

**Lower Mokelumne River Project**

**FERC Project No. 2916**

**2013 Project Operations Report**



**EAST BAY MUNICIPAL UTILITY DISTRICT**

**Submitted to the Federal Energy Regulatory Commission in  
Compliance with Ordering Paragraph (C) of the November 27, 1998  
Order Approving Settlement Agreement and Amending License**

**February 2014**



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*ABBREVIATIONS*

<b>AFRP</b>	Anadromous Fish Restoration Program
<b>AOP</b>	Annual Operations Plan
<b>CAMP</b>	Comprehensive Assessment and Monitoring Program
<b>CBDA</b>	California Bay Delta Authority
<b>CDFW</b>	California Department of Fish and Wildlife
<b>CVPIA</b>	Central Valley Project Improvement Act
<b>CWT</b>	Coded Wire Tag
<b>DCC</b>	Delta Cross Channel
<b>DWR</b>	Department of Water Resources
<b>EBMUD</b>	East Bay Municipal Utility District
<b>FERC</b>	Federal Energy Regulatory Commission
<b>HOS</b>	Hypolimnetic Oxygenation System
<b>JSA</b>	Joint Settlement Agreement
<b>LMRMP</b>	Lower Mokelumne River Management Plan
<b>LMRSP</b>	Lower Mokelumne River Stewardship Program
<b>LWWC</b>	Lodi-Woodbridge Winegrape Commission
<b>MRA</b>	Mokelumne River Association
<b>MRDUA</b>	Mokelumne River Day Use Area
<b>MRFH</b>	Mokelumne River Fish Hatchery
<b>MRTAC</b>	Mokelumne River Technical Advisory Committee
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NPDES</b>	National Pollution Discharge Elimination System Permit
<b>PCC</b>	Partnership Coordinating Committee
<b>PSC</b>	Partnership Steering Committee
<b>SAFCA</b>	Sacramento Area Flood Control Agency
<b>SCWA</b>	Sacramento County Water Agency
<b>SJCOG</b>	San Joaquin Council of Governments
<b>SJCRC</b>	San Joaquin County Resource Conservation District
<b>SWRCB</b>	State Water Resources Control Board
<b>TNC</b>	The Nature Conservancy
<b>USFWS</b>	United States Fish and Wildlife Service
<b>USBR</b>	United States Bureau of Reclamation
<b>USGS</b>	United States Geological Survey
<b>WID</b>	Woodbridge Irrigation District
<b>WQRMP</b>	Water Quality and Resource Management Program

## **I. PURPOSE AND SCOPE**

This report is submitted to the Federal Energy Regulatory Commission (FERC) in compliance with Ordering Paragraph (C) of the FERC’s November 27, 1998 Order Approving Settlement Agreement and Amending License (FERC Order), which provides:

“On February 15 of each year, the licensee shall file a report describing all measures completed pursuant to the Settlement during the previous calendar year, and actions proposed to be completed during the then-current calendar year.”

In this report, “Settlement Agreement” refers to the March 23, 1998 Joint Settlement Agreement (JSA) among the East Bay Municipal Utility District (EBMUD), the United States Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW), and “License” refers to the license for EBMUD’s Lower Mokelumne River Project, FERC Project No. 2916.

This report summarizes the measures EBMUD implemented the previous calendar year (2013), and those that it plans to implement in the current calendar year (2014), pursuant to the JSA, to protect and enhance the fishery resources and ecosystem of the lower Mokelumne River.

## **II. INTRODUCTION**

This submittal is EBMUD’s Project Operations Update Report<sup>1</sup> for 2013. EBMUD actions in 2013 were designed to improve water quality, flow regimes, and physical habitat in the lower Mokelumne River area for the benefit of the river’s anadromous and resident fish populations, the riparian zone, associated uplands, and recreational angling. In 1993, EBMUD began voluntarily releasing flows consistent with the Lower Mokelumne River Management Plan (LMRMP), and in March 1996, voluntarily began releasing flows to the lower Mokelumne

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<sup>1</sup> EBMUD submitted earlier Project Operations Reports to FERC prior to the JSA (for the years 1990-94, 1995-96) and after the JSA (for the years 1997-1998 through 2012).

River consistent with the flow requirements of the then proposed JSA. As part of EBMUD's implementation of the JSA and FERC Order, EBMUD continues to release flows consistent with the requirements of the JSA.

Additional efforts to improve the health of the river ecosystem have been implemented through the Water Quality and Resource Management Program (WQRMP). This program, developed by the Partnership Steering Committee (PSC) consisting of representatives from EBMUD, CDFW, and USFWS, in cooperation with NOAA Fisheries and the Mokelumne River Technical Advisory Committee (MRTAC) members, and in accordance with Sections E.3, F.5, and H.5 of the JSA, was approved by FERC May 9, 2001. The WQRMP includes a comprehensive monitoring and applied research program integrated with a well-coordinated program to adaptively manage water and power supply operations, flood control, hatchery operations, and ecosystem rehabilitation actions. The PSC oversees the implementation of the measures identified in the JSA and the WQRMP.

This report is composed of five sections. Section I describes the purpose and scope of EBMUD's Project Operations Update Report and Section II is an introduction to the report. Section III contains current and past data on the status of the lower Mokelumne River salmon populations, including escapement data, redd counts, and outmigration. Section IV covers six key areas in which EBMUD and the JSA partners have made efforts to restore, enhance, and protect the fisheries resource and ecosystem of the lower Mokelumne River. These areas are Flow, Water Quality, Lower Mokelumne River Partnership, Mokelumne River Technical Cooperation, Research and Monitoring, and Habitat Improvements. This section describes efforts made during the 2013 calendar year and efforts planned for 2014. Section V contains the appendices.

### III. STATUS OF THE LOWER MOKELUMNE RIVER SALMON POPULATION

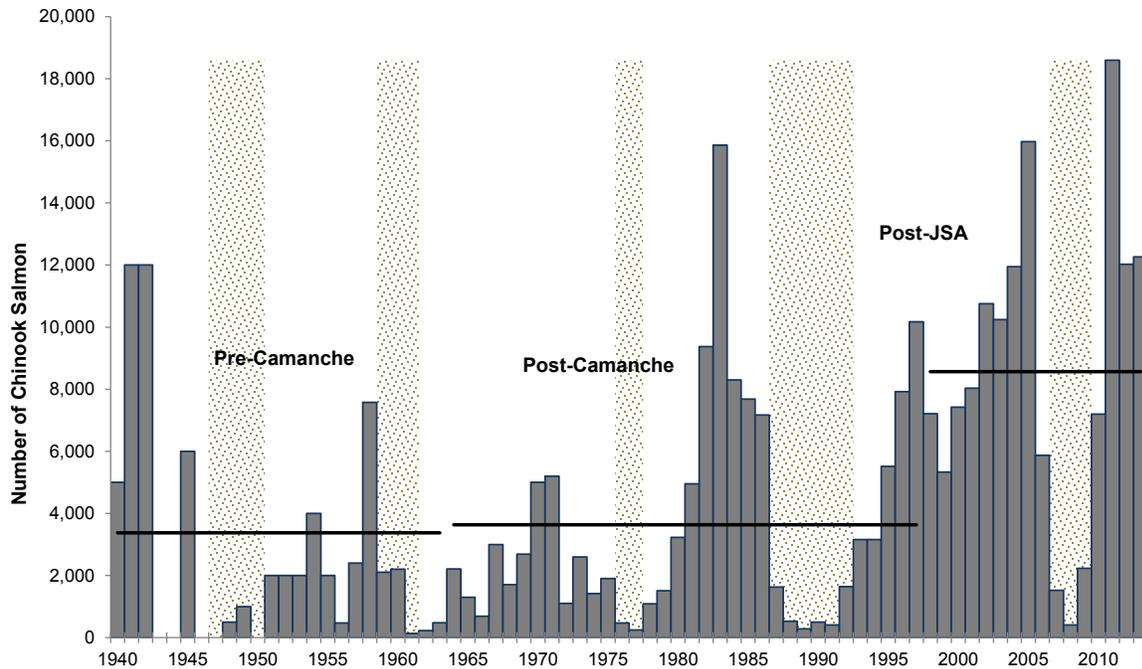
Through the 1990s and into 2013, the lower Mokelumne River Chinook salmon population continues to demonstrate characteristics consistent with long-term sustainability. The fall-run Chinook salmon escapement of 12,265 in 2013 was well above the long term average and was the third largest for the lower Mokelumne River during the period 1990 - 2013 (see Table 1 and Figure 1). EBMUD and Woodbridge Irrigation District (WID) continue to work cooperatively in managing operations to maximize the accuracy of monitoring systems.

**Table 1: Lower Mokelumne River Fall-Run Chinook Salmon Data, 1989-2013**

Year	Outmigration		Total Escapement	Hatchery Returns	Natural Spawners	Percent Natural Spawners of Total	Number of Redds
	Fry	Smolts					
1989	no data	no data	280	81	199	71	no data
1990	See note 3	78,179	497	68	429	86	71
1991	See note 3	31,025	410	42	368	90	127
1992	See note 3	69,993	1,645	710	935	57	345
1993	11,006	172,442	3,157	2,164	993	31	530
1994	554	142,670	3,157	1,919	1,238	39	777
1995	260,103	174,103	5,517	3,323	2,194	40	888
1996	103,270	80,744	7,921	3,883	4,038	51	929
1997	405,350	135,116	10,175	6,494	3,681	36	1,325
1998	1,336,768	511,771	7,213	3,091	4,122	57	1,116
1999	1,232,958	302,481	5,333	3,150	2,183	41	627
2000	107,134	61,391	7,423	5,450	1,973	27	987
2001	37,754	81,580	8,035	5,728	2,307	29	843
2002	11,791	66,132	10,753	7,913	2,840	26	848
2003	8,297	132,174	10,239	8,117	2,122	21	807
2004	45,467	42,187	11,944	10,356	1,588	13	835
2005	197,390	235,484	15,969	5,563	10,406	65	2,170
2006	1,008,289	179,264	5,871	4,139	1,732	30	755
2007	10,349	29,278	1,521	1,051	470	31	306
2008	1,835	16,512	412	239	173	42	63
2009	960	29,654	2,233	1,553	680	30	248
2010	4,243	63,106	7,195	5,275	1,920	27	314*
2011	228,829	52,288	18,596	15,922	2,674	14	564
2012	13,888	38,049	12,027	6,556	5,471	45	1,287
2013	49,102	98,488	12,265	5,170	7,095	58	1,823

Notes:

1. Escapement monitoring generally occurs from August through January, but dates vary each year.
  2. Hatchery Returns: count by CDFW at the Mokelumne River Fish Hatchery.
  3. Estimates were not segregated into fry and smolts.
  4. The data for the most recent year may change as estimates are finalized and new information is analyzed.
- \* Redd survey incomplete due to high flows



Horizontal lines indicate pre-Camanche, post-Camanche, and post-JSA periods, respectively.

1. "Pre-Camanche" escapement (3,374) is the average estimate at Woodbridge Dam for the period from 1940 through 1963 (excluding years when no data were recorded: 1943, 1944, 1946, 1947, and 1950).
2. "Post-Camanche" escapement (3,636) is the average estimate at Woodbridge Dam for the period 1964 through 1997.
3. "Post-JSA" escapement (8,564) is the average estimate at Woodbridge Dam since implementation of the JSA in 1998.
4. Dithered shaded areas are periods of drought in California (California Department of Water Resources, California's Drought Update. November 30, 2009).

**Figure 1: Estimated Annual Spawning Escapement of Fall-Run Chinook Salmon in the Lower Mokelumne River, 1940-2013**

Pacific salmon stocks have been stressed for decades by threats to their stream and estuary habitats. These threats include water diversions, dams, urbanization, sedimentation, pollution, habitat modification, droughts, and predation by non-native species. However, Pacific salmon abundance has also shown a clear correlation with 20<sup>th</sup> century climate variations, including the Pacific Decadal Oscillation (PDO) and the El Niño Southern Oscillation (ENSO). Salmon spend most of their lives in the ocean, and the physical and biological oceanographic conditions in the northern California Current affect the growth and survival of juvenile Pacific salmon. Warm/dry eras of the PDO have resulted in higher salmon returns in Alaska and poor productivity off the West Coast of the contiguous United States, while cool/wet eras produce the opposite effect. Researchers using metrics of large-scale ocean and atmospheric indicators,

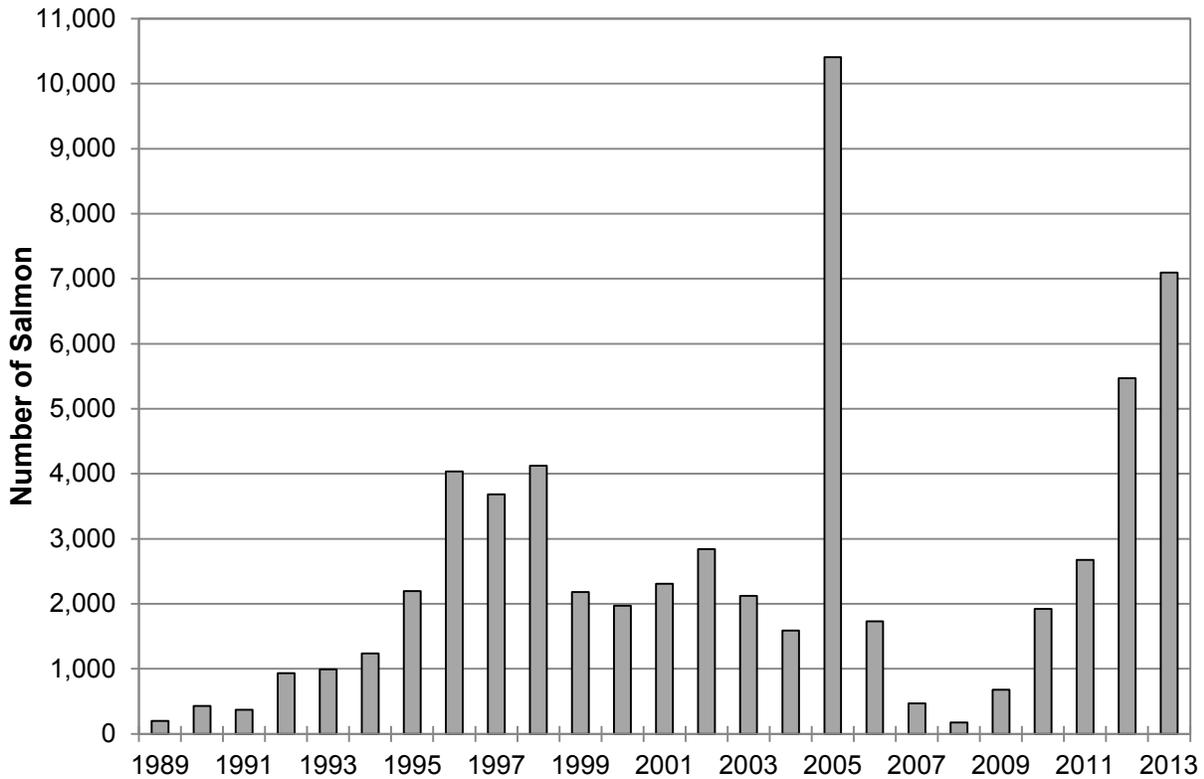
including the PDO and the multivariate ENSO Index; local and regional physical indicators, including sea surface temperature anomalies and the coastal upwelling index; and local biological indicators are able to make predictions on Chinook salmon returns (Peterson et al. 2006<sup>2</sup>).

For example, throughout 2011 the PDO was persistently negative, which contributed to an above average return to the Mokelumne River in 2012. The second half of 2010 saw a transition from El Nino to La Nina conditions, which continued through the duration of 2011. A negative PDO from May through September provided generally favorable conditions to juvenile salmonids that entered the ocean in 2011. This would have benefited the two-year-old grilse return in 2012 and the three-year-old adult return in 2013.

In addition to providing a forecasting tool for salmon returns, these metrics provide insight into the understanding of how variations in ocean conditions affect the annual recruitment of salmon. This is reflected in the escapement of fall-run Chinook salmon in the lower Mokelumne River from 2008 - 2013 (see Figure 1 and Figure 2). Individuals returning in 2008 (low escapement) experienced extremely poor conditions as juveniles, while individuals returning in 2012 and 2013 were exposed to good physical and ecosystem conditions as juveniles when entering the ocean in 2011.

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<sup>2</sup> Peterson, W.T., R.C. Hoof, C.A. Morgan, K.L. Hunter, E. Casillas, and J.W. Ferguson. 2006. Ocean Conditions and Salmon Survival in the Northern California Current. National Marine Fisheries Service, Newport, OR.



**Figure 2: Fall-Run Chinook Salmon Naturally Spawning in the Lower Mokelumne River, 1989-2013**

The Mokelumne River Fish Hatchery (MRFH), owned by the District and operated by the California Department of Fish and Wildlife (CDFW), reported that the 2013 salmon return at the MRFH was 5,170 salmon. The 2012 MRFH Annual Operations Plan (AOP) stated that the import ban of eggs originating from other hatcheries would continue for the long-term. In fact, due to the long-term nature of the egg importation ban, the District and CDFW are focused on achieving hatchery production goals through spawning only Mokelumne origin fish returning to MRFH. For recent news articles on the Mokelumne River fisheries, refer to Appendix A.

#### **IV. EBMUD EFFORTS TO RESTORE, ENHANCE, AND PROTECT THE FISHERIES RESOURCES AND ECOSYSTEM OF THE LOWER MOKELUMNE RIVER**

Responding to drought conditions, increased environmental concerns, and an improved understanding of fishery resource needs on the lower Mokelumne River, EBMUD began in 1987 to develop a multifaceted plan to protect and enhance the fishery and riparian resources of the lower Mokelumne River. This plan, known as the Lower Mokelumne River Management Plan (LMRMP), was developed over five years and was voluntarily implemented by EBMUD beginning in 1993. The 1998 Joint Settlement Agreement (JSA) incorporates the knowledge gained through the development of the LMRMP and also contains additional actions to protect the lower Mokelumne River resource beyond those already undertaken by EBMUD under the LMRMP. Actions taken by EBMUD in 2013, and those actions planned for 2014, are described in this section.

##### **A. FLOW**

Consultation with CDFW and USFWS, on a real-time basis, began during the 1992-1993 salmon run with voluntary flow releases consistent with the LMRMP, and real-time consultation has continued since that time. In March 1996, EBMUD voluntarily began releasing flows to the lower Mokelumne River consistent with the flow requirements of the JSA. The 2013 releases to the lower Mokelumne River are summarized in this section.

EBMUD owns and operates the gaging stations below Woodbridge Dam and below Camanche Dam and measures the flow in accordance with United States Geological Survey (USGS) stream gaging procedures. For water year 2013, releases were measured at Camanche Dam using its Accusonic flow meters. EBMUD also measured the stream flow below Camanche Dam at the McIntire Gage as a back-up to measurements collected with the Accusonic flow meters. The flow data is verified by USGS staff annually and subsequently published in the USGS Water Data Reports, approximately one to two years later. Because of the delay between

the time this flow data is collected and the time it is published in the USGS Water Data Reports, the 2013 flow data included in this report has not yet been verified or published by the USGS.

On December 29, 1999, the State Water Resources Control Board (SWRCB) issued Water Right Decision D-1641, a decision involving numerous parties throughout the Central Valley. A portion of D-1641, modified state water rights on the Mokelumne River, significantly increasing assurances that operations under the JSA will provide the expected flows below Woodbridge Dam. Water Right Decision D-1641, which was re-confirmed by the SWRCB's Water Right Order 2000-2 on March 15, 2000, modifies the water rights of both EBMUD and the Woodbridge Irrigation District (WID). Water Right Decision D-1641 conforms EBMUD's water rights to the FERC-approved JSA flow requirements and also requires WID to control its diversions to ensure that the minimum expected JSA bypass flows are met below Woodbridge Dam.

### 2013

In accordance with the November 27, 1998 FERC approval of the JSA, and based upon EBMUD's forecast of total Pardee and Camanche Reservoir storage on November 5, 2012, EBMUD provided "Below Normal" JSA water year type Camanche Dam flow releases from October 1, 2012 through March 31, 2013. Pardee and Camanche Reservoir actual total storage on November 5, 2012 was 429,000 acre-feet.

Based on the California Department of Water Resources (DWR) April 1, 2013 forecast of 480,000 acre-feet of unimpaired runoff into Pardee Reservoir, EBMUD operated under a "Dry" JSA water year type Camanche Dam flow releases from April 1, 2013 through September 30, 2013.

EBMUD is making, at a minimum, "Below Normal" JSA water year type Camanche Dam flow releases from October 1, 2013 through March 31, 2014. This is based on EBMUD's forecast of total Pardee and Camanche Reservoir storage on November 5, 2013. Actual Pardee and Camanche reservoir storage on November 5, 2013 is 430,540 acre-feet.

Calendar year 2013 actual Camanche Dam average daily flow releases and JSA agreed flow releases from Camanche Dam are shown in Table 2 and Figure 3. The daily average expected flow below Camanche Dam *did not* fall below the minimum during this period. Calendar year 2013 actual average daily flow below Woodbridge Dam and JSA expected flow below Woodbridge Dam are shown in Table 3 and Figure 4.

During the 2013 calendar year, one provisional, temporary flow deviation occurred from the JSA expected flow. That flow deviation occurred below Woodbridge Dam based on the recorded fifteen minute readings measured at Golf gage. The daily average expected flow below Woodbridge Dam *did not* fall below the minimum during this period.

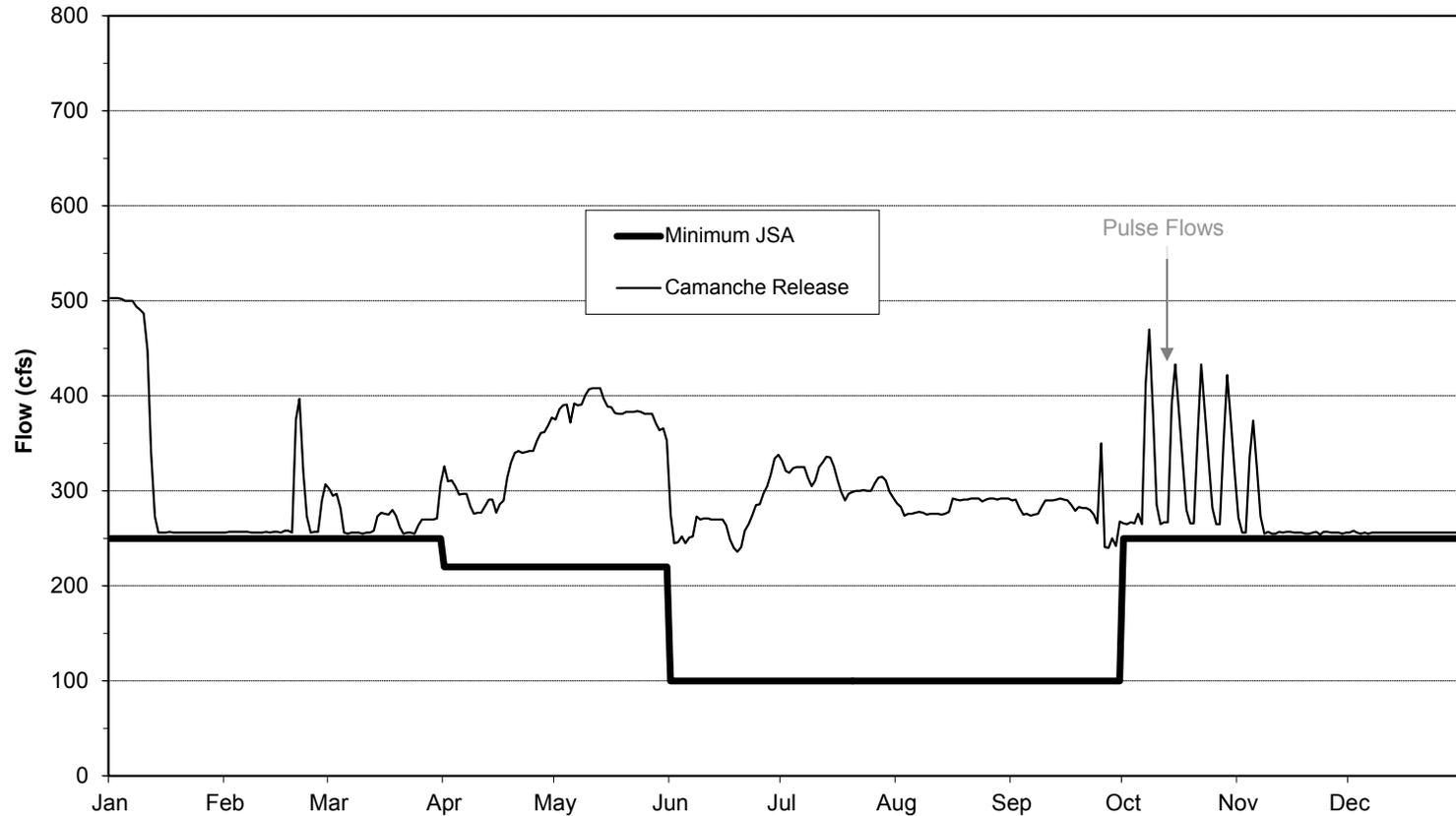
The fifteen minute readings of river flows at the USGS Gaging Station No. 11325500 below Woodbridge Dam, during the provisional, temporary flow deviation are shown in Table 4.

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**Table 2: Calendar Year 2013 Average Daily Release in Cubic Feet per Second from Camanche Dam**

Date	Camanche Release	JSA Release												
01/01/13	503	250	03/17/13	275	250	05/31/13	353	220	08/14/13	276	100	10/28/13	352	250
01/02/13	503	250	03/18/13	280	250	06/01/13	275	100	08/15/13	278	100	10/29/13	422	250
01/03/13	503	250	03/19/13	274	250	06/02/13	245	100	08/16/13	292	100	10/30/13	372	250
01/04/13	502	250	03/20/13	262	250	06/03/13	246	100	08/17/13	291	100	10/31/13	321	250
01/05/13	500	250	03/21/13	255	250	06/04/13	252	100	08/18/13	290	100	11/01/13	272	250
01/06/13	500	250	03/22/13	256	250	06/05/13	245	100	08/19/13	291	100	11/02/13	256	250
01/07/13	500	250	03/23/13	256	250	06/06/13	251	100	08/20/13	291	100	11/03/13	256	250
01/08/13	494	250	03/24/13	255	250	06/07/13	252	100	08/21/13	292	100	11/04/13	335	250
01/09/13	491	250	03/25/13	264	250	06/08/13	273	100	08/22/13	292	100	11/05/13	374	250
01/10/13	487	250	03/26/13	270	250	06/09/13	270	100	08/23/13	292	100	11/06/13	323	250
01/11/13	448	250	03/27/13	270	250	06/10/13	271	100	08/24/13	289	100	11/07/13	273	250
01/12/13	341	250	03/28/13	270	250	06/11/13	271	100	08/25/13	291	100	11/08/13	255	250
01/13/13	273	250	03/29/13	270	250	06/12/13	270	100	08/26/13	292	100	11/09/13	257	250
01/14/13	256	250	03/30/13	271	250	06/13/13	270	100	08/27/13	292	100	11/10/13	255	250
01/15/13	256	250	03/31/13	307	250	06/14/13	270	100	08/28/13	291	100	11/11/13	255	250
01/16/13	256	250	04/01/13	326	220	06/15/13	270	100	08/29/13	292	100	11/12/13	257	250
01/17/13	257	250	04/02/13	310	220	06/16/13	264	100	08/30/13	292	100	11/13/13	256	250
01/18/13	256	250	04/03/13	311	220	06/17/13	249	100	08/31/13	292	100	11/14/13	257	250
01/19/13	256	250	04/04/13	305	220	06/18/13	240	100	09/01/13	290	100	11/15/13	257	250
01/20/13	256	250	04/05/13	296	220	06/19/13	236	100	09/02/13	291	100	11/16/13	256	250
01/21/13	256	250	04/06/13	297	220	06/20/13	241	100	09/03/13	282	100	11/17/13	256	250
01/22/13	256	250	04/07/13	297	220	06/21/13	258	100	09/04/13	275	100	11/18/13	256	250
01/23/13	256	250	04/08/13	284	220	06/22/13	265	100	09/05/13	276	100	11/19/13	255	250
01/24/13	256	250	04/09/13	276	220	06/23/13	274	100	09/06/13	274	100	11/20/13	255	250
01/25/13	256	250	04/10/13	277	220	06/24/13	285	100	09/07/13	275	100	11/21/13	256	250
01/26/13	256	250	04/11/13	277	220	06/25/13	286	100	09/08/13	276	100	11/22/13	257	250
01/27/13	256	250	04/12/13	284	220	06/26/13	297	100	09/09/13	283	100	11/23/13	254	250
01/28/13	256	250	04/13/13	291	220	06/27/13	305	100	09/10/13	290	100	11/24/13	257	250
01/29/13	256	250	04/14/13	291	220	06/28/13	317	100	09/11/13	290	100	11/25/13	257	250
01/30/13	256	250	04/15/13	277	220	06/29/13	334	100	09/12/13	290	100	11/26/13	256	250
01/31/13	256	250	04/16/13	286	220	06/30/13	338	100	09/13/13	291	100	11/27/13	256	250
02/01/13	256	250	04/17/13	290	220	07/01/13	332	100	09/14/13	292	100	11/28/13	256	250
02/02/13	257	250	04/18/13	314	220	07/02/13	321	100	09/15/13	291	100	11/29/13	255	250
02/03/13	257	250	04/19/13	330	220	07/03/13	319	100	09/16/13	290	100	11/30/13	256	250
02/04/13	257	250	04/20/13	340	220	07/04/13	324	100	09/17/13	285	100	12/01/13	256	250
02/05/13	257	250	04/21/13	342	220	07/05/13	325	100	09/18/13	279	100	12/02/13	258	250
02/06/13	257	250	04/22/13	340	220	07/06/13	325	100	09/19/13	283	100	12/03/13	256	250
02/07/13	257	250	04/23/13	341	220	07/07/13	325	100	09/20/13	282	100	12/04/13	255	250
02/08/13	256	250	04/24/13	342	220	07/08/13	314	100	09/21/13	282	100	12/05/13	256	250
02/09/13	256	250	04/25/13	342	220	07/09/13	305	100	09/22/13	280	100	12/06/13	255	250
02/10/13	256	250	04/26/13	353	220	07/10/13	311	100	09/23/13	275	100	12/07/13	256	250
02/11/13	256	250	04/27/13	361	220	07/11/13	325	100	09/24/13	266	100	12/08/13	256	250
02/12/13	257	250	04/28/13	362	220	07/12/13	330	100	09/25/13	350	100	12/09/13	256	250
02/13/13	256	250	04/29/13	369	220	07/13/13	336	100	09/26/13	241	100	12/10/13	256	250
02/14/13	257	250	04/30/13	377	220	07/14/13	335	100	09/27/13	240	100	12/11/13	256	250
02/15/13	257	250	05/01/13	375	220	07/15/13	326	100	09/28/13	250	100	12/12/13	256	250
02/16/13	256	250	05/02/13	386	220	07/16/13	311	100	09/29/13	242	100	12/13/13	256	250
02/17/13	258	250	05/03/13	390	220	07/17/13	299	100	09/30/13	268	100	12/14/13	256	250
02/18/13	258	250	05/04/13	391	220	07/18/13	290	100	10/01/13	266	250	12/15/13	256	250
02/19/13	256	250	05/05/13	372	220	07/19/13	297	100	10/02/13	265	250	12/16/13	256	250
02/20/13	375	250	05/06/13	392	220	07/20/13	299	100	10/03/13	267	250	12/17/13	256	250
02/21/13	397	250	05/07/13	390	220	07/21/13	300	100	10/04/13	266	250	12/18/13	256	250
02/22/13	320	250	05/08/13	391	220	07/22/13	300	100	10/05/13	276	250	12/19/13	256	250
02/23/13	273	250	05/09/13	401	220	07/23/13	301	100	10/06/13	265	250	12/20/13	256	250
02/24/13	256	250	05/10/13	407	220	07/24/13	300	100	10/07/13	414	250	12/21/13	256	250
02/25/13	257	250	05/11/13	408	220	07/25/13	300	100	10/08/13	470	250	12/22/13	256	250
02/26/13	257	250	05/12/13	408	220	07/26/13	308	100	10/09/13	379	250	12/23/13	256	250
02/27/13	290	250	05/13/13	408	220	07/27/13	314	100	10/10/13	285	250	12/24/13	256	250
02/28/13	307	250	05/14/13	397	220	07/28/13	315	100	10/11/13	265	250	12/25/13	256	250
03/01/13	302	250	05/15/13	389	220	07/29/13	311	100	10/12/13	267	250	12/26/13	256	250
03/02/13	295	250	05/16/13	388	220	07/30/13	299	100	10/13/13	267	250	12/27/13	256	250
03/03/13	297	250	05/17/13	382	220	07/31/13	293	100	10/14/13	391	250	12/28/13	256	250
03/04/13	282	250	05/18/13	381	220	08/01/13	287	100	10/15/13	433	250	12/29/13	256	250
03/05/13	256	250	05/19/13	381	220	08/02/13	283	100	10/16/13	381	250	12/30/13	256	250
03/06/13	255	250	05/20/13	383	220	08/03/13	274	100	10/17/13	332	250	12/31/13	256	250
03/07/13	256	250	05/21/13	383	220	08/04/13	276	100	10/18/13	280	250			
03/08/13	256	250	05/22/13	383	220	08/05/13	276	100	10/19/13	266	250			
03/09/13	256	250	05/23/13	384	220	08/06/13	277	100	10/20/13	266	250			
03/10/13	255	250	05/24/13	383	220	08/07/13	278	100	10/21/13	358	250			
03/11/13	256	250	05/25/13	381	220	08/08/13	277	100	10/22/13	433	250			
03/12/13	256	250	05/26/13	381	220	08/09/13	275	100	10/23/13	381	250			
03/13/13	258	250	05/27/13	381	220	08/10/13	276	100	10/24/13	333	250			
03/14/13	273	250	05/28/13	371	220	08/11/13	276	100	10/25/13	282	250			
03/15/13	277	250	05/29/13	364	220	08/12/13	276	100	10/26/13	265	250			
03/16/13	276	250	05/30/13	366	220	08/13/13	275	100	10/27/13	265	250			

1. Releases in calendar year 2013 were made according to the "Below Normal" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Below Normal" year flow schedule from Oct. 1 through Dec. 31.  
2. Flow measured using Accusonic flow meter (USGS Gage #11323500 - Mokelumne River below Camanche Dam).  
3. Actual flow data has not yet been verified and published by the U.S. Geological Survey.



1. Releases in calendar year 2013 were made according to the "Below Normal" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Below Normal" year flow schedule from Oct. 1 through Dec. 31.
2. Actual flow data has not been verified and published by the U.S. Geological Survey.

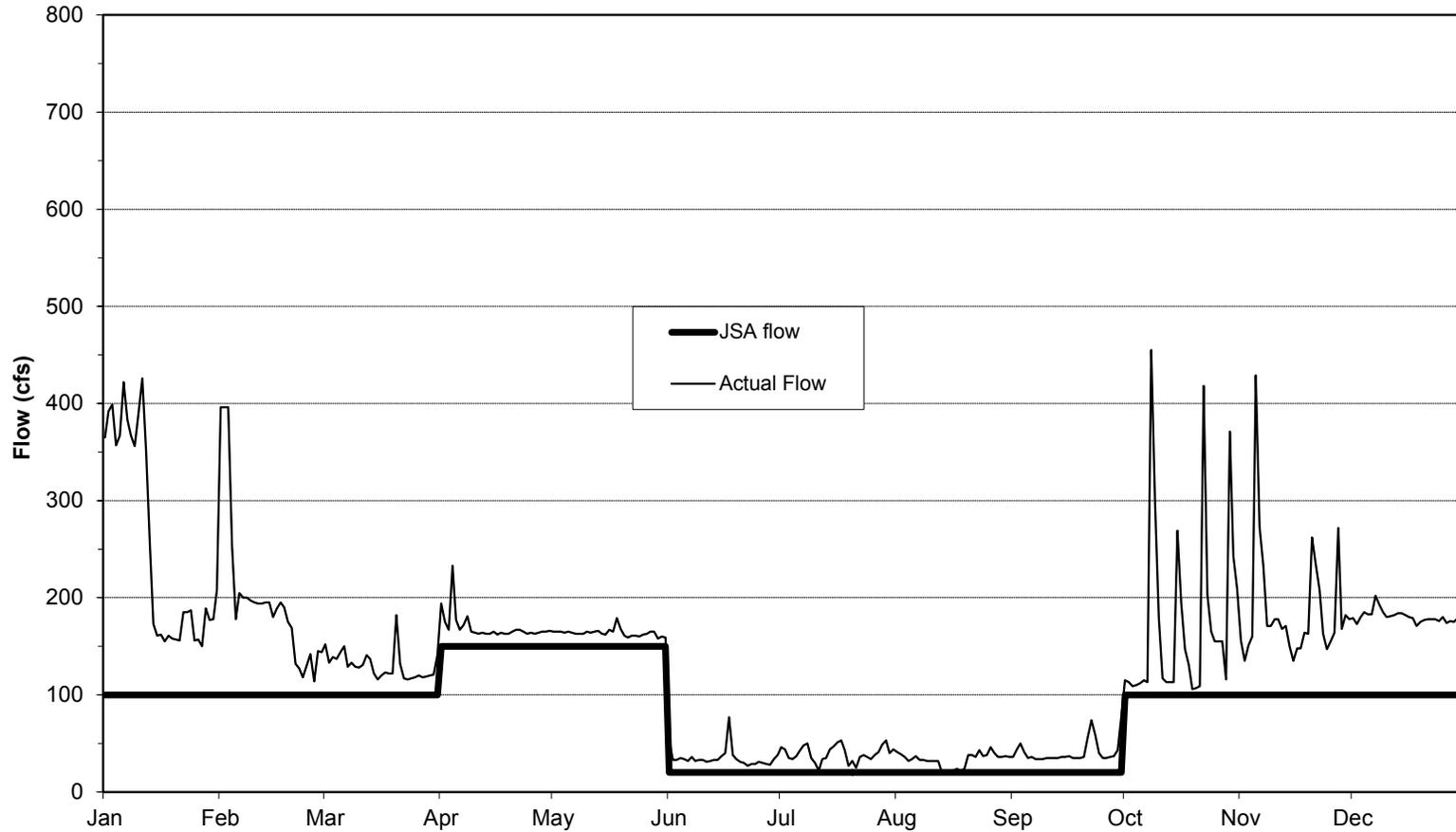
**Figure 3: Calendar Year 2013 Average Daily Release in Cubic Feet per Second from Camanche Dam**

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**Table 3: Calendar Year 2013 Average Daily Flow in Cubic Feet per Second Below Woodbridge Dam**

Date	Actual Flow	JSA Expected Flow	Date	Actual Flow	JSA Expected Flow	Date	Actual Flow	JSA Expected Flow	Date	Actual Flow	JSA Expected Flow	Date	Actual Flow	JSA Expected Flow
01/01/13	365	100	03/17/13	123	100	05/31/13	159	150	08/14/13	20	20	10/28/13	116	100
01/02/13	392	100	03/18/13	122	100	06/01/13	53	20	08/15/13	20	20	10/29/13	371	100
01/03/13	399	100	03/19/13	122	100	06/02/13	33	20	08/16/13	22	20	10/30/13	243	100
01/04/13	357	100	03/20/13	182	100	06/03/13	33	20	08/17/13	24	20	10/31/13	209	100
01/05/13	367	100	03/21/13	132	100	06/04/13	35	20	08/18/13	22	20	11/01/13	156	100
01/06/13	422	100	03/22/13	117	100	06/05/13	34	20	08/19/13	24	20	11/02/13	135	100
01/07/13	383	100	03/23/13	116	100	06/06/13	32	20	08/20/13	38	20	11/03/13	151	100
01/08/13	367	100	03/24/13	117	100	06/07/13	36	20	08/21/13	38	20	11/04/13	160	100
01/09/13	356	100	03/25/13	118	100	06/08/13	32	20	08/22/13	36	20	11/05/13	429	100
01/10/13	390	100	03/26/13	120	100	06/09/13	33	20	08/23/13	43	20	11/06/13	273	100
01/11/13	426	100	03/27/13	118	100	06/10/13	33	20	08/24/13	37	20	11/07/13	233	100
01/12/13	351	100	03/28/13	119	100	06/11/13	31	20	08/25/13	38	20	11/08/13	171	100
01/13/13	255	100	03/29/13	120	100	06/12/13	32	20	08/26/13	46	20	11/09/13	171	100
01/14/13	173	100	03/30/13	121	100	06/13/13	33	20	08/27/13	40	20	11/10/13	178	100
01/15/13	161	100	03/31/13	141	100	06/14/13	33	20	08/28/13	36	20	11/11/13	178	100
01/16/13	162	100	04/01/13	194	150	06/15/13	37	20	08/29/13	36	20	11/12/13	168	100
01/17/13	155	100	04/02/13	175	150	06/16/13	40	20	08/30/13	37	20	11/13/13	171	100
01/18/13	161	100	04/03/13	167	150	06/17/13	77	20	08/31/13	36	20	11/14/13	150	100
01/19/13	158	100	04/04/13	233	150	06/18/13	38	20	09/01/13	36	20	11/15/13	135	100
01/20/13	157	100	04/05/13	177	150	06/19/13	34	20	09/02/13	44	20	11/16/13	148	100
01/21/13	156	100	04/06/13	167	150	06/20/13	31	20	09/03/13	50	20	11/17/13	148	100
01/22/13	185	100	04/07/13	172	150	06/21/13	30	20	09/04/13	41	20	11/18/13	164	100
01/23/13	185	100	04/08/13	181	150	06/22/13	27	20	09/05/13	35	20	11/19/13	163	100
01/24/13	187	100	04/09/13	165	150	06/23/13	29	20	09/06/13	36	20	11/20/13	262	100
01/25/13	156	100	04/10/13	164	150	06/24/13	29	20	09/07/13	34	20	11/21/13	234	100
01/26/13	157	100	04/11/13	163	150	06/25/13	31	20	09/08/13	34	20	11/22/13	208	100
01/27/13	150	100	04/12/13	164	150	06/26/13	30	20	09/09/13	34	20	11/23/13	163	100
01/28/13	189	100	04/13/13	163	150	06/27/13	29	20	09/10/13	35	20	11/24/13	147	100
01/29/13	177	100	04/14/13	163	150	06/28/13	28	20	09/11/13	35	20	11/25/13	155	100
01/30/13	178	100	04/15/13	165	150	06/29/13	34	20	09/12/13	35	20	11/26/13	164	100
01/31/13	208	100	04/16/13	162	150	06/30/13	38	20	09/13/13	35	20	11/27/13	272	100
02/01/13	396	100	04/17/13	164	150	07/01/13	46	20	09/14/13	36	20	11/28/13	168	100
02/02/13	396	100	04/18/13	163	150	07/02/13	44	20	09/15/13	36	20	11/29/13	182	100
02/03/13	396	100	04/19/13	163	150	07/03/13	35	20	09/16/13	37	20	11/30/13	178	100
02/04/13	254	100	04/20/13	165	150	07/04/13	34	20	09/17/13	35	20	12/01/13	179	100
02/05/13	178	100	04/21/13	167	150	07/05/13	37	20	09/18/13	35	20	12/02/13	173	100
02/06/13	205	100	04/22/13	167	150	07/06/13	43	20	09/19/13	35	20	12/03/13	180	100
02/07/13	200	100	04/23/13	165	150	07/07/13	48	20	09/20/13	36	20	12/04/13	185	100
02/08/13	200	100	04/24/13	163	150	07/08/13	50	20	09/21/13	56	20	12/05/13	183	100
02/09/13	197	100	04/25/13	164	150	07/09/13	35	20	09/22/13	74	20	12/06/13	183	100
02/10/13	195	100	04/26/13	163	150	07/10/13	30	20	09/23/13	59	20	12/07/13	202	100
02/11/13	194	100	04/27/13	164	150	07/11/13	22	20	09/24/13	40	20	12/08/13	193	100
02/12/13	194	100	04/28/13	165	150	07/12/13	34	20	09/25/13	35	20	12/09/13	185	100
02/13/13	195	100	04/29/13	165	150	07/13/13	35	20	09/26/13	35	20	12/10/13	180	100
02/14/13	195	100	04/30/13	166	150	07/14/13	44	20	09/27/13	36	20	12/11/13	181	100
02/15/13	180	100	05/01/13	165	150	07/15/13	47	20	09/28/13	37	20	12/12/13	182	100
02/16/13	189	100	05/02/13	165	150	07/16/13	51	20	09/29/13	43	20	12/13/13	184	100
02/17/13	195	100	05/03/13	165	150	07/17/13	53	20	09/30/13	79	20	12/14/13	184	100
02/18/13	190	100	05/04/13	164	150	07/18/13	43	20	10/01/13	115	100	12/15/13	182	100
02/19/13	175	100	05/05/13	165	150	07/19/13	27	20	10/02/13	113	100	12/16/13	180	100
02/20/13	169	100	05/06/13	164	150	07/20/13	32	20	10/03/13	109	100	12/17/13	179	100
02/21/13	132	100	05/07/13	163	150	07/21/13	25	20	10/04/13	110	100	12/18/13	171	100
02/22/13	127	100	05/08/13	163	150	07/22/13	36	20	10/05/13	112	100	12/19/13	175	100
02/23/13	118	100	05/09/13	163	150	07/23/13	38	20	10/06/13	115	100	12/20/13	177	100
02/24/13	130	100	05/10/13	165	150	07/24/13	36	20	10/07/13	113	100	12/21/13	178	100
02/25/13	142	100	05/11/13	164	150	07/25/13	34	20	10/08/13	455	100	12/22/13	178	100
02/26/13	114	100	05/12/13	165	150	07/26/13	38	20	10/09/13	299	100	12/23/13	178	100
02/27/13	145	100	05/13/13	166	150	07/27/13	41	20	10/10/13	180	100	12/24/13	176	100
02/28/13	144	100	05/14/13	163	150	07/28/13	49	20	10/11/13	117	100	12/25/13	180	100
03/01/13	152	100	05/15/13	162	150	07/29/13	53	20	10/12/13	113	100	12/26/13	174	100
03/02/13	133	100	05/16/13	167	150	07/30/13	40	20	10/13/13	113	100	12/27/13	176	100
03/03/13	139	100	05/17/13	165	150	07/31/13	44	20	10/14/13	113	100	12/28/13	175	100
03/04/13	137	100	05/18/13	179	150	08/01/13	41	20	10/15/13	269	100	12/29/13	179	100
03/05/13	144	100	05/19/13	168	150	08/02/13	39	20	10/16/13	195	100	12/30/13	179	100
03/06/13	150	100	05/20/13	161	150	08/03/13	36	20	10/17/13	147	100	12/31/13	179	100
03/07/13	129	100	05/21/13	159	150	08/04/13	32	20	10/18/13	131	100			
03/08/13	133	100	05/22/13	161	150	08/05/13	34	20	10/19/13	106	100			
03/09/13	129	100	05/23/13	161	150	08/06/13	37	20	10/20/13	107	100			
03/10/13	128	100	05/24/13	160	150	08/07/13	33	20	10/21/13	109	100			
03/11/13	131	100	05/25/13	162	150	08/08/13	33	20	10/22/13	418	100			
03/12/13	141	100	05/26/13	163	150	08/09/13	32	20	10/23/13	203	100			
03/13/13	137	100	05/27/13	165	150	08/10/13	32	20	10/24/13	165	100			
03/14/13	122	100	05/28/13	165	150	08/11/13	32	20	10/25/13	155	100			
03/15/13	116	100	05/29/13	158	150	08/12/13	32	20	10/26/13	155	100			
03/16/13	120	100	05/30/13	160	150	08/13/13	20	20	10/27/13	155	100			

1. Expected flows past Woodbridge Dam in calendar year 2013 were according to the "Below Normal" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Below Normal" year flow schedule from Oct. 1. through Dec. 31.  
2. Flow measured at USGS Gage #11325500 - Mokelumne River at Woodbridge.  
3. Actual flow data has not yet been verified and published by the U.S. Geological Survey.



1. Releases in calendar year 2013 were made according to the "Below Normal" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Below Normal" year flow schedule from Oct. 1 through Dec. 31.
2. Actual flow data has not been verified and published by the U.S. Geological Survey.

**Figure 4: Calendar Year 2013 Average Daily Flow in Cubic Feet per Second Below Woodbridge Dam.**

**Table 4: Flow Below Woodbridge Dam During Temporary Flow Deviation -  
November 27-28, 2013**

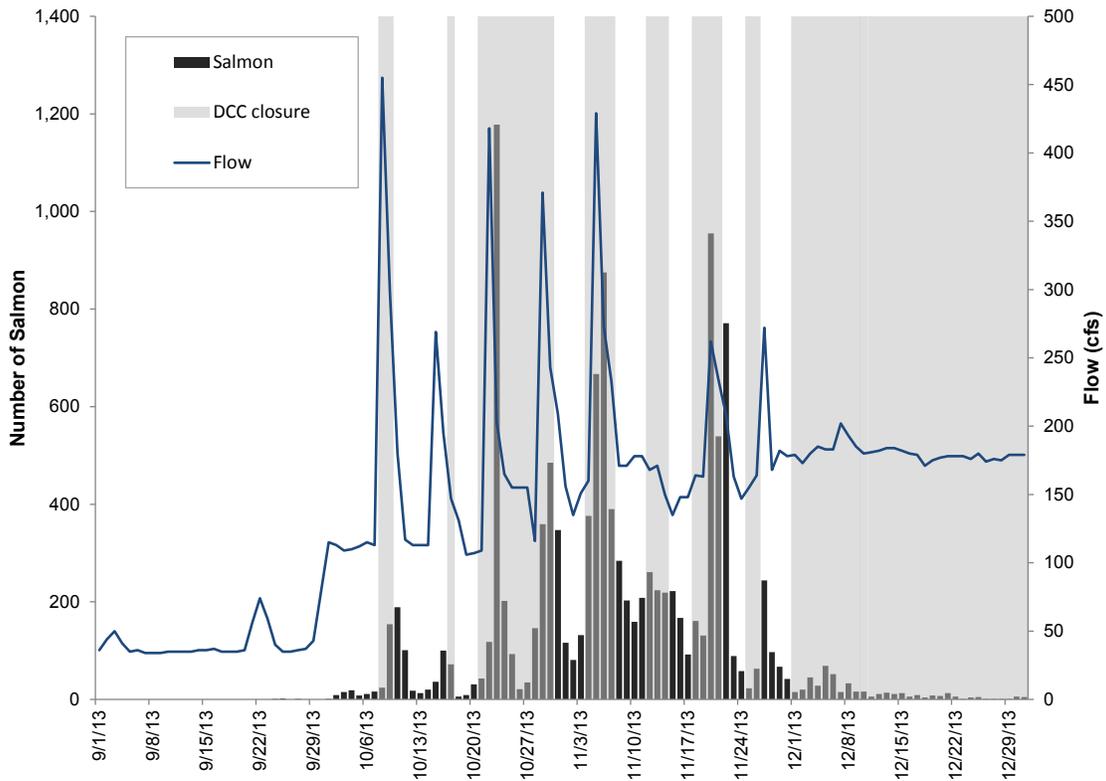
Reading Date and Time	Interval	Unit	JSA Water Year Type	Golf Gage Measured Flow	JSA Minimum Requirement (below WID Dam)
11/27/2013 21:15	15 Minute	cfs	Below Normal	111	100
11/27/2013 21:30	15 Minute	cfs	Below Normal	85	100
11/27/2013 21:45	15 Minute	cfs	Below Normal	69	100
11/27/2013 22:00	15 Minute	cfs	Below Normal	58	100
11/27/2013 22:15	15 Minute	cfs	Below Normal	55	100
11/27/2013 22:30	15 Minute	cfs	Below Normal	57	100
11/27/2013 22:45	15 Minute	cfs	Below Normal	67	100
11/27/2013 23:00	15 Minute	cfs	Below Normal	74	100
11/27/2013 23:15	15 Minute	cfs	Below Normal	80	100
11/27/2013 23:30	15 Minute	cfs	Below Normal	84	100
11/27/2013 23:45	15 Minute	cfs	Below Normal	88	100
11/28/2013 0:00	15 Minute	cfs	Below Normal	93	100
11/28/2013 0:15	15 Minute	cfs	Below Normal	96	100
11/28/2013 0:30	15 Minute	cfs	Below Normal	100	100

1. The daily value for 11/27/2013 is 272 cfs and for 11/28/2013 is 168 cfs.
2. The November 27-28, 2013 flow deviation occurred as a result of operational transitions between pulse flows and JSA minimum required flows as part of adaptive management flow changes at the WID Dam. Flows at the WID Dam were modulated to create numerous pulse flow releases for the salmon attraction and the up-migration. Through coordination with EBMUD fisheries and all stakeholder agencies, this management strategy made efficient use of limited water, which required storage and then subsequent release during pulses, and resulted in a very high return of salmon.

*Adaptive Management*

The JSA contains an adaptive management provision related to minimum flows. The flow schedule may be changed to optimize fishery habitat and other ecosystem values so long as the total quantity of water released in any given year will not be less than the quantity of water provided by the flow requirements for that type of year. In early 2013, because of forecasted low precipitation there was a need to proactively propose implementation of adaptive management. EBMUD worked cooperatively with the Partnership to develop a proposed adaptive management program that both reduced the JSA Camanche required release from 450 to 250 cfs and maintained expected flows below Woodbridge Dam in April 2013 in return for increased attraction flow releases from Camanche Dam to the Lower Mokelumne River in October and early November, 2013. The proposal was submitted by the Partnership to the SWRCB on March 7, 2013, and was approved by the SWRCB on March 20, 2013. Copies of the proposal and approval are included in Appendix B of this report. Subsequent to the approval, the April 1, 2013 DWR's runoff forecast resulted in revision of the water year type which eliminated the need to further implement the adaptive management. The 2,230 ac-ft saved prior to termination of the adaptive management action was released by EBMUD to the lower Mokelumne River in October and November per a schedule agreed upon by CDFW, USFWS, and EBMUD.

In order to maximize the effectiveness of the fall pulse flows, the Lower Mokelumne River Partnership has worked cooperatively with the USBR to develop a 5-year DCC closure study plan to determine the effects of closures on stray rates. DCC operations during the up migration period may contribute to excessive straying of Mokelumne origin salmon to the American River. In 2013 there were a number of DCC closures due to the need to meet Rio Vista minimum flows and not related to the 5-year study plan. A series of five pulse flows with average daily peaks ranging from 374 to 470 cfs were released by EBMUD in October and early November of 2013. Analysis of 2010 and 2011 returns show a significant decrease in straying rates to the American River. Additionally, there was an increase in salmon numbers entering the Mokelumne immediately during and after each pulse flow event (see Figure 5).



**Figure 5: Daily Upstream Passage of Chinook Salmon at Woodbridge Dam Relative to Flow and Delta Cross Channel Closure, September – December 2013**

Coded Wire Tag (CWT) return data clearly indicates that planting locations for hatchery reared juveniles plays a significant role in straying.<sup>3</sup> In 2007, CDFW planted nearly the entire MRFH production in the San Pablo Bay region. While this practice may increase overall survival, it significantly increases straying rates. With the elimination of egg transfers the overall impact to Mokelumne returns is significant. In 2013, CDFW continued the practice of releasing production in net pens at Jersey Point, which previous data indicates may result in better returns

<sup>3</sup> M. Palmer-Zwahlen, and B. Kormos. December 2013. Recovery of Coded-Wire Tags from Chinook Salmon in California’s Central Valley Escapement and Ocean Harvest in 2011. California Department of Fish and Wildlife Fisheries Branch Administrative Report 2013-02.

to the Mokelumne. Overall these adaptive management efforts will maximize returns to the Mokelumne River while minimizing straying to other systems.

## 2014

EBMUD is committed, pursuant to the FERC Order, to “Below Normal” JSA year type Camanche Dam flow releases through March 31, 2014. In accordance with the stipulation in Attachment 1 of the JSA, EBMUD will determine, based on the DWR forecasted unimpaired runoff into Pardee Reservoir as identified in the April 1, 2014 DWR Bulletin 120, the JSA water year type which will govern EBMUD’s flow schedule for the period April 1, 2014 through September 30, 2014. EBMUD will report to the FERC in the February 2015 report on the flow releases made in accordance with the JSA during the entire calendar year 2014. EBMUD will include finalized flow data in an Appendix of the report as it is verified and published by USGS. Refer to Appendix C for finalized flow data for the 2011 and 2012 calendar years.

## **B. WATER QUALITY**

Water quality in the Mokelumne River Fish Hatchery (MRFH) and lower Mokelumne River continues to be actively managed by EBMUD through its extensive data collection and analysis, reservoir operations, and the use of EBMUD’s Hypolimnetic Oxygenation System (HOS). Supplemental chillers are used to sustain MRFH water temperatures in the optimal range for egg incubation. Sand filters remove suspended solids from the hatchery water supply. Ultra violet (UV) disinfection equipment continuously protects against pathogenic organisms. These measures increase fish survival, and decrease the need for use of medicated feed or chemical treatment of the water supply, and have reduced the effort needed to comply with provisions of the hatchery’s National Pollution Discharge Elimination System Permit (NPDES). The operation of Pardee and Camanche Reservoirs is coordinated to maintain thermal stratification in Camanche Reservoir through October and manage water temperature for native fish in the lower Mokelumne River. The HOS is operated to prevent hydrogen sulfide formation in Camanche Reservoir. (The functions of the HOS system are described in Section IV.B.2 of this report).

## **1. Reservoir Operations**

EBMUD has developed and implemented adaptive reservoir operations plans (which include management of cold water in the reservoir, reservoir water quality monitoring, weekly review of conditions, modeling and forecasting of conditions, and scheduling of operations) that effectively meet the water temperature needs in the MRFH and the lower Mokelumne River. EBMUD manages temperatures in water released from Camanche Reservoir by keeping Camanche Reservoir thermally stratified until its surface waters naturally cool, usually in the fall. To maintain the volume of Camanche Reservoir's hypolimnion, which is needed to keep the reservoir thermally stratified, EBMUD manages the release of cold water available in Pardee Reservoir.

EBMUD's approach to managing the system is based on direct control of the cold water hypolimnion in both Camanche and Pardee Reservoirs. This approach has been developed operationally; incorporating a flexible response to several unique features of the Pardee Reservoir/Camanche Reservoir system, and is possible because of extensive monitoring during operation. The operational criteria for reservoir stratification in EBMUD's reservoir operations plan are:

1. Maintain stratification in Camanche Reservoir to the extent feasible from May through October to provide cold water releases to the lower Mokelumne River and the MRFH during the fall.
2. Maintain the stratification in Camanche by scheduling inflows of cold water from Pardee Reservoir, as needed, to replenish the hypolimnion of Camanche Reservoir. Releases from Pardee are normally not necessary for temperature management from approximately mid-November to April when Camanche Reservoir is cold and destratified.
3. Make best efforts to maintain a minimum of 28,000 acre-feet of hypolimnetic volume in Camanche Reservoir through October whenever Pardee Reservoir volume exceeds 100,000 acre-feet.

## 2013

The operational plan used by EBMUD since 1990 has proven effective in maintaining thermal stratification in Camanche Reservoir during normal and above, below normal, and dry JSA water year conditions. Resulting temperatures are shown in Figure 6, Calendar Year 2013 Mokelumne River Water Average Daily Temperatures of the Release from Camanche Dam.

From April 1, 2013 through September 30, 2013 EBMUD operated under a “Dry” JSA water year type, with releases in accordance with the JSA minimum flows. Furthermore, consistent with the JSA, EBMUD continued to adaptively manage its reservoir operations and use its best efforts to maintain a hypolimnion volume of 28,000 acre-feet in Camanche Reservoir by coordinating releases from Pardee Reservoir. EBMUD successfully maintained stratification in Camanche Reservoir, and provided cold water releases in the lower Mokelumne River through the critical spawning period from October through December. EBMUD also provided bypass (sluice) flows from Camanche Reservoir to increase dissolved oxygen levels in the lower Mokelumne River when needed during 2013.

## 2014

EBMUD will also continue to adaptively manage Pardee and Camanche Reservoir operations based on real-time reservoir and riverine conditions. Pursuant to Section H.4 of the JSA, EBMUD will continue to consult with the Resource Agencies about changes in real-time Lower Mokelumne River Project operations.

## **2. Hypolimnetic Oxygenation System**

EBMUD takes proactive steps to prevent naturally occurring hydrogen sulfide in Camanche Reservoir from entering the river. EBMUD studies found that when pure oxygen is added to Camanche Reservoir's anoxic hypolimnion, hydrogen sulfide production in the oxygenated area is eliminated. In response to these studies, EBMUD designed and installed, and began operating in 1993, a Hypolimnetic Oxygenation System (HOS) to add pure oxygen into

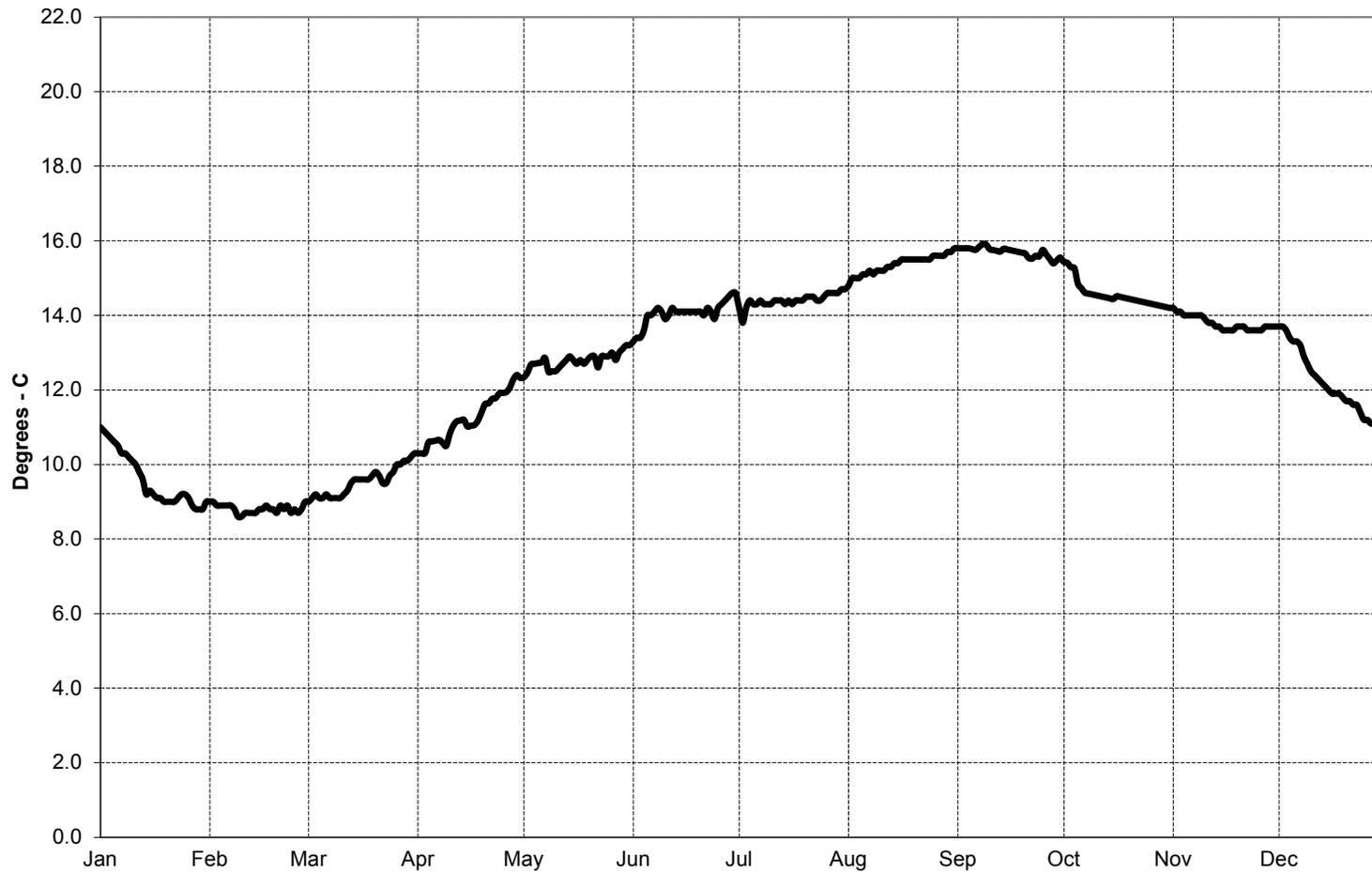
the Camanche Reservoir hypolimnion. EBMUD monitors oxidation-reduction potential and dissolved oxygen concentrations in the hypolimnion (at elevation 115 ft). The annual decision to activate the HOS is based on the dissolved oxygen concentration in the hypolimnion. The HOS is deactivated in anticipation of reservoir turnover in the fall. The HOS has proven to be very effective in preventing hydrogen sulfide formation in the Camanche Reservoir hypolimnion.

### 2013

The HOS was activated on July 25, 2013 and was shut down on November 14, 2013. The HOS has effectively prevented hydrogen sulfide formation.

### 2014

In 2014 EBMUD will continue to operate the HOS to manage the hydrogen sulfide concentrations for the benefit of the Camanche Reservoir, the lower Mokelumne River, and the MRFH.



**Figure 6: Calendar Year 2013 Mokelumne River Water Average Daily Temperatures of the Release from Camanche Dam.**

## **C. THE LOWER MOKELUMNE RIVER PARTNERSHIP**

### **1. The Partnership Steering Committee**

The Partnership Steering Committee (PSC), (consisting of representatives from EBMUD, CDFW, NOAA Fisheries and USFWS) met on December 12, 2013. Minutes of the PSC meeting are included in Appendix D. The PSC continued to oversee the operation of the Partnership Coordinating Committee (PCC), the technical group of Partnership representatives that meets biannually to ensure timely implementation of the measures identified in the JSA and the Water Quality and Resource Management Program (WQRMP). The PCC met on April 16, 2013 and October 28, 2013. In 2013 the PSC approved two projects, for a total of 36 projects since 1999, for Partnership funding. See Section IV.C.2 of this report for projects approved for Partnership funding in 2013 and projects with activity in 2013.

### **2. The Partnership Fund**

EBMUD established the \$2 million Partnership Fund in 1999, pursuant to Section E.2 of the JSA, to provide support to the Partnership programs. The interest income earned provides operating funds to pay for projects and programs that protect and enhance the lower Mokelumne River ecosystem. Since its inception, the fund has earned \$815,078. The available earnings, net of funds obligated to approved projects, were \$149,202 as of December 31, 2013.

In 2013, the Partnership Steering Committee approved funding for the following three stakeholder proposals:

- **2013 Lodi Sandhill Crane Festival.** Funding (\$2,500) to support the implementation of a lower Mokelumne River salmon workshop (“*Beyond the Water’s Edge: Salmon in the Mokelumne River*”) as part of the festival’s presentation program and associated tours of the Mokelumne River Fish Hatchery and restoration sites.

- **2013 Lower Mokelumne River Watershed Education Legacy Project – City of Lodi.** Funding (\$7,150) to support the implementation of (1) a kayak field trip to Big Break Regional Park for students to learn about the Delta ecosystem and its connection to the lower Mokelumne River, (2) a field trip for students to the San Francisco Bay to learn about the connection between the lower Mokelumne River and the Pacific Ocean (The field trip Included hands-on learning aboard the Marine Science Coast Guard vessel *Robert G. Brownlee*), and (3) the "Trekking the Mokelumne" education curriculum at Lodi Lake.

Ongoing projects funded by the PSC with activity in 2013 for ecosystem protection and restoration in the lower Mokelumne River are summarized in Table 5 on the following page.

**Table 5: Partnership Fund-Supported Projects 2013 Activity Summary**

Project Title	Project Sponsor	Project Description	Partnership Fund			Additional Funding	
			Date Approved by PSC	Anticipated Project Completion	Amount Obligated	Amount	Program
2013 Watershed Education Legacy Program	City of Lodi	Educational field trips for students	10/24/2013	Spring 2014	\$7,150	\$6,850	City of Lodi
2013 Lodi Sandhill Crane Festival	EBMUD	Salmonid workshops and tours	4/16/2013	COMPLETED	\$2,500	-	-
2012-2014 Watershed Coordinator	San Joaquin County Resource Conservation District	Cost-share to continue support of SJCRCD watershed coordinator position	4/23/2012	Fall 2014	\$30,000	-	-
Lower Mokelumne River Watershed Education Legacy Project	City of Lodi	River cleanup supplies and field trip	9/19/2012	COMPLETED	\$5,000	In-kind labor hours; Funding	Starbucks; Arts in Public Places Committee (City of Lodi)
Heritage Oak Winery Riparian Restoration and Streambank Stabilization Project	Tom and Matt Hoffman; Mokelumne Environmental Benefits Program	Phase 1: Invasive species removal, planting of riparian native plants; Phase 2: Streambank stabilization (bio-engineering)	11/15/2012	Spring 2015	\$21,196	**\$74,448	**Partnership Funding conditional on project sponsor securing balance of project funding (\$ and in-kind labor)

### **3. Water Quality and Resource Management Program**

The Water Quality and Resource Management Program (WQRMP), developed by the PSC in cooperation with NOAA Fisheries and the Mokelumne River Technical Advisory Committee (MRTAC) members, and in accordance with Sections E.3, F.5, and H.5 of the JSA, was submitted to FERC in June 1999 and approved by FERC on May 9, 2001. The WQRMP vision includes a comprehensive monitoring and applied research program integrated with a well-coordinated program to adaptively manage water and power supply operations, flood control, hatchery operations, and ecosystem rehabilitation actions.

EBMUD, the USFWS, and CDFW began implementing the specific WQRMP measures in 1999. These measures, including the ones implemented in 2013, are described in detail in Section IV.E, Research and Monitoring.

### **4. Lower Mokelumne River Stakeholders Group**

The members and the role of the Lower Mokelumne River Stakeholders Group are specified in Section E.5 of the JSA. These members include public resource agency representatives, private landowners, community and non-profit organizations, and local government staff.

At the time the Lower Mokelumne River Stakeholders Group was convened, the Mokelumne/Cosumnes Watershed Alliance (Watershed Alliance) and the Lower Mokelumne Watershed Stewardship Program (Stewardship Program) were already functioning organizations. These two groups' areas of interest overlap geographically and share the same stakeholder base as the Lower Mokelumne River Partnership. To improve effectiveness and to eliminate redundant efforts, the PSC agreed that Partnership representatives would concentrate outreach activities by working directly with the existing Watershed Alliance and the Stewardship Program. Since 2006, the stakeholder outreach efforts have focused on support and cooperation with the Stewardship Program.

The Lower Mokelumne River Stewardship Program (LMRSP) was initiated as a proposal to the former CALFED made by the San Joaquin County Resource Conservation District. EBMUD was a key contributor to this proposal, coordinating the implementation and participating in the biological monitoring necessary to complete the proposal. In 2013, EBMUD and the Partnership continued as regular participants in the work of the Stewardship Program Steering Committee to implement elements of the LMRSP.

The Stewardship Program Steering Committee meets monthly and includes participation from private landowners, farmers, community groups, local government staff, and agency representatives, including representatives for EBMUD and the Partnership. In 2013, the Stewardship Steering Committee led watershed tours for state legislative and California Department of Conservation representatives and also continued work towards increasing watershed stewardship awareness among urban landowners along the Mokelumne River and elsewhere in the watershed by initiating the process to update the LMRSP *Mokelumne River Watershed Owner's Manual*. Additional information on the Stewardship Program, including the watershed owner's manual is available at [www.sjcrwd.org](http://www.sjcrwd.org).

## **5. Additional EBMUD Stakeholder Activities**

### 2013

In 2013, EBMUD pursued numerous opportunities to solicit Mokelumne River stakeholder participation independently of, but coordinated with, Partnership activities. Collaborative stakeholder activities that EBMUD representatives were involved with in 2013 included:

- Participation in the Mokelumne River Association (MRA). The mission of the MRA is to stimulate a greater understanding and a cooperative atmosphere and to provide information to the private owners, political entities, and public agencies responsible for the operation, maintenance, control, and management of Mokelumne River water systems. The MRA membership consists of representatives of any duly constituted public or private entity within the Mokelumne River Watershed. There are 19 public and private entities that are members of the MRA (1993-present). The MRA meets quarterly.

- Ongoing cooperation with the U.S. Fish and Wildlife Service to implement the Central Valley Project Improvement Act's Anadromous Fish Restoration Program (AFRP) on the Mokelumne River. The goal of AFRP is to make all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis. EBMUD continues to monitor anadromous fish populations in the lower Mokelumne River using the AFRP protocols, participates cooperatively in restoration activities through cost sharing, provides scientific data for the analysis of AFRP projects, and supports biological research activities throughout the lower Mokelumne River basin and Sacramento-San Joaquin Delta. In 2013 several improvements were made within a 1-km enhancement reach of the lower Mokelumne River. EBMUD added large woody material and boulders to several sites within the reach. In addition, several sites within the reach were reshaped to meet topography design objectives.
- Participation and sponsorship of the 16<sup>th</sup> annual Sandhill Crane Festival in Lodi, CA on November 1-3, 2013. The festival provides information and education as well as field trips to various locations along the lower Mokelumne River. The Sandhill Crane Festival seeks to promote broad public awareness of lower Mokelumne River natural resource values. In collaboration with the Lower Mokelumne River Partnership, salmon workshops and tours were added to the existing lineup of activities in 2013. In addition, EBMUD staff has led field trips to view bald eagles at Pardee Reservoir. (1997-present)
- Participation in the 16<sup>th</sup> annual Central Valley Birding Symposium in Stockton on November 21-22, 2013. EBMUD staff led 1 field trip on Pardee Reservoir.
- Continuing active involvement with the state's Biologically Integrated Orchard Systems Program (BIOS) in San Joaquin County. BIOS is designed to support local agricultural growers through the use of biological pest control and ecologically friendly (Integrated Pest Management Program) agricultural methods. EBMUD biologists participate as advisors to individual farmers, UC Cooperative Extension specialists, and Natural Resource Conservation Service staff on wildlife issues in San Joaquin County. (1998-present)
- Continuing active involvement with the Lodi-Woodbridge Winegrape Commission (LWWC). The LWWC is designed to support local grape growers through the use of biological pest control and ecologically friendly (Integrated Pest Management Program) agricultural methods. EBMUD biologists participate as advisors to the LWWC, individual farmers, UC Cooperative Extension specialists, and Natural Resource Conservation Service staff on wildlife issues in the lower Mokelumne River watershed. (1998-present)
- Presentations on fish and wildlife issues to local sportsmen's groups, community groups, local schools, and local fishing and environmental organizations. (Ongoing)
- Periodic participation as docents for the Lodi Parks and Recreation Department by giving presentations, nature tours, and demonstrations on fish and wildlife issues in the lower Mokelumne River. (1998-present)

- Providing continuing technical support to the San Joaquin County Resource Conservation District (SJCRCDD) and private landowners to enhance anadromous fish habitat in Murphy Creek (a tributary to the lower Mokelumne River).
- Participating on the San Joaquin County Resource Conservation District’s Lower Mokelumne River Recreational Waterway Steering Committee to develop and improve recreational access to the lower Mokelumne River.
- Participating on the California Bay Delta Authority (CBDA’s) Watershed Public Advisory Sub-Committee and Ecosystem Restoration Sub-Committee.
- Participating in San Joaquin Council of Governments Habitat Technical Advisory Committee meetings.
- Participating in Mokelumne River Clean-up Day, which was associated with the Greater Sierra River Cleanup events. EBMUD provided dumpster, watercraft and personnel for the event.
- Continue to participate with the U.S. Fish and Wildlife Service in the “Lower Mokelumne Safe Harbor Cooperative Agreement (SHA). (2007-present) The SHA covers the valley elderberry longhorn beetle on District land in San Joaquin County.
- Continue to participate with the U.S. Fish and Wildlife Service in the “Safe Harbor Agreement for East Bay Municipal Utility District Lands in San Joaquin, Amador, and Calaveras Counties”, which was implemented in 2009. The SHA covers valley elderberry beetles, California tiger salamanders, and California red-legged frogs on District land in the aforementioned counties.
- Participation with the Sierra Nevada Conservancy, U.S. Forest Service, Sustainable Conservation, Mokelumne Consensus Group, Sure Harvest, Environmental Defense Fund, and others in the development of a pilot program to measure environmental benefits in the Mokelumne River watershed. (Ongoing)

## 2014

In 2014, EBMUD plans to continue the above activities, as well as search for new opportunities to participate in collaborative stakeholder activities. Specific efforts will be made to evaluate the implementation efforts and priorities of the Lower Mokelumne River Watershed Stewardship Plan and, for implementation efforts consistent with Partnership objectives, to determine how Partnership funding could possibly support them.

## **6. Surplus Water**

### 2013

At the April 23, 2013 meeting of the Board of Directors, the District accepted the 2013 Water Supply Availability and Deficiency Report declaring the lack of availability of water to be used by Resource Agencies for 2013. A copy of the letter of notification to the Resource Agencies is included in Appendix E of this report.

## **D. MOKELUMNE RIVER TECHNICAL COOPERATION**

### **1. Mokelumne River Technical Advisory Committee**

EBMUD established the Mokelumne River Technical Advisory Committee (MRTAC) in 1988 to improve communication and coordination among a variety of state and federal agencies, EBMUD, irrigation districts, and interest groups. Agencies and organizations that currently participate in the MRTAC include EBMUD, CDFW, USFWS, NOAA Fisheries, and Woodbridge Irrigation District (WID). San Joaquin County, the State Water Resources Control Board (SWRCB), and the Federal Energy Regulatory Commission (FERC) are also members of the MRTAC, but do not attend consistently. The MRTAC provides an interactive and proactive forum in which factors affecting lower Mokelumne River aquatic resources are identified, specific scientific investigations are formulated, technical data and analyses are presented and discussed, and agency activities are coordinated to improve the aquatic resources of the lower Mokelumne River.

### 2013

In 2013, the MRTAC met semiannually (alternating quarterly meetings between the MRTAC and the PCC). Representatives from WID, CDFW, EBMUD, USFWS, and NOAA Fisheries, participated in the MRTAC meetings held on February 5, 2013 and August 7, 2013.

## 2014

Pursuant to Section H.1 of the JSA, EBMUD, USFWS, and CDFW agree that they will continue to actively support the MRTAC as a technical information-sharing forum and that the Partnership Steering Committee will review the need for the MRTAC periodically, with input from the Stakeholders Group. The next MRTAC meeting is scheduled for January 29, 2014.

## **2. Mokelumne River Science Database**

Section H.2 of the JSA specifies that EBMUD will develop a science database for the lower Mokelumne River. In 2013, EBMUD continued updating this database. The Mokelumne Science Database consists of two parts, the written record (reports, correspondence, scientific literature and historic documents) and an electronic database (Oracle® format). The written record is compiled and cataloged by EBMUD. The District also provides scientific data to the Central Valley Project Improvement Act (CVPIA) Comprehensive Assessment and Monitoring Program (CAMP) to evaluate the relative effectiveness of CVPIA actions in restoring anadromous fish production. Recently, CAMP has developed a standardized database for juvenile outmigration monitoring in the California Central Valley. During this process EBMUD has worked with CAMP to transfer all juvenile trapping data collected on the lower Mokelumne River to the CAMP platform. Other contributors to the CAMP database include several resource agencies and associated contractors conducting juvenile outmigration monitoring in the California Central Valley.

## **E. RESEARCH AND MONITORING**

In 1987, EBMUD initiated and presently continues proactive, comprehensive programs to monitor, research, and improve anadromous salmonids in the lower Mokelumne River and to investigate potential ecological factors affecting the lower Mokelumne River anadromous fishery. The programs encompass every freshwater life phase of lower Mokelumne River salmon including upstream migration, spawning, egg incubation, fry and juvenile rearing, and outmigration. As a result, EBMUD has carried out some of the most extensive monitoring and

research activities on anadromous fish and their habitats in the Central Valley. EBMUD has made a significant commitment and contribution to improving the technical understanding of the lower Mokelumne River salmon resource through intensive in-river scientific investigations. The results of those investigations were used to develop the agreed upon flows and non-flow measures identified in the Joint Settlement Agreement.

### 2013

The ongoing research and monitoring actions undertaken pursuant to the JSA and WQRMP include:

- Seasonal monitoring of fish populations in the lower Mokelumne River from Camanche Dam downstream to the San Joaquin River.
- Enumeration of migrating adult Chinook salmon and steelhead by video monitoring at Woodbridge Dam.
- Salmon and steelhead redd surveys in the lower Mokelumne River between Camanche Dam and the Elliott Road Bridge.
- Estimation of redd production and emigration of juvenile Chinook salmon and steelhead by operation of rotary screw traps.
- Monitoring Camanche Reservoir water to measure temperature, pH, dissolved oxygen, conductivity, and oxidation-reduction potential.
- Collection of monthly water samples in the lower Mokelumne River at the Elliott Road Bridge and in Camanche Reservoir at PENN20 to measure hardness, cadmium, copper, and zinc.
- Monitoring of spawning reach substrate characteristics, including channel configuration and gradient.
- Monitoring temperature, pH, dissolved oxygen, conductivity, and oxidation-reduction potential of the Mokelumne River Fish Hatchery water supply and effluent.
- Conducted acoustic telemetry study using young of year hatchery Chinook salmon. Study was designed to measure migration rate and survival from Woodbridge Dam to Chipps Island.
- Continuing seasonal electrofishing and seining surveys of the lower Mokelumne River fish community.
- Cooperation with the state-wide Constant Fractional Marking (coded-wire tagging) of Chinook salmon released from the Mokelumne River Fish Hatchery.

- Continuing predation management program which relocates non-native salmonid predators from the Mokelumne River.

## 2014

EBMUD will continue similar research and monitoring activities in 2014. These efforts will be described in full in the calendar year 2014 update report.

## **F. HABITAT IMPROVEMENTS**

### **1. Ongoing Efforts**

EBMUD has continued to enhance the instream and riparian habitat of the lower Mokelumne River. These ongoing projects include:

## 2013

- Gravel Enhancement: Gravel enhancement projects began in 1990. Clean, washed gravel of a size suitable for salmon spawning is placed in the river in appropriate locations and mixed with seasoned gravel. In 2013, several improvements were made within a 1-km gravel enhancement reach of the lower Mokelumne River. EBMUD added large woody material and boulders to several sites within the reach. Several sites within the reach were also reshaped to meet topography design objectives. EBMUD provided \$5,150 to fund the project. In addition, EBMUD submitted a grant funding proposal to the Anadromous Fish Restoration Program (AFRP) to extend the gravel enhancement reach through the Mokelumne River Day Use Area (MRDUA). Since 1998, EBMUD has placed 41,956 cubic yards of spawning gravel in the Lower Mokelumne River.
- Riparian Habitat Enhancement: Developing a cooperative program with local interests to improve land management with agricultural best management practices and livestock grazing along riparian zones to reduce stream bank erosion and fine sediment input. EBMUD continues working with winegrape and walnut growers to enhance and restore riparian vegetation. In 2013, 2,000 native grass plugs (Baltic rush, *Juncus balticus*, and Creeping wild rye, *Leymus triticoides*) were planted in the Mokelumne River corridor.
- Providing technical support in seeking grant funding to continue implementation of *Lower Mokelumne River Stewardship Plan*, primarily restoration and invasive plant removal. Anticipated funding sources include: Wildlife Conservation Board, USFWS

Partners for Fish and Wildlife and Private Stewardship Grant Program, LMR Partnership, DWR, CBDA, Central Valley Joint Venture, and Ducks Unlimited.

EBMUD has continued to support and collaborate with the Lower Mokelumne River Watershed Stewardship Program, including, but not limited to, the following projects:

- Continuing implementation of \$1.3 million SWQCB grant. This includes EBMUD involvement with prioritization for riparian restoration, permitting, and providing technical advice.
- Participated in Lower Mokelumne River Restoration Tour coordinated by EBMUD and the San Joaquin County RCD. The tour involved local land owners, Department of Conservation staff from their office of government and environmental relations, the State Watershed Coordinator, Woodbridge Wine Grape Commission, and San Joaquin Council of Governments (SJCOG).
- Continuing to participate in the Student and Landowner Education and Watershed Stewardship (SLEWS) program.
- Continuing to work with the San Joaquin County Farm Bureau to educate local teachers about farming and conservation practices along the Mokelumne River through the Ag in the Classroom program (2002 – present).
- Continuing to work with NGO Environmental Defense, USFWS, and California Association of RCD's to conduct management activities noted in the Lower Mokelumne River Safe Harbor Agreement for the valley elderberry longhorn beetle on EBMUD property in the Mokelumne River Watershed in San Joaquin County.
- Continuing to work with the U.S. Department of Agriculture's Natural Resources Conservation Service to promote Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentive Program (WHIP), and other federal programs that benefit watershed resources.
- Restoration and Monitoring of Riparian Habitat Corridors along the Lower Mokelumne River. This project, funded by the CBDA (\$859,405) and managed by the San Joaquin County Resource Conservation District, enhanced approximately 45 acres of riparian habitat along two miles of the lower Mokelumne River to increase the diversity and richness of riparian birds. Monitoring will provide information about which plants benefit avian communities, reduce stream bank erosion, and enhance river functions for anadromous fish.

2014

Many of the above habitat improvement activities will continue in 2014. A full description of 2013 activities will be reported in the calendar year 2014 update report.

**2. Fish Guidance Fence**

The guidance fence is put in place in conjunction with opening the fish ladder and is used to guide fish towards the ladder opening. The fence was installed on October 1, 2013 and will be removed in early 2014. It is anticipated that it will be installed and operated during approximately the same period in 2014.

**V. APPENDICES**

Appendix A: Sample of Lower Mokelumne River Related Stories From Local Press

Appendix B: Correspondence Related to the 2013 Adaptive Management Flow Change  
Fall 2013 Attraction Flow

Appendix C: USGS Verified Flow Data for 2011 and 2012

Appendix D: Meeting Minutes of the Partnership Steering Committee

Appendix E: Notification of Availability for Sale of Surplus Mokelumne River Water



**APPENDIX A**

**SAMPLE OF LOWER MOKELUMNE RIVER  
RELATED STORIES FROM LOCAL PRESS**



# Lodi students help with habitat makeover



Lodi High School students and volunteers install wood duck nest boxes along the Mokelumne River. Students had to dig a couple of feet to place the pole, fill the hole with concrete and place the nest boxes once the concrete dried. They had to learn how and where to strategically place the nest boxes so they were accessible to the ducks but difficult for predators to attack them. Nicole Liebelt/Contributed photo  
January 25, 2013 12:00 AM

Lodi High School students, along with the Center for Land-Based Learning, helped restore nearly an acre of sensitive habitat along the Mokelumne River at the NRCS Lockeford Plant Materials Center along with Pacific Gas and Electric Co. and the National Fish and Wildlife Foundation.

As a part of the Student and Landowner Education and Watershed Stewardship program, designed to engage California high school students in habitat restoration projects that enhance classroom learning, develop leadership skills and result in real positive impact for the environment, 30 area high school students will participate in five all-day field trips during 2012-13 to the restoration site.

Program participants plant native vegetation, remove invasive species, build and install nest boxes for cavity nesting birds and monitor plant survival while learning about how their efforts will enhance species diversity, stabilize the soil and protect the critical habitat of this riparian corridor.

Overseeing the effort are mentors from the United States Fish and Wildlife Service, the U.S. Department of Agriculture Natural Resources Conservation Service, San Joaquin County Resource Conservation District, PG&E, East Bay Municipal Utility District and Vino Farms, a Lodi-based California certified sustainable winegrower.

"This project gives students the opportunity to participate long-term in a real restoration project, engage in positive environmental action, learn about careers, and develop skills that they can use

through high school and beyond," said Nina Suzuki, SLEWS program director at the Center for Land-Based Learning.

PG&E's Nature Restoration Trust provided \$23,750 to support this restoration effort. The Nature Restoration Trust is a partnership between PG&E and the National Fish and Wildlife Foundation to bring together public and private resources to conserve and enhance the natural habitats of fish and wildlife. Since 2001, PG&E has committed more than

\$1 million to this unique, public-private partnership to support habitat and wildlife restoration projects throughout Northern and Central California.

By including California school students in habitat restoration, Student and Landowner Education and Watershed Stewardship addresses the needs for healthier land and more wildlife habitat, and the need to instill conservation and stewardship values in high school students. SLEWS is one of the few habitat restoration projects targeted to high school students.

"The National Fish and Wildlife Foundation is extremely proud to collaborate with PG&E and a diverse range of community partners through PG&E's Nature Restoration Trust," said Jeff Trandahl, executive director and CEO of the foundation. "Restoring the health of California's streams, wetlands, and coastal habitats is a vital task that will benefit both our wildlife and our citizens."

The Center for Land-Based Learning inspires and motivates people of all ages, especially youth, to promote a healthy interplay between agriculture, nature and society through their own actions and as leaders in their communities. The Center for Land-Based Learning's SLEWS Program engages California high school students in habitat restoration projects that enhance classroom learning, develop leadership skills and result in real positive impact for the environment. Information: [www.landbasedlearning.org/slews.php](http://www.landbasedlearning.org/slews.php).

#### About National Fish and Wildlife Foundation

A nonprofit established by Congress in 1984, the National Fish and Wildlife Foundation sustains, restores and enhances the nation's fish, wildlife, plants and habitats. Through leadership conservation investments with public and private partners, NFWF is dedicated to achieving maximum conservation impact by developing and applying best practices and innovative methods for measurable outcomes. Since its establishment, NFWF has awarded nearly 9,500 grants to over 3,000 organizations in the United States and abroad and leveraged - with its partners - more than \$400 million in federal funds into more than \$1.3 billion for on-the-ground conservation. Information: [www.nfwf.org](http://www.nfwf.org).

- Information and photos submitted by Nicole Liebelt

# Marine Science Institute Blog

Discovering Our Bay

Posted by: [jennifersfbaymsi](#) | June 28, 2013

## School Shout-out: Lodi Heritage School

Lodi Heritage School partnered with local agencies to help their 5th grade turn their field trip with MSI into a 'Watershed Legacy Project,' culminating in the creation of a mosaic ceramic bench and mural inspired by their trip.



<http://sfmsi.files.wordpress.com/2013/06/odiart-project-may-watershed-awarenessmonth.jpg>

Ms. Jacinto's 5th grade class went on a Discovery Voyage with the Marine Science Institute on November 12, 2012. They planned a public art project that would reflect their experience and share the take away message of "the importance of keeping the streets of Lodi clean, since stormwater runoff goes to the Mokelumne River, then the San Joaquin River, and westward, potentially affecting downstream waterways." The result was an aesthetically pleasing and educational mosaic bench and mural that students may share with the community with pride. We at MSI love to hear stories such as this, as beyond teaching marine science our mission is to inspire stewardship.



[http://sfmsi.files.wordpress.com/2013/06/odiartproject\\_2.jpg](http://sfmsi.files.wordpress.com/2013/06/odiartproject_2.jpg)

With the state of the economy and school budgets, many classes have less funds available for field trips and special projects. Though MSI provides all of its programs belowcost, many schools still need to fundraise to pay their portion of the program cost. Fundraising and grantwriting can be a daunting challenge, so in order to help our teachers raise funds more efficiently and effectively, MSI created a Teacher 'GetaGrant' online toolkit

(<http://www.sfbaymsi.org/toolbox.html>).

In order to fund the class field trip and followup activities, Watershed Education coordinator Kathy Grant successfully reached out to various local agencies and corporations, leveraging the education and public art aspects of her project to find funding for both. They garnered support from WalMart's Art in Public Places Program and the Lower Mukelumne River Partnership (East Bay Municipal Utility

District, US Fish and Wildlife, and CA Dept. of Fish and Wildlife). Donna Billick and her team from UC Davis provided fundamental artistic vision and expertise at an affordable rate that enabled this project to be a success.

We asked Kathy to share some tips and best practices to help others effectively fundraise for local classrooms. Some of her top tips include:

- “Hunt online, trying to stay local”
- “Build a network” with steering committees, agencies, and others that may be involved in grant programs with goals that align to your class’s education goals.
- “Education is key” and additional projects such as a public art project are an additional benefit, not the primary goal.
- Summer is an ideal time to grantwrite because the process because “takes a LONG time from start to finish.”

Thanks to Kathy for her helpful tips, and thanks to Lodi Heritage School 5th Grade and Earth Keepers Club for such great work a fantastic project! Learn more about the project and those that made it possible here ([http://www.lodinews.com/newsyneighbors/news/article\\_e1d5b12ecec411e2924f001a4bcf887a.html?mode=jqm](http://www.lodinews.com/newsyneighbors/news/article_e1d5b12ecec411e2924f001a4bcf887a.html?mode=jqm))!

Do you have a story of a classroom follow up project from an MSI program or success in fundraising? Let us know!

*(Photos provided by Kathy Grant)*  
Posted in Uncategorized

# Sandhill Cranes are coming!



**News-Sentinel file photograph**

A pair of cranes fly over Woodbridge Road during the Sandhill Crane festival in 2012.

Posted: Thursday, October 24, 2013 12:49 pm

Standing out at the Isenberg Crane Reserve off Woodbridge Road, the sky darkens as thousands of birds start circling to find a place to roost for the evening.

In October, the Sandhill cranes arrive outside of Lodi feasting on abundant food and socializing with each other through vocal calls and dance. They will stay through spring, offering plenty of opportunities to photograph and observe the lanky, ash-gray birds.

Wildlife enthusiasts from all over Northern California will also migrate to Lodi from Nov. 1 to 3 to spend a weekend learning about these majestic birds. Local residents can also enjoy the [17th annual Sandhill Crane Festival](#) too, whether it is meeting raptors at Hutchins Street Square or snagging a spot on one of the wildlife tours.

This year, the festival has added in tours at the Mokelumne River Fish Hatchery, where people can learn about the salmon. The goal is to create a festival where people can learn about the entire watershed the birds live in while in Lodi, festival spokeswoman Kathy Grant said.

“Those Sandhill cranes, the water they are standing in at night to roost in is Mokelumne River water, she said. “They are wetland birds, they belong to a river system. The salmon are part of that system too.”

Below are some of the highlights of the festival:

**Tours:** The festival offers a plethora of tours on Friday, Saturday and Sunday, offering a variety of ways to experience the cranes. The main tours are the fly-in tours in the evening when the birds return from a day of foraging in fields and land at the places where they will roost for the evening. For early birds, there also is an early morning photo tour with Lon Yarbrough, who is a keynote speaker at the festival as well.

There are a variety of boating tours, whether it is kayaking along the Mokelumne River or spending an afternoon on a patio boat in the Delta. One of the more unique tours is raptors by boat at Pardee Reservoir where James Jones, a biologist for East

Bay Municipal Utility District, will take you in search for Golden and Bald eagles arriving in the foothills.

To register for the tours, you can go to [www.cranefestival.com/tours.php](http://www.cranefestival.com/tours.php). There also is registration during the festival at Hutchins Street Square, and even if the tour says it is sold out, there will be some spots available for those who register the weekend of the festival.

Festival spokeswoman Kathy Grant recommends people sign up for tours on Friday night or Saturday morning for the Sunday tours.

**Opening reception and art show:** The festival kicks off with an opening reception featuring local food and wine. Throughout the festival, there will be displays from artists who have depicted the cranes either with a camera or in a painting. The reception is from 6-8:30 p.m.

### **Keynote speakers**

**Lon Yarbrough:** As a regular participant at the festival, Lon Yarbrough has taught beginner photographers how to capture the cranes and other wetland birds on film for years. He will be giving tips on how to both photograph and take video of the birds as well as showing some of his own work. (12:30 p.m. Saturday).

**Mike Best:** At Pacific Gas and Electric, Best runs their bird protection program. He works on preventing birds from running into electrical wires, through measures like putting reflectors on wires. He also runs an owl box program. (1:30 p.m. Saturday)

**David Lukas:** One of the way to identify birds is through their vocalizations. Lukas, an expert in old growth riparian habitat in places like Lodi Lake, will discuss the wonder of bird song. He will also have a book signing before the presentation.

This talk will be a lead-in to a tour at 2 p.m. of Lodi Lake where birders will learn to match the calls to birds. (12:30 p.m. Sunday)

**Dorothy Maas:** A favorite at the festival, Dorothy Maas will bring a medley of puppets to tell stories about wildlife. After the presentation, kids can stay and meet the puppets.

### **Activities**

**Origami cranes:** Take a break from the festival and learn how to fold a paper crane. The Central Valley Student Chapter of People to People International, a group promoting international understanding through educational, cultural and humanitarian activities, organized the crane project, and there will be a trail of folded cranes leading to the table in the Cottage-Pisano foyer.

**Meet wildlife:** Two of the big events for children are the wildlife shows, where actual animals are shown and described at the square.

On Saturday, Native Bird Connections will let kids meet raptors, owls and other birds of prey up close.

On Sunday, there will be WildThings! In past years, they have shared bears, raccoons, eagles, owls and other rescued animals. (11 a.m. and 1:30 p.m. Sunday)

**Other opportunities:** There are multiple programs running all day on Saturday and Sunday at the square. Highlights include Native American flute circles where beginners can come borrow a flute learn how to play, a Taiko drumming performance, owl pellet dissection for kids and even decoy duck carving. All the information on these programs can be found on the festival's website.

**The basics:** The free festival centers around Hutchins Street Square, 125 N. Church Street. The art show, exhibit halls, vendors and food are open from 10 a.m. to 5 p.m. Saturday and 10 a.m. to 4 p.m. Sunday, in addition to the opening reception from 6 to 8:30 p.m. Friday.

Contact reporter Maggie Creamer at [maggiec@lodinews.com](mailto:maggiec@lodinews.com).

# Salmon have arrived



Jim Inman, a biologist with Fishbio consulting company, Thursday looks over the monitoring system that counts the passage of salmon on the Stanislaus River near Riverbank. CRAIG SANDERS/The Record

By **Alex Breitler**  
Record Staff Writer  
October 25, 2013 12:00 AM

Another near-record salmon run is expected on the Stanislaus River this fall, while farther north, thousands of fish are already splashing their way up the Mokelumne River past Lodi.

So if you've never seen a mighty Chinook, this might be the year to get out there and find one.

The first opportunity comes Saturday at the Stanislaus River Salmon Festival at Knights Ferry, off Highway 120 east of Oakdale. From the festival on the banks of the river, you should be able to walk onto the Sonora Road bridge and peer down at the fish spawning in the gravel streambed.

## Stanislaus River Salmon Festival

**When:** 10 a.m. to 3 p.m. Saturday

**Where:** Knights Ferry Recreation Area, 12 miles east of Oakdale off Highway 120

The action will also soon pick up at the Mokelumne River Fish Hatchery below Camanche Dam, where you can watch salmon on the final moments of their journey before blood-spattered hatchery workers harvest fish eggs and sperm.

There may even be a few salmon swimming through Stockton in the coming weeks, once we finally get a decent dose of fall rains allowing the Calaveras River to connect through to the Delta.

"If you want to see salmon anywhere, from now through the end of November is the best window of time," said U.S. Fish and Wildlife Service biologist J.D. Wikert.

The Stanislaus festival has attracted up to 3,000 people during its first four years, said Wikert, one of many organizers. This year's fifth festival almost didn't happen, thanks to the government shutdown, but that ended just in time to allow organizers to push forward.

Among other highlights will be calendars featuring salmon artwork drawn by children who live near the river.

"We just decided it was a good idea to raise awareness about the fact that we have salmon in the Stanislaus River, and it's a valuable resource," Wikert said. "The hope is to keep it community-focused and not grow it into some huge rock band, cotton-candy, deep-fried Twinkies kind of event."

Last year a record 7,248 migratory salmon returned to the Stanislaus to spawn, nearly 10 times as many as the year before. (For perspective, though, far more fish likely returned before dams were built and before surveys were first conducted.)

Last year's increase was attributed to continued improvement in Central Valley salmon runs several years after a steep decline.

"A lot of it has to do with good ocean conditions," Wikert said. After being born in streams and rivers, young salmon migrate to the ocean, where they spend most of their lives before returning to the streams to spawn and die.

As of Thursday, 2,680 salmon had passed a downstream weir near Riverbank, putting the Stanislaus only slightly behind last year's record-breaking pace.

To the north, about 1,250 salmon have passed the Woodbridge Dam on the Mokelumne, said Jose Setka, supervising fisheries biologist for the East Bay Municipal Utility District.

The Mokelumne saw a record-breaking run of more than 18,500 fish two years ago, and another strong run last year of more than 12,000 fish.

"Things are looking good, but it's still a little early in the year to make any sort of predictions on the Mokelumne specifically," Setka said.

East Bay MUD released extra water down the river this week, hoping the fish would take the cue and head upstream.

Additionally, federal officials this week closed the Delta Cross Channel gate near Walnut Grove in an effort to meet flow standards near Rio Vista. The closure also has the effect of helping fish by preventing Mokelumne River salmon from straying into the Sacramento River.

Stockton's own Calaveras River is tougher to predict. A good, solid storm is needed before fish waiting in the Delta will dare to head up the Calaveras, said biologist Kari Burr with the Fisheries Foundation.

And with warmer-than-usual water temperatures in the Delta, the salmon might get tired of waiting and head someplace else.

More often than not, however, nature finds a way.

"Usually we get a few fish that come up (the Calaveras)," Burr said, "even if it's just a handful."

Contact reporter Alex Breitler at (209) 546-8295 or [abreitler@recordnet.com](mailto:abreitler@recordnet.com). Visit his blog at [www.recordnet.com/breitlerblog](http://www.recordnet.com/breitlerblog).

# Despite dry year, Mokelumne River teeming with salmon



**Dan Evans/News-Sentinel**

A salmon leaps out of the water while swimming up the Mokelumne River on Tuesday, Nov. 19, 2013.

Posted: Wednesday, November 20, 2013 12:00 am

**Despite dry year, Mokelumne River teeming with salmon** By Ross Farrow/News-Sentinel  
Staff Writer Lodi News-Sentinel | [0 comments](#)

Despite the lack of rainfall in Northern California this year, the Mokelumne River's salmon run is about as plentiful as it was in 2012 — 2,500 salmon have found their way through the [fish hatchery](#) at Lake Camanche.

So if you want to check out the salmon, they'll be at the fish hatchery a while longer.

“So far, we've spotted about 2,500 fish at the hatchery, about the same as last year,” said Eric Barrow, an office technician for the U.S. Department of Fish and Wildlife. “We're grateful.”

The plentiful salmon numbers are due to extremely rainy conditions in November and Dec. 2012, according to Abby Figueroa, a spokeswoman for the East Bay Municipal Utility District, which holds a majority of the Mokelumne River's water rights.

But if the weather continues to be as dry as it has been for most of the 2013 calendar year, we can expect a smaller number of salmon next year, Figueroa said.

When salmon swim upstream on the Mokelumne each year from the San Francisco Bay, workers at the fish hatchery kill the females, slice open their bellies and harvest

the eggs. They also harvest milt, or sperm, from the males, which is mixed with the eggs.

“We fertilize the eggs and raise them,” he said. “We keep them here about nine months and bring them back to the Delta.”

Hatchery workers will fertilize the eggs from about 7:30 to 10:30 a.m. on Thursday and then on Nov. 25 and Nov. 27, Barrow said.

Contact reporter Ross Farrow at [rossf@lodinews.com](mailto:rossf@lodinews.com).

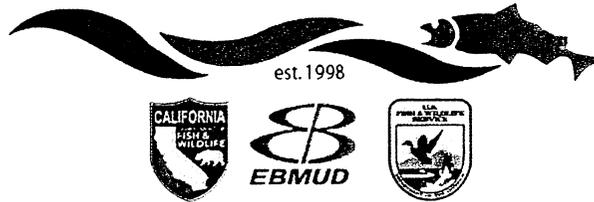
**APPENDIX B**

**CORRESPONDENCE RELATED TO THE 2013  
ADAPTIVE MANAGEMENT FLOW CHANGE—FALL 2013 ATTRACTION FLOW**



P-2916

### Lower Mokelumne River Partnership



FILED  
 SECRETARY OF THE  
 COMMISSION  
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 FEDERAL ENERGY  
 REGULATORY COMMISSION

**Partnership Steering Committee:**

**California Department of Fish & Wildlife**

**Tina Bartlett**  
Regional Manager  
1701 Nimbus Rd., Suite A  
Rancho Cordova, CA 95670

**East Bay Municipal Utility District**

**Richard Sykes**  
Director of Water & Natural Resources  
375 Eleventh St., M.S. 901  
Oakland, CA 94607

**U.S. Fish & Wildlife Service**

**Dan Welsh**  
Asst. Field Supervisor  
2800 Cottage Way, Rm. W2605  
Sacramento, CA 95825

March 7, 2013

Mr. Thomas Howard  
Executive Director  
State Water Resources Control Board  
P.O. Box 100  
Sacramento, CA 95812

SUBJECT: Modification of Mokelumne River Flows pursuant to D-1641

Dear Mr. Howard:

The Lower Mokelumne River Partnership seeks your concurrence with the recommended changes to the Operations Plan provided as Attachment 1, modifying releases to the lower Mokelumne River in April 2013, in order to provide an attraction pulse flow for the fall run Chinook salmon during the month of October 2013. For the reasons set forth below, this pulse flow may be beneficial to Mokelumne origin salmonids.

In December 1999, the State Water Resource Control Board (SWRCB) adopted, as part of Water Right Decision D-1641, new minimum release requirements from EBMUD's Camanche Dam to the lower Mokelumne River and expected flow requirements below Woodbridge Irrigation District's (WID) dam. The Decision also contains an adaptive management provision allowing the Executive Director of the SWRCB to approve rescheduled release requirements, provided that the total quantity of water released in any given year will not be less than the quantity of water provided by the flow requirements for that type of year, and provided there is written concurrence from the California Department of Fish & Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS).

Dry Conditions in January and February indicate that predicted runoff on the Mokelumne may likely result in a "Below Normal" water year type designation for April-September 2013 as defined by D-1641. Should the system receive average precipitation starting now until or if dry conditions persist, there will be limited water available above the JSA minimum levels in October 2013 with which to conduct the experimental pulse flows which appear to help reduce straying of Mokelumne origin Chinook salmon. Because of this potential condition, the Partnership Steering Committee requests approval for an adaptive management operations plan to reduce releases during April 2013 below JSA minimum levels in order to conserve a volume of water (approx. 7.5 TAF) to be used as an attraction pulse flow in October 2013.

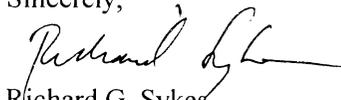
**To Protect and Enhance the Lower Mokelumne River Ecosystem**

We, the Partnership Steering Committee, and the NMFS believe that the adaptive management action should start as soon as possible after April 1. Because the April-September water year forecast is not determined until April 1<sup>st</sup>, past adaptive management proposals required short-notice approval from SWRCB (normal requirement is that requests be submitted to SWRCB 30-days in advance). By obtaining SWRCB support prior to the April 1<sup>st</sup> forecast, the potential benefits from the adaptive management approach could be maximized (e.g., Re-allocation of flows could begin in April rather than in May). There is little downside from the pre-approval because if the April 1<sup>st</sup> DWR forecast determines that the April-September water year type is other than "Below Normal", the approved adaptive management action would not be implemented.

Enclosed are letters of concurrence with the modified flow schedule from the Lower Mokelumne River Partnership Steering Committee (CDFW, EBMUD, and USFWS) and NMFS.

Please let me know as soon as conveniently possible if you approve this request. Should you have any questions, please call me at (510) 287-1629, email [rsykes@ebmud.com](mailto:rsykes@ebmud.com) or Lena Tam, Manager of Water Resources Planning at (510) 287-1240, email [ltam@ebmud.com](mailto:ltam@ebmud.com).

Sincerely,



Richard G. Sykes  
Partnership Steering Committee  
EBMUD, Director of Water & Natural Resources

RGS:rl

Enclosures

cc: B. Evoy (SWRCB) D. Welsh (USFWS)  
Hon. K. Bose (FERC) D. Ratcliff (USFWS)  
R. Finucane (FERC) T. Bartlett (CDFW)  
A. Christensen (WID) R. Vincek (CDFW)  
M. Rea (NMFS)  
M. Gutierrez (NMFS)  
J. Miyamoto (EBMUD)  
J. Setka (EBMUD)  
R. Leong (EBMUD)  
L. Tam (EBMUD)

## 2013 Adaptive Management Flow Change on the Mokelumne River

TABLE 1 – Standard and Proposed Adaptive Management Operation Plans – Below Normal Water Year Type

*Standard Operation Plan for 2013 Below Normal Water Year Type (cfs)*

### Standard Operation Plan (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	JSA Required Camanche Release	JSA Expected Flow below Woodbridge
April	Below Normal	455	280	450**	150
October	Above Normal	330	195	325	100

\*\*Includes JSA Attachment 1 Below Normal Year Flow – Mokelumne River Minimum Flow Schedule (footnote 5) and assumes March 31, 2012 storage of < 10 TAF BMAS

*Proposed Adaptive Management Operation Plan to modify JSA releases for 2013 Below Normal Year Type (cfs)*

### Proposed Adaptive Management Operation Plan to modify JSA releases (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
April	Below Normal	330	165	250	150
October	Above Normal	455	385	325 + 7,500 AF for pulse flow	100 + 7,500 AF for pulse flow

Table one provides details of modified October releases assuming Below Normal Water Year October 2013. The actual water year will depend on the projected combined Pardee and Camanche reservoir storage on November 5, 2013,

The April – September 2013 water year is expected to be Below Normal. However, if runoff projections change this adaptive management action will be re-evaluated or terminated with the flow schedule returned to the standard JSA flows. Any flows saved prior to termination of the adaptive management action will be reserved and released in the fall per a schedule developed by CDFW, USFWS, and EBMUD.



RICHARD G. SYKES  
DIRECTOR OF WATER AND NATURAL RESOURCES  
(510) 287-1629  
rsykes@ebmud.com

March 5, 2013

Mr. Dan Welsh  
Assistant Field Supervisor, CRC  
US Fish and Wildlife Service  
2800 Cottage Way, Rm W2605  
Sacramento, CA 95825-1846

Ms. Tina Bartlett  
California Dept. of Fish and Game  
1701 Nimbus Road, Suite A  
Rancho Cordova, CA 95670

**SUBJECT: Adaptive Management Flow Change on the Mokelumne River**

Dear Mr. Welsh and Ms. Bartlett:

This letter is written to authorize the recommendation made by U.S. Fish & Wildlife Service (USFWS), California Department of Fish & Wildlife (CDFW), National Marine Fisheries Service (NMFS) and East Bay Municipal Utility District (EBMUD) staff during the February 5, 2013 meeting of the Mokelumne River Technical Advisory Committee (MRTAC).

Dry conditions in January and February indicate that predicted runoff on the Mokelumne may likely result in a "Below Normal" water year designation for April-September 2013 as defined in D-1641. Should the system receive average precipitation starting now or if dry conditions persist, there will be limited water available above the JSA minimum levels in October 2013 with which to conduct the experimental pulse flows which appear to help reduce straying rates for Mokelumne origin Chinook salmon. Because of this potential condition, the PCC recommends an adaptive management operations plan to reduce releases in the period of April-June 2013 below JSA minimum levels in order to conserve a volume of water (approx. 7.5 TAF) to be used as an attraction pulse flow in October 2013.

The PCC, and the NMFS representative to the coordinating committee believe that the adaptive management action should start after April 1, 2013. Because the April-September water year forecast is not determined until April 1<sup>st</sup>, past April-September adaptive management proposals required short-notice approval from SWRCB (normal requirement is that requests be submitted to SWRCB 30-days in advance). By obtaining SWRCB support prior to the April 1<sup>st</sup> forecast, the potential benefits from the adaptive management approach could be maximized (e.g., Re-allocation of flows could begin in

## Adaptive Management Flow Change on the Mokelumne River

March 5, 2013

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April rather than in May). There is little downside from the pre-approval because if the April 1<sup>st</sup> DWR forecast determines that the April-September water year type is other than "Below Normal", the approved adaptive management action for April-September 2013 would not be implemented.

**JSA Flows.** EBMUD's Joint Settlement Agreement (JSA) with the CDFW and the USFWS includes a schedule of minimum flow releases from Camanche Dam based on water year type. Based on the expected DWR April 1<sup>st</sup> 2013 runoff forecast for April – September, the 2013 JSA year type will likely be designated as "Below Normal." For the months of April, May and June in Below Normal year types, the JSA release from Camanche Dam is 250 cfs with expected flows below Woodbridge Dam of 150 cfs in April and 200 cfs in May and June. The JSA also includes a provision for additional releases from Camanche during April, May and June if the storage in Camanche and Pardee Reservoirs is within 40 thousand acre-feet (TAF) of the maximum allowable for the end of the prior month.

**Adaptive Management Provision.** The JSA includes an adaptive management provision (Section F(1)) to increase the opportunity for optimizing fishery habitat and other ecosystem values to be responsive to changing river conditions and scientific knowledge. To accomplish this objective, the JSA provides that EBMUD may reschedule the JSA flows with prior written concurrence of CDFW and USFWS (and also including NMFS written concurrence per FERC's order adopting the JSA) provided the total quantity of water released in any given year is not less than the quantity of water provided by the JSA flow schedule for that water year type. Our agencies relied on this provision in the 2009, 2010 and 2012 adaptive management flow changes. Our agencies also recommended a similar action in 2010 but the late rains that year provided enough runoff that there was no need to reduce the JSA flows.

**Proposed 2013 Adaptive Management Flow Change.** As of January 22, 2013, runoff this year is expected to be approximately 740,000 AF on assuming median (50% exceedance) precipitation for the remainder of the water year which would result in a Below Normal JSA water year type. Should additional rains come to reach 10% exceedance precipitation, then the runoff projection would be 1,060,000 AF resulting in a Normal and Above JSA water year type. Additionally, Camanche and Pardee Reservoirs are not expected to be at full allowable storage as we enter the next water year. These conditions trigger a Below Normal Water Year designation with resultant JSA flow requirements. Often in Below Normal Water Years, flood control releases are made in the fall, but because of dry conditions in January and February this particular year, adaptive management flows are being proposed. This adaptive management flow change would not be necessary if the runoff was closer to the normal pattern.

## Adaptive Management Flow Change on the Mokelumne River

March 5, 2013

Page 3

Based on the PCC (resource agencies and EBMUD staff) recommendation, a 2013 adaptive management flow change is proposed as noted in the attached Table 1.

Table 1 shows the standard JSA and proposed adaptive management operation plans and JSA releases for a Below Normal Water Year. The water for the proposed adaptive flow change would come from a reduction of spring flows in April 2013. The proposal would: 1) reduce the required JSA Camanche release from 450 to 250 cfs in April, 2), not reduce the expected flows below Woodbridge Dam (will remain at 150 cfs in April and 4) provide approximately 7.5 TAF of water for a pulse flow in October.

Similar to past years when an adaptive management operations plan was implemented, the timing of the fall flow would be determined by the CDFW and USFWS, and the flow schedule would be established by EBMUD in consultation with the CDFW and USFWS based on the actual flow saved, this year, during April.

The 2009, 2010, and 2012 fall pulse flows appear to have been beneficial to reducing Mokelumne origin salmonids from straying into the American River. Many other factors contribute to straying including DCC operations, hatchery planting practices and weather, but the very limited information indicates a positive response to the pulse flows. During 2009, 2010, and 2012 all agencies, including NMFS, concurred with the requested adaptive management action. The primary concern was that river temperatures below Woodbridge not exceed 22° C during the adaptive management action. Temperatures were monitored and did not exceed this threshold and remained below 22°C from the implementation of past adaptive management flows.. EBMUD will conduct the same monitoring and meet the same notification condition contained in NMFS' 2010 approval letter (attached) for similar adaptive management action.

The PCC discussed this adaptive management change to the standard release schedule to shift water from April until the fall to better attract returning Chinook salmon. The three members of the PCC and the representative from NMFS agreed that this change was worthwhile and provides a potential benefit with little risk of adverse consequences.

If you concur with these adaptive management actions, please sign and date the proposed plan in the signature block below Table 1 and return to me via e-mail or regular mail.

Subject to your written concurrence to the attached proposed plan, EBMUD will then submit the proposed plan to the Executive Director of the State Water Resources Control Board, as required by Decision 1641. Because Decision 1641 requires such adaptive management flow changes to be submitted to the SWRCB 30 days in advance, we are requesting your written concurrence as soon as possible. Once we receive your written concurrences, we will immediately submit the proposed plan to the SWRCB.

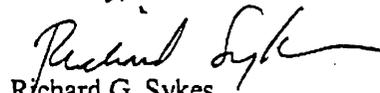
Adaptive Management Flow Change on the Mokelumne River

March 5, 2013

Page 4

If you have any questions or would like to discuss this request, please do not hesitate to contact me at 510-287-1629, or Joe Miyamoto at 510-287-2021.

Sincerely,



Richard G. Sykes  
Director of Water and Natural Resources

RGS:rl

Attachment

cc: Monica Gutierrez (NMFS)  
Robert Vincek (CDFG)  
Joe Johnson (CDFG)  
Donald Ratcliff (USFWS)  
Ramon Martin (USFWS)  
Joseph Miyamoto (EBMUD)  
Jose Setka (EBMUD)

Adaptive Management Flow Change on the Mokelumne River  
 March 5, 2013  
 Page 5

**PARTNERSHIP STEERING COMMITTEE APPROVAL OF PCC  
 RECOMMENDATION**

**TABLE 1 – Standard and Proposed Adaptive Management Operation Plans –  
 Below Normal Water Year Type**

Standard Operation Plan for 2013 Below Normal Water Year Type (cfs)

Standard Operation Plan (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
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\*\*Includes JSA Attachment 1 Below Normal Year Flow – Mokelumne River Minimum Flow Schedule (footnote 5) and assumes March 31, 2012 storage of < 10 TAF BMAS

Proposed Adaptive Management Operation Plan to modify JSA releases for 2013 Below Normal Year Type (cfs)

Proposed Adaptive Management Operation Plan to modify JSA releases (cfs)

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April	Below Normal	330	165	250	150
October	Above Normal	455	385	325 + 7,500 AF for pulse flow	100 + 7,500 AF for pulse flow

The actual dates and flow schedule for the pulse flow will be determined by DFG and EBMUD based on detection of returning Chinook in the Delta and other area rivers and coordination with pulse flows on other river systems. The fall pulse flow will be completed no later than November 5th.

The April – September 2013 water year is expected to be Below Normal. However, if runoff projections change this adaptive management action will be re-evaluated or terminated with the flow schedule returned to the standard JSA flows. Any flows saved prior to termination of the adaptive management action will be reserved and released in the fall per a schedule developed by CDFW, USFWS, and EBMUD.

Adaptive Management Flow Change on the Mokelumne River

March 5, 2013

Page 6

The agencies below authorize and concur with this proposed 2013 adaptive management proposal.

  
\_\_\_\_\_  
Richard Sykes, Director of Water and Natural Resources  
East Bay Municipal Utility District

Date: 3-5-13

\_\_\_\_\_  
Daniel Welsh, Assistant Field Supervisor, CRC  
U.S. Fish and Wildlife Service

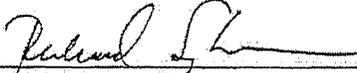
Date: \_\_\_\_\_

  
\_\_\_\_\_  
Tina Bartlett, Region II Manager  
California Department of Fish and Wildlife

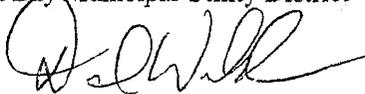
Date: 3-6-13

Adaptive Management Flow Change on the Mokelumne River  
March 5, 2013  
Page 6

The agencies below authorize and concur with this proposed 2013 adaptive management proposal.

  
\_\_\_\_\_  
Richard Sykes, Director of Water and Natural Resources  
East Bay Municipal Utility District

Date: 3-5-13

  
\_\_\_\_\_  
Daniel Welsh, Assistant Field Supervisor, CRC  
U.S. Fish and Wildlife Service

Date: 3/6/13

\_\_\_\_\_  
Tina Bartlett, Region II Manager  
California Department of Fish and Wildlife

Date: \_\_\_\_\_


**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**

NATIONAL MARINE FISHERIES SERVICE

Southwest Region

650 Capitol Mall, Suite 5-100

Sacramento, CA 95814-4700

MAR 5 2013

Joe Miyamoto  
 Manager of Fisheries and Wildlife  
 East Bay Municipal Utility District  
 500 San Pablo Dam Road  
 Orinda, California 94563

Dear Mr. Miyamoto:

This letter is in response to your request for NOAA's National Marine Fisheries Service (NMFS) support of the Joint Settlement Agreement (JSA) Adaptive Management Flow Change on the Mokelumne River. The request was made via email on February 25, 2013.

NMFS provided technical assistance to EBMUD regarding flow changes in May 2009, April 2010, and again in February 2012. This is the fourth year NMFS is providing our opinion as technical assistance. NMFS' response is provided as technical assistance with EBMUD, and is not intended to take the place of formal comments or consultation as required under the ESA, and does not provide incidental take authorization pursuant to section 7(b) (4) and section 7(o) (2) of the ESA.

The Mokelumne River is within the range of the CCV steelhead which is listed as threatened under the ESA (January 5, 2006; 71 FR 834). The Central Valley fall-run Chinook salmon (*O. tshawytscha*) evolutionarily significant unit, a NMFS Species of Concern, also occurs in the Mokelumne River. The Mokelumne River is designated as critical habitat for CCV steelhead as well as essential fish habitat for Pacific salmon pursuant to the provisions of the Magnuson-Stevens Fishery Conservation and Management Act.

EBMUD proposes to reduce the JSA required release for April 2013 based upon JSA water year type for April-October 2013 of "Below Normal". Under these conditions, there will be limited water available above the JSA minimum levels in October 2013 with which to conduct the experimental pulse flows that appear to help reduce straying rates for Mokelumne origin Chinook salmon. The pulse flow would occur during the first two weeks of October, adaptively coordinated for maximum effect contingent on fish presence within the Mokelumne system and operations on other river systems, such as the American River.

The proposed adaptive flow change would come from a reduction of spring flows in April 2013. The proposal would: 1) reduce the required JSA Camanche release from 450 to 250 cubic feet per second in April and 2) provide a release of approximately 7,825 acre feet of water for a pulse flow in October for migrating adult Chinook salmon.



In an effort to adaptively manage the flows and monitor potential impacts to downstream salmonids, EBMUD proposes to monitor water temperatures below Woodbridge Dam during the month of April 2013, as has been done in previous years. If water temperatures exceed 22 degrees Celsius, JSA parties and NMFS will be notified and measures will be taken to reduce temperature impacts. NMFS agrees that the flows should be adaptively managed and using temperature as an indicator for monitoring potential impacts to salmonids. The fall pulse flow may benefit adult CV steelhead returning to the Mokelumne River but likely does not optimize migration flows throughout the steelhead migration period. We will continue to provide technical assist as best we can. We look forward to working with EBMUD on a long-term management strategy for anadromous fish on the Mokelumne River.

Please contact Monica Gutierrez (916) 930-3657, or via e-mail at [Monica.Gutierrez@noaa.gov](mailto:Monica.Gutierrez@noaa.gov), if you have any questions regarding this project or require additional information.

Sincerely,



Maria Rea

Central Valley Office Supervisor

Cc: Copy to the file: ARN151422SWR2010SA00127  
NMFS-PRD, Long Beach, CA

Document Content(s)

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State Water Resources Control Board

**MAR 20 2013**

Richard G. Sykes  
East Bay Municipal Utility District  
Lower Mokelumne River Partnership  
375 Eleventh Street, M.S. 901  
Oakland, CA 94607  
rsykes@ebmud.com

Dear Mr. Sykes:

**MODIFICATION OF MOKELUMNE RIVER FLOWS PURSUANT TO DECISION 1641 –  
LICENSE 11109 AND PERMIT 10478 (APPLICATIONS 4228 AND 13156) OF EAST BAY  
MUNICIPAL UTILITIES DISTRICT**

On March 7, 2013, the Lower Mokelumne River Partnership requested the State Water Resources Control Board's (State Water Board) concurrence with recommended changes to the Operations Plan established in Decision 1641 (p. 172) to modify releases to the lower Mokelumne River in April 2013. The purpose of the change is to establish a bank of water which can be utilized to provide an attraction pulse flow for the fall run Chinook salmon during the month of October 2013.

Decision 1641 contains an adaptive management provision allowing the Executive Director of the State Water Board to approve rescheduled release requirements, provided that the total quantity of water released in any given year will not be less than the quantity of water provided by the flow requirements for that type of year. Per Decision 1641, any proposed change requires written concurrence from the California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service.

The proposed modification has been requested because predicted runoff is expected to result in a "Below Normal" water year type designation for April-September 2013, as defined by Decision 1641. If this occurs, there will be limited water available above the Joint Settlement Agreement (JSA) minimum levels in October 2013 with which to conduct the experimental pulse flows which appear to help reduce straying of Mokelumne origin Chinook salmon. Thus, the Partnership Steering Committee has requested approval to reduce releases during April 2013 below JSA minimum levels in order to conserve approximately 7,500 acre-feet to be used as an attraction pulse flow in October 2013. If the April 1<sup>st</sup> Department of Water Resources forecast determines that the April –September water year type is other than "Below Normal", the adaptive management action would not be implemented.

The March 7 letter indicates that if runoff projections change, the adaptive management action will be re-evaluated or terminated with the flow schedule returned to the standard JSA flows. Any flows saved prior to termination of the adaptive management action will be reserved and released in the fall per a schedule developed by CDFW, USFWS and East Bay Municipal Utilities District.

MAR 20 2013

The required letters of concurrence from the fisheries agencies were provided to the State Water Board.

The standard and proposed flow schedules are listed below. The requested adaptive management action is approved, subject to the termination criteria listed herein.

Standard Operation Plan in cubic feet per second (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	JSA Required Camanche Release	JSA Expected Flow below Woodbridge
April	Below Normal	455	280	450**	150
October	Above Normal	330	195	325	150

\*\* Includes JSA Attachment 1 Below Normal Year Flow - Mokelumne River Minimum Flow Schedule (footnote 5) and assumes March 31, 2012 storage of < 10 TAF BMAS

Adaptive Management Action to Modify JSA Releases (cfs) for 2013 Below Normal Year Type

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	JSA Required Camanche Release	JSA Expected Flow below Woodbridge
April	Below Normal	330	165	250	150
October	Above Normal	455	385	325 + 7,500 af for pulse flow	100 + 7,500 af for pulse flow

If you require further assistance, please contact Katherine Mrowka at (916) 341- 5363 or by email at [kmrowka@waterboards.ca.gov](mailto:kmrowka@waterboards.ca.gov). Written correspondence or inquiries should be addressed as follows:

State Water Resources Control Board  
 Division of Water Rights  
 Attn: Katherine Mrowka  
 P.O. Box 2000  
 Sacramento, CA 95812-2000

Sincerely,

  
 Thomas Howard  
 Executive Director

cc: See next page.

**MAR 20 2013**

cc: Maria Rea  
National Marine Fisheries Service  
Southwest Region  
650 Capitol Mall, Suite 5-100  
Sacramento, CA 95814-4700  
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Honorable Kimberly D. Bose  
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Federal Energy Regulatory Commission  
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Anders Christensen  
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**APPENDIX C**

**USGS VERIFIED FLOW DATA FOR 2011 AND 2012**



11323500 Mokelumne River below Camanche Dam, CA

DISCHARGE, CUBIC FEET PER SECOND  
JANUARY TO DECEMBER 2011  
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2,600	599	602	3,400	2,800	1,800	4,990	1,310	900	996	1,390	347
2	2,600	599	602	3,400	2,790	1,800	4,780	1,310	895	998	971	329
3	2,600	599	601	3,400	2,750	1,800	4,600	1,310	832	995	742	330
4	2,600	599	716	3,400	2,650	1,800	4,600	1,310	731	996	642	330
5	2,600	599	801	3,400	2,540	1,800	4,390	1,310	628	1,220	599	330
6	2,490	600	800	3,400	2,500	1,800	4,010	1,310	527	1,620	598	330
7	2,290	602	861	3,400	2,510	1,750	3,580	1,300	497	1,800	601	330
8	2,200	601	950	3,400	2,510	1,650	3,170	1,330	498	1,800	600	330
9	2,190	599	950	3,400	2,510	1,550	2,770	1,350	500	1,800	604	330
10	2,090	600	950	3,400	2,500	1,450	2,370	1,350	500	1,570	539	331
11	1,890	601	950	3,400	2,440	1,400	1,970	1,350	502	1,170	671	330
12	1,700	600	951	3,390	2,350	1,400	1,690	1,280	431	871	799	331
13	1,500	600	950	3,390	2,250	1,400	1,490	1,180	395	800	797	330
14	1,290	601	1,180	3,280	2,200	1,400	1,340	1,080	397	1,030	800	330
15	1,170	601	1,400	3,090	2,200	1,630	1,290	975	396	1,430	739	331
16	1,120	601	1,660	3,000	2,200	1,800	1,290	907	397	1,600	640	331
17	1,070	601	2,060	3,000	2,210	1,800	1,290	885	514	1,370	535	330
18	1,020	601	2,680	3,000	2,210	1,800	1,290	885	713	972	435	331
19	971	601	3,000	3,000	2,210	1,800	1,290	883	914	797	399	333
20	922	601	3,000	3,000	2,200	1,800	1,280	882	999	800	398	332
21	870	600	3,000	3,000	2,150	1,800	1,280	882	999	1,030	398	329
22	822	599	3,230	3,000	2,100	1,800	1,290	881	968	1,430	400	329
23	800	602	3,400	3,000	2,050	1,800	1,290	881	966	1,600	401	330
24	802	600	3,400	3,000	1,950	1,970	1,300	881	994	1,370	401	331
25	773	600	3,400	3,000	1,900	2,230	1,300	882	999	970	400	331
26	721	600	3,410	2,950	1,850	2,400	1,300	887	1,000	795	399	331
27	670	601	3,410	2,850	1,800	2,400	1,310	887	1,000	795	399	330
28	620	602	3,400	2,800	1,800	2,470	1,310	890	1,000	1,030	400	330
29	601	-----	3,400	2,800	1,800	2,870	1,310	898	999	1,420	400	330
30	600	-----	3,400	2,800	1,800	4,520	1,310	896	995	1,600	393	332
31	600	-----	3,400	-----	1,800	-----	1,310	899	-----	1,600	-----	335
<b>Total</b>	44,792	16,809	62,514	94,750	69,530	57,690	67,790	33,261	22,086	38,275	17,490	10,264
<b>Mean</b>	1,445	600	2,017	3,158	2,243	1,923	2,187	1,073	736	1,235	583	331
<b>Max</b>	2,600	602	3,410	3,400	2,800	4,520	4,990	1,350	1,000	1,800	1,390	347
<b>Min</b>	600	599	601	2,800	1,800	1,400	1,280	881	395	795	393	329
<b>Ac-ft</b>	88,840	33,340	124,000	187,940	137,910	114,430	134,460	65,970	43,810	75,920	34,690	20,360

11323500 Mokelumne River below Camanche Dam, CA

DISCHARGE, CUBIC FEET PER SECOND  
JANUARY TO DECEMBER 2012  
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	333	331	299	245	292	283	262	322	291	266	273	756
2	331	331	265	246	302	252	261	321	293	264	257	723
3	332	329	256	251	300	253	261	317	290	272	258	672
4	330	328	256	250	300	241	261	310	292	272	257	619
5	331	331	256	250	300	220	261	311	286	271	342	570
6	331	329	254	252	302	205	261	310	281	271	371	518
7	331	331	255	252	299	202	261	311	282	272	322	468
8	330	331	256	248	310	208	260	311	281	464	275	427
9	331	331	255	250	326	210	270	313	283	553	258	369
10	331	331	255	251	337	216	280	314	282	452	258	319
11	331	331	255	245	343	222	292	311	281	352	255	268
12	333	331	254	242	345	215	296	310	281	279	256	255
13	331	330	255	241	346	222	289	311	281	260	255	255
14	330	330	256	242	350	230	288	311	275	261	256	255
15	330	331	255	242	353	239	289	312	271	369	256	257
16	330	331	255	242	359	246	294	312	270	428	257	257
17	331	331	255	242	352	245	281	316	271	380	257	258
18	332	330	256	240	345	255	272	321	270	328	257	259
19	331	331	255	240	344	261	284	321	271	275	255	258
20	330	331	255	249	349	261	299	321	270	255	255	370
21	334	332	255	269	357	270	305	321	271	256	255	452
22	329	332	254	263	345	276	313	322	271	329	256	451
23	330	330	256	282	340	276	333	320	271	422	255	452
24	329	331	255	293	346	277	360	320	271	373	256	452
25	331	330	255	291	349	269	367	320	270	323	257	453
26	332	330	256	273	351	261	355	322	270	274	257	444
27	332	332	257	260	359	262	340	313	272	255	256	503
28	331	333	257	255	370	260	336	299	270	255	254	503
29	328	333	257	255	370	260	337	293	271	334	256	503
30	327		256	271	369	263	327	293	272	372	504	503
31	330		256		357		322	292		322		503
<b>Total</b>	10,253	9,593	7,972	7,632	10,467	7,360	9,217	9,701	8,311	10,059	8,236	13,352
<b>Mean</b>	331	331	257	254	338	245	297	313	277	324	275	431
<b>Max</b>	334	333	299	293	370	283	367	322	293	553	504	756
<b>Min</b>	327	328	254	240	292	202	260	292	270	255	254	255
<b>Ac-ft</b>	20,340	19,030	15,810	15,140	20,760	14,600	18,280	19,240	16,480	19,950	16,340	26,480

Flow data from October through December have not yet been verified or published by the USGS.

11325500 Mokelumne River At Woodbridge, CA

DISCHARGE, CUBIC FEET PER SECOND  
 JANUARY TO DECEMBER 2011  
 DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2,600	893	540	3,380	2,710	1,640	3,700	1,070	622	756	1,400	320
2	2,640	634	549	3,390	2,700	1,640	4,200	1,070	612	764	1,130	270
3	2,640	595	545	3,390	2,700	1,650	4,200	1,060	606	773	789	283
4	2,620	587	510	3,390	2,620	1,680	4,120	1,040	531	781	660	278
5	2,610	582	386	3,390	2,520	1,680	4,090	1,040	449	856	576	277
6	2,580	578	559	3,390	2,420	1,690	3,960	1,040	353	1,160	569	272
7	2,450	572	693	3,380	2,410	1,660	3,720	1,030	266	1,490	550	269
8	2,260	571	793	3,380	2,410	1,580	3,400	1,040	256	1,560	552	269
9	2,210	569	832	3,390	2,400	1,480	3,000	1,060	260	1,580	548	248
10	2,190	564	841	3,380	2,390	1,380	2,570	1,070	258	1,570	540	261
11	2,040	559	840	3,390	2,370	1,280	2,150	1,060	265	1,240	478	265
12	1,840	555	840	3,380	2,280	1,270	1,760	1,050	253	880	705	266
13	1,650	553	851	3,380	2,180	1,210	1,520	963	168	688	725	265
14	1,450	559	848	3,380	2,110	1,180	1,340	885	165	707	728	253
15	1,260	560	1,160	3,270	2,110	1,240	1,210	802	159	1,020	715	265
16	1,190	583	1,320	3,090	2,100	1,530	1,190	720	156	1,340	629	266
17	1,130	582	1,620	3,020	2,100	1,590	1,170	644	169	1,360	533	265
18	1,070	603	2,050	3,010	2,110	1,550	1,170	633	349	1,030	433	268
19	1,030	645	2,660	2,890	2,100	1,550	1,130	631	527	689	350	255
20	970	589	2,820	3,000	2,110	1,560	1,120	636	687	645	373	267
21	915	557	2,920	2,960	2,110	1,570	1,090	642	707	681	340	260
22	868	548	2,900	2,950	2,040	1,560	1,100	642	709	1,010	336	269
23	816	546	3,140	2,950	2,000	1,550	1,090	639	673	1,320	337	267
24	805	547	3,330	2,960	1,890	1,580	1,090	631	712	1,340	346	263
25	793	608	3,480	2,960	1,790	1,830	1,090	624	732	1,020	334	266
26	747	617	3,470	2,950	1,750	2,030	1,090	620	733	696	336	267
27	692	557	3,420	2,880	1,660	2,130	1,090	615	730	655	326	265
28	642	550	3,400	2,770	1,660	2,140	1,090	619	732	688	333	251
29	594	-----	3,390	2,730	1,660	2,320	1,080	637	740	1,020	331	258
30	606	-----	3,380	2,710	1,640	2,800	1,060	641	750	1,330	334	260
31	715	-----	3,380	-----	1,620	-----	1,070	629	-----	1,380	-----	265
<b>Total</b>	46,623	16,463	57,467	94,490	66,670	49,550	62,660	25,483	14,329	32,029	16,336	8,273
<b>Mean</b>	1,504	588	1,854	3,150	2,151	1,652	2,021	822	478	1,033	545	267
<b>Max</b>	2,640	893	3,480	3,390	2,710	2,800	4,200	1,070	750	1,580	1,400	320
<b>Min</b>	594	546	386	2,710	1,620	1,180	1,060	615	156	645	326	248
<b>Ac-ft</b>	92,480	32,650	113,990	187,420	132,240	98,280	124,290	50,550	28,420	63,530	32,400	16,410

11325500 Mokelumne River At Woodbridge, CA

DISCHARGE, CUBIC FEET PER SECOND  
JANUARY TO DECEMBER 2012  
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	265	430	236	182	173	112	37	35	35	111	218	631
2	250	506	209	173	174	70	34	38	35	107	175	794
3	260	367	172	179	163	61	33	34	36	108	172	692
4	255	290	164	179	157	63	34	34	37	106	178	603
5	251	281	156	182	158	49	34	36	37	115	178	580
6	250	275	170	181	165	44	34	34	38	110	305	530
7	251	276	160	184	161	42	32	33	35	110	268	465
8	257	266	160	183	161	42	33	33	37	137	224	409
9	258	266	159	182	164	42	37	38	37	437	186	352
10	239	266	159	185	163	43	34	34	36	331	179	287
11	245	268	170	207	164	42	35	35	36	286	177	237
12	242	267	176	201	165	45	35	36	37	176	170	207
13	246	278	182	235	166	42	38	35	37	115	173	190
14	242	270	194	226	166	32	38	36	38	113	176	192
15	247	269	181	195	174	33	38	35	36	133	170	198
16	264	262	213	183	177	33	43	33	39	299	176	188
17	249	259	219	171	165	35	54	32	39	265	205	194
18	254	236	191	177	165	35	43	34	37	224	203	188
19	259	235	189	174	164	35	34	36	37	172	178	182
20	264	259	171	176	167	37	34	37	36	109	170	186
21	317	266	181	188	170	35	35	34	39	110	205	372
22	259	257	185	177	171	36	35	34	37	184	176	446
23	313	258	180	180	161	37	35	35	37	311	175	457
24	260	234	182	187	159	41	34	37	37	274	176	440
25	279	149	201	201	161	53	37	40	38	215	181	438
26	291	142	176	219	162	48	38	40	37	170	175	450
27	260	152	196	179	162	35	46	54	37	121	172	436
28	257	197	200	167	163	34	46	41	40	123	208	460
29	253	164	184	158	167	34	61	34	39	125	177	457
30	257		184	167	160	34	54	35	50	248	374	454
31	259		196		159		35	35		211		454
<b>Total</b>	8,053	7,645	5,696	5,578	5,107	1,324	1,190	1,117	1,126	5,656	5,900	12,169
<b>Mean</b>	260	264	184	186	165	44	38	36	38	182	197	393
<b>Max</b>	317	506	236	235	177	112	61	54	50	437	374	794
<b>Min</b>	239	142	156	158	157	32	32	32	35	106	170	182
<b>Ac-ft</b>	15,970	15,160	11,300	11,060	10,130	2,630	2,360	2,220	2,230	11,220	11,700	24,140

**APPENDIX D**

**MEETING MINUTES OF THE PARTNERSHIP STEERING COMMITTEE**



## **Mokelumne River Partnership Steering Committee Minutes**

**December 12, 2013  
2:30 pm – 4:30 pm**

Attendance: US FWS: Dan Welsh\*, Donnie Ratcliff  
CDFG: Kathy Hill  
NMFS: Monica Gutierrez, Rhonda Reed  
EBMUD: Richard Sykes\*, Jose Setka, Rick Leong  
*\*JSA Steering Committee representatives*

Meeting Location: USFWS Office, 2800 Cottage Way (Sacramento)

Self-introductions were made.

1. Water Education Legacy Program: (Kathy Grant) Kathy Grant was unable to attend the meeting.
2. JSA Adaptive Management Flow Modification – DCC Closure (Jose Setka) Jose reported that because of the lengthy dry weather, it is very unlikely that there will be enough water to allow for a DCC closure or adaptive management flows in 2014.
3. 2013 Mokelumne Escapement Update (Jose Setka): Jose explained that EBMUD operates two rotary screw traps to estimate outmigration of juvenile salmonids. The upper trap is located approximately 10 miles downstream of Camanche Dam and the lower trap is located just downstream of WID dam. Jose reported that an estimated 1.2 million juveniles passed the upper trap and 148 thousand is estimated to have passed the lower trap resulting in an estimated 12% survival rate between the traps. Potential factors contributing to this, such as predation, will require ongoing investigation. Next Jose spoke to the issue of release location and methodologies. He explained that barging is being examined as a potential method for increasing survival.

Jose presented slides that showed the effectiveness of past adaptive management flows in reducing straying of Mokelumne-origin fish. In 2013, 2,230 acre feet of water was saved in the spring for use in the fall for attraction flows. In addition to the water saved for this purpose by EBMUD, Woodbridge Irrigation District collaborated with EBMUD by adding additional water from Lake Lodi to the planned pulse flows. As of December 10, 2013, the escapement was 12,108. 2013 river composition was 37% male, 40% female, 17% grilse-male, 5% grilse-female, and 29% adipose clipped.

4. 2013 Mokelumne River Redd Count, and Egg Take (Jose Setka): Jose reported that the 2013 egg take at the MRFH was 6.9 million eggs. Jose stated that the 2013 redd count was 1,711 as of 3 December 2013 and that 85% were located in Reach 6.
5. 2013 Spawning Gravel Restoration (Jose Setka) Jose explained that the 2013 spawning gravel restoration work focused on re-shaping reaches that had been restored in previous years and that this included placement of boulders and large woody material into the river channel. Jose stated that this working the gravel also resulted in the added benefit of removal of aquatic vegetation within the gravel beds.

Jose added that the Bureau of Reclamation is continuing to develop a plan for the potential installation of an electronic barrier system at the DCC to address potential straying.

Donnie Ratcliff stated that it is very likely that there will be \$100K of AFRP funding for Mokelumne gravel restoration in 2014.

6. Update on HSRG Implementation (Kathy Hill) Kathy stated that the first Hatchery Scientific Review Group (HSRG) meeting is being planned for January 6, 2014 at Nimbus.
7. Update on JSA Partnership Fund and Activities (Rick Leong) Rick reported that, as of December 2013, the available balance of the Fund was approximately \$148K. Rick reported that the 2013 Frank Beeler Watershed Stewardship Award was presented to the Center for Land-based Learning for their Student and Landowner Education and Watershed Stewardship (SLEWS) program.

Rick stated that interest income from the Partnership Fund continues to be very low and has been for several years during the down economy. The PCC discussed this and will be re-visiting the funding priorities that were established for the Fund. Rick explained that, at least in the short-term, it would be in the best interest of the Partnership to have a strategy for funding projects during this time when interest income is extremely low. Rick said that one example of a strategy would be to focus on a very specific Partnership priority, such as screening of pumps. Another example would be to develop a generic project description of a particular type of project that the Partnership is interested in funding (e.g., request for proposals approach). The PSC as a group discussed screening and some of the information that might be needed to assess screening needs on the lower Mokelumne River.

Jose mentioned that the Upper Mokelumne Anadromous Fish Restoration group met for the first time recently. This group's desire is to see an anadromous fishery re-established above Pardee Reservoir.

8. Update on Camanche Permit Extension (Richard Sykes): Richard reported that the public comment deadline for the DEIR was extended to January 10, 2014.
9. Updates from Steering Committee Members Rhonda Reed reported that NMFS's Northwest and Southwest regions have been combined in what is for now being referred to as the "West Coast Region". Rhonda also reported that there will be a spring-run experimental population rule for the San Joaquin River that will be noticed on the Federal Register in the coming weeks.
10. Meeting Adjournment: The meeting adjourned at 4:40 p.m.

Respectfully submitted by: Rick Leong

**APPENDIX E**

**NOTIFICATION OF AVAILABILITY FOR SALE  
OF SURPLUS MOKELUMNE RIVER WATER**





AGENDA NO. 9.  
 MEETING DATE April 23, 2013

TITLE WATER SUPPLY AVAILABILITY AND DEFICIENCY REPORT 2013

MOTION \_\_\_\_\_  RESOLUTION \_\_\_\_\_  ORDINANCE \_\_\_\_\_

**RECOMMENDED ACTION**

File the Water Supply Availability and Deficiency Report in conformance with Policy 9.03, and declare that the District's water supply is sufficient for meeting customer demands in 2013.

**SUMMARY**

This annual Water Supply Availability and Deficiency Report is prepared and submitted to the Board of Directors as required under District Policy 9.03. This report evaluates the adequacy of current year (2013) water supply, and assesses the District's ability to reliably meet demands through the year 2040. In low water years, this annual report provides the basis for the Board's consideration of possible demand management measures. In years of excess supply, this report provides the basis for the Board's determination of additional availability of water.

For 2013, the median forecast for the September 30 total system storage volume is 535 TAF (thousand acre-feet). The projected total system storage is above the trigger of 500 TAF that would lead to consideration of demand management measures. The 2013 assessment concludes that projected runoff and water storage requires "Dry" year flows in the lower Mokelumne River under the District's Joint Settlement Agreement (JSA). This determination is based on the Department of Water Resources' April 1 projected Mokelumne River runoff of 480,000 acre-feet or about 64% of average. This 2013 assessment continues to show that although current demand is below the planning level of demand, the District will require additional supplemental supplies to achieve a reliable dry-year water supply by 2040.

Based on current 2013 runoff projections assuming median rainfall for the remainder of the year, Woodbridge Irrigation District (WID) will receive 60,000 acre-feet; and Jackson Valley Irrigation District will receive its maximum entitlement of 3,850 acre-feet. However, if precipitation is substantially below median level for the next two months, inflow to Pardee could drop below 375,000 acre-feet, and WID's allocation would be reduced to 39,000 acre-feet. A final estimate of inflow to Pardee Reservoir will be made on July 1 in accordance with our 1965 Agreement with WID. This year, there is no water available for North San Joaquin Water Conservation District, a junior water right holder. In addition, no flood control releases are anticipated and no water surplus to District needs will be available.

Funds Available: N/A		Budget Code:
DEPARTMENT SUBMITTING Water and Natural Resources	DEPARTMENT MANAGER or DIRECTOR  Richard G. Sykes	APPROVED  General Manager

Contact the Office of the District Secretary with questions about completing or submitting this form.

## **2013 WATER SUPPLY AND DEMAND ASSESSMENT**

Current year water supply availability is determined by forecasting the amount of water that will be stored in District reservoirs on September 30, which marks the end of the “water year.” This forecast is a two-step calculation. First, the amount of total system storage as of September 30 is determined by adding projected runoff amounts to existing storage levels. The second step is the subtraction of anticipated customer demands and the volume of water that must be released from the District’s storage reservoirs to meet downstream obligations. These obligations include minimum instream flows for JSA fishery requirements, use by senior water right holders, and water requirements by other downstream interests. If the projected September 30 total system storage exceeds 500 TAF, the District has sufficient current year water supply. If the sum is less than 500 TAF, the District’s water supply is deficient.

Precipitation from July 1 through mid-April typically represents most of the total amount for the season. Precipitation as of April 14 in the Mokelumne is 71% of average, and precipitation in the East Bay is 72% of average. Based on rainfall through April 14, and assuming average rainfall for the remainder of the year, the 2013 runoff projection is 440 TAF; for comparison, an average year yields 745 TAF of runoff. The corresponding median total system storage at the end of September 2013 is projected to be 535 TAF, relative to the target of about 600 TAF for normal storage carry-over to the next water year.

## **INTERIM WATER SUPPLY AND DEMAND ASSESSMENT**

The residual rationing effect of the most recent drought management program that begun in 2007, and the suppressed demand resulting from the downturn in the economy, led EBMUD to implement Interim Drought Management Program Guidelines beginning in 2010. These interim guidelines recognize that demand is below the planning level during a recovery period.

During this time, while demand is below the planning level of demand, a sufficient water supply defers the need for dry-year supplemental water supplies beyond the District’s Central Valley Project contract supply and the Bayside Groundwater Phase 1 Project. It is anticipated that the demands will return to pre-2007 levels within the next 10-15-years.

## **2040 WATER SUPPLY AND DEMAND ASSESSMENT**

To assess the adequacy of the District’s water supply in 2040, this report compares projected service area planning level of demand to an analysis of the reliability of future water supply.

The *District-Wide Update of Water Demand Projections* (2009 Demand Study) estimates future customer demands based on expected changes in land use patterns as described in the general plans of municipalities located in the District's service area. The planning level demands do not include the short-term reduction and rebound in demand caused by the multi-year drought and the downturn in the economy. These demands include billed consumption for which the District receives revenue, unbilled consumption, and system losses. The 2009 Demand Study estimates a planning level of demand of 230 MGD in 2040.

The Allowable Maximum Level of Demand (AMLD) is the demand that the District's water supply system can sustain under the three-year drought planning sequence (DPS). The AMLD is calculated using the District's water supply planning model and applying the following assumptions:

- The existing supplemental supplies consisting of the District's Central Valley Project contract supply and Bayside Groundwater Phase 1 Project will be available;
- Customer rationing is assumed not to exceed 15% during the DPS, per the District's Long Term Drought Management Program Guidelines as outlined in Chapter 3 of the Urban Water Management Plan 2010;
- Drought management measures will be imposed when specified threshold storage levels will not be maintained per the District's Long Term Drought Management Program Guidelines as outlined in Chapter 3 of the Urban Water Management Plan 2010;
- Fishery releases to the lower Mokelumne River will be made pursuant to the 1998 JSA between USFWS, CDFG, and EBMUD and approved by FERC and the SWRCB;
- Senior water right holders needs will be satisfied as required by their prior rights and established water rights settlement agreements; and
- All other operational requirements will be met, including the Army Corps of Engineers flood control requirements.

Based on these assumptions, the water supply planning model calculates an AMLD of 190 MGD for the year 2040. The 2040 AMLD estimate reflects the expectation that senior water right holders will increase water diversions under their entitlements, in addition to increases in the District's customer demand.

The planning level of demand of 230 MGD for 2040 exceeds the 2040 AMLD estimate of 190 MGD. Accordingly, without the development of dry-year supplemental supplies beyond the District's Central Valley Project contract supply and the Bayside Groundwater Phase 1 Project, the District's water supply will not be adequate to meet customer water demands during future severe drought conditions while maintaining a 15% rationing limit. The District is pursuing development of these additional dry-year supplies as outlined in the Water Supply Management Program as adopted last year.



May 3, 2013

Tina Bartlett  
Regional Manager  
Department of Fish and Wildlife  
1701 Nimbus Road  
Rancho Cordova, CA 95670

Dan Welsh  
Deputy Field Supervisor  
U.S. Fish & Wildlife Service  
2800 Cottage Way, Room 2605  
Sacramento, CA 95825

Subject: Lack of Availability of Additional Mokelumne River Water

Dear Ms. Bartlett and Mr. Welsh:

The Federal Energy Regulatory Commission's November 27, 1998 Order approved the March 1998 Joint Settlement Agreement (JSA) between the East Bay Municipal Utility District (District) and your agencies. Section F.3 of the JSA provides that the District notify your agencies of the availability of additional Mokelumne River water. Based on the 2013 hydrologic conditions and the District' storage levels, there will be no water that is surplus to the District needs.

Enclosed is a copy of the 2013 Water Supply Availability and Deficiency Report (Report) accepted by the District's Board of Directors at their April 23, 2013 meeting. In low water years, this annual report provides the basis for the Board's consideration of demand management measures. In other years, this report provides the basis for the Board's determination of sufficient water supply. The 2013 assessment, based on the Department of Water Resources' April 1 projected Mokelumne River runoff (64% of average), concludes that water year 2013 is a Dry year. Predictably, no flood control releases are anticipated this year. Pursuant to the JSA, the District will provide flow releases to the lower Mokelumne River according to the "Dry" year water type. As per the adaptive management plan, requested by the Lower Mokelumne River Partnership and approved by the State Water Resources Control Board in March of this year, approximately 2,230 acre-feet will be available for release from Camanche Reservoir to support Chinook salmon attraction pulse flows in the fall of 2013.

If you have any questions regarding this matter, please contact Priyanka K. Jain, Senior Civil Engineer at (510) 287-1153 or by email at [pjain@ebmud.com](mailto:pjain@ebmud.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'Lena L. Tam'.

Lena L. Tam  
Manager of Water Resources Planning

LLT:PKJ:EW:smc

Enclosure

cc: Richard Sykes, Director of Water & Natural Resources Department

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . TOLL FREE 1-866-40-EBMUD



AGENDA NO. 9.

MEETING DATE April 23, 2013

TITLE WATER SUPPLY AVAILABILITY AND DEFICIENCY REPORT 2013

MOTION \_\_\_\_\_  RESOLUTION \_\_\_\_\_  ORDINANCE \_\_\_\_\_

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Water and Natural Resources	 Richard G. Sykes	 General Manager	

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May 3, 2013

Tina Bartlett & Dan Welsh

Lack of Availability of Additional Mokelumne River Water

Page 2

bcc: Records Management

Lena Tam

Priyanka Jain

Eileen White

Karen Donovan

Emilia Wisniewski

WRPD File# 731 - FERC 2916.004 Binder

Chron.

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