100	Sedimentation, turbidity, acoustic effects, hazardous spills in upper Sacramento River	1.000	3.250	1	3.25	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Loss of Natural Morphologic Function	0.150	Loss of Natural Morphologic Function in the middle Sacramento River	0.150	0.731	4	2.93	V
Sacramento River	1	Adult Immigration and holding	0.1	Short-term Inwater Construction	0.150	Sedimentation, turbidity, acoustic effects, hazardous spills in the upper Sacramento River	0.350	0.525	5	2.63	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Water Temperature	0.050	Middle Sacramento River	0.400	0.650	4	2.60	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Individual Diversions in the lower Sacramento River	0.150	0.366	7	2.56	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Individual Diversions in the middle Sacramento River	0.150	0.366	7	2.56	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Entrainment	0.075	Individual Diversions in the upper Sacramento River	0.150	0.366	7	2.56	V
Sacramento River	1	Juvenile Rearing and Outmigration	0.325	Flow Conditions	0.125	Flow Dependent Habitat Availability in the middle Sacramento River	0.125	0.508	5	2.54	V

DRAFT: Delta Outflow, Upstream Consumptive Use, and Exports



WHERE THE WATER WENT MAY 1 THROUGH JUNE 16, 2015



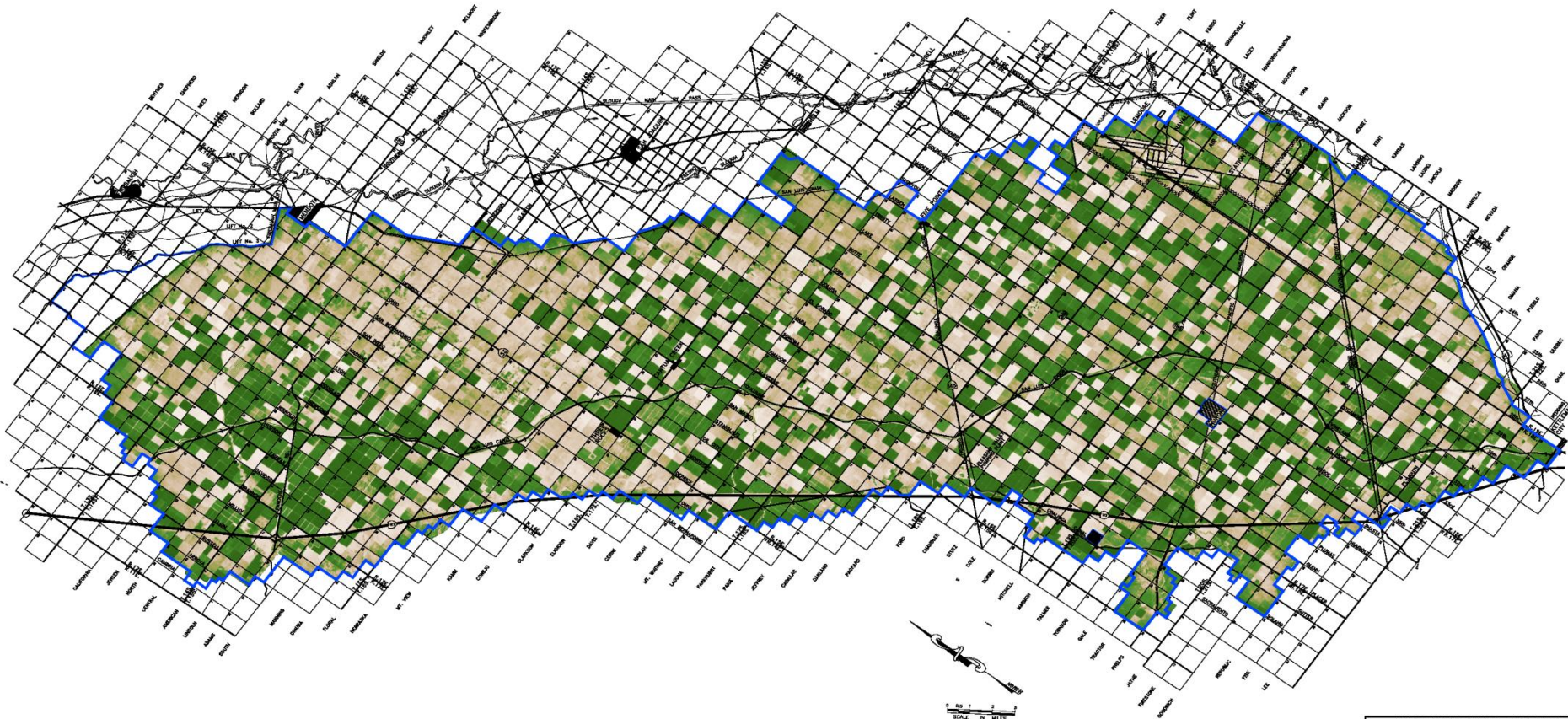


DEPARTMENT OF WATER RESOURCES
DIVISION OF FLOOD MANAGEMENT
FLOOD OPERATIONS BRANCH
SACRAMENTO AND SAN JOAQUIN RIVER
SYSTEMS SCHEMATIC

- LEGEND**
- BYPASS AND FLOODWAY
 - Telemetered Gaging Stations
 - 1.0 RESERVOIR (Million Aa-Ft)
 - 10.0 FLOOD CONTROL RESERVOIR (Million Aa-Ft)
 - STATE OF CALIFORNIA
 - FEDERALLY OWNED
 - OTHER

2009 Satellite Image of Westlands

Reflects only 317,000 acres farmed



Westlands Water District Fallowed Fields

This is a satellite image displaying the condition of farming in the Westlands Water District on July 12, 2009. The vivid green areas are fields on which crops are being grown. The brown areas are fields that have been fallowed. And brown areas with random patchy areas of light green are fallowed fields which have been overrun with weeds. Overall, out of a total of 572,000 irrigable acres, the image confirms that only 317,000 acres were being farmed on this date. Fallowed lands included 169,000 acres that had been taken out of production due to water shortages and an additional 86,000 acres that have been permanently retired by the district.

WESTLANDS WATER DISTRICT <small>4140 N. FRENCH ST., FRESNO, CALIFORNIA 93704 559.254.1523 Fax 559.241.6277</small>											
<small>LOCATION MAP</small> WESTLANDS AERIAL VIEW <small>Satellite Image taken 7/12/2009</small>											
<small>DESIGNED/REVISED: 2009-09-0109 DMC</small> <small>DATE: 9/2/09</small> <small>BY: J. RANGEL</small> <small>DESCRIPTION: Aerial View</small>	<small>APPROVED</small> <small>CHECKED</small> <small>DATE: 7/22/09</small> <small>DRAWING No. 2009-9-0109A</small>										
<table border="1"> <thead> <tr> <th>NUMBER</th> <th>DATE</th> <th>DRAWN</th> <th>CHECKED</th> <th>APPROVED</th> </tr> </thead> <tbody> <tr> <td>7</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <small>BY: J. RANGEL</small>	NUMBER	DATE	DRAWN	CHECKED	APPROVED	7					
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