

Lower Mokelumne River Project

FERC Project No. 2916

2014 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 2015

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ABBREVIATIONS

AFRP	Anadromous Fish Restoration Program
AOP	Annual Operations Plan
CAMP	Comprehensive Assessment and Monitoring Program
CBDA	California Bay Delta Authority
CDFW	California Department of Fish and Wildlife
CVPIA	Central Valley Project Improvement Act
CWT	Coded Wire Tag
DCC	Delta Cross Channel
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utility District
FERC	Federal Energy Regulatory Commission
HOS	Hypolimnetic Oxygenation System
JSA	Joint Settlement Agreement
LMRMP	Lower Mokelumne River Management Plan
LMRSP	Lower Mokelumne River Stewardship Program
LWWC	Lodi-Woodbridge Winegrape Commission
MRA	Mokelumne River Association
MRDUA	Mokelumne River Day Use Area
MRFH	Mokelumne River Fish Hatchery
MRTAC	Mokelumne River Technical Advisory Committee
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System Permit
PCC	Partnership Coordinating Committee
PSC	Partnership Steering Committee
SAFCA	Sacramento Area Flood Control Agency
SCWA	Sacramento County Water Agency
SJCOG	San Joaquin Council of Governments
SJCRC	San Joaquin County Resource Conservation District
SWRCB	State Water Resources Control Board
TNC	The Nature Conservancy
USFWS	United States Fish and Wildlife Service
USBR	United States Bureau of Reclamation
USGS	United States Geological Survey
WID	Woodbridge Irrigation District
WQRMP	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 (2014), and those that it plans to implement in the current calendar year (2015), 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 Report¹ for 2014. EBMUD actions in 2014 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

¹ 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 2013).

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 2014 calendar year and efforts planned for 2015. Section V contains the appendices.

III. STATUS OF THE LOWER MOKELUMNE RIVER SALMON POPULATION

Through the 1990s and into 2014, the lower Mokelumne River Chinook salmon population continues to demonstrate characteristics consistent with long-term sustainability. The Mokelumne River fall-run Chinook salmon escapement of 12,113 in 2014 was well above the long term average and was the fourth largest for the lower Mokelumne River during the period 1990 - 2014 (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.

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Table 1: Lower Mokelumne River Fall-Run Chinook Salmon Data, 1989-2014

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
2014	15,764	154,100	12,113	8,817	3,296	27	909

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

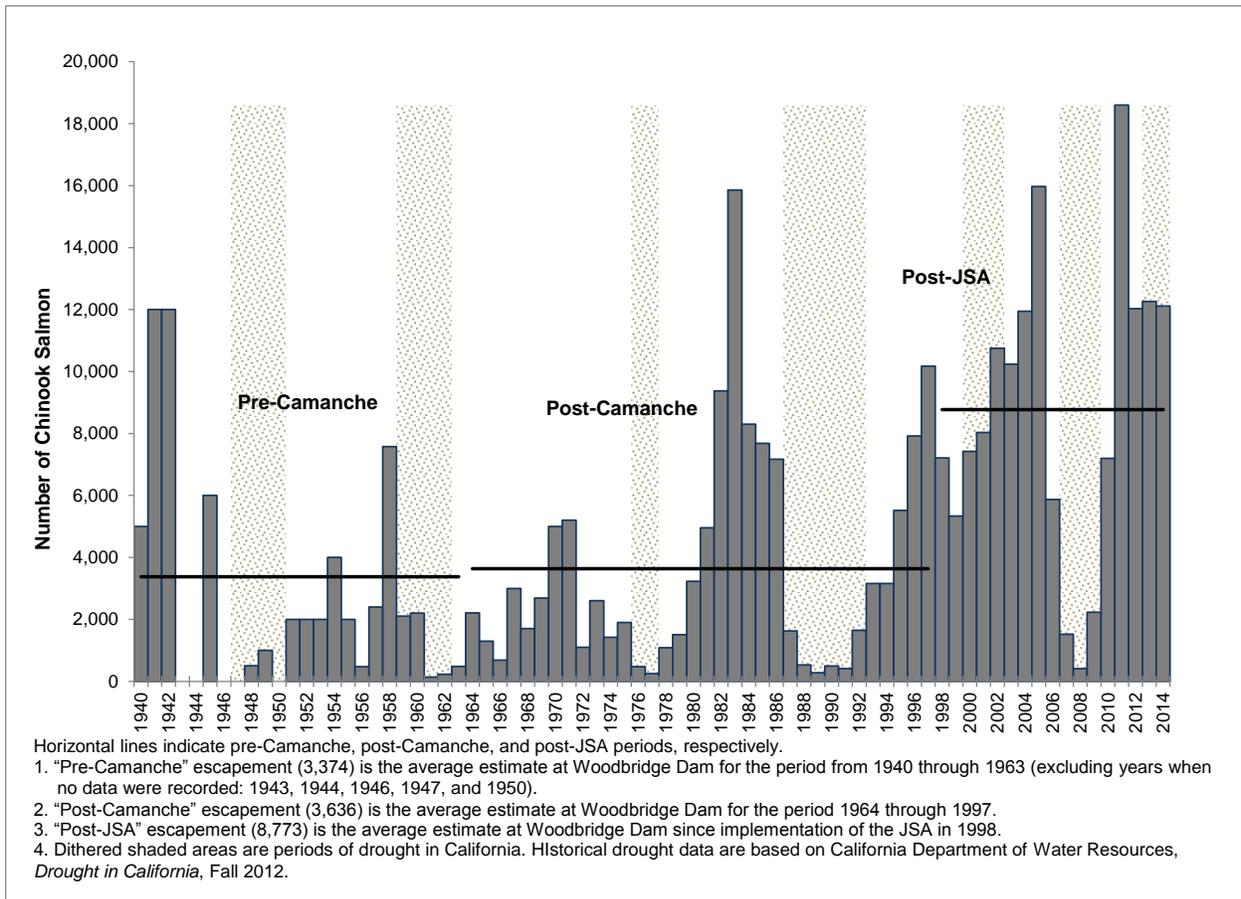


Figure 1: Estimated Annual Spawning Escapement of Fall-Run Chinook Salmon in the Lower Mokelumne River, 1940-2014

Four of the top five returns recorded have occurred during the period of 2011-2014, including a record return in 2011. Continued favorable ocean conditions, based on Pacific Decadal Oscillation (PDO) and the El Niño Southern Oscillation (ENSO) measures, have played a significant role in the survival of juvenile salmon entering the ocean (Peterson et al. 2006²). Additionally, the continued string of above average returns is indicative of positive response to the adaptive management actions (discussed in later sections) implemented during the 2009 – 2014 period. While mired in a multi-year drought and associated flow regimes, the lower

² 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.

Mokelumne River Chinook salmon population continues to demonstrate characteristics consistent with long-term sustainability. In fact, the Mokelumne is one of the few salmon populations nearing the established Central Valley Project Improvement Act (CVPIA) doubling goal established by the USFWS Anadromous Fish Restoration Program (AFRP). The AFRP established doubling goal for the Mokelumne is 9,300 and the calculated number for the Mokelumne is 8,372 as of 2011, which represents a higher percentage of attainment than nearly all other Central Valley river populations.

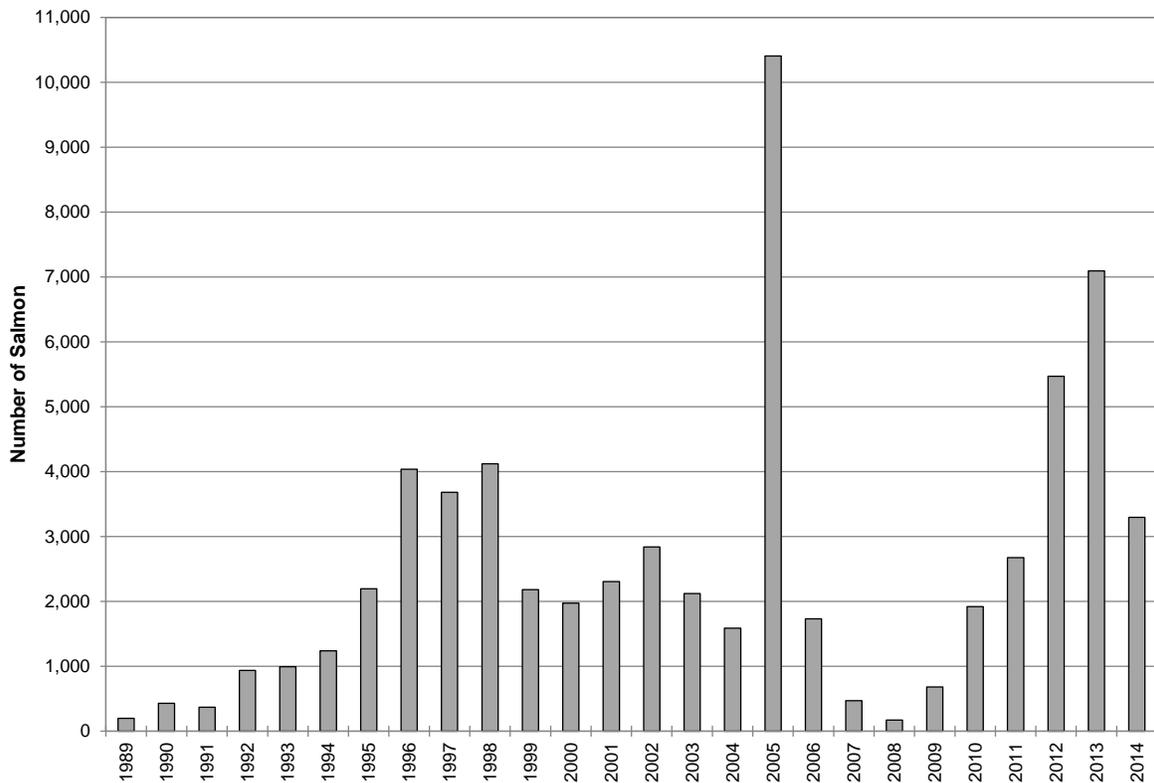


Figure 2: Fall-Run Chinook Salmon Naturally Spawning in the Lower Mokelumne River, 1989-2014

The Mokelumne River Fish Hatchery (MRFH), owned by EBMUD and operated by the California Department of Fish and Wildlife (CDFW), reported that the 2014 salmon return at the MRFH was 8,817 salmon. The 2014 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, EBMUD 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, in 1987 EBMUD began 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 2014, and those actions planned for 2015, 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 2014 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 2014, releases were measured at Camanche Dam using its 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 flow data are collected and the timing of publication in the USGS Water Data Reports, the 2014 flow data included in this report have 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.

2014

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, 2013, EBMUD provided "Below Normal" JSA water year type Camanche Dam flow releases from October 1, 2013 through March 31, 2014. Pardee and Camanche Reservoir actual total storage on November 5, 2013 was 431,000 acre-feet.

Based on the California Department of Water Resources (DWR) April 1, 2014 forecast of 310,000 acre-feet of unimpaired runoff into Pardee Reservoir, EBMUD operated under a "Dry" JSA water year type Camanche Dam flow releases from April 1, 2014 through September 30, 2014. (Note that the actual unimpaired runoff into Pardee Reservoir for this period was only 263,000 acre-feet, far less than DWR's estimate of 310,000 acre-feet. Had DWR's estimate been closer to the actual 263,000 acre-feet figure, it would have resulted in a "Critically Dry" JSA water year type.)

EBMUD is making, at a minimum, “Dry” JSA water year type Camanche Dam flow releases from October 1, 2014 through March 31, 2015. This is based on EBMUD’s forecast of total Pardee and Camanche Reservoir storage on November 5, 2014. Actual Pardee and Camanche reservoir storage on November 5, 2014 was 293,000 acre-feet.

As further described in the *Adaptive Management and Pulse Flow Operations* sections of this report, EBMUD’s 2014 flow operations included an adaptive management program which reduced JSA agreed releases and expected flows in early spring to allow for later increased releases in the fall. Flows at the WID Dam were also modulated to create numerous pulse flow releases for the salmon attraction and the up-migration. Through EBMUD coordination with the partnership, 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. As a result of these various operational adjustments in flows and releases, a limited number of temporary flow deviations below Woodbridge Dam occurred during transition periods.

Calendar year 2014 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 flow below Camanche Dam did not fall below the minimum during this period.

Calendar year 2014 actual average daily flow below Woodbridge Dam and JSA expected flow below Woodbridge Dam are shown in Table 3 and Figure 4. During the 2014 calendar year, four provisional, temporary flow deviations from the JSA expected flow 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 EBMUD’s gaging station, USGS No. 11325500, “Mokelumne River below Woodbridge Dam,” during the four provisional, temporary flow deviations are shown in Tables 4a, 4b, 4c, 4d.

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Table 2: Calendar Year 2014 Average Daily Release in Cubic Feet per Second from Camanche Dam

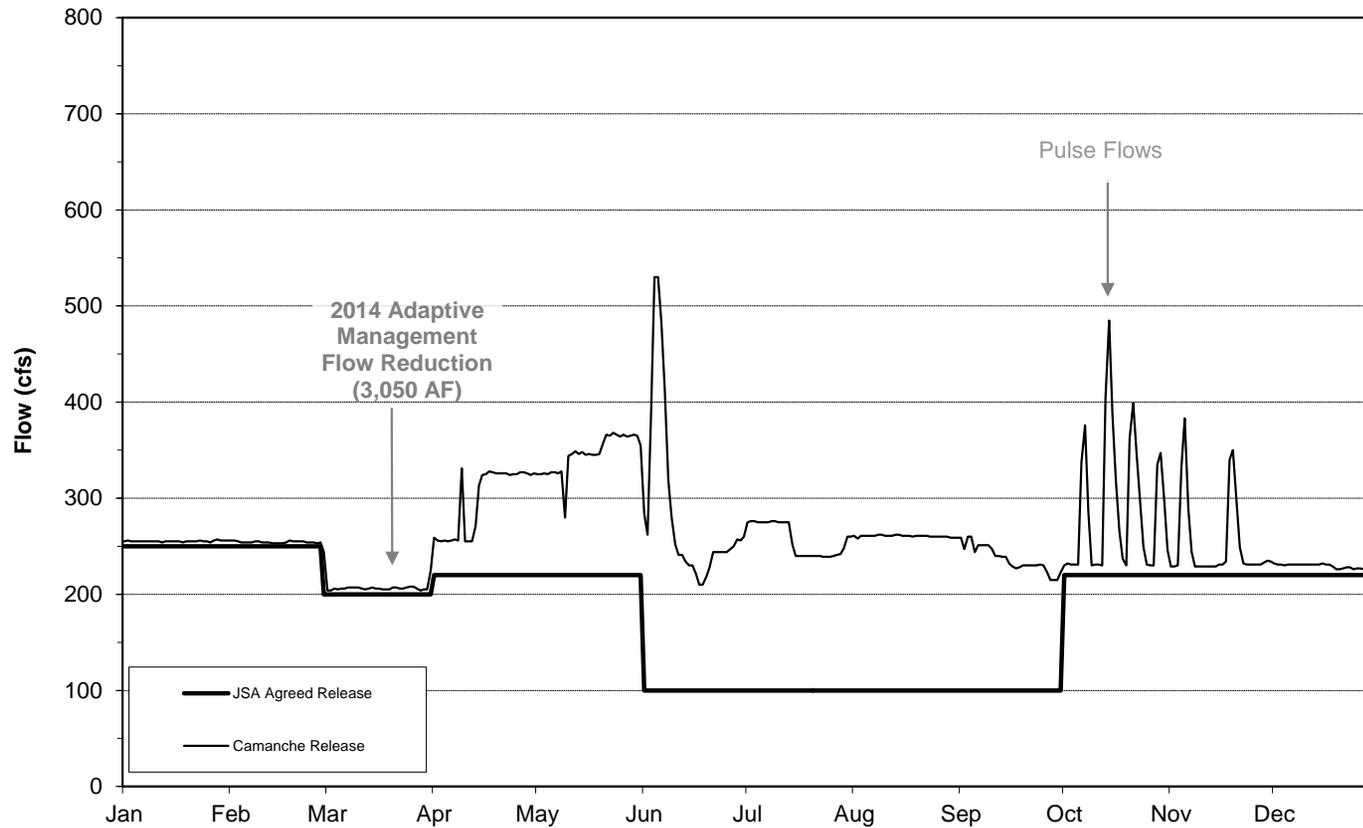
JSA		JSA		JSA		JSA		JSA			
Date	Camanche Release	Agreed Release									
01/01/14	255	250	03/17/14	205	200 *	05/31/14	355	220	08/14/14	262	100
01/02/14	256	250	03/18/14	205	200 *	06/01/14	284	100	08/15/14	261	100
01/03/14	255	250	03/19/14	205	200 *	06/02/14	262	100	08/16/14	261	100
01/04/14	255	250	03/20/14	207	200 *	06/03/14	391	100	08/17/14	261	100
01/05/14	255	250	03/21/14	207	200 *	06/04/14	530	100	08/18/14	260	100
01/06/14	255	250	03/22/14	206	200 *	06/05/14	530	100	08/19/14	261	100
01/07/14	255	250	03/23/14	206	200 *	06/06/14	483	100	08/20/14	261	100
01/08/14	255	250	03/24/14	207	200 *	06/07/14	414	100	08/21/14	261	100
01/09/14	255	250	03/25/14	208	200 *	06/08/14	319	100	08/22/14	261	100
01/10/14	255	250	03/26/14	208	200 *	06/09/14	280	100	08/23/14	260	100
01/11/14	255	250	03/27/14	206	200 *	06/10/14	252	100	08/24/14	260	100
01/12/14	254	250	03/28/14	204	200 *	06/11/14	241	100	08/25/14	260	100
01/13/14	255	250	03/29/14	205	200 *	06/12/14	241	100	08/26/14	260	100
01/14/14	255	250	03/30/14	205	200 *	06/13/14	234	100	08/27/14	260	100
01/15/14	255	250	03/31/14	225	200 *	06/14/14	230	100	08/28/14	260	100
01/16/14	255	250	04/01/14	259	220	06/15/14	230	100	08/29/14	259	100
01/17/14	255	250	04/02/14	256	220	06/16/14	222	100	08/30/14	259	100
01/18/14	254	250	04/03/14	255	220	06/17/14	210	100	08/31/14	259	100
01/19/14	255	250	04/04/14	256	220	06/18/14	210	100	09/01/14	259	100
01/20/14	255	250	04/05/14	255	220	06/19/14	218	100	09/02/14	247	100
01/21/14	255	250	04/06/14	256	220	06/20/14	228	100	09/03/14	260	100
01/22/14	255	250	04/07/14	257	220	06/21/14	244	100	09/04/14	260	100
01/23/14	256	250	04/08/14	256	220	06/22/14	244	100	09/05/14	244	100
01/24/14	255	250	04/09/14	331	220	06/23/14	244	100	09/06/14	251	100
01/25/14	255	250	04/10/14	255	220	06/24/14	244	100	09/07/14	251	100
01/26/14	254	250	04/11/14	255	220	06/25/14	244	100	09/08/14	251	100
01/27/14	256	250	04/12/14	255	220	06/26/14	247	100	09/09/14	251	100
01/28/14	257	250	04/13/14	271	220	06/27/14	250	100	09/10/14	247	100
01/29/14	256	250	04/14/14	313	220	06/28/14	257	100	09/11/14	240	100
01/30/14	256	250	04/15/14	324	220	06/29/14	256	100	09/12/14	240	100
01/31/14	256	250	04/16/14	325	220	06/30/14	260	100	09/13/14	239	100
02/01/14	256	250	04/17/14	328	220	07/01/14	275	100	09/14/14	239	100
02/02/14	256	250	04/18/14	327	220	07/02/14	276	100	09/15/14	232	100
02/03/14	255	250	04/19/14	326	220	07/03/14	276	100	09/16/14	229	100
02/04/14	254	250	04/20/14	326	220	07/04/14	275	100	09/17/14	227	100
02/05/14	254	250	04/21/14	326	220	07/05/14	275	100	09/18/14	228	100
02/06/14	254	250	04/22/14	326	220	07/06/14	275	100	09/19/14	230	100
02/07/14	254	250	04/23/14	324	220	07/07/14	275	100	09/20/14	230	100
02/08/14	255	250	04/24/14	325	220	07/08/14	276	100	09/21/14	230	100
02/09/14	255	250	04/25/14	325	220	07/09/14	276	100	09/22/14	230	100
02/10/14	254	250	04/26/14	327	220	07/10/14	275	100	09/23/14	230	100
02/11/14	254	250	04/27/14	327	220	07/11/14	275	100	09/24/14	231	100
02/12/14	254	250	04/28/14	326	220	07/12/14	275	100	09/25/14	230	100
02/13/14	253	250	04/29/14	324	220	07/13/14	275	100	09/26/14	223	100
02/14/14	253	250	04/30/14	326	220	07/14/14	252	100	09/27/14	215	100
02/15/14	253	250	05/01/14	325	220	07/15/14	240	100	09/28/14	215	100
02/16/14	253	250	05/02/14	325	220	07/16/14	240	100	09/29/14	215	100
02/17/14	254	250	05/03/14	326	220	07/17/14	240	100	09/30/14	223	100
02/18/14	256	250	05/04/14	325	220	07/18/14	240	100	10/01/14	230	220
02/19/14	255	250	05/05/14	327	220	07/19/14	240	100	10/02/14	232	220
02/20/14	255	250	05/06/14	327	220	07/20/14	240	100	10/03/14	231	220
02/21/14	255	250	05/07/14	326	220	07/21/14	240	100	10/04/14	231	220
02/22/14	255	250	05/08/14	328	220	07/22/14	240	100	10/05/14	231	220
02/23/14	254	250	05/09/14	280	220	07/23/14	239	100	10/06/14	337	220
02/24/14	254	250	05/10/14	344	220	07/24/14	239	100	10/07/14	376	220
02/25/14	254	250	05/11/14	346	220	07/25/14	239	100	10/08/14	286	220
02/26/14	253	250	05/12/14	349	220	07/26/14	240	100	10/09/14	230	220
02/27/14	254	250	05/13/14	346	220	07/27/14	241	100	10/10/14	231	220
02/28/14	244	200 *	05/14/14	348	220	07/28/14	242	100	10/11/14	231	220
03/01/14	204	200 *	05/15/14	345	220	07/29/14	248	100	10/12/14	230	220
03/02/14	204	200 *	05/16/14	346	220	07/30/14	260	100	10/13/14	405	220
03/03/14	206	200 *	05/17/14	345	220	07/31/14	260	100	10/14/14	485	220
03/04/14	205	200 *	05/18/14	345	220	08/01/14	261	100	10/15/14	387	220
03/05/14	206	200 *	05/19/14	346	220	08/02/14	258	100	10/16/14	320	220
03/06/14	206	200 *	05/20/14	357	220	08/03/14	261	100	10/17/14	266	220
03/07/14	207	200 *	05/21/14	366	220	08/04/14	261	100	10/18/14	237	220
03/08/14	207	200 *	05/22/14	365	220	08/05/14	261	100	10/19/14	230	220
03/09/14	207	200 *	05/23/14	368	220	08/06/14	261	100	10/20/14	362	220
03/10/14	207	200 *	05/24/14	366	220	08/07/14	261	100	10/21/14	399	220
03/11/14	206	200 *	05/25/14	364	220	08/08/14	262	100	10/22/14	347	220
03/12/14	205	200 *	05/26/14	366	220	08/09/14	262	100	10/23/14	300	220
03/13/14	206	200 *	05/27/14	364	220	08/10/14	261	100	10/24/14	249	220
03/14/14	207	200 *	05/28/14	365	220	08/11/14	261	100	10/25/14	231	220
03/15/14	206	200 *	05/29/14	366	220	08/12/14	261	100	10/26/14	230	220
03/16/14	206	200 *	05/30/14	365	220	08/13/14	262	100	10/27/14	230	220

1. Releases in calendar year 2014 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 "Dry" 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.

*An adaptive management program that temporarily reduced the JSA Camanche agreed release from 250 to 200 cfs from mid-February to end of March 2014 in return for increased attraction flow releases from Camanche Dam to the Lower Mokelumne River in October and early November 2014 was initiated on the evening of February 28, 2014 when approval from SWRCB was received.



1. Releases in calendar year 2014 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 "Dry" 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 2014 Average Daily Release in Cubic Feet per Second from Camanche Dam

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Table 3: Calendar Year 2014 Average Daily Flow in Cubic Feet per Second Below Woodbridge Dam

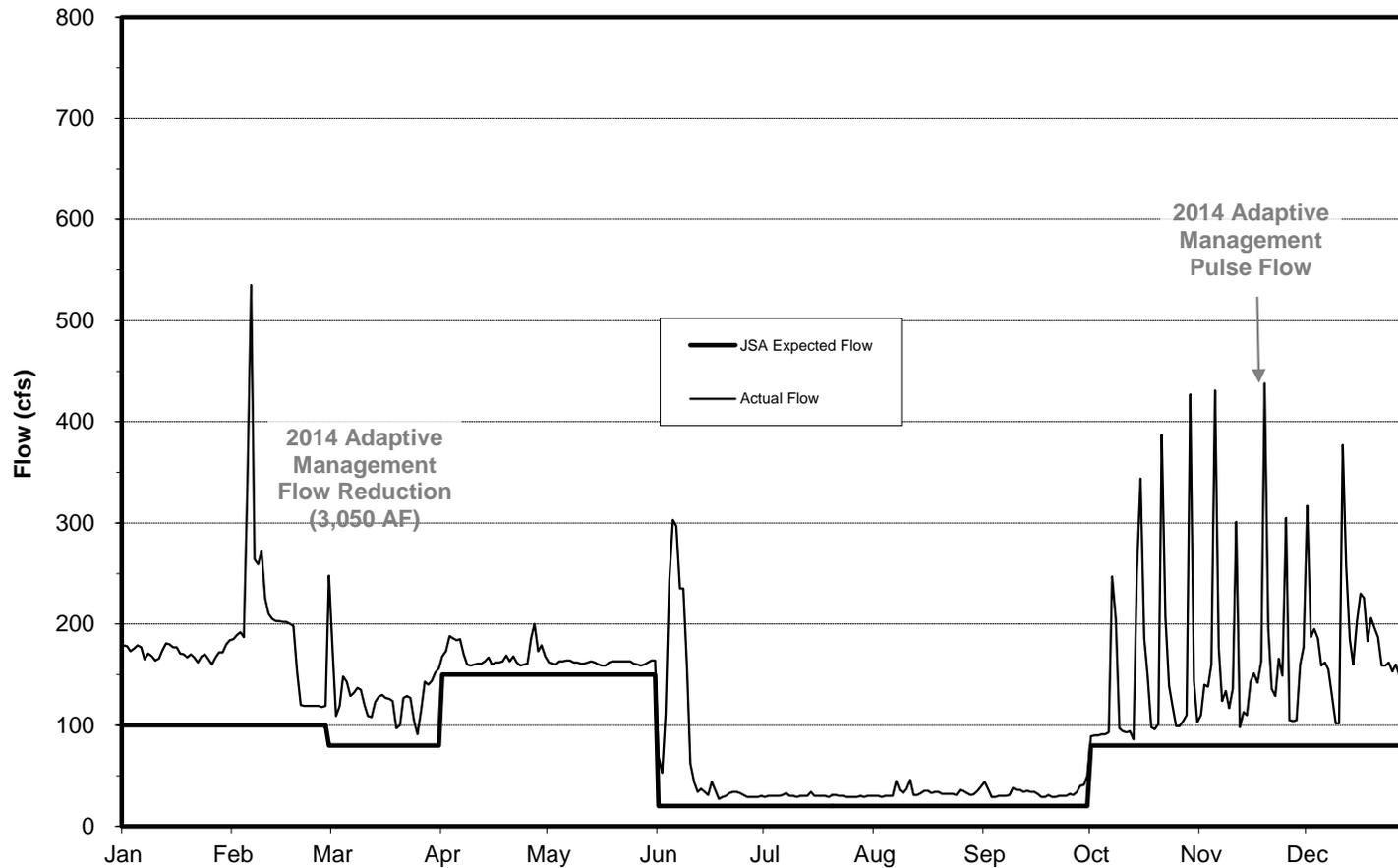
Actual		JSA															
Date	Flow	Expected	Flow														
01/01/14	179	100		03/17/14	126	80 *		05/31/14	164	150		08/14/14	33	20	10/28/14	110	80
01/02/14	178	100		03/18/14	124	80 *		06/01/14	69	20		08/15/14	35	20	10/29/14	427	80
01/03/14	173	100		03/19/14	97	80 *		06/02/14	53	20		08/16/14	35	20	10/30/14	144	80
01/04/14	176	100		03/20/14	100	80 *		06/03/14	111	20		08/17/14	33	20	10/31/14	103	80
01/05/14	179	100		03/21/14	127	80 *		06/04/14	243	20		08/18/14	34	20	11/01/14	110	80
01/06/14	177	100		03/22/14	129	80 *		06/05/14	303	20		08/19/14	34	20	11/02/14	140	80
01/07/14	165	100		03/23/14	127	80 *		06/06/14	297	20		08/20/14	32	20	11/03/14	138	80
01/08/14	171	100		03/24/14	104	80 *		06/07/14	235	20		08/21/14	32	20	11/04/14	160	80
01/09/14	168	100		03/25/14	91	80 *		06/08/14	235	20		08/22/14	32	20	11/05/14	431	80
01/10/14	164	100		03/26/14	115	80 *		06/09/14	157	20		08/23/14	32	20	11/06/14	177	80
01/11/14	166	100		03/27/14	143	80 *		06/10/14	62	20		08/24/14	31	20	11/07/14	124	80
01/12/14	174	100		03/28/14	140	80 *		06/11/14	44	20		08/25/14	36	20	11/08/14	134	80
01/13/14	181	100		03/29/14	144	80 *		06/12/14	34	20		08/26/14	35	20	11/09/14	117	80
01/14/14	180	100		03/30/14	152	80 *		06/13/14	37	20		08/27/14	33	20	11/10/14	136	80
01/15/14	177	100		03/31/14	156	80 *		06/14/14	34	20		08/28/14	31	20	11/11/14	301	80
01/16/14	177	100		04/01/14	168	150		06/15/14	31	20		08/29/14	32	20	11/12/14	98	80
01/17/14	171	100		04/02/14	173	150		06/16/14	44	20		08/30/14	35	20	11/13/14	113	80
01/18/14	170	100		04/03/14	188	150		06/17/14	36	20		08/31/14	39	20	11/14/14	110	80
01/19/14	167	100		04/04/14	186	150		06/18/14	27	20		09/01/14	44	20	11/15/14	143	80
01/20/14	170	100		04/05/14	184	150		06/19/14	29	20		09/02/14	37	20	11/16/14	151	80
01/21/14	167	100		04/06/14	185	150		06/20/14	30	20		09/03/14	29	20	11/17/14	142	80
01/22/14	162	100		04/07/14	170	150		06/21/14	33	20		09/04/14	29	20	11/18/14	163	80
01/23/14	168	100		04/08/14	160	150		06/22/14	34	20		09/05/14	30	20	11/19/14	438	80
01/24/14	170	100		04/09/14	159	150		06/23/14	34	20		09/06/14	30	20	11/20/14	195	80
01/25/14	165	100		04/10/14	160	150		06/24/14	33	20		09/07/14	30	20	11/21/14	136	80
01/26/14	160	100		04/11/14	161	150		06/25/14	31	20		09/08/14	31	20	11/22/14	129	80
01/27/14	167	100		04/12/14	161	150		06/26/14	29	20		09/09/14	38	20	11/23/14	166	80
01/28/14	172	100		04/13/14	163	150		06/27/14	29	20		09/10/14	36	20	11/24/14	149	80
01/29/14	172	100		04/14/14	167	150		06/28/14	29	20		09/11/14	36	20	11/25/14	305	80
01/30/14	180	100		04/15/14	160	150		06/29/14	29	20		09/12/14	34	20	11/26/14	105	80
01/31/14	184	100		04/16/14	162	150		06/30/14	30	20		09/13/14	35	20	11/27/14	104	80
02/01/14	185	100		04/17/14	162	150		07/01/14	29	20		09/14/14	34	20	11/28/14	105	80
02/02/14	189	100		04/18/14	163	150		07/02/14	30	20		09/15/14	34	20	11/29/14	160	80
02/03/14	192	100		04/19/14	169	150		07/03/14	30	20		09/16/14	32	20	11/30/14	177	80
02/04/14	187	100		04/20/14	163	150		07/04/14	30	20		09/17/14	29	20	12/01/14	317	80
02/05/14	341	100		04/21/14	168	150		07/05/14	30	20		09/18/14	29	20	12/02/14	187	80
02/06/14	535	100		04/22/14	162	150		07/06/14	31	20		09/19/14	31	20	12/03/14	195	80
02/07/14	264	100		04/23/14	159	150		07/07/14	33	20		09/20/14	29	20	12/04/14	186	80
02/08/14	259	100		04/24/14	160	150		07/08/14	30	20		09/21/14	29	20	12/05/14	159	80
02/09/14	272	100		04/25/14	161	150		07/09/14	30	20		09/22/14	30	20	12/06/14	162	80
02/10/14	225	100		04/26/14	186	150		07/10/14	29	20		09/23/14	30	20	12/07/14	155	80
02/11/14	210	100		04/27/14	200	150		07/11/14	30	20		09/24/14	30	20	12/08/14	129	80
02/12/14	205	100		04/28/14	173	150		07/12/14	30	20		09/25/14	32	20	12/09/14	102	80
02/13/14	203	100		04/29/14	179	150		07/13/14	30	20		09/26/14	31	20	12/10/14	102	80
02/14/14	203	100		04/30/14	168	150		07/14/14	34	20		09/27/14	34	20	12/11/14	377	80
02/15/14	202	100		05/01/14	162	150		07/15/14	30	20		09/28/14	40	20	12/12/14	258	80
02/16/14	202	100		05/02/14	161	150		07/16/14	30	20		09/29/14	41	20	12/13/14	185	80
02/17/14	200	100		05/03/14	160	150		07/17/14	30	20		09/30/14	50	20	12/14/14	160	80
02/18/14	198	100		05/04/14	163	150		07/18/14	30	20		10/01/14	89	80	12/15/14	202	80
02/19/14	153	100		05/05/14	163	150		07/19/14	29	20		10/02/14	90	80	12/16/14	230	80
02/20/14	120	100		05/06/14	164	150		07/20/14	31	20		10/03/14	90	80	12/17/14	226	80
02/21/14	119	100		05/07/14	164	150		07/21/14	31	20		10/04/14	91	80	12/18/14	183	80
02/22/14	119	100		05/08/14	162	150		07/22/14	30	20		10/05/14	91	80	12/19/14	206	80
02/23/14	119	100		05/09/14	162	150		07/23/14	30	20		10/06/14	93	80	12/20/14	196	80
02/24/14	119	100		05/10/14	161	150		07/24/14	29	20		10/07/14	247	80	12/21/14	187	80
02/25/14	119	100		05/11/14	161	150		07/25/14	29	20		10/08/14	205	80	12/22/14	159	80
02/26/14	118	100		05/12/14	162	150		07/26/14	29	20		10/09/14	97	80	12/23/14	159	80
02/27/14	119	100		05/13/14	163	150		07/27/14	29	20		10/10/14	94	80	12/24/14	162	80
02/28/14	248	80 *		05/14/14	162	150		07/28/14	30	20		10/11/14	93	80	12/25/14	153	80
03/01/14	174	80 *		05/15/14	160	150		07/29/14	29	20		10/12/14	94	80	12/26/14	160	80
03/02/14	109	80 *		05/16/14	159	150		07/30/14	30	20		10/13/14	86	80	12/27/14	149	80
03/03/14	119	80 *		05/17/14	159	150		07/31/14	30	20		10/14/14	252	80	12/28/14	155	80
03/04/14	148	80 *		05/18/14	162	150		08/01/14	30	20		10/15/14	344	80	12/29/14	153	80
03/05/14	143	80 *		05/19/14	163	150		08/02/14	30	20		10/16/14	186	80	12/30/14	157	80
03/06/14	129	80 *		05/20/14	163	150		08/03/14	29	20		10/17/14	149	80	12/31/14	149	80
03/07/14	132	80 *		05/21/14	163	150		08/04/14	30	20		10/18/14	98	80			
03/08/14	137	80 *		05/22/14	163	150		08/05/14	30	20		10/19/14	96	80			
03/09/14	135	80 *		05/23/14	163	150		08/06/14	30	20		10/20/14	101	80			
03/10/14	120	80 *		05/24/14	163	150		08/07/14	45	20		10/21/14	387	80			
03/11/14	109	80 *		05/25/14	161	150		08/08/14	36	20		10/22/14	207	80			
03/12/14	108	80 *		05/26/14	160	150		08/09/14	33	20		10/23/14	139	80			
03/13/14	123	80 *		05/27/14	159	150		08/10/14	37	20		10/24/14	119	80			
03/14/14	128	80 *		05/28/14	160	150		08/11/14	46	20		10/25/14	99	80			
03/15/14	130	80 *		05/29/14	162	150		08/12/14	31	20		10/26/14	99	80			
03/16/14	127	80 *		05/30/14	164	150		08/13/14	31	20		10/27/14	104	80			

1. Expected flows past Woodbridge Dam in calendar year 2014 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 "Dry" 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.

*An adaptive management program that temporarily reduced the expected flows below Woodbridge Dam from 100 to 80 cfs from mid-February to end of March 2014 in return for increased attraction flow releases from Camanche Dam to the Lower Mokelumne River in October and early November 2014 was initiated on the evening of February 28, 2014 when approval from SWRCB was received.



1. Releases in calendar year 2014 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 "Dry" 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 2014 Average Daily Flow in Cubic Feet per Second Below Woodbridge Dam.

**Table 4a: Flow Below Woodbridge Dam During Temporary Flow Deviation -
 April 21, 2014**

Reading Date and Time	Interval	Unit	JSA Water Year Type	Golf Gage Measured Flow	JSA Expected Flow (below WID Dam)
4/21/14 11:00	15 Minute	cfs	Dry	193	150
4/21/14 11:15	15 Minute	cfs	Dry	123	150
4/21/14 11:30	15 Minute	cfs	Dry	110	150
4/21/14 11:45	15 Minute	cfs	Dry	213	150
4/21/14 12:00	15 Minute	cfs	Dry	255	150
4/21/14 12:15	15 Minute	cfs	Dry	200	150
4/21/14 12:30	15 Minute	cfs	Dry	147	150
4/21/14 12:45	15 Minute	cfs	Dry	119	150
4/21/14 13:00	15 Minute	cfs	Dry	125	150
4/21/14 13:15	15 Minute	cfs	Dry	218	150

1. The daily value for 4/21/14 is 168 cfs.
2. The April 21, 2014 temporary flow deviation occurred as a result of WID's computer programming anomaly in setting the proper target water level, which caused flows to temporarily fluctuate downstream of WID dam. The condition was corrected to stabilize levels, which resulted in WID dam releases exceeding the target expected JSA flow and meeting flow obligations.

Table 4b: Flow Below Woodbridge Dam During Temporary Flow Deviation - June 1, 2014

Reading Date and Time	Interval	Unit	JSA Water Year Type	Golf Gage Measured Flow	JSA Expected Flow (below WID Dam)
6/1/2014 13:30	15 Minute	cfs	Dry	20	20
6/1/2014 13:45	15 Minute	cfs	Dry	19	20
6/1/2014 14:00	15 Minute	cfs	Dry	18	20
6/1/2014 14:15	15 Minute	cfs	Dry	17	20
6/1/2014 14:30	15 Minute	cfs	Dry	17	20
6/1/2014 14:45	15 Minute	cfs	Dry	17	20
6/1/2014 15:00	15 Minute	cfs	Dry	17	20
6/1/2014 15:15	15 Minute	cfs	Dry	16	20
6/1/2014 15:30	15 Minute	cfs	Dry	16	20
6/1/2014 15:45	15 Minute	cfs	Dry	16	20
6/1/2014 16:00	15 Minute	cfs	Dry	16	20
6/1/2014 16:15	15 Minute	cfs	Dry	16	20
6/1/2014 16:30	15 Minute	cfs	Dry	16	20
6/1/2014 16:45	15 Minute	cfs	Dry	16	20
6/1/2014 17:00	15 Minute	cfs	Dry	16	20
6/1/2014 17:15	15 Minute	cfs	Dry	16	20
6/1/2014 17:30	15 Minute	cfs	Dry	32	20

1. The daily value for 6/1//2014 is 69 cfs.
2. The June 1, 2014 temporary flow deviation occurred as a result of operational transitions to meet a change in JSA minimum expected flows schedule starting June 1.

Table 4c: Flow Below Woodbridge Dam During Temporary Flow Deviation - October 8, 2014

Reading Date and Time	Interval	Unit	JSA Water Year Type	Golf Gage Measured Flow	JSA Expected Flow (below WID Dam)
10/8/2014 13:00	15 Minute	cfs	Dry	84	80
10/8/2014 13:15	15 Minute	cfs	Dry	72	80
10/8/2014 13:30	15 Minute	cfs	Dry	69	80
10/8/2014 13:45	15 Minute	cfs	Dry	70	80
10/8/2014 14:00	15 Minute	cfs	Dry	74	80
10/8/2014 14:15	15 Minute	cfs	Dry	81	80

1. The daily value for 10/8/2014 is 196 cfs.
2. The October 8, 2014 temporary flow deviation occurred as a result of operational transitions between the end of the first pulse flow event and JSA expected 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 EBMUD coordination with the partnership, 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.

**Table 4d: Flow Below Woodbridge Dam During Temporary Flow Deviation -
October 13, 2014**

Reading Date and Time	Interval	Unit	JSA Water Year Type	Golf Gage Measured Flow	JSA Expected Flow (below WID Dam)
10/13/2014 13:00	15 Minute	cfs	Dry	80	80
10/13/2014 13:15	15 Minute	cfs	Dry	78	80
10/13/2014 13:30	15 Minute	cfs	Dry	77	80
10/13/2014 13:45	15 Minute	cfs	Dry	75	80
10/13/2014 14:00	15 Minute	cfs	Dry	74	80
10/13/2014 14:15	15 Minute	cfs	Dry	72	80
10/13/2014 14:30	15 Minute	cfs	Dry	72	80
10/13/2014 14:45	15 Minute	cfs	Dry	70	80
10/13/2014 15:00	15 Minute	cfs	Dry	70	80
10/13/2014 15:15	15 Minute	cfs	Dry	70	80
10/13/2014 15:30	15 Minute	cfs	Dry	69	80
10/13/2014 15:45	15 Minute	cfs	Dry	67	80
10/13/2014 16:00	15 Minute	cfs	Dry	67	80
10/13/2014 16:15	15 Minute	cfs	Dry	67	80
10/13/2014 16:30	15 Minute	cfs	Dry	67	80
10/13/2014 16:45	15 Minute	cfs	Dry	67	80
10/13/2014 17:00	15 Minute	cfs	Dry	67	80
10/13/2014 17:15	15 Minute	cfs	Dry	67	80
10/13/2014 17:30	15 Minute	cfs	Dry	67	80
10/13/2014 17:45	15 Minute	cfs	Dry	69	80
10/13/2014 18:00	15 Minute	cfs	Dry	69	80
10/13/2014 18:15	15 Minute	cfs	Dry	70	80
10/13/2014 18:30	15 Minute	cfs	Dry	70	80
10/13/2014 18:45	15 Minute	cfs	Dry	72	80
10/13/2014 19:00	15 Minute	cfs	Dry	74	80
10/13/2014 19:15	15 Minute	cfs	Dry	74	80
10/13/2014 19:30	15 Minute	cfs	Dry	75	80
10/13/2014 19:45	15 Minute	cfs	Dry	75	80
10/13/2014 20:00	15 Minute	cfs	Dry	77	80
10/13/2014 20:15	15 Minute	cfs	Dry	77	80
10/13/2014 20:30	15 Minute	cfs	Dry	78	80
10/13/2014 20:45	15 Minute	cfs	Dry	80	80

1. The daily value for 10/13/2014 is 86 cfs.
2. The October 13, 2014 temporary flow deviation occurred as a result of operational transitions between the beginning of the second pulse flow event and JSA expected 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 EBMUD coordination with the partnership, 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 2014, 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 agreed release from 250 to 200 cfs and reduced the expected flows below Woodbridge Dam from 100 to 80 cfs from February 28 to March 31, 2014 in return for increased attraction flow releases from Camanche Dam to the Lower Mokelumne River in October and early November, 2014. The proposal was submitted by the Partnership to the SWRCB on February 7, 2014, and was approved by the SWRCB on February 28, 2014. Copies of the proposal and approval are included in Appendix B of this report. The 3,000 ac-ft saved at the completion 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.

Gainsharing Increase in Flows

Due to continued drought conditions and reduced projected Mokelumne run-off (41% of average), EBMUD obtained additional water supplies through its Freeport Project. The JSA states that EBMUD will “increase instream flows beyond the flows specified in Attachment 1 [of the JSA] by an amount equal to 20% of the actual yield of additional water supplies developed by EBMUD ... until reaching a maximum quantity of 20 TAF....” In 2014, a total of 23,250 AF of supplemental supplies was delivered to EBMUD from two entities: the Central Valley Project (CVP) contract between EBMUD and U.S. Bureau of Reclamation (USBR) and the 2014 Temporary Water Purchase Agreement between EBMUD and Placer County Water Agency. Based on these deliveries a total of 4,650 AF was made available through the JSA gainsharing provision.

USFWS and CDFW were notified of the availability of gainsharing water in May 2014. Initial planning for use of the water was conducted at the July 2014 MRTAC meeting. In September 2014, a draft fall flow plan was forwarded to the Partnership Coordinating Committee (PCC) for review and approval. Subsequent discussions were held at the October 2014 PCC meeting. Based on PCC member concurrence, a total of 1,788 AF (38%) of the gainsharing supply was used in October and November 2014 for additional pulse flows. Combined with the adaptive management savings, a total of 4,788 AF was used to augment base flows for attraction pulses.

The remaining 2,862 AF of gainsharing water will be carried over to 2015 per JSA provision F.2. Initial planning for use of the remaining gainsharing water occurred at the January 2015 MRTAC meeting.

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 Delta Cross Channel (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 2014, there were multiple DCC closures, due to the need to meet Rio Vista minimum flows and fish protection closures for winter run chinook salmon. Closures were not related to the 5-year study plan. Analysis of return data beginning in 2010 indicate significant reductions in straying to the American River can be achieved with Mokelumne River pulse flows and DCC closures.

Pulse Flow Operations

A series of six pulse flows were released by EBMUD from Camanche Dam in October and November of 2014 using the combined volume of water resulting from the adaptive management action and the portion of the gainsharing water discussed above. Reoperation of Woodbridge dam by WID downstream augmented the magnitude of pulse flow peaks below Woodbridge Dam with average daily peaks ranging from 247 to 438 cfs. In addition to pulse flows supported through adaptive management and gainsharing, an additional four pulses were

developed through collaboration with Woodbridge Irrigation District (WID) on reoperation of Woodbridge Dam elevations. These pulses did not require additional volume of release from Camanche Dam, but contributed significantly to the positive fish response. Each pulse resulted in an increase in salmon numbers entering the Mokelumne River (see Figure 5).

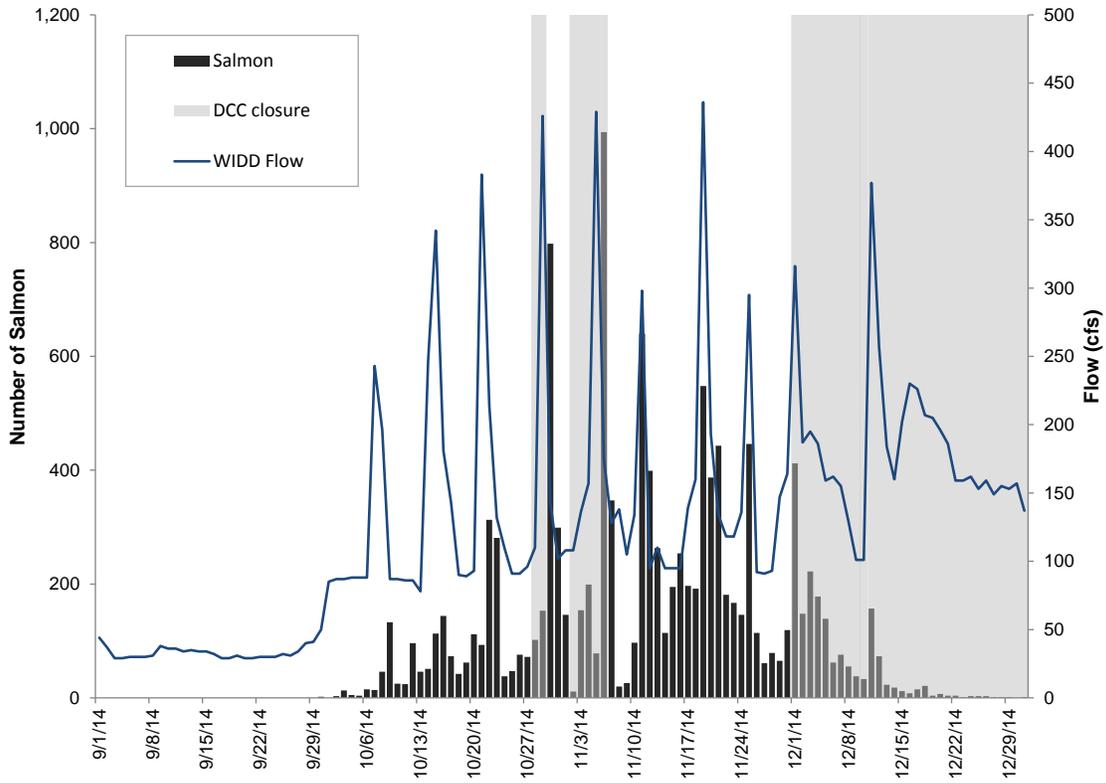


Figure 5: Daily Upstream Passage of Chinook Salmon at Woodbridge Dam Relative to Flow and Delta Cross Channel Closure, September 2014 – January 2015

Coded Wire Tag (CWT) return data clearly indicates that planting locations for hatchery reared juveniles plays a significant role in straying.³ In 2007, CDFW planted nearly the entire MRFH production in the San Pablo Bay region. While this practice may increase overall

³ 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.

survival, it significantly increases straying rates. With the elimination of egg transfers the overall impact to Mokelumne returns is significant. In 2014, CDFW continued the practice of releasing production in net pens at Jersey Point, which previous return data indicates leads to less straying and better returns to the Mokelumne. Overall, these adaptive management efforts will maximize returns to the Mokelumne River while minimizing straying to other systems.

2015

EBMUD is committed, pursuant to the FERC Order, to “Dry” JSA year type Camanche Dam flow releases through March 31, 2015. 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, 2015 DWR Bulletin 120, the JSA water year type which will govern EBMUD’s flow schedule for the period April 1, 2015 through September 30, 2015. EBMUD will report to the FERC in the February 2016 report on the flow releases made in accordance with the JSA during the entire calendar year 2015. 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 2012 and 2013 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.

2014

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 2014 Mokelumne River Water Average Daily Temperatures of the Release from Camanche Dam.

From April 1, 2014 through September 30, 2014 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 2014.

In response to extreme drought conditions affecting California, the SWRCB issued a curtailment notice in May 2014 to all post-1914 water rights holders, including EBMUD, to cease diversions and to pass true natural flows through the system. While EBMUD managed operations to comply with the curtailment notice, EBMUD also requested from SWRCB a modification to facilitate required temperature management efforts to benefit the Mokelumne River anadromous fishery. The request proposed delaying the release of 2 – 5 TAF of cold water from Camanche in June 2014 for later release in July and August to help preserve cold water in the reservoirs for the fall run Chinook salmon migration. The SWRCB denied the request. EBMUD consequently made operational adjustments to effectively manage the temperature, and these adjustments, in conjunction with the SWRCB’s temporarily lifting the curtailment notice

later in 2014 in response to water made available from a storm event, enabled temperatures to be managed through 2014.

2015

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.

2014

The HOS was activated on May 23, 2014 and was shut down on November 20, 2014. The HOS has effectively prevented hydrogen sulfide formation.

2015

In 2015 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.

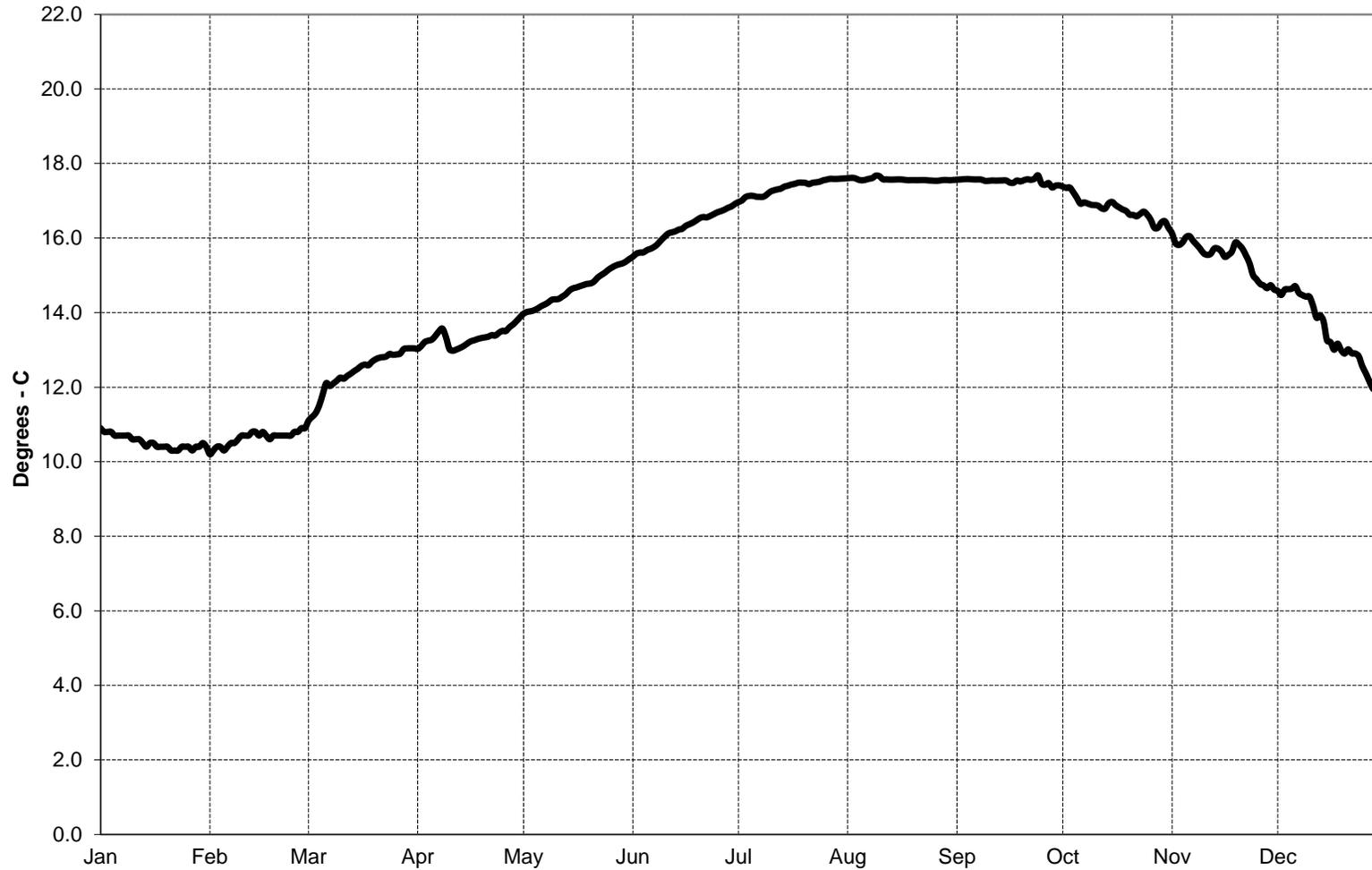


Figure 6: Calendar Year 2014 Mokelumne River Water Average Daily Temperatures of the Release from Camanche Dam.

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 18, 2014. 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 8, 2014 and October 7, 2014. In 2014, the PSC approved four projects, for a total of 40 projects since 1999, for Partnership funding. See Section IV.C.2 of this report for projects approved for Partnership funding in 2014 and projects with activity in 2014.

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 \$808,601. The available earnings, net of funds obligated to approved projects, were \$73,485 as of December 31, 2014.

In 2014, the Partnership Steering Committee approved funding for the following four stakeholder proposals:

- **Great Sierra River Cleanup Project – EBMUD** (\$3,000) To purchase supplies for the annual community volunteer cleanup effort on the lower Mokelumne River in conjunction with annual coastal cleanup events in California.
- **Jahant Slough Watershed Restoration Project – LangeTwins** (\$5,000) The Jahant Slough Watershed Restoration Project was initiated as a response to the Pacific Gas & Electric Co. “Pipeline Pathways” program. For public safety needs, PG&E was authorized to remove 100 oak trees and other native shrubs on LangeTwins property that is located in the “pipe zone” of a PG&E gas line installed in the 1950’s. These areas of upland and riparian habitat will be completely cleared of all vegetation so the

roots do not damage the integrity of the pipeline. LangeTwins will coordinate a habitat restoration project to restore appropriate habitat to help reduce the impact that the PG&E tree removal will have on Jahant Slough (Mokelumne River) water quality and local habitat & biodiversity.

- **2014-15 and 2015-16 Lower Mokelumne River Watershed Education Project – City of Lodi** (\$15,000) City of Lodi's 2014-15 and 2015-16 Watershed Education Legacy Project is a multiple tasked year-long series of activities that will help Lodi's student community better understand their relationship to the Mokelumne River watershed. Project elements include field study trips, inland and coastal clean-up, and classroom curriculum. The purpose of the project is to teach students how they are connected to and potentially influence the lower Mokelumne ecosystem.
- **2015 Mokelumne River Salmonid Spawning and Rearing Habitat Potential: Analysis of Coarse Sediment and Floodplain Extent Project – EBMUD** (\$59,097) Jointly funded by the Partnership, EBMUD, and USFWS, the Mokelumne River Salmonid Spawning and Rearing Habitat Potential/Analysis of Course Sediment and Floodplain Extent Project will estimate the available coarse substrate in areas adjacent to the lower Mokelumne River that could be used for potential ongoing gravel augmentation to enhance Chinook salmon and steelhead spawning habitat. In addition, the project will estimate the total acreage of functional floodplain rearing habitat that could be generated by removing coarse sediment adjacent to the river for use in gravel augmentation. Locations will be prioritized based on access, amount of coarse sediment available, and landowner access. The project will begin in 2015 with final reporting due by July of 2015.

Ongoing projects funded by the PSC with activity in 2014 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 2014 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	COMPLETED in 2014	\$7,150	\$6,850	City of Lodi
2012-2014 Watershed Coordinator	San Joaquin County Resource Conservation District	Cost-share to continue support of SJCRCD watershed coordinator position	4/23/2012	Winter 2016 (deadline extended)	\$30,000	-	-
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 2014, 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 2014, 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 2014, the Stewardship Steering Committee 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.sjcrd.org.

5. Additional EBMUD Stakeholder Activities

2014

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 2014 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 2014, actions on the AFRP funded habitat restoration project included revising permitting, completion of a new CEQA IS/MND for gravel enhancement activities, and renewal of permits needed to conduct in channel work in 2015.

- Participation in the 17th annual Sandhill Crane Festival in Lodi, CA on November 7-9, 2014. 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 part of the activities in 2014. In addition, EBMUD staff has led field trips to view bald eagles at Pardee Reservoir. (1997-present)
- Participation in the 17th annual Central Valley Birding Symposium in Stockton on November 20-23, 2014. EBMUD staff led 1 field trip on Pardee Reservoir.
- Participation in the Upper Mokelumne River Anadromous Fish Restoration Work Group. The workgroup's mission statement is to 'Reestablish a successfully reproducing population of fall-run Chinook salmon and or central valley steelhead in the upper Mokelumne River.' EBMUD staff is participating in the group to provide technical assistance in developing a plan that is based on sound science and addresses concerns from multiple stakeholders, resource agencies and other local entities. The group is developing a draft pilot project study plan and will continue to work with resource agencies to gain support for the project.
- 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)

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- 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 EBMUD 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 EBMUD 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)

2015

In 2015, 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

2014

At the April 22, 2014 meeting of the Board of Directors, EBMUD accepted the 2014 Water Supply Availability and Deficiency Report declaring the lack of availability of water to be used by Resource Agencies for 2014. 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.

2014

In 2014, 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 January 29, 2014 and July 29, 2014.

2015

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 most recent MRTAC meeting was held on January 27, 2015.

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 2014, 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. EBMUD 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.

2014

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.
- 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.
- Participating in a juvenile salmon barging study led by CDFW to assess differences in homing and straying rates from adult returns from paired barged and trucked release groups to the Golden Gate Bridge.
- Continuing to assist CDFW with acoustic tagging and tracking of adult salmon migration through the Delta system.

2015

EBMUD will continue similar research and monitoring activities in 2015. These efforts will be described in full in the calendar year 2015 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:

2014

- 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 2014, EBMUD updated the environmental documents needed to continue gravel augmentation activities, including an updated CEQA review of gravel enhancement activities, and renewing permits. EBMUD purchased and stockpiled steelhead sized spawning material, for placement in 2015. 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.
- 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.

2015

Many of the above habitat improvement activities will continue in 2015. A full description of 2015 activities will be reported in the calendar year 2015 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, 2014 and will be removed in early 2015. It is anticipated that it will be installed and operated during approximately the same period in 2015.

V. APPENDICES

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

Appendix B: Correspondence Related to the 2014 Adaptive Management Flow Change
Fall 2014 Attraction Flow

Appendix C: USGS Verified Flow Data for 2012 and 2013

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**

All eyes on the sky

Some local reservoirs are OK for now, but lingering drought conditions could change that



Above, low water levels reveal once-submerged tree trunks along the south shore of Camanche Lake near Burson. Below, parts of a once-submerged lake bed are now drying up. CLIFFORD OTO/The Record

By *Staff and wire reports*

January 10, 2014 12:00 AM

As dry as California is, not all of our reservoirs are in dire shape.

Lake Camanche, on the Mokelumne River, is only about half full, but that's normal for this time of year. The lake level was 97 percent of average on Thursday.

The problem, of course, is if Mother Nature fails to deliver significant snow to the high Sierra this winter, there will be little runoff next spring. If that happens, Camanche and other reservoirs could shrink well below historic averages.

So all eyes are on the sky. The National Weather Service on Thursday reported a slight chance of rain in Stockton on Saturday, but the forecast beyond that is not promising: clear, sunny skies well into next week.

Other important nearby reservoirs are relatively low. New Hogan Lake, one source of water for Stockton and for east-side farmers, was less than one-third full Thursday, or 76 percent of average; and New Melones Lake, on the Stanislaus River, was 43 percent full, or 78 percent of average.

Still, no extraordinary restrictions on water use have been announced in San Joaquin County, as opposed to portions of Sacramento County, where Folsom Lake on Thursday was a mere 36 percent of average.

State officials indicated earlier this week that a formal drought declaration could come as early as February.

Gov. Jerry Brown said Thursday that he would "do everything that is humanly possible" to make sure the state's water reserves are used efficiently but noted that even a formal drought declaration has its limits.

"Governors can't make it rain," he told reporters during a briefing on his state budget proposal.

State water managers have said they expect to deliver just 5 percent of the water sought by agencies that supply more than 25 million Californians and nearly a million acres of irrigated farmland.

Farmers also are taking steps to prepare for a severe reduction in water during the summer growing season, conditions that could force them to fallow crops and sell off livestock. That has the potential to affect the nation's food supply, because the Central Valley is one of the country's most important food-producing regions.

Brown, a Democrat, said he is aware of the problems caused by the dry conditions, noting that he dealt with the state's last major drought, in 1976 and 1977, during his first tour in the governor's office.

"We'll take whatever steps we can, in collaboration with the state's farmers, to deal with water and, also, the urban people have to do their part," he said. "But don't think that a paper from the Governor's Office is going to affect the rain."

Lodi area is no exception as dry spell weighs heavy on most of California

Posted: Friday, January 10, 2014 12:00 am

By Wes Bowers/News-Sentinel Staff Writer Lodi News-Sentinel | [0 comments](#)

East Bay Municipal Utilities District said 2013 may be one of the driest years on record in the area in decades.

Russell Taylor, EBMUD's supervising hydrographer in its Stockton office, presented a dry year conditions report to the Woodbridge Irrigation District Board of Directors at a Thursday morning meeting.

Taylor said the Mokelumne Basin received an average of just 14.4 inches of rain in 2013, beating a record low set in 1976 when the basin saw 20.36 inches.

The basin, the watershed for the Mokelumne River, begins in the Sierra Nevada and extends 90 miles into the East Bay. It is EBMUD's chief water supply, with one monitoring station in Woodbridge.

Average rainfall for the basin is 48.3 inches per year, but if current weather conditions continue throughout 2014, it may see just 23 inches of rain.

If rainfall does begin meeting the average, the basin could see 30 inches this year.

"The median forecast does not look good," Taylor told the board Thursday. "There's no question we are going to be below average this year."

He said if the basin receives 20 inches of rainfall or less this year, 2014, will be declared another dry year for EBMUD.

However, Taylor said there may be a wet February in store for the area.

According to News-Sentinel records, Lodi saw 6.45 inches of rain in 2013. For the rainfall season from July 2012 to June 2013, Lodi received 14.35 inches of rain. So far, the city has seen only 1.97 inches this season, which began in July 2013.

Lodi likely won't see rain again until Feb. 7, according to Accuweather, a private weather forecasting service. Some rain was expected to fall this weekend, but AccuWeather is now predicting sunny skies.

There may also be a few showers around Feb. 17, according to the service.

In addition, precipitation in the Mokelumne Basin was recorded at 4.55 inches as of Jan. 1, which Taylor said is 24 percent of average.

The Mokelumne Basin, which includes EBMUD's Camanche and Pardee reservoirs, had 542,130 acre-feet of water stored at the beginning of 2013, which is about 70 percent of full capacity. As of Jan. 1, the district reported 504,590 acre-feet of water in the basin, according to EBMUD.

Pardee Reservoir, which can hold a maximum of 197,950 acre-feet, is currently at 171,076 acre-feet. Camanche Reservoir, which can hold 417,120 acre-feet of water, currently holds 224,664 acre-feet, according to the Department of Water Resources.

According to EBMUD's website, if rainstorms do not replenish the area's reservoirs enough, the district could declare a drought emergency.

Despite below-average numbers, Taylor said the district's water system is in better shape than other reservoirs around the state.

While EBMUD's system can hold about 767,000 acre-feet of water, capacity is at 90 percent, a "good" rating, according to Taylor.

However, Shasta reservoir, which can hold 4,552,000 acre-feet of water, is currently at 1,657,000 acre-feet, or 59 percent of average, a "poor" rating, according to EBMUD records.

Similar reservoirs like Trinity and Oroville also have poor ratings. Trinity holds as much as 2,448,000 acre-feet of water and is currently at 1,180,000, 74 percent of average. Oroville can hold 3,538,000 acre-feet and is currently at 1,280,000 acre-feet, 66 percent of average.

Taylor said Folsom Reservoir, which can hold 977,000 acre-feet of water, is in critical condition. It currently holds 175,000 acre-feet of water, or just 42 percent of average.

"Basically, I'd plan on having a dry year this year," board president Bill Stokes said.

Contact reporter Wes Bowers at wesb@lodinews.com.

Local agencies work to boost number of trout, salmon in Mokelumne River

Local agencies work to boost number of trout, salmon in Mokelumne



News-Sentinel file photograph

Eggs spill out as Cynthia Pierce, of the Department of Fish and Game, cuts open a mature female salmon at the Mokelumne River Fish Hatchery on Thursday, Oct. 20, 2011. Local hatcheries are working with the East Bay Municipal Utility District and California Department of Fish and Wildlife to boost natural-born fish populations in California rivers.

Posted: Wednesday, February 26, 2014 12:00 am

By Wes Bowers/News-Sentinel Staff Writer |

While thousands of salmon and trout return to the Mokelumne River each year, regional and state agencies are working to increase the number of natural fish that swim in the waterways.

Jose Setka, spokesman for the East Bay Municipal Utility District, said his agency and the California Department of Fish and Wildlife, along with the U.S. Fish and Wildlife Service, created hatchery coordination teams in 2012 for several California fish hatcheries on its numerous river systems.

A team was created for the Mokelumne River Fish Hatchery, located just downstream from the Camanche Dam. The team's primary goal, Setka said, is increasing the amount of natural fish in the basin.

The Mokelumne River Basin is home to fall-run Chinook salmon and Central Valley steelhead trout.

Fall-run Chinook salmon migrate from the ocean and begin arriving in the Mokelumne River in late summer and early fall to spawn.

Many salmon enter the Mokelumne River Fish Hatchery, where eggs are collected and incubated.

Other salmon may choose to spawn in gravel beds throughout a 10-mile section of the river just downstream of Camanche Dam, according to EBMUD.

Setka said about 25 percent of both Chinook and steelhead are marked or tagged as hatchery-born.

Determining which are natural and hatchery-raised is difficult, Setka said.

“For every one tagged fish, there are three or four that aren’t tagged,” he said. “If you caught a couple fish out of the river, you wouldn’t be able to tell with the naked eye if they were natural or not.”

Setka said hatchery-born fish are genetically no different than wild fish.

Juvenile salmon from the hatchery are released between March and June, and all fish are marked with a fin clip and coded wire tag in the nose.

All hatchery steelhead are released in February and March, and are marked with a fin clip.

Strategies used by EBMUD and partner agencies to boost the numbers of natural-born fish along the Mokelumne include improving habitat by adding gravel to the river, increasing the amount and quality of natural spawning areas and minimizing non-native predator fish in the area.

However, Setka said EBMUD’s biggest issue is keeping Mokelumne fish from straying into the Delta and out to the American River.

According to EBMUD’s website, experimental pulse flows on the Mokelumne River have been used to mimic storm flows and attract fish upstream over the last four years, in the hopes of reducing straying.

Short-term closures of the Delta Cross Channel when salmon migrate in the fall have helped more native salmon find their way back to the Mokelumne River, according to the district.

With the channel gates closed, a potential route to the Sacramento River is temporarily blocked, keeping fish from straying.

Another strategy is “trapping and trucking,” in which the fish are caught and relocated in dry years to other areas of the Mokelumne to spawn in natural environments.

Survival often declines in dry years with warmer ocean temperatures, and increases in wet years with cool ocean temperatures, according to EBMUD.

“In a year like this one, where it’s going to be very dry, we’re going to have to catch the juvenile fish out of the Delta area, and we’re going to need to transport them into our own system with better quality water,” Setka said.

The Mokelumne hatchery was built to rear 100,000 juvenile salmon and spawning channels, and has a capacity for up to 15 million Chinook salmon eggs, according to the California Hatchery Review.

Upwards of 12,000 adult salmon and steelhead returned the Mokelumne last year, according to EBMUD statistics.

“Our numbers are above what most of the other hatcheries have seen in terms of adult returns,” Setka said. “It’s definitely a positive, but there’s always room for improvement. And we are always going to have challenges to getting those fish through that Delta.”

Contact reporter Wes Bowers at wesb@lodinews.com.

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First load of Sacramento River salmon begin migration – by truck

BY MATT WEISER - MWEISER@SACBEE.COM

03/25/2014 2:58 PM | Updated:10/08/2014 11:47 AM



The salmon smolts are released from trucks into protective pens to acclimate. The fish normally take about three weeks to travel downriver from the Coleman hatchery on their own.

RPENCH@SACBEE.COM

Wildlife officials on Tuesday formally launched a massive trucking operation to move 30 million Sacramento River salmon toward the sea to help the fish avoid harmful river conditions caused by drought.

Tuesday's operation transported about 400,000 juvenile salmon, each about 3 inches long, in three climate-controlled tanker trucks from Coleman National hatchery near Red Bluff to floating pens in the Sacramento River near Rio Vista.

About 240 such truck trips are expected over the next 10 weeks from five state and federal salmon hatcheries in the Central Valley. Officials said the operation is unprecedented: They could not recall another time when so many juvenile salmon were transported by truck in such a short period of time.

“This is a real unusual situation, and it requires us to take immediate and unusual action,” said Howard Brown, Sacramento River branch chief of the National Marine Fisheries Service. “If we don’t take immediate action, we run the risk of perhaps losing an entire year-class of salmon.”

The goal is to save the salmon from low river flows, warm water and greater exposure to predators – all induced by the worst drought to strike California in 40 years. Although rain is forecast for this week, officials said it would not be nearly enough to avoid harm to salmon if they were released at the hatcheries, which is the usual practice.

These hatchery salmon are the foundation of a \$1.4 billion commercial and recreational fishing industry in California that supports about 23,000 jobs.

“If we didn’t truck these salmon, under these drought conditions we believe we would likely lose them all,” said John McManus, executive director of the Golden Gate Salmon Association, which represents commercial and recreational fishermen and has been urging officials since December to prepare a trucking plan.

Every fall-run Chinook salmon produced at the five hatcheries in the Central Valley will be moved. In addition to Coleman hatchery on Battle Creek, which is operated by the U.S. Fish and Wildlife Service, the trucking operation involves four hatcheries operated by the California Department of Fish and Wildlife: Feather River Hatchery, Nimbus Hatchery on the American River, Mokelumne River Hatchery and Merced River Hatchery.

The fish travel by tanker truck more than four hours, avoiding about 200 miles of challenging river habitat, before reaching the Rio Vista waterfront. The trucks stop several times along the way to ensure the enclosed tanks – which resemble a small milk transport truck – are operating properly and to check on the welfare of the fish. On Monday, one of the first tankers had to turn back to Coleman Hatchery because its onboard aerator was operating intermittently.



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“This is a herculean effort between state and federal agencies to try to stave off a fisheries disaster,” said Stafford Lehr, fisheries branch chief at the California Department of Fish and Wildlife. “Our fish right now are undergoing extreme duress due to the drought.”

Fishery experts normally release salmon into rivers at the hatcheries so the fish can imprint on that location and find their way back from the ocean as adults, in three to four years, to spawn another generation of salmon. They acknowledged many of the salmon might not find their way back due to the trucking operation, but that trucking gives the population better odds this year.

The fish normally take about three weeks to travel 270 miles downriver on their own from Coleman hatchery. In comparison, the truck trip exposes them to dramatic changes in water temperature and chemistry in just a few hours – a disorienting experience that can make them vulnerable to predators. That’s where the net pens come in.

At the Rio Vista site, a former Army installation along the Sacramento River, the tanker trucks back down a slope to a pier. The truck connects to a 10-inch diameter aluminum tube, which shoots the salmon across the pier into one of three white net pens suspended in an aluminum pontoon barge. The nets hang down into the river itself, so the fish can adjust to the new water environment while safely protected from predators.

Boats tow the barge slowly downriver for two to four hours. Then the pens are opened on an outgoing tide, allowing the salmon to continue their downstream migration to the sea on their own. The net pens and barging operation is handled by the Fishery Foundation of California, a nonprofit organization.

Officials chose the Rio Vista location because the young salmon, called smolts, aren't big enough yet to maneuver in the strong currents of San Francisco Bay. It is also hoped that this location in the Delta will help them imprint on the Sacramento River.

The rest of this year's salmon crop is still at the hatcheries waiting for a truck ride. As some of these fish wait, they will continue growing larger. When they reach a minimum of 4 inches long, they will be trucked a little farther, to Mare Island in Vallejo, and then released into net pens in San Pablo Bay.

Plans are also in the works to assist winter- and spring-run Chinook salmon, which are protected by the Endangered Species Act. The National Marine Fisheries Service and U.S. Bureau of Reclamation plan to expand holding capacity at Livingston-Stone Hatchery, located at Shasta Dam, and bring in water chillers. Winter-run salmon will be trapped from the Sacramento River and transported to the hatchery to help them survive as temperatures warm up in the weeks ahead, Brown said.

The fisheries service is also looking for places to transport the fish where in-stream temperatures will remain cool. And it is working with the State Water Resources Control Board, which regulates water rights, to prioritize streams where water diversion curtailments might be ordered to ensure enough water flow for fish.

"We are looking at the potential for a full year-class failure of winter-run salmon," Brown said. "We're trying to plan for a worst-case scenario."





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Low flows a danger to salmon coming and going

By Alex Breitler

Record Staff Writer

Posted Sep. 30, 2014 @ 12:01 am

While waterfowl are winging toward Central Valley skies, salmon will simultaneously be splashing up Central Valley streams.

And like the birds, they'll have a drought to deal with when they get there.

Closest to Stockton, officials are planning to release "pulse flows" of water down the Mokelumne and Stanislaus rivers in coming weeks to help fish find their way upstream.

On the Stanislaus in particular, those releases are controversial in a drought year when reservoirs are already depleted.

But J.D. Wikert, a biologist with the U.S. Fish and Wildlife Service, said the flows will help the fish return to the same streams in which they were born, while also helping keep temperatures cool.

For the fish that do make it upstream to spawn, the challenge will be flushing the babies out of the river next year.

"That's my biggest concern," Wikert said. "The issue is how much water we're going to get into the reservoir over this winter."

Many of the salmon returning this year will be three years old, meaning they were born early in the drought, when there was still a fair amount of water to push them to the ocean. So the drought's most significant impact on salmon may not be known until the fish that are born this year return in 2017.

On the Mokelumne, extra fish flows were doable this year.

But next year?

"If we get another year like we did this year, who knows?" said Jose Setka, a supervising biologist with the East Bay Municipal Utility District, which diverts much of the Mokelumne to the Bay Area.

Warm water temperatures are also a concern on the Sacramento River, where advocates are urging the state and federal government to artificially inject fertilized salmon eggs into

the stream later this winter, when temperatures are colder and the eggs have a higher chance of survival.

"We're going to lose a generation of the fall-run (salmon) if they don't take action," said John McManus, director of the Golden Gate Salmon Association.

A Fish and Wildlife spokesman in Sacramento said state and federal agencies have already taken several actions to help salmon during the drought and continue to discuss other potential strategies with fishing groups.

Contact reporter Alex Breitler at (209) 546-8295 or abreitler@recordnet.com. Follow him at recordnet.com/breitlerblog and on Twitter [@alexbreitler](https://twitter.com/alexbreitler).

>

By The Record

Print Page

November 06, 2014 12:01AM

Briefs -- Published Nov. 6, 2014

No-kill shelter seeks animal food

STOCKTON — The Delta Humane Society, a no-kill shelter in Stockton, is asking for help with food and donations after announcing its supplier will no longer provide food.

The shelter says it has enough food for 30 days and is appealing for people to donate dry and canned dog and cat food.

Anyone interested in donating food can drop it off at any of the following locations:

- The Main Shelter, 4590 S. Highway 99, Stockton.
- Thrift and Gift Boutique, 6830 Pacific Ave., Stockton.
- Carter's Pet Mart, 909 W. March Lane, Stockton.

Cash donations are welcomed. They can be mailed to the Delta Humane Society, P.O. Box 30908, Stockton, Calif., 95213.

For more information, call (209) 466-0339 or visit deltahumanesociety.com.

Mega Millions ticket worth mega bucks

STOCKTON — A Mega Millions ticket sold in Stockton matched five out of six numbers in the multi-state lottery on Tuesday night, earning its owner or owners \$597,933, Lottery officials announced Wednesday.

The ticket was sold at Cigarettes 4 Less, 4011 E. Morada Lane. It matched the numbers 9, 15, 24, 39 and 41 and failed only to match the Mega number of 1.

A ticket sold in New York hit all numbers and the estimated \$321 million jackpot.

The next Mega Millions drawing for \$15 million is set for Friday.

The California Lottery recommends that anyone who wins a jackpot immediately sign the back of their tickets in ink, keep the tickets in a safe place and visit any of the nine Lottery District Offices as soon as possible to claim a prize. The closest office to Stockton is in Sacramento, at 4106 E. Commerce Way. People can call (916) 830-0292. Winners have up to 180 days from the date of the draw to claim any Mega Millions prize that isn't the jackpot and up to one year to claim the jackpot.

Mega Millions is played in 44 states plus the District of Columbia and the U.S. Virgin Islands, and numbers are drawn at 8 p.m. PST on Tuesdays and Fridays. Tickets cost \$1 and can be purchased at more than 21,000 California Lottery retailers.

Woodbridge Irrigation District leader honored

LODI — Anders Christensen, general manager of the Woodbridge Irrigation District, has received the Frank R. Beeler Watershed Stewardship Award.

That award, given out annually by the Lower Mokelumne River Watershed Stewardship Steering Committee, recognizes people or organizations that have been good stewards of natural resources and the Mokelumne River drainage.

Among other things, Christensen was honored for timing releases from Woodbridge Dam to assist migrating salmon, despite the drought. Those releases helped result in relatively abundant salmon runs in recent years.

<http://www.recordnet.com/article/20141106/NEWS/141109739>

Print Page

APPENDIX B

**CORRESPONDENCE RELATED TO THE 2014
ADAPTIVE MANAGEMENT FLOW CHANGE—FALL 2014 ATTRACTION FLOW**

Lower Mokelumne River Partnership



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

To Protect and Enhance the Lower Mokelumne River Ecosystem

February 7, 2014

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 February and March 2014, in order to provide an attraction pulse flow for the fall run Chinook salmon during the month of October 2014. 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).

Persistent dry Conditions in January and February indicate that predicted runoff on the Mokelumne will likely result in a "Critically Dry" water year type designation for April-September 2014 as defined by D-1641. Should the system receive average precipitation for the remainder of the rainy season or if dry conditions persist, there will be limited water available above the JSA minimum levels in October 2014 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 February and March 2014, below JSA minimum levels in order to conserve a volume of water (approx. 2-4 TAF) to be used as an attraction pulse flow in October 2014.

We, the Partnership Steering Committee, and the NMFS believe that the adaptive management action should start as soon as possible after February 14. Because the April-September water year forecast is not determined until April 1st, 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 1st forecast, the potential benefits from the adaptive management approach could be maximized (e.g., Re-allocation of flows could begin in February rather than in April or May).

Enclosed are the letters of concurrence with the modified flow schedule from the Lower Mokelumne River Partnership Steering Committee (CDFW, EBMUD, and USFWS). NMFS staff has indicated that they are working on their letter and we will get that to you as soon as we receive it. If NMFS decides to not concur with this action, then it will be cancelled.

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 or via email rsykes@ebmud.com. You may also contact Lena Tam, Manager of Water Resources Planning at (510) 287-1240, or via email ltam@ebmud.com.

Sincerely,



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

RGS:rl

Enclosures

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

2014 Adaptive Management Flow Change on the Mokelumne River

TABLE 1: Standard and Proposed Adaptive Management Operations Plans – Dry and Critically Dry Water Year Types (October 2014)

JSA WATER YEAR IN OCT 2014 – DRY

Standard Operation Plan – Dry Water Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	255	170	250	100
March	Below Normal	255	150	250	100
October	Dry	225	140 ²	220	80

Proposed Adaptive Management Operation Plan – Dry Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	205	130	200 ³	80 ³
March	Below Normal	205	110	200 ³	80 ³
October-November	Dry	300	200 ²	220 + up to 4,550 AF*	80 + up to 4,550 AF*

JSA WATER YEAR IN OCT 2014 – CRITICALLY DRY

Standard Operation Plan – Critically Dry Water Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	255	170	250	100
March	Below Normal	255	150	250	100
October 1-15	Critically Dry	105	35 ²	100	15
October 16-November 30	Critically Dry	160	90 ²	130	75

Proposed Adaptive Management Operation Plan – Critically Dry Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	205	130	200 ³	80 ³
March	Below Normal	205	110	200 ³	80 ³
October 1-15	Critically Dry	180	100 ²	100 + ~2,200 AF*	15 + ~2,200 AF*
October 16-November 30	Critically Dry	235	155 ²	100 + ~2,350 AF*	75 + ~2,350 AF*

¹Based on current Flow below Woodbridge (includes riparian diversions and channel loss)

²Assumes no Woodbridge Irrigation District diversions in October

³Adaptive Management Plan (Feb 15-28 and March 1-31, 2014) includes 50 cfs reduction in JSA Required Flow for Camanche Dam release and 20 cfs reduction in JSA Required Flow below Woodbridge

***Actual volume may vary based on February Adaptive Management Operation Plan start date and need to meet JSA Required flows in February and March 2014. Volume to be used to support fish habitat (includes pulse flows, temperature management, etc.) during fall months as considered appropriate to support fish habitat.**

February 6, 2014

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 Wildlife
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 January 29, 2014 meeting of the Mokelumne River Technical Advisory Committee (MRTAC).

Persistent dry conditions during the period of October 2013 to February 2014 indicate that predicted runoff on the Mokelumne will likely result in a "Critically Dry" water year designation for April-September 2014 as defined in D-1641. Even if the watershed should receive average precipitation for the remainder of the rainy season, there will be limited water available above the JSA minimum levels in October-November 2014 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 Partnership Coordinating Committee (PCC) recommends an adaptive management operations plan to reduce releases in February 2014 and March 2014 below JSA minimum levels in order to conserve a volume of water (2-4 thousand acre-feet (TAF)) to be used as an attraction pulse flow in October-November 2014.

The PCC, and the NMFS representative to the coordinating committee believe that the adaptive management action should start as soon as possible after February 14, 2014 in order to benefit from the preceding October 2013 -March 2014 period that was designated as a "Below Normal" water year type. Because the April-September water year forecast is not determined until April 1st, 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 1st forecast, the potential benefits from the adaptive management approach could be maximized (e.g., Re-allocation of flows could begin in February rather than in April or May).

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. The current JSA year type for October 2013 – March 2014 is designated as a "Below Normal" year type. Based on the expected DWR April 1st 2014 runoff forecast for April – September, the 2014 JSA year type will likely be designated as "Critically Dry." With current projections, the ensuing October 2014 – March 2015 JSA year type will likely be designated as "Dry" or "Critically Dry." For the month of October in the Dry year type, the JSA release from Camanche Dam would be 220 cfs with expected flows below Woodbridge of 80 cfs. For early October in the Critically Dry year type, the JSA release from Camanche Dam would be 100 cfs with expected flows below Woodbridge of 15 cfs. For late October in the Critically Dry year type, the JSA release from Camanche Dam would be 130 cfs with expected flows below Woodbridge of 75 cfs.

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, 2012, and 2013 adaptive management flow changes. Our agencies also recommended a similar action in 2011 but the late rains that year provided enough runoff that there was no need to reduce the JSA flows.

Proposed 2014 Adaptive Management Flow Change. As of January 28, 2014, runoff this year is expected to be approximately 220 TAF assuming median (50% exceedence) precipitation for the remainder of the water year which would result in a Critically Dry JSA water year type. Even with substantially above average precipitation for the remainder of the year, Camanche and Pardee Reservoirs are not expected to be at full allowable storage as we enter the next water year and no water would be available for pulse flow releases and thus an adaptive management action is merited.

Based on the PCC recommendation, a 2014 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 Dry and Critically Dry Water Year for October 2014-March 2015.

Adaptive Management Flow Change on the Mokelumne River

February 6, 2014

Page 3

The water for the proposed adaptive flow change would come from a reduction of flows in February and March 2014. The proposal would: 1) reduce the required JSA Camanche release from 250 to 200 cfs in February and March, 2), reduce the expected flows below Woodbridge Dam from 100 to 80 cfs in February and March and 3) provide approximately 2-4 TAF of water for a pulse flow in October-November 2014.

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 February and March.

The 2009, 2010, 2012 and 2013 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 information collected indicates a positive response to the pulse flows. During 2009, 2010, 2012 and 2013 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 this similar adaptive management action.

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.

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

Sincerely,



Richard G. Sykes

Director of Water and Natural Resources

Adaptive Management Flow Change on the Mokelumne River

February 6, 2014

Page 4

RGS:rl

Attachment

**cc: Monica Gutierrez (NMFS)
Michael Healey (CDFW)
Kathy Hill (CDFW)
Donald Ratcliff (USFWS)
Jose Setka (EBMUD)
Rick Leong (EBMUD)**

**PARTNERSHIP STEERING COMMITTEE APPROVAL OF PCC
 RECOMMENDATION**

**TABLE 1: Standard and Proposed Adaptive Management Operations Plans – Dry
 and Critically Dry Water Year Types (October 2014)**

JSA WATER YEAR IN OCT 2014 – DRY

Standard Operation Plan – Dry Water Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	255	170	250	100
March	Below Normal	255	150	250	100
October	Dry	225	140 ²	220	80

Proposed Adaptive Management Operation Plan – Dry Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	205	130	200 ³	80 ³
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JSA WATER YEAR IN OCT 2014 – CRITICALLY DRY

Standard Operation Plan – Critically Dry Water Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	255	170	250	100
March	Below Normal	255	150	250	100
October 1-15	Critically Dry	105	35 ²	100	15
October 16-November 30	Critically Dry	160	90 ²	130	75

Proposed Adaptive Management Operation Plan – Critically Dry Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	205	130	200 ³	80 ³
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Adaptive Management Flow Change on the Mokelumne River

February 6, 2014

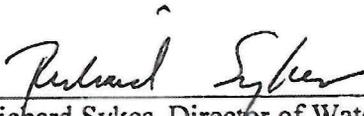
Page 7

support fish habitat (includes pulse flows, temperature management, etc.) during fall months as considered appropriate to support fish habitat.

The actual dates and flow schedule for the pulse flow will be determined by CDFW 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 2014 water year is expected to be Critically Dry. 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.

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

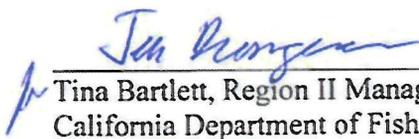


Richard Sykes, Director of Water and Natural Resources
East Bay Municipal Utility District

Date: 2/6/14

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: 2/6/14

February 6, 2014

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 Wildlife
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

SUBJECT: Adaptive Management Flow Change on the Mokelumne River

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Persistent dry conditions during the period of October 2013 to February 2014 indicate that predicted runoff on the Mokelumne will likely result in a "Critically Dry" water year designation for April-September 2014 as defined in D-1641. Even if the watershed should receive average precipitation for the remainder of the rainy season, there will be limited water available above the JSA minimum levels in October-November 2014 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 Partnership Coordinating Committee (PCC) recommends an adaptive management operations plan to reduce releases in February 2014 and March 2014 below JSA minimum levels in order to conserve a volume of water (2-4 thousand acre-feet (TAF)) to be used as an attraction pulse flow in October-November 2014.

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

Sincerely,



Richard G. Sykes
Director of Water and Natural Resources

Adaptive Management Flow Change on the Mokelumne River
February 6, 2014
Page 4

RGS:rl

Attachment

cc: Monica Gutierrez (NMFS)
Michael Healey (CDFW)
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**PARTNERSHIP STEERING COMMITTEE APPROVAL OF PCC
 RECOMMENDATION**

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Proposed Adaptive Management Operation Plan – Critically Dry Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
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February 15-28	Below Normal	205	130	200 ³	80 ³
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Adaptive Management Flow Change on the Mokelumne River

February 6, 2014

Page 7

support fish habitat (includes pulse flows, temperature management, etc.) during fall months as considered appropriate to support fish habitat.

The actual dates and flow schedule for the pulse flow will be determined by CDFW 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 2014 water year is expected to be Critically Dry. 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.

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: 2/6/14



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

Date: 2/6/14

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
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4700

February 19, 2014

RECEIVED

FEB 25 14

Fisheries & Wildlife

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

Dear Mr. Setka:

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 6, 2014.

NMFS provided technical assistance to East Bay Municipal Utility District (EBMUD) regarding flow changes in May 2009, April 2010, February 2012 and 2013. 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 Endangered Species Act (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 California Central Valley (CCV) steelhead (*Oncorhynchus mykiss*) distinct population segment 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.

Water conditions during the period of October 2013 to February 2014 have indicated that the predicted runoff on the Mokelumne River will likely result in a critically dry water year designation for April-September 2014 period. Under these water conditions, there will be limited water available above the JSA minimum levels in October and November 2014 with which to conduct the experimental pulse flows that help reduce straying rates for Mokelumne origin Chinook salmon. The pulse flows would be adaptively coordinated for maximum effect contingent on fish presence within the Mokelumne River system and operations on other river systems, such as the American River.

The proposed adaptive flow change would come from a reduction of flows in the latter half of February and March 2014. The proposal would: 1) reduce the required JSA Camanche release from 250 to 200 cubic feet per second (cfs) in February and March, 2) reduce the expected flows below Woodbridge Dam from 100 to 80 cfs in February and March, and 3) provide a release of



approximately 2,000 to 4,000 acre feet of water for pulse flows in October and November 2014 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 months of February and March 2014, 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 could be adaptively managed given current drought conditions and that temperature is an appropriate indicator for monitoring potential impacts to salmonids. The fall pulse flow may benefit adult CCV steelhead returning to the Mokelumne River but likely does not optimize migration flows throughout the steelhead migration period. We will continue to provide technical assistance 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, if you have any questions regarding this project or require additional information.

Sincerely,



Maria Rea
Assistant Regional Administrator

Cc: Copy to the file: ARN151422SWR2010SA00127

From: Tam, Lena
To: White, Eileen; Encarnacion, Rey; Lydon, Patrick; Hurlburt, John; Hom, Damon; Rowan, Stephen
Cc: Setka, Jose; Sykes, Richard
Subject: FW: 2014 Adapt. Mgmt - Mokelumne
Date: Friday, February 28, 2014 4:57:34 PM

We have received approval from the SWB to implement the adaptive management flows. Please see below.

Lena L. Tam, P.E. | Manager of Water Resources Planning East Bay Municipal Utility District
P: 510.287.1240 | f: 510.287.1275 | 375 – 11th Street, MS 901, Oakland, CA 94607

From: Satkowski, Rich@Waterboards [mailto:Rich.Satkowski@waterboards.ca.gov]
Sent: Friday, February 28, 2014 4:49 PM
To: Tam, Lena
Cc: Riddle, Diane@Waterboards
Subject: RE: 2014 Adapt. Mgmt - Mokelumne

Lena,
We intend to approve the Mokelumne River flows so it's okay for EBMUD to operate per the following conditions... (similar to the 2012 conditions):

1. EBMUD shall coordinate releases with DFW, USFWS and NOAA Fisheries (Fisheries Agencies) throughout the flow modification period and shall propose any additional necessary modifications to the proposed flow schedule to optimize conditions for fish and wildlife.
2. EBMUD shall provide the State Water Board and the Fisheries Agencies with a summary of mean daily water temperatures and flows from the Golf gaging station within the two weeks following the newly proposed JSA for reduction in February and March 2014.
3. EBMUD shall determine the final date of implementation of the pulse flow based on detection of returning adult Chinook salmon in the Sacramento-San Joaquin Delta and other area rivers. Pulse flow implementation shall be coordinated as much as possible with the pulse flows released in other river systems. EBMUD shall provide the information to the State Water Board and Fisheries Agencies.
4. EBMUD shall provide notification to the Fisheries Agencies when water temperatures below Woodbridge Dam exceed 22 degrees Celsius during the flow reduction period.
5. At the conclusion of the pulse flow period, EBMUD shall provide the State Water Board and the Fisheries Agencies with: (1) the amount of water conserved in February and March 2014 as a result of this approval, (2) the amount of water released in the fall as a result of this approval, and (3) the resulting flows in the river this fall.

Rich

From: Tam, Lena [mailto:ltam@ebmud.com]
Sent: Friday, February 28, 2014 4:13 PM
To: Satkowski, Rich@Waterboards
Cc: Sykes, Richard; Setka, Jose@ebmud.com; Ulloa, Ana; rleong@ebmud.com
Subject: RE: 2014 Adapt. Mgmt - Mokelumne

Hello Rich – Thank you for your help in tracking the status of the SWRCB's approval of EBMUD's request to adaptively manage fishery flows for 2014. I understand that the SWRCB staff is inundated with drought activities, and we noted a due date of March 5. We are hoping to implement the flow changes this weekend in light of the weather and upcoming drought supplies that we will be receiving through the Freeport Regional Water Supply Project. Would it be possible to get a confirmation of approval before Tom Howard signs the letter?
I appreciate any help you can provide.

Lena L. Tam, P.E. | Manager of Water Resources Planning East Bay Municipal Utility District
P: 510.287.1240 | f: 510.287.1275 | 375 – 11th Street, MS 901, Oakland, CA 94607

From: Leong, Rick
Sent: Thursday, February 20, 2014 12:52 PM
To: rsatkowski@waterboards.ca.gov
Cc: Sykes, Richard; Setka, Jose; Ulloa, Ana; Tam, Lena
Subject: 2014 Adapt. Mgmt - Mokelumne

Rich – attached is a letter from NMFS to EBMUD re: adaptive management flows for the 2014 Mokelumne River. This is being sent to you per your conversation with Lena Tam on 2/18/14. You can email a your letter and send the hard copy via US mail.
Thanks.

rick leong
watershed planning analyst
east bay municipal utility district
water & natural resources department
375 Eleventh St. M.S. 902 Oakland, CA 94607
ph: 510-287-1192 fax:510-287-0541
rleong@ebmud.com



EDMUND G. BROWN JR.
GOVERNOR



MATTHEW RODRIGUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

MAR 11 2014

Mr. Richard G. Sykes
Partnership Steering Committee
Lower Mokelumne River Partnership
East Bay Municipal Utility District
375 Eleventh Street, M.S. 901
Oakland, CA 94607

Dear Mr. Sykes:

2014 APPROVAL OF MODIFICATION OF MOKELUMNE RIVER FLOWS PURSUANT TO STATE WATER RESOURCES CONTROL BOARD WATER RIGHT DECISION 1641, WATER RIGHT LICENSE 11109 AND PERMIT 10478 (APPLICATIONS 4228 AND 13156) OF EAST BAY MUNICIPAL UTILITY DISTRICT IN AMADOR, CALAVERAS AND SAN JOAQUIN COUNTIES

This letter responds to your February 7, 2014 letter requesting modification of the required minimum releases from Camanche Dam to the Mokelumne River pursuant to State Water Resources Control Board (State Water Board), Water Right Decision 1641 (D-1641) (Condition 1 on pages 170-175). East Bay Municipal Utility District (EBMUD) may request to reschedule or modify the flows required by D-1641 pursuant to the following condition (Condition 5 on page 176):

Permittee/Licensee may reschedule or modify the specified flow release required by this order, but the total quantity of water released in any year shall not be less than the quantity of water that would have been provided pursuant to the flow schedule specified in this order for the water year type in which the rescheduling or modification occurs. Thirty days prior to rescheduling or modifying the specified flow releases, Permittee/Licensee shall submit to the Executive Director of the [State Water Board] an operations plan acceptable to the Executive Director of the [State Water Board] that specifies the release schedule for that year. Permittee/Licensee shall also submit a written concurrence to the operations plan signed by a representative of the [Department of Fish and Wildlife (DFW)] and the U.S. Fish and Wildlife Service (USFWS).

Similar to a request to modify flows approved in 2012, as a result of recommendations from the Mokelumne River Joint Settlement Agreement (JSA) Coordinating Committee, EBMUD requests to reduce the minimum flow requirement during February and March 2014 for later release in October 2014. The release of additional water in October 2014 will increase Chinook salmon attraction flows on the Mokelumne River. The enclosed Table 1 shows the standard and proposed adaptive management operation plans for dry and critically-dry water year types, respectively.

FELICIA MARCUS, CHAIR | THOMAS HOWARD, EXECUTIVE DIRECTOR

1001 I Street, Sacramento, CA 95814 | Mailing Address: P.O. Box 100, Sacramento, Ca 95812-0100 | www.waterboards.ca.gov

MAR 11 2014

In accordance with D-1641, EBMUD indicates that its proposed modifications of releases from Camanche Reservoir will not be less than the total quantity of water that would have been released this year absent the flow modifications. EBMUD submitted written concurrence to the operations plan from DFW and USFWS, both dated February 6, 2014. EBMUD also submitted a letter from the National Marine Fisheries Service (NOAA Fisheries) indicating that flows could be adaptively managed using temperature as an indicator for monitoring potential impacts to salmonids. NOAA Fisheries indicates that the proposed action could benefit steelhead returning to the Mokelumne River but likely does not optimize flows during the migration period. NOAA Fisheries indicates that it will continue to provide technical assistance on this matter.

I hereby approve EBMUD's *Proposed Operations Plan to Modify JSA Releases in 2014* (as shown in the enclosed Tables 1 and 2) pursuant to the following conditions (similar to the 2012 conditions):

1. EBMUD shall coordinate releases with DFW, USFWS and NOAA Fisheries (Fisheries Agencies) throughout the flow modification period and shall propose any additional necessary modifications to the proposed flow schedule to optimize conditions for fish and wildlife.
2. EBMUD shall provide the State Water Board and the Fisheries Agencies with a summary of mean daily water temperatures and flows from the Golf gaging station within the two weeks following the newly proposed JSA for reduction in February and March 2014.
3. EBMUD shall determine the final date of implementation of the pulse flow based on detection of returning adult Chinook salmon in the Sacramento-San Joaquin Delta and other area rivers. Pulse flow implementation shall be coordinated as much as possible with the pulse flows released in other river systems. EBMUD shall provide the information to the State Water Board and Fisheries Agencies.
4. EBMUD shall provide notification to the Fisheries Agencies when water temperatures below Woodbridge Dam exceed 22 degrees Celsius during the flow reduction period.
5. At the conclusion of the pulse flow period, EBMUD shall provide the State Water Board and the Fisheries Agencies with: (1) the amount of water conserved in February and March 2014 as a result of this approval, (2) the amount of water released in the fall as a result of this approval, and (3) the resulting flows in the river this fall.

If you have any questions, please contact Rich Satkowski at (916) 341-5439 or by email at rich.satkowski@waterboards.ca.gov. Written correspondence should be address as follows: State Water Resources Control Board, Division of Water Rights, Attention: Rich Satkowski, P.O. Box 2000, Sacramento, CA 95812.

Sincerely,



Thomas Howard
Executive Director

Enclosures

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

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

Jose Setka
Manager of Fisheries and Wildlife
East Bay Municipal Utility District
500 San Pablo Dam Road
Orinda, CA 94563
See next page

2014 Adaptive Management Flow Change on the Mokelumne River

TABLE 1: Standard and Proposed Adaptive Management Operations Plans – Dry and Critically Dry Water Year Types (October 2014)

JSA WATER YEAR IN OCT 2014 – DRY

Standard Operation Plan – Dry Water Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	255	170	250	100
March	Below Normal	255	150	250	100
October	Dry	225	140 ²	220	80

Proposed Adaptive Management Operation Plan – Dry Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	205	130	200 ³	80 ³
March	Below Normal	205	110	200 ³	80 ³
October-November	Dry	300	200 ²	220 + up to 4,550 AF*	80 + up to 4,550 AF*

JSA WATER YEAR IN OCT 2014 – CRITICALLY DRY

Standard Operation Plan – Critically Dry Water Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	255	170	250	100
March	Below Normal	255	150	250	100
October 1-15	Critically Dry	105	35 ²	100	15
October 16-November 30	Critically Dry	160	90 ²	130	75

Proposed Adaptive Management Operation Plan – Critically Dry Year Type in October 2014 (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge ¹	Camanche Release	Flow below Woodbridge
February 15-28	Below Normal	205	130	200 ³	80 ³
March	Below Normal	205	110	200 ³	80 ³
October 1-15	Critically Dry	180	100 ²	100 + ~2,200 AF*	15 + ~2,200 AF*
October 16-November 30	Critically Dry	235	155 ²	100 + ~2,350 AF*	75 + ~2,350 AF*

Mr. Thomas Howard
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¹Based on current Flow below Woodbridge (includes riparian diversions and channel loss)

²Assumes no Woodbridge Irrigation District diversions in October

³Adaptive Management Plan (Feb 15-28 and March 1-31, 2014) includes 50 cfs reduction in JSA Required Flow for Camanche Dam release and 20 cfs reduction in JSA Required Flow below Woodbridge

***Actual volume may vary based on February Adaptive Management Operation Plan start date and need to meet JSA Required flows in February and March 2014. Volume to be used to support fish habitat (includes pulse flows, temperature management, etc.) during fall months as considered appropriate to support fish habitat.**

APPENDIX C

USGS VERIFIED FLOW DATA FOR 2012 AND 2013

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	272	754
2	331	331	265	246	302	252	261	321	293	266	258	722
3	332	329	256	251	300	253	261	317	290	271	256	670
4	330	328	256	250	300	241	261	310	292	271	258	617
5	331	331	256	250	300	220	261	311	286	272	341	569
6	331	329	254	252	302	205	261	310	281	271	371	518
7	331	331	255	252	299	202	261	311	282	271	322	467
8	330	331	256	248	310	208	260	311	281	474	275	450
9	331	331	255	250	326	210	270	313	283	550	256	377
10	331	331	255	251	337	216	280	314	282	450	257	321
11	331	331	255	245	343	222	292	311	281	350	255	270
12	333	331	254	242	345	215	296	310	281	277	256	255
13	331	330	255	241	346	222	289	311	281	259	255	255
14	330	330	256	242	350	230	288	311	275	262	256	255
15	330	331	255	242	353	239	289	312	271	372	256	255
16	330	331	255	242	359	246	294	312	270	427	257	255
17	331	331	255	242	352	245	281	316	271	379	257	256
18	332	330	256	240	345	255	272	321	270	327	257	257
19	331	331	255	240	344	261	284	321	271	274	256	256
20	330	331	255	249	349	261	299	321	270	255	255	366
21	334	332	255	269	357	270	305	321	271	257	255	450
22	329	332	254	263	345	276	313	322	271	370	257	451
23	330	330	256	282	340	276	333	320	271	421	255	451
24	329	331	255	293	346	277	360	320	271	371	256	451
25	331	330	255	291	349	269	367	320	270	321	256	452
26	332	330	256	273	351	261	355	322	270	272	258	443
27	332	332	257	260	359	262	340	313	272	255	256	501
28	331	333	257	255	370	260	336	299	270	255	254	500
29	328	333	257	255	370	260	337	293	271	348	255	500
30	327		256	271	369	263	327	293	272	371	495	501
31	330		256		357		322	292		321		501
Total	10,253	9,593	7,972	7,632	10,467	7,360	9,217	9,701	8,311	10106	8223	13346
Mean	331	331	257	254	338	245	297	313	277	326	274	431
Max	334	333	299	293	370	283	367	322	293	550	495	754
Min	327	328	254	240	292	202	260	292	270	255	254	255
Ac-ft	20,340	19,030	15,810	15,140	20,760	14,600	18,280	19,240	16,480	20050	16310	26470

1132350 Mokelumne River below Camanche Dam, CA

DISCHARGE, CUBIC FEET PER SECOND
 JANUARY TO DECEMBER 2013
 DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	500	255	300	326	375	267	331	287	290	265	273	256
2	501	255	294	320	385	245	320	284	291	266	256	257
3	501	255	294	311	390	247	320	275	283	267	256	256
4	500	255	272	305	390	246	325	276	276	266	333	255
5	498	256	257	297	392	245	326	275	275	266	374	256
6	498	255	254	297	390	251	325	277	275	265	324	256
7	499	255	255	297	389	265	326	277	276	410	274	255
8	492	254	258	284	390	271	314	277	277	472	256	255
9	489	254	256	275	400	270	306	276	283	381	257	255
10	486	254	256	276	405	272	314	276	290	287	255	255
11	449	254	255	274	406	271	327	276	291	266	255	255
12	334	255	257	275	406	271	331	276	291	267	256	255
13	273	255	259	276	406	270	336	276	292	267	256	255
14	255	255	276	276	399	271	335	276	291	388	257	255
15	255	255	281	276	387	271	326	283	291	434	256	255
16	255	254	279	286	386	263	311	292	290	382	255	255
17	255	256	280	301	380	248	298	290	284	333	255	255
18	255	256	279	314	379	240	292	290	279	281	255	255
19	254	254	272	329	380	237	297	292	281	265	255	255
20	255	370	261	339	381	242	300	291	281	266	256	255
21	255	397	255	341	382	260	301	293	282	355	256	255
22	255	320	256	340	382	263	300	292	281	434	257	255
23	255	268	256	340	382	278	303	293	274	383	255	255
24	255	264	266	341	381	285	301	290	266	334	256	255
25	254	255	263	339	380	286	301	292	249	283	257	255
26	255	255	270	354	380	297	310	292	240	266	257	255
27	256	288	271	360	379	305	315	293	240	265	257	255
28	255	305	270	360	370	317	316	291	241	350	256	255
29	255		271	367	365	335	312	293	242	423	255	255
30	255		271	376	365	337	299	292	259	372	256	255
31	255		308		350		292	292		322		255
Total	10609	7564	8352	9452	11932	8126	9710	8835	8261	10081	7976	7911
Mean	342	270	269	315	385	271	313	285	275	325	266	255
Max	501	397	308	376	406	337	336	293	292	472	374	257
Min	254	254	254	274	350	237	292	275	240	265	255	255
Ac-ft	21040	15000	16570	18750	23670	16120	19260	17520	16390	20000	15820	15690

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 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
Total	8,053	7,645	5,696	5,578	5,107	1,324	1,190	1,117	1,126	5,656	5,900	12,169
Mean	260	264	184	186	165	44	38	36	38	182	197	393
Max	317	506	236	235	177	112	61	54	50	437	374	794
Min	239	142	156	158	157	32	32	32	35	106	170	182
Ac-ft	15,970	15,160	11,300	11,060	10,130	2,630	2,360	2,220	2,230	11,220	11,700	24,140

11325500 Mokelumne River At Woodbridge, CA

DISCHARGE, CUBIC FEET PER SECOND
JANUARY TO DECEMBER 2013
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	453	435	157	203	170	59	42	40	34	112	156	178
2	444	514	159	186	169	41	42	39	40	110	135	172
3	452	276	166	172	169	41	36	37	46	105	151	179
4	443	258	164	234	169	38	36	35	38	107	160	184
5	454	216	174	181	170	38	38	36	32	109	397	183
6	511	209	180	172	169	37	41	38	34	114	273	182
7	471	204	154	177	167	39	45	35	32	116	227	202
8	455	204	159	186	168	37	46	35	32	459	171	185
9	443	202	154	169	168	38	37	33	33	287	171	184
10	443	199	153	168	170	37	34	35	33	181	173	179
11	428	199	157	167	170	36	37	34	33	114	175	181
12	355	198	146	169	171	36	36	34	34	109	168	182
13	259	199	142	167	172	37	37	33	33	110	171	184
14	211	201	128	167	167	37	42	34	34	115	151	183
15	195	184	122	170	167	40	44	34	34	270	135	181
16	196	194	125	167	171	41	48	37	35	197	148	179
17	188	199	128	168	169	73	45	40	33	149	148	179
18	195	194	128	167	182	40	43	38	33	133	164	170
19	191	179	123	167	172	37	32	40	33	107	163	174
20	190	174	183	169	166	36	36	37	34	108	262	176
21	188	137	133	171	164	35	37	37	53	110	235	174
22	189	133	119	171	164	34	40	37	70	419	209	181
23	189	124	118	170	166	34	38	42	56	205	163	178
24	191	135	118	167	165	36	37	36	38	168	147	175
25	187	147	119	168	166	37	37	37	34	149	156	179
26	189	120	121	168	168	35	39	43	34	113	163	174
27	180	150	119	168	170	34	40	37	34	110	270	175
28	193	149	120	169	169	33	47	33	36	116	167	174
29	182		121	170	162	37	52	34	42	371	181	179
30	182		122	171	165	39	39	34	77	243	177	178
31	212		142		163		42	34		204		178
Total	9059	5733	4354	5219	5218	1172	1245	1128	1164	5320	5567	5562
Mean	292	205	140	174	168	39.1	40.2	36.4	38.8	172	186	179
Max	511	514	183	234	182	73	52	43	77	459	397	202
Min	180	120	118	167	162	33	32	33	32	105	135	170
Ac-ft	17970	11370	8640	10350	10350	2320	2470	2240	2310	10550	11040	11030

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

APPENDIX D

MEETING MINUTES OF THE PARTNERSHIP STEERING COMMITTEE

Mokelumne River Partnership Steering Committee Minutes

**December 18, 2014
10:00 am – Noon**

Attendance: US FWS: Dan Welsh*, Donnie Ratcliff
CDFW: (absent)
NMFS: Monica Gutierrez, Rhonda Reed
EBMUD: Richard Sykes*, Jose Setka, Michelle Workman, Rick Leong
**JSA Steering Committee representatives*

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

1. 2014 Mokelumne Escapement Update: (Michelle Workman) Michelle reported that the final number for the 2013-14 run was 12,269. Michelle reviewed the adaptive management flows that were implemented in 2014, including the flows augmented by Woodbridge Irrigation District. She also reported that the salmon response to those pulses was positive. She stated that these pulse flows included water savings gained from adaptively managed JSA flows in the spring and a portion of the 2014 gainshare volume resulting from EBMUD's use of the Freeport intake facility. Michelle also reported on the 2014 *O. mykiss* count of 120 adults at Woodbridge between August 2013 and July 2014.

Michelle also reported that the current escapement figure for 2014-15 run is 12,050. The total escapement will not be finalized until February of 2015.

2. 2014 Mokelumne River Redd Counts and Egg Take (Michelle Workman) Michelle reported that 1,823 redds were surveyed during the BY13 run and approx. 63% of these were in gravel enhancement sites. Michelle reported that there were 8.3 million total BY14 egg take at the Mokelumne River Fish Hatchery. She stated that there were 2.4 million in egg reductions (transfers to Merced and discarded). 5.8 million eggs are in inventory. 151 steelhead were captured and 21 thousand eggs are in inventory,
3. 2014 Spawning Gravel Restoration (Michelle Workman) Michelle explained that the 5-year permit cycle ended in 2013. She reviewed the work in progress to obtain new permits from both state and federal agencies. Michelle explained assessment of juvenile losses to predation is a subject that will be a priority in the coming years, including the evaluation of predator habitat conditions.
 - a. 2014/15 AFRP Funding (Donnie Ratcliff) Donnie stated that funding should be available for continuing spawning gravel restoration work in 2015.
4. Water Supply Update (Michelle Workman) Michelle provided a water supply update in Russ Taylor's absence. Michelle reviewed precipitation, snow levels, and reservoir storage to-date for 2014. The Mokelumne 4-station average for precipitation thru 12/9/14 was 9.74 inches (84% of average) Pardee reservoir storage was 88% (102% of average) and Camanche storage was 29% (47% of average) as of December 11, 2014.
5. JSA Adaptive Management Flow Modifications (Jose Setka) Jose
 - a. Gainshare Procedure: Jose explained that because this is the first time gainshare water has become available, it is important to have a procedure for meeting the agency notification requirement under the JSA gainshare provision. It was suggested that the PCC be used as the initial planning group regarding the use of gainshare water and that their

recommendations be forwarded to the PSC agency reps for approval. The Steering Committee members present agreed that an implementation procedure could be developed and agreed upon by each Partnership member agency without having to amend the JSA language in any way. The request was for a formal proposal to be drafted and presented for approval.

ACTION ITEM: Jose offered to develop a draft gainshare implementation procedure by mid-January 2015 and to coordinate the review by the Partnership members.

- b. DCC Closure: During her report on escapement, Michelle Workman reported that DCC closures did occur multiple times in 2013 and twice in 2014 to meet Rio Vista flow standards. Jose explained that DCC closure coordination with Mokelumne fall attraction flows is receiving less focus at this time. He and Michelle did state that there is still interest by the Bureau of Reclamation to implement a pilot project to evaluate the use of an electronic barrier at the DCC.
6. Update MRFH Coordination Team (Jose Setka) Jose reported that there have been 3 meetings so far of the MRFH Coordination Team and that there are Central Valley committees forming to address Central Valley-specific hatchery issues.
7. Update on JSA Partnership Fund and Activities (Rick Leong) Rick reported that, as of December 2014, the available balance of the Fund was approximately \$72K. Rick stated that the San Joaquin County RCD has hired a new watershed coordinator, Jonna Spaletta, to replace the vacancy created by the departure of John Brodie in 2014. Rick said that this watershed coordinator position for the lower Mokelumne River is partially funded by the Partnership. Rick also stated that he is currently working with EBMUD Treasury staff to evaluate potential investment alternatives for the Partnership Fund principal in order to maximize interest income.
8. Upper Mokelumne Anadromous Fish Restoration Work Group (Michelle Workman and Donnie Ratcliff) Michelle and Donnie reported that a draft pilot project plan is being developed as part of the process to consider introduction of anadromous fish upstream of Pardee Dam.
9. Update on Camanche Permit Extension (Richard Sykes): Richard reported that the EIR has been certified by the EBMUD Board of Directors and that all protests have been resolved. Richard said that the Order from the SWRCB extending the permit and updating the monitoring plan is expected in early 2015.. He thanked the Partnership agencies for their time in reviewing the draft EIR.
10. Updates from Steering Committee Members Dan Welsh reported that some of his staff in the USFWS Conservation, Restoration, and Contaminants Program will be moving from the Cottage Way office to downtown Sacramento. Dan said that this would not impact his role on the Partnership Steering Committee. Donnie reported that he did receive a promotion to AFRP Assistant Program Manager. He stated that this would not change his role on the Partnership Coordinating Committee. Rhonda reported that Amanda Cranford, previously a NMFS contractor, has been hired as NMFS staff (Hatchery Coordinator).

Dan offered a suggestion to provide multiple reminders to PSC members with regards to scheduled PSC meetings to reduce confusion and improve attendance. It was also suggested that the PSC consider the next meeting to be at CDFW's Region 2 office in Rancho Cordova.

Action Item; EBMUD will request that the next coordination meeting will be requested to take place at the Region 2 offices. It will be scheduled at least two months in advance.

11. Meeting Adjournment: The meeting adjourned at 12:30 p.m.

Respectfully submitted by: Rick Leong

APPENDIX E

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

May 2, 2014

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 2014 hydrologic conditions and the District's storage levels, there will be no water that is surplus to the District needs.

Enclosed is a copy of the 2014 Water Supply Availability and Deficiency Report (Report) accepted by the District's Board of Directors at their April 22, 2014 meeting. In low water years, this report provides the basis for the Board's consideration of demand management and/or supplemental supply measures. In other years, this report provides the basis for the Board's determination of sufficient water supply. The 2014 assessment, based on the Department of Water Resources' April 1 projected Mokelumne River runoff (41% of average), concludes that a customer water use reduction program coupled with supplemental supplies from the Freeport Project will be needed this 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.

This year the District is anticipated to receive 23,250 AF of supplemental supply from two different entities: the Central Valley Project (CVP) contract between the District and the U.S. Bureau of Reclamation (Bureau) and the 2014 Temporary Water Purchase Agreement between the District and Placer County Water Agency (PCWA). This supply has resulted in 4,650 AF of gainsharing water. This gainsharing amount will be added to carry over storage, but shall not affect subsequent water year type determination. EBMUD staff is consulting with biologists and other stakeholders to maximize the benefits of the gainsharing water for the Lower Mokelumne River. The District has also, through the adaptive management plan that was implemented earlier this year, 3,000 AF available for use in the fall. In August 2014, the Lower Mokelumne River Partnership Coordinating Committee will meet to develop a preliminary recommended release schedule for the gainshare water. The recommendation will be forwarded to your agencies for approval. The final release schedule, including the adaptive management water, will be

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circulated for approval in September or October depending on reservoir temperature and hypolimnion volume. Actual deliveries of additional water supplies will be monitored on a monthly basis, and if there are changes to the water obtained for supplemental supply, the District will adjust the amount of water available for gainsharing and notify your agencies accordingly.

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.

Sincerely,



Lena L. Tam
Manager of Water Resources Planning

LLT:PKJ:AL:smc

Enclosure

cc: Richard Sykes, Director of Water & Natural Resources Department
Lower Mokelumne River Partnership Coordinating Committee



AGENDA NO. 17A.

MEETING DATE April 22, 2014

TITLE WATER SUPPLY AVAILABILITY AND DEFICIENCY REPORT 2014

MOTION _____ RESOLUTION _____ ORDINANCE _____

RECOMMENDED ACTION

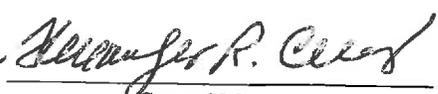
File the Water Supply Availability and Deficiency Report in conformance with Policy 9.03, and declare that the District's water supply is deficient for meeting customer demands in 2014.

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 the current year's (2014) 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 and/or supplemental supply measures. In years of excess supply, this report provides the basis for the Board's determination of additional availability of water for use by others. The 2014 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). In addition, the projected water supply forecast for this year indicates that there is not sufficient supply from the Mokelumne and East Bay to meet the District's expected customer demands, and a customer water use reduction program coupled with supplemental supplies from the Freeport Project will be needed. The Board will consider staff's recommendation on the use of the Freeport Project as a separate action on April 22, 2014. A final Dry Year Response Plan including a customer water use reduction program will be considered by the Board on May 13, 2014.

2014 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 flows for fishery requirements, use by senior water right holders, and water requirements of other downstream interests. If the projected September 30 total system storage

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

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

exceeds 500 thousand acre-feet (TAF), the District has sufficient current year water supply. If the sum is less than 500 TAF, the District's water supply is deficient.

Water Year 2014 is on track to be one of the driest years on record and the Mokelumne and East Bay water supplies will not be sufficient to meet normal water demands. In consideration of these very dry conditions, on February 11, 2014, the Board authorized a Preliminary Dry Year Response Plan which initiated a ten percent voluntary customer demand reduction program. The Board also approved a one-year water transfer agreement with Placer County Water Agency (PCWA) to supplement water which is available from EBMUD's contract with the U.S. Bureau of Reclamation. At the end of the water year (September 30), total system storage is projected to be between 370 thousand acre-feet (TAF) and 490 TAF. This forecast includes continuation of the ten percent voluntary customer reduction program initiated in February as well as 6,900 acre-feet of water from the Sacramento River, which is currently being used to test the Freeport Project facilities in April.

The Interim Drought Management Program (DMP) contained in the Urban Water Management Plan 2010 established various triggers depending upon the September 30 forecast. The 2014 forecast is below the trigger of 500 TAF that initiates consideration of voluntary customer demand reduction measures. The forecast is also below the 450 TAF trigger for considering use of the Freeport Project for supplemental dry-year water supplies. The Board will consider staff's recommendation on the use of the Freeport Project as a separate action on April 22, 2014. A final Dry Year Response Plan, including a customer demand reduction program will be considered by the Board on May 13, 2014.

The 2014 water year falls within the "Dry" year category under the terms of the District's Joint Settlement Agreement (JSA) which establishes fishery flow releases by water year type. This determination is based on Department of Water Resources' April 1st projected Mokelumne River runoff of 310,000 acre feet or about 41% of average. This low runoff also has consequences for other water rights holders and downstream diverters on the Mokelumne River. Woodbridge Irrigation District (WID) will receive 39 TAF compared to its normal allocation of 60 TAF. There will be no water available for North San Joaquin Water Conservation District (NJWCD). Jackson Valley Irrigation District (JVID) will still receive its maximum entitlement of 3,580 acre-feet but it may need to use a pump to move that water from Pardee Reservoir to Jackson Creek if the reservoir elevation drops below 550 feet.

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 Demand Study estimates a planning level of demand of 230 MGD in 2040.

The Allowable Maximum Level of Demand (AML) is the demand that the District's water supply system can sustain under the three-year drought planning sequence (DPS). The AML 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 fifteen percent during the DPS, per the District's 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 AML of 189 MGD for the year 2040. The 2040 AML 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 AML estimate of 189 MGD. Accordingly, without the development of further 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 fifteen percent rationing limit. As noted in the February 11, 2014 Board Workshop on water supply, staff will continue to pursue projects which provide future supply consistent with the 2040 projected level of demand.



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