Lower Mokelumne River Project

FERC Project No. 2916

2012 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 2013

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ABBREVIATIONS

AFRP	Anadromous Fish Restoration Program
CBDA	California Bay Delta Authority
CDFW	California Department of Fish and Wildlife
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
PCC	Partnership Coordinating Committee
PSC	Partnership Steering Committee
SAFCA	Sacramento Area Flood Control Agency
SCWA	Sacramento County Water Agency
SJCRCD	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 (2012), and those it plans to implement in the current calendar year (2013), pursuant to the JSA, to protect and enhance the fishery resources and ecosystem of the lower Mokelumne River.

II. INTRODUCTION

This submittal is EBMUD's Project Operations Update Report[1] for 2012. EBMUD actions in 2012 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 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

[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 2011).

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 2012 calendar year and efforts planned for 2013. Section V contains the appendices.

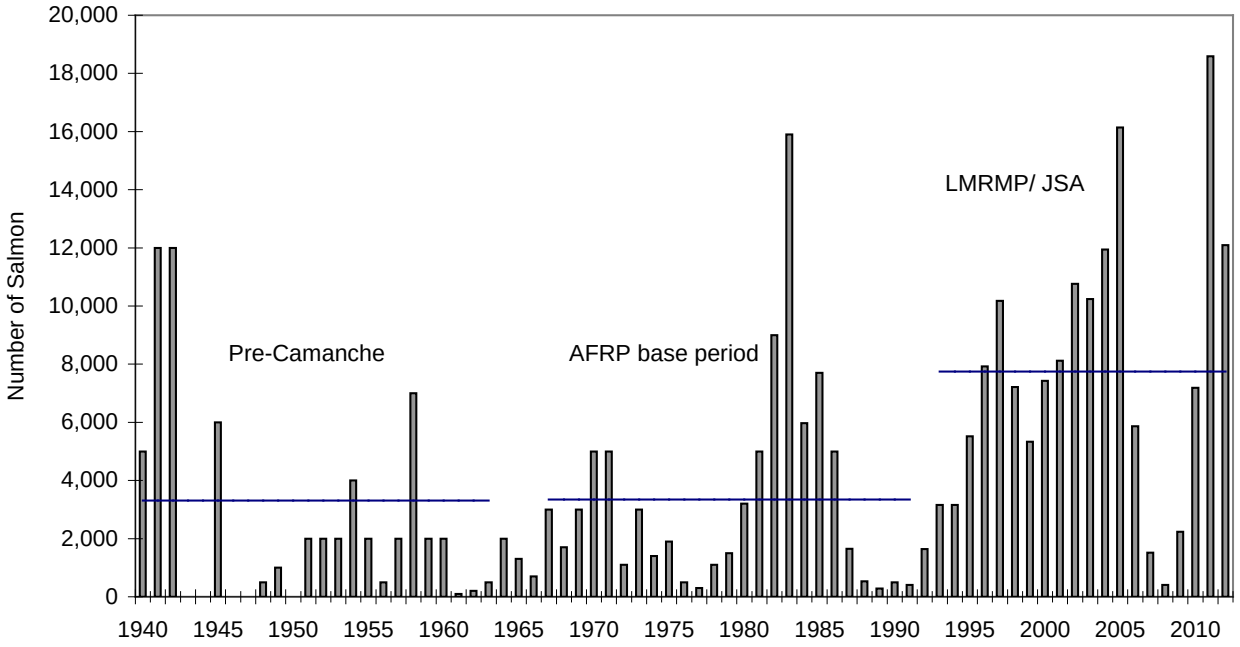
III. STATUS OF THE LOWER MOKELUMNE RIVER SALMON POPULATION

Through the 1990s and into 2012, the lower Mokelumne River Chinook salmon population continues to demonstrate characteristics consistent with long-term sustainability. The fall-run Chinook salmon escapement of 12,090 in 2012 was well above the long term average and was the third largest for the lower Mokelumne River during the period 1990 - 2012 (see Table 1 and Figure 1). EBMUD and WID continue to work cooperatively in managing operations to maximize the accuracy of monitoring systems.

Table 1: Lower Mokelumne River Fall-Run Chinook Salmon Data, 1989-2012.

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	343
1993	11,006	172,442	3,157	2,164	993	31	530
1994	554	142,670	3,157	1,919	1,238	39	774
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	1,322
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	623
2000	107,134	61,391	7,423	5,450	1,973	27	987
2001	37,754	81,580	8,116	5,809	2,307	28	843
2002	11,791	66,132	10,759	7,919	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	16,144	5,738	10,406	64	2,170
2006	1,008,289	179,264	5,861	4,138	1,723	29	754
2007	10,349	29,278	1,519	1,049	470	31	305
2008	1,835	16,512	412	239	173	42	63
2009	960	29,654	2,232	1,552	680	31	248
2010	4,243	63,106	7,188	5,276	1,192	27	310*
2011	228,829	52,288	18,589	15,922	2,767	14	563
2012	13,888	38,049	12,090	6,620	5,470	45	1,286

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



1. "Pre-Camanche" escapement (3305) is the average estimate at Woodbridge for the period of record beginning in 1940 through 1963 (excluding years when no data was recorded).
2. "AFRP base period" is defined as the 1967-1991 period. Mokelumne River average escapement estimate, at Woodbridge, for the AFRP base period is 3345.
3. "LMRMP/ JSA" escapement (7521) is the average estimate at Woodbridge since voluntary flow improvements were initiated in 1993.

Figure 1: Lower Mokelumne River Fall-Run Chinook Salmon Escapement, 1940-2012.

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

including sea surface temperature anomalies and the coastal upwelling index; and local biological indicators are able to make predictions on Chinook salmon returns (Peterson et al. 2006[2]).

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

In addition to providing a forecasting tool for salmon returns, these metrics provide insight into the understanding of how variations in ocean conditions affect the annual recruitment of salmon. This is reflected in the escapement of fall-run Chinook salmon in the lower Mokelumne River from 2008 - 2012 (see Figure 1 and Figure 2). Individuals returning in 2008 (low escapement) experienced extremely poor conditions as juveniles, while individuals returning in 2011 and 2012 were exposed to good physical and ecosystem conditions as juveniles when entering the ocean in 2010.

[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.

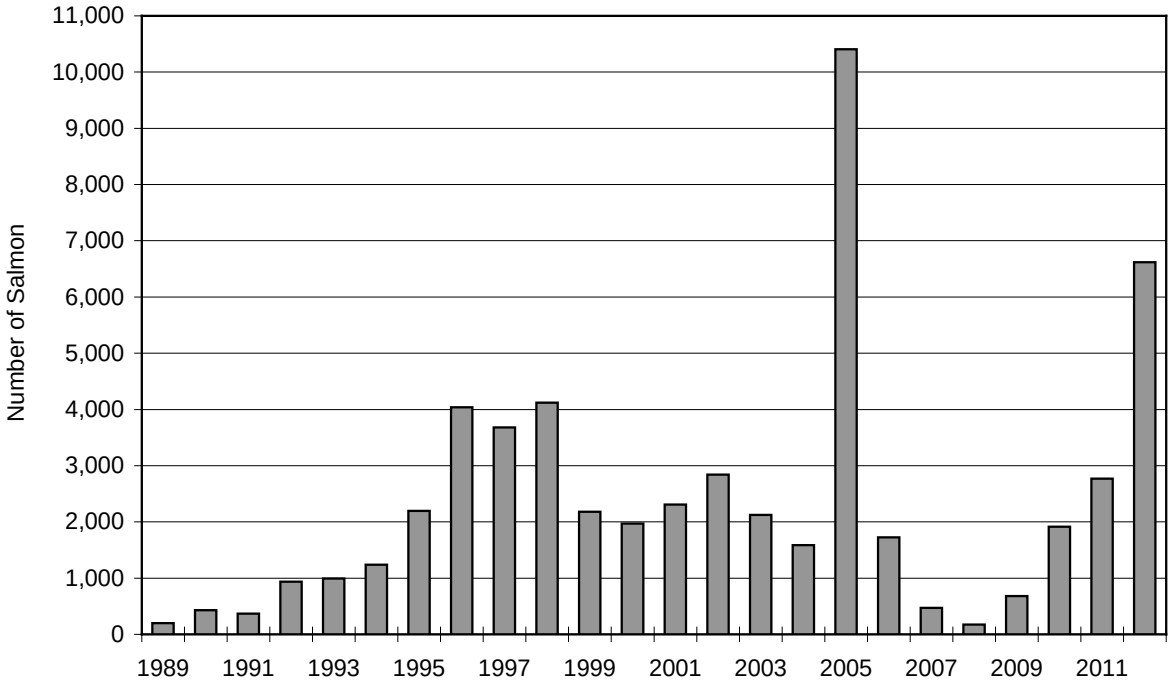


Figure 2: Fall-Run Chinook Salmon Natural Spawning in the Lower Mokelumne River, 1989-2012.

The Mokelumne River Fish Hatchery (MRFH), owned by the District and operated by the California Department of Fish and Wildlife (CDFW), reported that the 2012 salmon return at the MRFH was 6,620 salmon. The 2012 MRFH Annual Operations Plan (AOP) stated that the import ban of eggs originating from other hatcheries would continue for the long-term. In fact, due to the long-term nature of the egg importation ban the District and CDFW are focused on achieving hatchery production goals through spawning only Mokelumne origin fish returning to MRFH. For recent news articles on the Mokelumne River fisheries resource, refer to Appendix A.

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

Responding to drought conditions, increased environmental concerns, and an improved understanding of fishery resource needs on the lower Mokelumne River, EBMUD began in 1987 to develop a multifaceted plan to protect and enhance the fishery and riparian resources of the lower Mokelumne River. This plan, known as the Lower Mokelumne River Management Plan (LMRMP), was developed over five years and was voluntarily implemented by EBMUD beginning in 1993. The 1998 Joint Settlement Agreement (JSA) incorporates the knowledge gained through the development of the LMRMP and also contains additional actions to protect the lower Mokelumne River resource beyond those already undertaken by EBMUD under the LMRMP. Actions taken by EBMUD in 2012, and those actions planned for 2013, 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 2012 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 2012, releases were measured at Camanche Dam using its Accusonic flow meters. EBMUD also measured the stream flow below Camanche Dam at the McIntire Gage as a back-up to measurements collected with the Accusonic flow meters. The flow data is verified by USGS staff annually and subsequently published in the USGS Water Data Reports, approximately one to two years later. Because of the delay between

the time this flow data is collected and the time it is published in the USGS Water Data Reports, the 2012 flow data included in this report has not yet been verified or published by the USGS.

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

2012

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, 2011, EBMUD provided "Normal and Above" JSA water year type Camanche Dam flow releases from October 1, 2011 through March 31, 2012, except flows in March were reduced from 325 to 250 cfs under a JSA adaptive management flow modification described below. Pardee and Camanche Reservoir actual total storage on November 5, 2011 was 431,000 acre-feet.

Based on the California Department of Water Resources (DWR) April 1, 2012 forecast of 350,000 acre-feet of unimpaired runoff into Pardee Reservoir, EBMUD operated under a "Dry" JSA water year type Camanche Dam flow releases from April 1, 2012 through September 30, 2012.

EBMUD is making, at a minimum, "Below Normal" JSA water year type Camanche Dam flow releases from October 1, 2012 through March 31, 2013. This is based on EBMUD's October 1, 2012 forecast of total Pardee and Camanche Reservoir storage on November 5, 2012

of 440,000 acre feet. Pardee and Camanche actual total storage on November 5, 2012 was 439,000 acre-feet.

Calendar year 2012 actual Camanche Dam average daily flow releases and JSA agreed flow releases from Camanche Dam are shown in Table 5 and Figure 4, on the following pages. Calendar year 2012 actual average daily flow below Woodbridge Dam and JSA expected flow below Woodbridge Dam are shown in Table 6 and Figure 5.

During the 2012 calendar three provisional, temporary flow deviations occurred from the JSA expected flow. One flow deviation occurred at Camanche Dam based on Accusonic flow meter readings at a fifteen minute time step; and two flow deviations occurred below Woodbridge Dam based on the recorded fifteen minute readings measured at Golf gage. The daily average expected flow below Camanche Dam and below Woodbridge Dam *did not* fall below the minimum during this period.

The flow releases measured at USGS Gaging Station No. 11323500 with the Accusonic flow meter at Camanche Dam in fifteen minute time steps during the provisional temporary flow deviation is shown in Table 2. The fifteen minute readings of river flows at the USGS Gaging Station No. 11325500 below Woodbridge Dam, during the provisional, temporary flow deviation are shown in the tables 3 and 4.

Table 2. Flow Releases at Camanche Dam during Temporary Flow Deviation - Nov. 19, 2012

Reading Date	Interval	Unit	JSA Water Year Type	Golf Gage Measured Flow	JSA Min. Reqt (below WID Dam)
11/19/2012 15:15	15 minute	cfs	Below Normal	202	250
11/19/2012 15:30	15 minute	cfs	Below Normal	203	250

1. The daily value for 11/19/2012 is 255 cfs.

Table 3. Flow below Woodbridge Dam during Temporary Flow Deviation - April 17, 2012

Reading Date	Interval	Unit	JSA Water Year Type	Golf Gage Measured Flow	JSA Min. Reqt (below WID Dam)
4/17/2012 17:15	15 Minute	cfs	Dry	140.61	150
4/17/2012 17:30	15 Minute	cf/s	Dry	130.94	150
4/17/2012 17:45	15 Minute	cf/s	Dry	120.33	150
4/17/2012 18:00	15 Minute	cf/s	Dry	112.27	150
4/17/2012 18:15	15 Minute	cf/s	Dry	104.23	150
4/17/2012 18:30	15 Minute	cf/s	Dry	98.73	150
4/17/2012 18:45	15 Minute	cf/s	Dry	94.95	150
4/17/2012 19:00	15 Minute	cf/s	Dry	97.46	150
4/17/2012 19:15	15 Minute	cf/s	Dry	101.4	150
4/17/2012 19:30	15 Minute	cf/s	Dry	104.23	150
4/17/2012 19:45	15 Minute	cf/s	Dry	110	150
4/17/2012 20:00	15 Minute	cf/s	Dry	113.41	150
4/17/2012 20:15	15 Minute	cf/s	Dry	119.16	150
4/17/2012 20:30	15 Minute	cf/s	Dry	125	150
4/17/2012 20:45	15 Minute	cf/s	Dry	128.55	150
4/17/2012 21:00	15 Minute	cf/s	Dry	133.34	150
4/17/2012 21:15	15 Minute	cf/s	Dry	134.54	150
4/17/2012 21:30	15 Minute	cf/s	Dry	140.61	150

1. The daily value for 4/17/2012 is 162 cfs.
2. The flow deviation that occurred on April 17th was a result of a mechanical problem with WID's irrigation canal overshot gates.

Table 4. Flow below Woodbridge Dam during Temporary Flow Deviation - Oct. 1, 2012

Reading Date	Interval	Unit	JSA Water Year Type	Golf Gage Measured Flow	JSA Min. Reqt (below WID Dam)
10/1/2012 13:00	15 Minute	cf/s	Below Normal	79	100
10/1/2012 13:15	15 Minute	cf/s	Below Normal	67	100
10/1/2012 13:30	15 Minute	cf/s	Below Normal	64	100
10/1/2012 13:45	15 Minute	cf/s	Below Normal	82	100

1. The daily value for 10/1/2012 is 111 cfs.

Adaptive Management

The JSA contains an adaptive management provision related to minimum flows which allows for changes in the schedule in order to optimize fishery habitat and other ecosystem values, 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. In 2012, because of low precipitation there was a need to implement adaptive management. EBMUD worked cooperatively with the Partnership to develop a proposed adaptive management program whereby JSA flows would be reduced by 75 cfs in March, 2012 in return for increased attraction flow releases from Camanche Dam to the Lower Mokelumne River in October and early November, 2012. The proposal was submitted by the Partnership to the SWRCB on February 4 2012, and was approved by the SWRCB on February 24, 2012. As described below, EBMUD made releases to the lower Mokelumne River consistent with the approved Adaptive Management Program.

In order to maximize the effectiveness of the fall pulse flows, the Lower Mokelumne River Partnership sent a letter to USBR requesting the closure of the Delta Cross Channel (DCC) for a 10-day period in October 2012 (Appendix B). DCC operations during the up migration period may contribute to excessive straying of Mokelumne origin salmon to the American River. With the ban on egg exports, the DCC influence and impact on Mokelumne escapement is magnified. Similar requests were made in 2009 and 2010 resulting in a 48-hour closure in October 2010 and a ten day closure in October 2011. Due to dry conditions and the need to meet Delta water quality standards under SWRCB D1641, no closure was granted by the US Bureau of Reclamation in 2012. Consistent with the approved Adaptive Management Program, a series of five pulse flows ranging with peaks of 405 to 615 cfs in additional flows were released by EBMUD in October and early November. While an assessment of straying rates will not be available prior to this report's completion, there was an increase in salmon numbers entering the Mokelumne immediately during the closure and after each pulse flow event (see Figure 3). See Appendix B, the Lower Mokelumne River Experimental Action Plan, for stray rates from previous years. The partnership, working with the USBR completed a final Environmental

Assessment with no significant impact for a five year experimental plan associated with DCC operations during the October through November period.

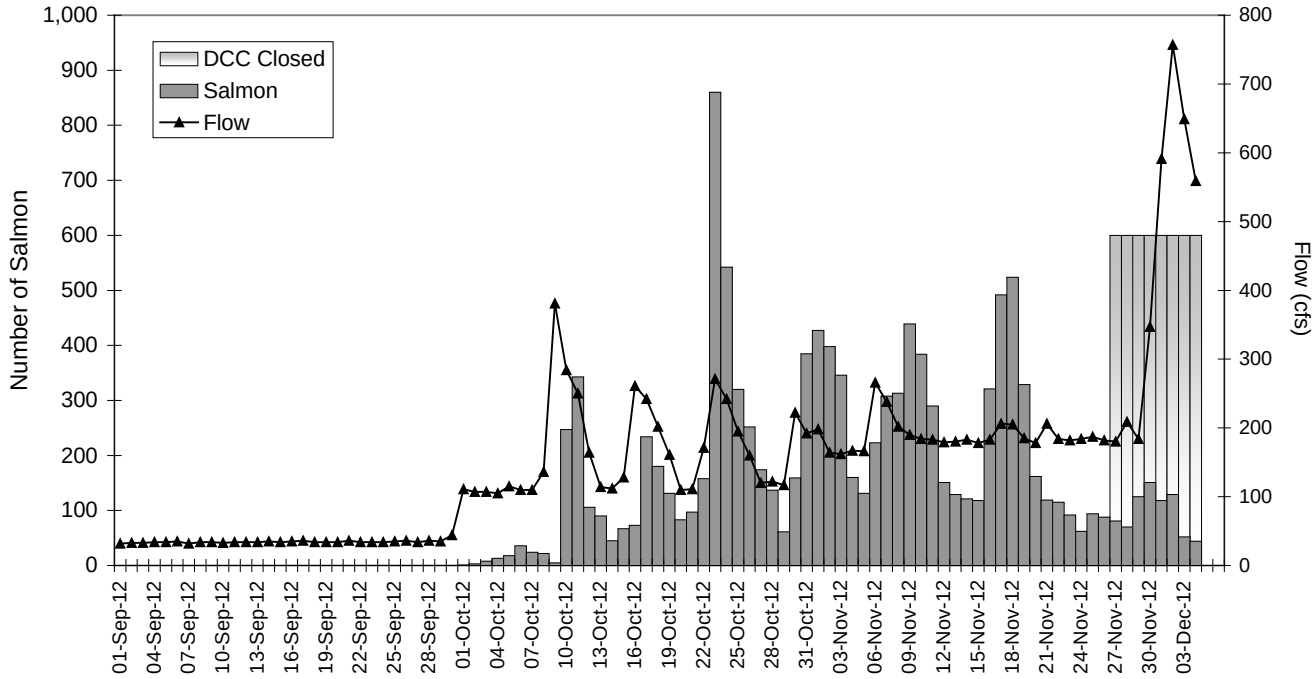


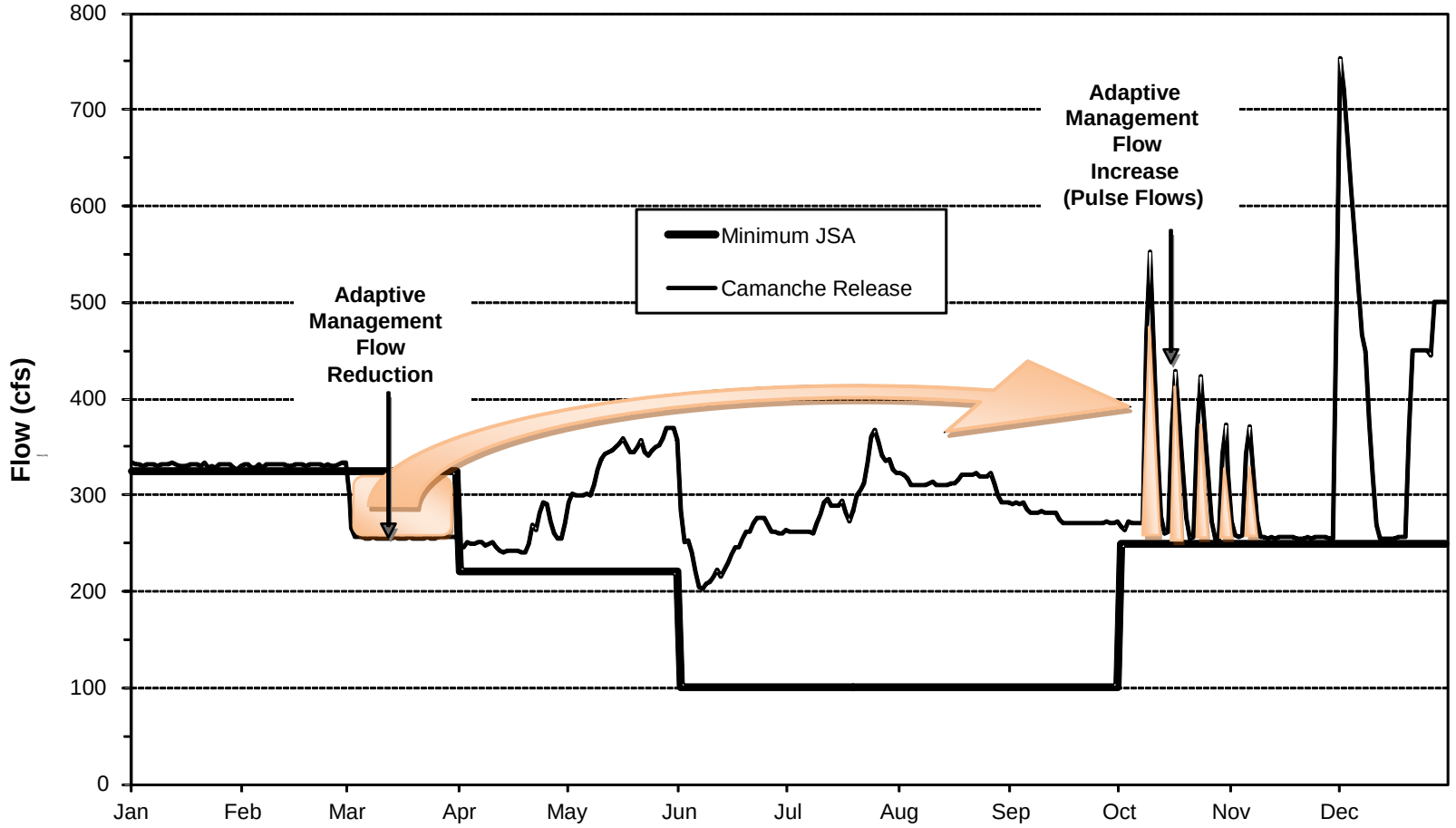
Figure 3: Daily upstream passage of Chinook salmon at Woodbridge Dam relative to flow and Delta Cross Channel closure, September – November 2012.

CWT return data clearly indicates that planting locations for hatchery reared juveniles plays a significant role in straying. In 2007 DFG planted nearly the entire MRFH production in the San Pablo Bay region. While this practice may increase overall survival, it significantly increases straying rates. With the elimination of egg transfers the overall impact to Mokelumne returns is significant. In 2012 CDFW continued the practice of releasing production in net pens at Jersey Point, which previous data indicates may result in better returns to the Mokelumne. Overall these adaptive management efforts will maximize returns to the Mokelumne River while minimizing straying to other systems.

Table 5: Calendar Year 2012 Release in Cubic Feet per Second from Camanche Dam.

Date	Camanche Release	JSA Release	Date	Camanche Release	JSA Release	Date	Camanche Release	JSA Release	Date	Camanche Release	JSA Release	Date	Camanche Release	JSA Release
01/01/12	333	325	03/16/12	255	325	05/30/12	369	220	08/13/12	311	100	10/27/12	255	250
01/02/12	331	325	03/17/12	255	325	05/31/12	357	220	08/14/12	311	100	10/28/12	255	250
01/03/12	332	325	03/18/12	256	325	06/01/12	283	100	08/15/12	312	100	10/29/12	343	250
01/04/12	330	325	03/19/12	255	325	06/02/12	252	100	08/16/12	312	100	10/30/12	373	250
01/05/12	331	325	03/20/12	255	325	06/03/12	253	100	08/17/12	316	100	10/31/12	322	250
01/06/12	331	325	03/21/12	255	325	06/04/12	241	100	08/18/12	321	100	11/01/12	273	250
01/07/12	331	325	03/22/12	254	325	06/05/12	220	100	08/19/12	321	100	11/02/12	258	250
01/08/12	330	325	03/23/12	256	325	06/06/12	205	100	08/20/12	321	100	11/03/12	256	250
01/09/12	331	325	03/24/12	255	325	06/07/12	202	100	08/21/12	321	100	11/04/12	258	250
01/10/12	331	325	03/25/12	255	325	06/08/12	208	100	08/22/12	322	100	11/05/12	342	250
01/11/12	331	325	03/26/12	256	325	06/09/12	210	100	08/23/12	320	100	11/06/12	371	250
01/12/12	333	325	03/27/12	257	325	06/10/12	216	100	08/24/12	320	100	11/07/12	322	250
01/13/12	331	325	03/28/12	257	325	06/11/12	222	100	08/25/12	320	100	11/08/12	275	250
01/14/12	330	325	03/29/12	257	325	06/12/12	215	100	08/26/12	322	100	11/09/12	256	250
01/15/12	330	325	03/30/12	256	325	06/13/12	222	100	08/27/12	313	100	11/10/12	257	250
01/16/12	330	325	03/31/12	256	325	06/14/12	230	100	08/28/12	299	100	11/11/12	255	250
01/17/12	331	325	04/01/12	245	220	06/15/12	239	100	08/29/12	293	100	11/12/12	256	250
01/18/12	332	325	04/02/12	246	220	06/16/12	246	100	08/30/12	293	100	11/13/12	255	250
01/19/12	331	325	04/03/12	251	220	06/17/12	245	100	08/31/12	292	100	11/14/12	256	250
01/20/12	330	325	04/04/12	250	220	06/18/12	255	100	09/01/12	291	100	11/15/12	256	250
01/21/12	334	325	04/05/12	250	220	06/19/12	261	100	09/02/12	293	100	11/16/12	257	250
01/22/12	329	325	04/06/12	252	220	06/20/12	261	100	09/03/12	290	100	11/17/12	257	250
01/23/12	330	325	04/07/12	252	220	06/21/12	270	100	09/04/12	292	100	11/18/12	256	250
01/24/12	329	325	04/08/12	248	220	06/22/12	276	100	09/05/12	286	100	11/19/12	255	250
01/25/12	331	325	04/09/12	250	220	06/23/12	276	100	09/06/12	281	100	11/20/12	255	250
01/26/12	332	325	04/10/12	251	220	06/24/12	277	100	09/07/12	282	100	11/21/12	255	250
01/27/12	332	325	04/11/12	245	220	06/25/12	269	100	09/08/12	281	100	11/22/12	256	250
01/28/12	331	325	04/12/12	242	220	06/26/12	261	100	09/09/12	283	100	11/23/12	255	250
01/29/12	328	325	04/13/12	241	220	06/27/12	262	100	09/10/12	282	100	11/24/12	256	250
01/30/12	327	325	04/14/12	242	220	06/28/12	260	100	09/11/12	281	100	11/25/12	257	250
01/31/12	330	325	04/15/12	242	220	06/29/12	260	100	09/12/12	281	100	11/26/12	256	250
02/01/12	331	325	04/16/12	242	220	06/30/12	263	100	09/13/12	281	100	11/27/12	256	250
02/02/12	331	325	04/17/12	242	220	07/01/12	262	100	09/14/12	275	100	11/28/12	254	250
02/03/12	329	325	04/18/12	240	220	07/02/12	261	100	09/15/12	271	100	11/29/12	255	250
02/04/12	328	325	04/19/12	240	220	07/03/12	261	100	09/16/12	270	100	11/30/12	501	250
02/05/12	331	325	04/20/12	249	220	07/04/12	261	100	09/17/12	271	100	12/01/12	753	250
02/06/12	329	325	04/21/12	269	220	07/05/12	261	100	09/18/12	270	100	12/02/12	721	250
02/07/12	331	325	04/22/12	263	220	07/06/12	261	100	09/19/12	271	100	12/03/12	670	250
02/08/12	331	325	04/23/12	282	220	07/07/12	261	100	09/20/12	270	100	12/04/12	617	250
02/09/12	331	325	04/24/12	293	220	07/08/12	260	100	09/21/12	271	100	12/05/12	568	250
02/10/12	331	325	04/25/12	291	220	07/09/12	270	100	09/22/12	271	100	12/06/12	517	250
02/11/12	331	325	04/26/12	273	220	07/10/12	280	100	09/23/12	271	100	12/07/12	467	250
02/12/12	331	325	04/27/12	260	220	07/11/12	292	100	09/24/12	271	100	12/08/12	449	250
02/13/12	330	325	04/28/12	255	220	07/12/12	296	100	09/25/12	270	100	12/09/12	376	250
02/14/12	330	325	04/29/12	255	220	07/13/12	289	100	09/26/12	270	100	12/10/12	320	250
02/15/12	331	325	04/30/12	271	220	07/14/12	288	100	09/27/12	272	100	12/11/12	269	250
02/16/12	331	325	05/01/12	292	220	07/15/12	289	100	09/28/12	270	100	12/12/12	255	250
02/17/12	331	325	05/02/12	302	220	07/16/12	294	100	09/29/12	271	100	12/13/12	255	250
02/18/12	330	325	05/03/12	300	220	07/17/12	281	100	09/30/12	272	100	12/14/12	255	250
02/19/12	331	325	05/04/12	300	220	07/18/12	272	100	10/01/12	267	250	12/15/12	255	250
02/20/12	331	325	05/05/12	300	220	07/19/12	284	100	10/02/12	264	250	12/16/12	255	250
02/21/12	332	325	05/06/12	302	220	07/20/12	299	100	10/03/12	272	250	12/17/12	256	250
02/22/12	332	325	05/07/12	299	220	07/21/12	305	100	10/04/12	271	250	12/18/12	257	250
02/23/12	330	325	05/08/12	310	220	07/22/12	313	100	10/05/12	271	250	12/19/12	256	250
02/24/12	331	325	05/09/12	326	220	07/23/12	333	100	10/06/12	270	250	12/20/12	368	250
02/25/12	330	325	05/10/12	337	220	07/24/12	360	100	10/07/12	271	250	12/21/12	450	250
02/26/12	330	325	05/11/12	343	220	07/25/12	367	100	10/08/12	464	250	12/22/12	450	250
02/27/12	332	325	05/12/12	345	220	07/26/12	355	100	10/09/12	553	250	12/23/12	450	250
02/28/12	333	325	05/13/12	346	220	07/27/12	340	100	10/10/12	453	250	12/24/12	450	250
02/29/12	333	325	05/14/12	350	220	07/28/12	336	100	10/11/12	353	250	12/25/12	451	250
03/01/12	299	325	05/15/12	353	220	07/29/12	337	100	10/12/12	278	250	12/26/12	444	250
03/02/12	265	325	05/16/12	359	220	07/30/12	327	100	10/13/12	260	250	12/27/12	501	250
03/03/12	256	325	05/17/12	352	220	07/31/12	322	100	10/14/12	262	250	12/28/12	500	250
03/04/12	256	325	05/18/12	345	220	08/01/12	322	100	10/15/12	367	250	12/29/12	500	250
03/05/12	256	325	05/19/12	344	220	08/02/12	321	100	10/16/12	428	250	12/30/12	501	250
03/06/12	254	325	05/20/12	349	220	08/03/12	317	100	10/17/12	380	250	12/31/12	500	250
03/07/12	255	325	05/21/12	357	220	08/04/12	310	100	10/18/12	328	250			
03/08/12	256	325	05/22/12	345	220	08/05/12	311	100	10/19/12	276	250			
03/09/12	255	325	05/23/12	340	220	08/06/12	310	100	10/20/12	255	250			
03/10/12	255	325	05/24/12	346	220	08/07/12	311	100	10/21/12	256	250			
03/11/12	255	325	05/25/12	349	220	08/08/12	311	100	10/22/12	364	250			
03/12/12	254	325	05/26/12	351	220	08/09/12	313	100	10/23/12	423	250			
03/13/12	255	325	05/27/12	359	220	08/10/12	314	100	10/24/12	373	250			
03/14/12	256	325	05/28/12	370	220	08/11/12	311	100	10/25/12	323	250			
03/15/12	255	325	05/29/12	370	220	08/12/12	310	100	10/26/12	273	250			

1. Releases in calendar year 2012 were made according to the "Normal/Above" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Below Normal" year flow schedule from Oct. 1 through Dec. 31.
2. Flow measured using Accusonic flow meter (USGS Gage #11323500 - Mokelumne River below Camanche Dam).
3. Flow data are accurate to within +- 2%.
4. Actual flow data has not yet been verified and published by the U.S. Geological Survey.



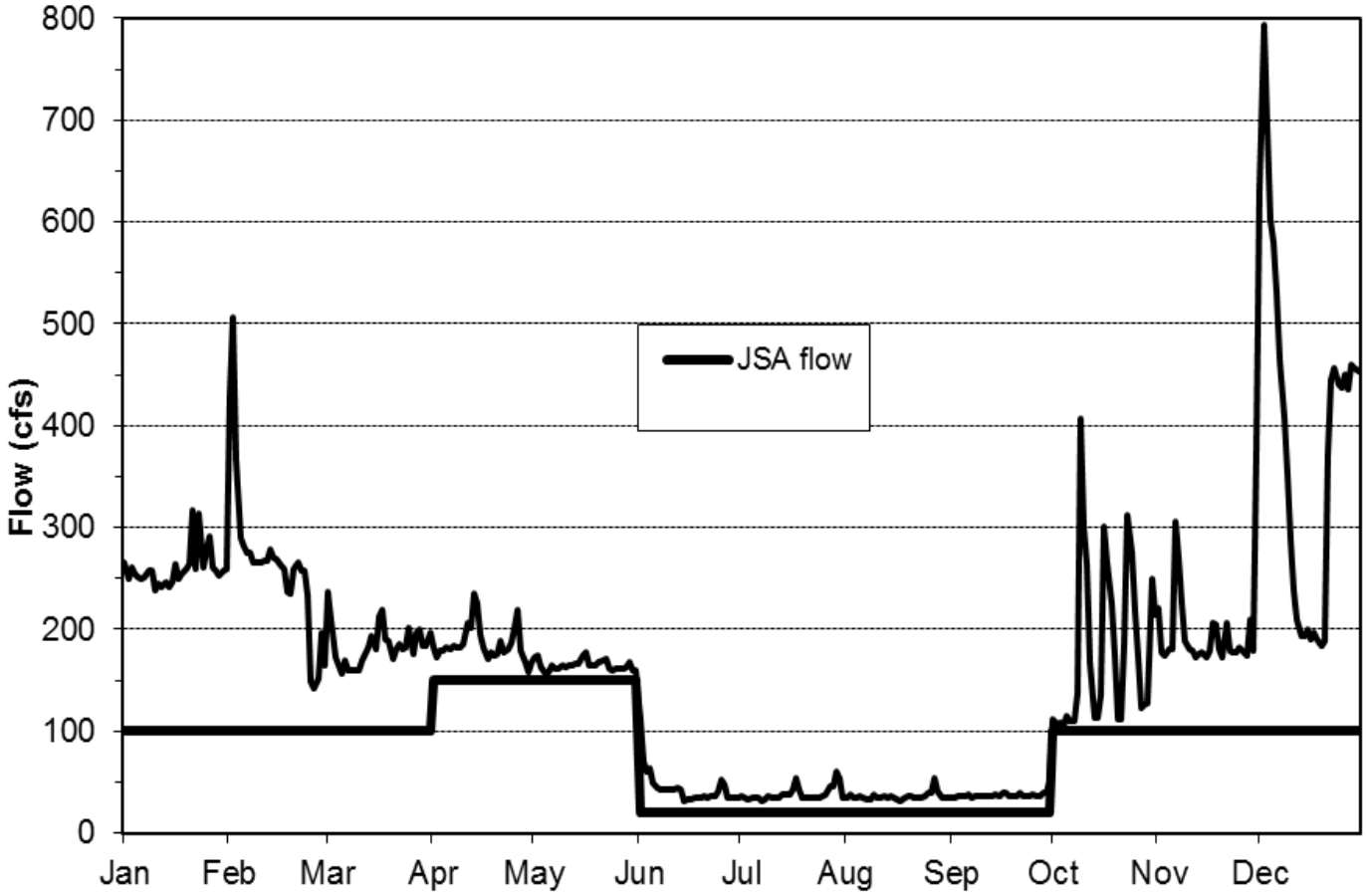
1. Releases in calendar year 2012 were made according to the "Normal/Above" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Below Normal" year flow schedule from Oct. 1 through Dec. 31.
2. Actual flow data has not been verified and published by the U.S. Geological Survey.

Figure 4: Calendar Year 2012 Average Daily Release in Cubic Feet per Second from Camanche Dam.

Table 6: Calendar Year 2012 Average Daily Flow in Cubic Feet per Second Below Woodbridge Dam.

Date	Actual Flow	JSA Expected Flow	Date	Actual Flow	JSA Expected Flow	Date	Actual Flow	JSA Expected Flow	Date	Actual Flow	JSA Expected Flow	Date	Actual Flow	JSA Expected Flow
01/01/12	265	100	03/16/12	213	100	05/30/12	160	150	08/13/12	35	20	10/27/12	123	100
01/02/12	250	100	03/17/12	219	100	05/31/12	159	150	08/14/12	36	20	10/28/12	126	100
01/03/12	260	100	03/18/12	191	100	06/01/12	112	20	08/15/12	35	20	10/29/12	128	100
01/04/12	255	100	03/19/12	189	100	06/02/12	70	20	08/16/12	33	20	10/30/12	249	100
01/05/12	251	100	03/20/12	171	100	06/03/12	61	20	08/17/12	32	20	10/31/12	214	100
01/06/12	250	100	03/21/12	181	100	06/04/12	63	20	08/18/12	34	20	11/01/12	220	100
01/07/12	251	100	03/22/12	185	100	06/05/12	49	20	08/19/12	36	20	11/02/12	178	100
01/08/12	257	100	03/23/12	180	100	06/06/12	44	20	08/20/12	37	20	11/03/12	174	100
01/09/12	258	100	03/24/12	182	100	06/07/12	42	20	08/21/12	34	20	11/04/12	180	100
01/10/12	239	100	03/25/12	201	100	06/08/12	42	20	08/22/12	34	20	11/05/12	180	100
01/11/12	245	100	03/26/12	176	100	06/09/12	42	20	08/23/12	35	20	11/06/12	306	100
01/12/12	242	100	03/27/12	196	100	06/10/12	43	20	08/24/12	37	20	11/07/12	270	100
01/13/12	246	100	03/28/12	200	100	06/11/12	42	20	08/25/12	40	20	11/08/12	226	100
01/14/12	242	100	03/29/12	184	100	06/12/12	45	20	08/26/12	40	20	11/09/12	188	100
01/15/12	247	100	03/30/12	184	100	06/13/12	42	20	08/27/12	54	20	11/10/12	181	100
01/16/12	264	100	03/31/12	196	100	06/14/12	32	20	08/28/12	41	20	11/11/12	179	100
01/17/12	249	100	04/01/12	182	150	06/15/12	33	20	08/29/12	34	20	11/12/12	173	100
01/18/12	254	100	04/02/12	173	150	06/16/12	33	20	08/30/12	35	20	11/13/12	175	100
01/19/12	259	100	04/03/12	179	150	06/17/12	35	20	08/31/12	35	20	11/14/12	178	100
01/20/12	264	100	04/04/12	179	150	06/18/12	35	20	09/01/12	35	20	11/15/12	172	100
01/21/12	317	100	04/05/12	182	150	06/19/12	35	20	09/02/12	35	20	11/16/12	179	100
01/22/12	259	100	04/06/12	181	150	06/20/12	37	20	09/03/12	36	20	11/17/12	207	100
01/23/12	313	100	04/07/12	184	150	06/21/12	35	20	09/04/12	37	20	11/18/12	205	100
01/24/12	260	100	04/08/12	183	150	06/22/12	36	20	09/05/12	37	20	11/19/12	180	100
01/25/12	279	100	04/09/12	182	150	06/23/12	37	20	09/06/12	38	20	11/20/12	172	100
01/26/12	291	100	04/10/12	185	150	06/24/12	41	20	09/07/12	35	20	11/21/12	207	100
01/27/12	260	100	04/11/12	207	150	06/25/12	53	20	09/08/12	37	20	11/22/12	179	100
01/28/12	257	100	04/12/12	201	150	06/26/12	48	20	09/09/12	37	20	11/23/12	177	100
01/29/12	253	100	04/13/12	235	150	06/27/12	35	20	09/10/12	36	20	11/24/12	178	100
01/30/12	257	100	04/14/12	226	150	06/28/12	34	20	09/11/12	36	20	11/25/12	183	100
01/31/12	259	100	04/15/12	195	150	06/29/12	34	20	09/12/12	37	20	11/26/12	177	100
02/01/12	430	100	04/16/12	183	150	06/30/12	34	20	09/13/12	37	20	11/27/12	174	100
02/02/12	506	100	04/17/12	171	150	07/01/12	37	20	09/14/12	38	20	11/28/12	210	100
02/03/12	367	100	04/18/12	177	150	07/02/12	34	20	09/15/12	36	20	11/29/12	179	100
02/04/12	290	100	04/19/12	174	150	07/03/12	33	20	09/16/12	39	20	11/30/12	375	100
02/05/12	281	100	04/20/12	176	150	07/04/12	34	20	09/17/12	39	20	12/01/12	631	100
02/06/12	275	100	04/21/12	188	150	07/05/12	34	20	09/18/12	37	20	12/02/12	794	100
02/07/12	276	100	04/22/12	177	150	07/06/12	34	20	09/19/12	37	20	12/03/12	692	100
02/08/12	266	100	04/23/12	180	150	07/07/12	32	20	09/20/12	36	20	12/04/12	603	100
02/09/12	266	100	04/24/12	187	150	07/08/12	33	20	09/21/12	39	20	12/05/12	580	100
02/10/12	266	100	04/25/12	201	150	07/09/12	37	20	09/22/12	37	20	12/06/12	530	100
02/11/12	268	100	04/26/12	219	150	07/10/12	34	20	09/23/12	37	20	12/07/12	465	100
02/12/12	267	100	04/27/12	179	150	07/11/12	35	20	09/24/12	37	20	12/08/12	409	100
02/13/12	278	100	04/28/12	167	150	07/12/12	35	20	09/25/12	38	20	12/09/12	353	100
02/14/12	270	100	04/29/12	158	150	07/13/12	38	20	09/26/12	37	20	12/10/12	288	100
02/15/12	269	100	04/30/12	167	150	07/14/12	38	20	09/27/12	37	20	12/11/12	239	100
02/16/12	262	100	05/01/12	173	150	07/15/12	38	20	09/28/12	40	20	12/12/12	209	100
02/17/12	259	100	05/02/12	174	150	07/16/12	43	20	09/29/12	39	20	12/13/12	193	100
02/18/12	236	100	05/03/12	163	150	07/17/12	54	20	09/30/12	50	20	12/14/12	194	100
02/19/12	235	100	05/04/12	157	150	07/18/12	43	20	10/01/12	111	100	12/15/12	200	100
02/20/12	259	100	05/05/12	158	150	07/19/12	34	20	10/02/12	107	100	12/16/12	190	100
02/21/12	266	100	05/06/12	165	150	07/20/12	34	20	10/03/12	108	100	12/17/12	196	100
02/22/12	257	100	05/07/12	161	150	07/21/12	35	20	10/04/12	106	100	12/18/12	190	100
02/23/12	258	100	05/08/12	161	150	07/22/12	35	20	10/05/12	115	100	12/19/12	184	100
02/24/12	234	100	05/09/12	164	150	07/23/12	35	20	10/06/12	110	100	12/20/12	189	100
02/25/12	149	100	05/10/12	163	150	07/24/12	34	20	10/07/12	110	100	12/21/12	372	100
02/26/12	142	100	05/11/12	164	150	07/25/12	37	20	10/08/12	138	100	12/22/12	445	100
02/27/12	152	100	05/12/12	165	150	07/26/12	38	20	10/09/12	406	100	12/23/12	457	100
02/28/12	197	100	05/13/12	166	150	07/27/12	46	20	10/10/12	301	100	12/24/12	440	100
02/29/12	164	100	05/14/12	166	150	07/28/12	46	20	10/11/12	264	100	12/25/12	438	100
03/01/12	236	100	05/15/12	174	150	07/29/12	61	20	10/12/12	168	100	12/26/12	450	100
03/02/12	209	100	05/16/12	177	150	07/30/12	54	20	10/13/12	114	100	12/27/12	436	100
03/03/12	172	100	05/17/12	165	150	07/31/12	35	20	10/14/12	113	100	12/28/12	460	100
03/04/12	164	100	05/18/12	165	150	08/01/12	35	20	10/15/12	135	100	12/29/12	457	100
03/05/12	156	100	05/19/12	164	150	08/02/12	38	20	10/16/12	301	100	12/30/12	454	100
03/06/12	170	100	05/20/12	167	150	08/03/12	34	20	10/17/12	266	100	12/31/12	454	100
03/07/12	160	100	05/21/12	170	150	08/04/12	34	20	10/18/12	226	100			
03/08/12	160	100	05/22/12	171	150	08/05/12	36	20	10/19/12	174	100			
03/09/12	159	100	05/23/12	161	150	08/06/12	34	20	10/20/12	111	100			
03/10/12	159	100	05/24/12	159	150	08/07/12	33	20	10/21/12	112	100			
03/11/12	170	100	05/25/12	161	150	08/08/12	33	20	10/22/12	186	100			
03/12/12	176	100	05/26/12	162	150	08/09/12	38	20	10/23/12	312	100			
03/13/12	182	100	05/27/12	162	150	08/10/12	34	20	10/24/12	275	100			
03/14/12	194	100	05/28/12	163	150	08/11/12	35	20	10/25/12	217	100			
03/15/12	181	100	05/29/12	167	150	08/12/12	36	20	10/26/12	172	100			

1. Expected flows past Woodbridge Dam in calendar year 2012 were according to the "Normal/Above" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Below Normal" year flow schedule from Oct 1. through Dec. 31.
2. Flow measured at USGS Gage #11325500 - Mokelumne River at Woodbridge.
3. Flow data are accurate to within +- 5%.
4. Actual flow data has not yet been verified and published by the U.S. Geological Survey.



1. Releases in calendar year 2012 were made according to the "Normal/Above" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Below Normal" year flow schedule from Oct. 1

Figure 5: Calendar Year 2012 Average Daily Flow in Cubic Feet per Second Below Woodbridge Dam.

2013

EBMUD is committed, pursuant to the FERC Order, to "Below Normal" JSA year type Camanche Dam flow releases through March 31, 2013. 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, 2013 DWR Bulletin 120, the JSA water year type which will govern EBMUD's flow schedule for the period April 1, 2013 through September 30, 2013. EBMUD will report to the FERC in the February 2014 report on the flow releases made in accordance with the JSA during the entire calendar year 2013. 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 2010 and 2011 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 LMRFH water temperatures in the optimal range for egg incubation, sand filters remove suspended solids from the hatchery water supply, and 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 functioning of the HOS system is 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 MRHF 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.

2012

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 year conditions. Resulting temperatures are shown in Figure 6, Calendar Year 2012 Mokelumne River Water Average Daily Temperatures of the Release from Camanche Dam.

From April 1, 2012 through September 30, 2012 EBMUD operated under a "Normal and Above" JSA water year type, with releases in accordance with the JSA minimum flows (see Adaptive Management under Section VI.F), and consistent with the JSA 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 2012.

2013

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, as it has in the past, about changes in real-time Lower Mokelumne River Project operations.

2. Hypolimnetic Oxygenation System

EBMUD takes proactive steps to prevent the hydrogen sulfide that can naturally occur 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 the formation of hydrogen sulfide in the Camanche Reservoir hypolimnion.

2012

The HOS was activated on August 29, 2012 and was shut down on November 28, 2012. The HOS was effective in preventing hydrogen sulfide formation.

2013

In 2013 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.

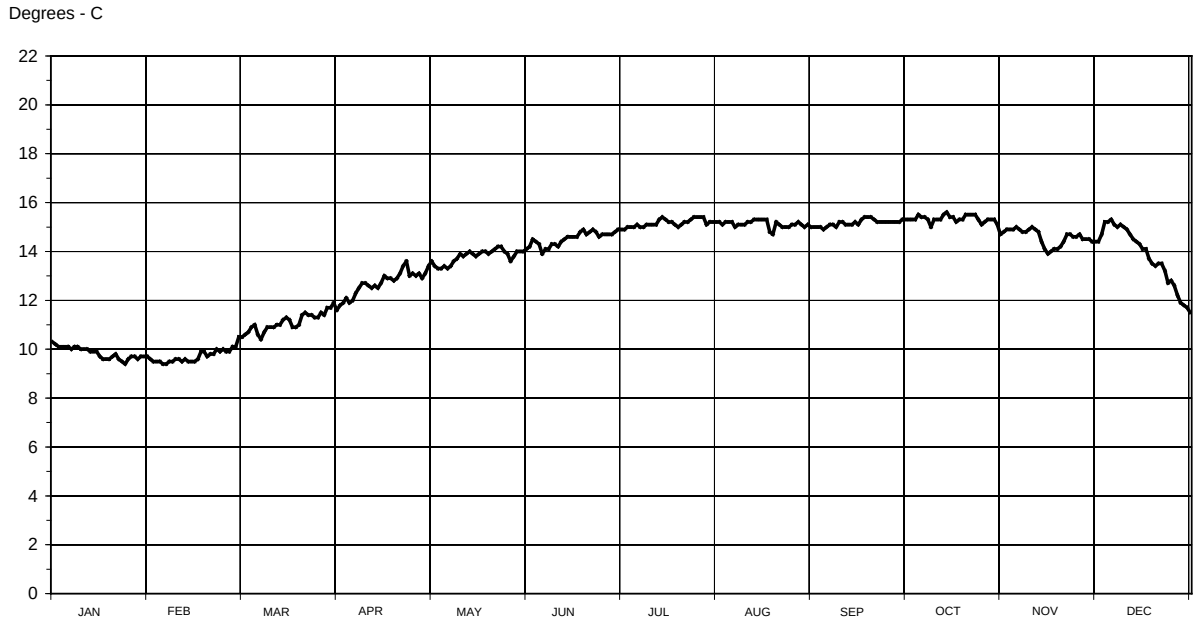


Figure 6: Calendar Year 2012 Mokelumne River Water Average Daily Temperatures of the Release from Camanche Dam.

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 11, 2012. 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 3, 2012 and September 27, 2012. In 2012 the PSC approved three projects, for a total of 34 projects since 1999, for Partnership funding. See Section IV.C.2 of this report for projects approved for Partnership funding in 2012 and projects with activity in 2012.

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. Interest from this fund provides operating funds for projects and programs to protect and enhance the lower Mokelumne River ecosystem. Since its inception, the fund has earned $811,519. The available earnings, after funds obligated to approved projects, were $155,372 as of December 31, 2012.

In 2012, the Partnership Steering Committee approved funding for the following three stakeholder proposals:

- **Watershed Coordinator – San Joaquin County Resource Conservation District.** Funding ($30,000 over 3 years) to support the SJCRCD's Lower Mokelumne River Watershed Coordinator position and the continued implementation of the Lower Mokelumne River Watershed Stewardship Plan and staff support for the Lower Mokelumne River Watershed Stewardship Steering Committee.

- **Lower Mokelumne River Watershed Education Legacy Project – City of Lodi.** Funding ($5,000) to (1) purchase supplies for the annual community volunteer cleanup effort on the lower Mokelumne River, and (2) support the implementation of a field trip for cleanup volunteers and students to the San Francisco Bay to learn about the connection between the lower Mokelumne River and the Pacific Ocean. The field trip Included hands-on learning aboard the Marine Science Coast Guard vessel *Robert G. Brownlee*.
- **Heritage Oak Winery Riparian Restoration and Streambank Stabilization Project.** Funding ($21,196) to support the riparian restoration (Phase 1). The approval of this funding was conditional – pending securing of additional funding for implementation of Phase 2 – streambank stabilization from other funding sources.

Ongoing projects funded by the PSC with activity in 2012 for ecosystem protection and restoration in the lower Mokelumne River are summarized in Table 7 on the following page.

Table 7: Partnership Fund-Supported Projects 2012 Activity Summary

Project Title	Project Sponsor	Project Description	Partnership Fund			Additional Funding	
			Date Approved by PSC	Anticipated Project Completion	Amount Obligated	Amount	Program
2008-2010 Watershed Coordinator grant Cash Match	San Joaquin County Resource Conservation District	Cash match for Dept of Conservation Watershed Coordinator Grant	5/2/2007	COMPLETED	$30,000	$183,425	California Dept. of Conservation - Watershed Coordinator
Invasive Species Removal - Hoffman Farms	Hoffman Farms/EBMUD	Remove Arundo donax from .2 acres	4/18/2011	COMPLETED	$750	in-kind labor hours	Boy Scouts of America
Lower Mokelumne River Watershed Stewards in Action and Education	City of Lodi	River cleanup supplies and field trip	10/4/2011	COMPLETED	$4,050	in-kind labor hours	City of Lodi
Vino Farms Ranch 5 Habitat Restoration	Vino Farms, Inc.	Planting of native plants on 2 acres	12/8/2011	COMPLETED	$1,225	in-kind labor hours	Vino Farms, SLEWS students
2012-2014 Watershed Coordinator	San Joaquin County Resource Conservation District	Cost-share to continue support of SJCRCD watershed coordinator position	4/23/2012	Fall 2014	$30,000	-	-
Lower Mokelumne River Watershed Education Legacy Project	City of Lodi	River cleanup supplies and field trip	9/19/2012	Spring 2013	$5,000	In-kind labor hours; Funding	Starbucks; Arts in Public Places Committee (City of Lodi)
Heritage Oak Winery Riparian Restoration and Streambank Stabilization Project	Tom and Matt Hoffman; Mokelumne Environmental Benefits Program	Phase 1: Invasive species removal, planting of riparian native plants; Phase 2: Streambank stabilization (bio-engineering)	11/15/2012	Spring 2015	$21,196	**$74,448	**Partnership Funding conditional on project sponsor securing balance of project funding ($ and in-kind labor)

3. Water Quality and Resource Management Program

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

EBMUD, the USFWS, and CDFW began implementing the specific WQRMP measures in 1999. These measures, including the ones implemented in 2012, 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 Partnership 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 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 2012, EBMUD and the Partnership continued as regular participants in the work of the Stewardship 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 2012, the Stewardship Steering Committee led watershed tours for state legislative and California Department of Conservation representatives and also continued work towards increasing watershed stewardship awareness among urban landowners along the Mokelumne River and elsewhere in the watershed by initiating the process to update the LMRSP *Mokelumne River Owner's Manual*. Additional information on the Stewardship Program, including the watershed owner's manual is available on the Internet at www.sjcrcd.org.

5. Additional EBMUD Stakeholder Activities

2012

In 2012, 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 2012 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 2012, with funding from AFRP, EBMUD added 3,574 cubic yards of spawning gravel to a 0.2 km section of the one km SHIRA reach by the placement of 3,574 short tons of three sizes of gravel and also six boulders and large woody material.
- Participation and sponsorship of the 15th annual Sandhill Crane Festival in Lodi, CA on November 2-4, 2012. 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. EBMUD staff has lead field trips to view bald eagles at Pardee Reservoir. (1997-present)
- Participation in the 15th annual Central Valley Birding Symposium in Stockton on November 15-18, 2012. EBMUD staff led 1 field trip on Pardee Reservoir.
- Continuing active involvement with the state's Biologically Integrated Orchard Systems Program (BIOS) in San Joaquin County. BIOS is designed to support local agricultural growers through the use of biological pest control and ecologically friendly (Integrated Pest Management Program) agricultural methods. EBMUD biologists participate as advisors to individual farmers, UC Cooperative Extension specialists, and Natural Resource Conservation Service staff on wildlife issues in San Joaquin County. (1998-present)
- Continuing active involvement with the Lodi-Woodbridge Winegrape Commission (LWWC). The LWWC is designed to support local grape growers through the use of biological pest control and ecologically friendly (Integrated Pest Management Program) agricultural methods. EBMUD biologists participate as advisors to the LWWC, individual farmers, UC Cooperative Extension specialists, and Natural Resource Conservation Service staff on wildlife issues in the lower Mokelumne River watershed. (1998-present)
- Presentations on fish and wildlife issues to local sportsmen's groups, community groups, local schools, and local fishing and environmental organizations. (Ongoing)
- Periodic participation as docents for the Lodi Parks and Recreation Department by giving presentations, nature tours, and demonstrations on fish and wildlife issues in the lower Mokelumne River. (1998-present)

- Providing continuing technical support to the SJCRCD 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 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. (2007-present) The SHA covers the valley elderberry longhorn beetle on District land in San Joaquin County.
- Continue to participate with the U.S. Fish and Wildlife Service in the "Safe Harbor Agreement for East Bay Municipal Utility District Lands in San Joaquin, Amador, and Calaveras Counties", which was implemented in 2009. The SHA covers valley elderberry beetles, California tiger salamanders, and California red-legged frogs on District land in the aforementioned counties.
- Participation with the Sierra Nevada Conservancy, U.S. Forest Service, Sustainable Conservation, Mokelumne Consensus Group, Sure Harvest, Environmental Defense Fund, and others in the development of a pilot program to measure environmental benefits in the Mokelumne River watershed. (Ongoing)

2013

In 2012, 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

2012

At the April 27, 2012 meeting of the Board of Directors, the District accepted the 2012 Water Supply Availability and Deficiency Report declaring the availability of water to be used by Resource Agencies for 2012. 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.

2012

In 2012, 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 24, 2012 and July 17, 2012.

2013

Pursuant to Section H.1 of the JSA, EBMUD, USFWS, and CDFW agree that they will continue to actively support the MRTAC as a technical information-sharing forum and that the Partnership Steering Committee will review the need for the MRTAC periodically, with input from the Stakeholders Group. The next MRTAC meeting is scheduled for February 5, 2013.

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 2012, EBMUD continued updating this database. The Mokelumne Science Database consists of two parts, the written record (reports, correspondence, scientific literature and historic documents) and an electronic database (Oracle® format). The written record is compiled and cataloged by EBMUD. The District also provides scientific data to the Central Valley Project Improvement Act (CVPIA) Comprehensive Assessment and Monitoring Program (CAMP) to evaluate the relative effectiveness of CVPIA actions in restoring anadromous fish production. Recently, CAMP has developed a standardized database for juvenile outmigration monitoring in the California Central Valley. During this process EBMUD has worked with CAMP to transfer all juvenile trapping data collected on the lower Mokelumne River to the CAMP platform. Other contributors to the CAMP database include several resource agencies and associated contractors conducting juvenile outmigration monitoring in the California Central Valley.

E. RESEARCH AND MONITORING

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

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

2012

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.
- Implementation of a passive integrated transponder and telemetry study of striped bass, and Chinook salmon smolts and yearlings in the lower Mokelumne River to assess movement, migration success and distribution.
- 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 salmonids predators from the Mokelumne River.

2013

EBMUD will continue similar research and monitoring activities in 2013. These efforts will be described in full in the calendar year 2013 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:

2012

- 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 2012 EBMUD placed 3,574 cubic yards of spawning gravel in the lower Mokelumne River at a site adjacent to the Mokelumne River Day Use Area. The Anadromous Fish Restoration Program (AFRP) administered by the U.S. Fish and Wildlife Service provided $118,000 and EBMUD provided $25,000 to fund the project. The weekly redd survey results indicate that anadromous fish are using the enhancement gravel. 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 practices and livestock grazing along riparian zones to reduce stream bank erosion and fine sediment input. EBMUD continues working with winegrape and walnut growers to enhance and restore riparian vegetation. In 2012, 225 (Vino Farms Ranch #5) trees and shrubs (blue elderberry, *Sambucus Mexicana*, California wild rose, *Rosa californica*; Cleaveland Sage, *Salvia cleavelandii*; coyote bush, *Baccharis pilularis*; interior live oak, *Quercus wislizenii*; Island Bush Poppy, *Dendromecon harfordii*; Quail Bush, *Atriplex lentiformis*; Red Twig dogwood, *Cornus sericea*; Spice bush, *Calycanthus occidentalis*; St. Catherine's Lace, *eriogonum giganteum*; Toyon, *Heteromeles arbutifolia*; Twin Berry, *Lonicera involucrate*; valley oak, *Quercus lobata*; western

redbud, *Cercis occidentalis*; and White Icicle Current, *Rosa californica*) were planted in the Mokelumne River corridor.

- Providing technical support in seeking grant funding to continue implementation of *Lower Mokelumne River Stewardship Plan*, primarily restoration and invasive plant removal. Anticipated funding sources include: Wildlife Conservation Board, USFWS Partners for Fish and Wildlife and Private Stewardship Grant Program, LMR Partnership, DWR, CBDA, Central Valley Joint Venture, and Ducks Unlimited.

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

- Continuing implementation of $1.3 million SWQCB grant. This includes EBMUD involvement with prioritization for riparian restoration, permitting, and providing technical advice.
- Participated in Lower Mokelumne River Restoration Tour coordinated by EBMUD and the San Joaquin County RCD. The tour involved local land owners, Department of Conservation staff from their office of government and environmental relations, the State Watershed Coordinator, Woodbridge Wine Grape Commission, and 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 EBMUD property in the Mokelumne River Watershed in San Joaquin County.
- Continuing to work with the USDA NRCS to promote EQIP, 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.

2013

Many of the above habitat improvement activities will continue in 2013. A full description of 2012 activities will be reported in calendar year 2013 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, 2012 and will be removed in early 2013. It is anticipated that it will be installed and operated during approximately same period in 2013.

V. APPENDICES

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

Appendix B: Correspondence Related to the 2012 Adaptive Management Flow Change Fall 2012 Attraction Flow

Appendix C: USGS Verified Flow Data for 2010 and 2011

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

Catching fish — and the sights — on the Mokelumne River

The Lower Mokelumne River has officially opened, and local fishing fans are taking the chance to bag rainbow trout and

Dan Evans/News-Sentinel

Shrouded by steam rising from the water, Mike Nicholson of Stockton casts out his line while fly fishing at the the Mokelumne River day use area early Wednesday, Jan. 4, 2012. The river opened for fishing season on Jan. 1.

A closer look at rainbow trout and steelhead

> Rainbow trout are running rampant through the Lower Mokelumne right now. The fish are native only to the region west of the Rocky Mountains. They are colorful, with patterns that vary depending on the habitat and a fish's age. They're members of the salmon family and can grow to about 20 to 30 inches and 4 pounds.
>
> Some adult fish migrate out to the open ocean and acquire a silvery sheen. These are called steelhead, and spend several years growing strong at sea before fighting their way up their natal streams to spawn.
>
> Rainbow trout and steelhead have healthy, strong populations and are under no special status or protections. In some areas, they are actually considered a non-native pest species.
>
> — *Source: www.nationalgeographic.com*

Posted: Thursday, January 5, 2012 12:00 am | *Updated: 6:03 am, Thu Jan 5, 2012.*

By Sara Jane Pohlman/News-Sentinel Staff Writer Lodinews.com |

The sun was barely rising over a nearby ridge as Mike Nicholson climbed out of his red pickup truck and pulled on a new pair of waders and his boots at the Mokelumne Fish Hatchery Day Use Area on Wednesday. Nicholson set up his 9-feet-long fly fishing rod and fixed a nymph, or sinking fly, to his line.

"I hope there's some steelhead," Nicholson said. "If not, I'll catch little rainbow trout out there."

Nicholson strapped on a tackle bag, tucked a net into his belt and secured a wool beanie over his baseball cap. He scoped out an ideal spot and waded thigh-deep into the river, flicking his line back and forth before sending out a long cast.

Taking in the gently flowing water and calm scenery, it's easy to see what draws people out into the cold winter air.

"This is where I get away from it all. It's peaceful," he said.

The Lower Mokelumne River is now officially open for fishing. Salmon often get the most attention and publicity, but the river is home to a robust population of rainbow trout and steelhead, too. Those are the quarry this time of year. And with unusually sunny weather, fisherman can catch some rays while they catch fish. The season runs through March 31; a second season runs from late May through Oct. 15.

On opening day, the Delta Fly Fishermen were on site at the Mokelumne day use area, offering coffee and doughnuts to the crowd and trying to drum up membership.

River aficionados warn that if you go strictly for the catch, you might miss something. There's lush scenery on the banks and otters, beavers, herons and bald eagles also call the area home.

"It's a celebration of getting fish to bite, the fun of fighting that fish," said Bill Ferrero, who runs a fishing guide service called Mokelumne River Outfitters. He is a strong promoter of careful catch-and-release to preserve fish populations.

For those who do head out, Ferrero offers some advice.

"Understand all the rules," he emphasized.

This means showing up with a fishing license and a steelhead report and restoration card already filled out. The card serves to gather catch data over time and to pay for projects dedicated to restore and manage California steelhead habitats.

Remember only one hatchery fish, identified by a clipped adipose fin, is permitted per person per day to take home. Wading is fine, but do keep an eye out for salmon redds, or nests, marked by bright yellow and red flags. Disturbing them could damage the fragile eggs.

Chinook salmon have had a very good year on the Mokelumne, according to Bill Smith, general manager of the Mokelumne River Fish Hatchery.

The fall run saw 15,000 fish return to the hatchery. Compare that to a little over 5,200 last year, and it's easy to see the river is thriving. Due to continuing restoration efforts, there has been no salmon fishing season on the Mokelumne since 2007.

Smith credits a change in salmon release strategies, attraction flows sent down from Camanche Reservoir and closing the Delta Cross Channel gates in October with the rise in numbers, along with good survival rates of young salmon out in the ocean.

Salmon fishing regulations have not yet been released, but Smith says this year might be the one in which salmon are again up for grabs.

Contact reporter Sara Jane Pohlman at sarap@lodinews.com.

Salmon numbers booming

Ocean conditions, Delta experiment credited for growth

By ***Alex Breitler***
Record Staff Writer
January 06, 2012 12:00 AM

A record number of fall-run Chinook salmon returned to the Mokelumne River to spawn in 2011, just three years after salmon populations plummeted across the Central Valley.

Fish counts at Woodbridge Dam exceeded any year since monitoring began in the 1940s. Some swam upstream all the way to the fish hatchery below Lake Camanche, where they were killed and their eggs and sperm harvested to make baby fish. Or, they spawned in the river on their own.

Either way, officials say the Mokelumne has rebounded from the disaster of the late 2000s faster than any other stream in the Valley, swelling from a mere 418 fish in 2008 to more than 18,500 this past season (with a few stragglers still heading home this week).

Improved conditions in the ocean, where salmon spend most of their adult lives, are believed to be one reason for the overall increase in Central Valley salmon.

But a unique experiment with Delta plumbing appears to have also helped Mokelumne fish. And if an upcoming study proves that to be true, officials say the remarkable improvement could help frame future cooperation among agencies and interest groups that might normally disagree.

"You don't have to sacrifice environmental or economic issues, one against another," said Calaveras County Supervisor Steve Wilensky. "For no cost, we have the beginnings of the restoration of a tremendous salmon run. This has all kinds of implications for recreation and local economies. ... The idea that a river could go from near extinction to this level just holds all kinds of promise."

The "experiment" happened in October, when federal officials closed a gate on the Delta Cross Channel, which connects the Mokelumne to the nearby Sacramento River.

Normally, fresh water from the Sacramento is diverted through the channel into the central Delta instead of flowing farther west toward San Francisco Bay. The diverted water is then pulled to south Delta pumps that supply cities and farms from the Bay Area to San Diego.

The jet of Sacramento River water confuses migrating salmon. Instead of returning to their native stream, they follow the fresh water and turn up the Sacramento. They wind up many miles from home.

Last October's 10-day closure kept more fish in the Mokelumne. Just how many more is unknown, but thousands of fish heads should provide the needed clues.

When they were young, the salmon were implanted with tags the size of a grain of rice. Biologists must now cut open the heads of the dead adults, extract the tags and read them with a microscope to learn where the fish originated.

That work won't be finished for three or four months, said Richard Sykes. He is the director of water and natural resources for the East Bay Municipal Utility District, which diverts Mokelumne water to the Bay Area and has worked to repair the once-broken river.

"We have so many fish heads to read," Sykes said.

But he does believe closing the gate helped the fish.

An even bigger return might be in store for 2012. Most salmon spawn after three or four years in the ocean, but a large number of returning salmon this year were only 2 years old, foretelling greater numbers to come.

"We could burst the riverbanks next year," Sykes said.

The Mokelumne could be reopened to recreational salmon fishing for the first time since the crash, he said.

Other streams, including the Stanislaus River, also saw more fish last year but have not recovered to levels seen a decade ago.

The Tuolumne River swelled from 264 fish in 2009 to 2,810 fish in 2011. "Going from a couple hundred fish to a couple of thousand in a short period of time, it really does show you how resilient the populations are," said Doug Demko, a consulting fisheries biologist.

Even the Calaveras River through Stockton hosted salmon for the first time in four years.

Demko cautions that more fish doesn't always mean a healthy population. Many returning fish were bred in hatcheries, meaning they lack the genetic diversity of wild salmon and might be more susceptible to disease.

Historical perspective is also important. While this year's Mokelumne run is a record, thousands more fish probably made it upstream before records were kept - before the dams were built, blocking upstream habitat, and before intensive Gold Rush mining activities poisoned and dewatered the river.

Finally, the fact that there was plenty of water last year made it possible to close the cross channel without denting water supplies for cities and farms. That's not a given in future years.

For now, however, Wilensky said a rebound on the Mokelumne can only be good news. He credits collaboration among state and federal agencies, East Bay MUD and upstream interests.

For Calaveras County itself, salmon attract fishermen who buy fuel at gas stations, stay at hotels and eat in restaurants, Wilensky said.

"This kind of thing brings attention to the recreational possibilities in our area," he said.

Contact reporter Alex Breitler at (209) 546-8295 or abreitler@recordnet.com. Visit his blog at recordnet.com/breitlerblog.

Lodi News Sentinel, March 5, 2012

Catch of the Week

Daniel Arbuckle of Lodi holds a 24-inch steelhead he caught from his kayak while backtrolling with a nightcrawler on the Mokelumne River.

Posted: Tuesday, August 7, 2012 10:03 am | *Updated: 10:56 am, Tue Aug 7, 2012.*

Salmon, and salmon counters, return to the Moke

By Joel Metzger Calaveras Enterprise |

Large Chinook salmon runs in the Mokelumne River last year signaled the return of the prized fish to foothill rivers after numbers precipitously declined in 2007.

In order to properly manage wild salmon and protect fisheries in the future, the state Department of Fish and Game is conducting angler surveys on the Mokelumne, American, Feather and Sacramento rivers to determine how many salmon are being caught.

Over the next five months, survey crews will repeatedly visit 20 different sections of river to cover the full extent of the inland salmon fishery. Survey crews count the number of boats and anglers, weigh and measure each fish caught and collect the heads of those salmon imbedded with a coded wire tag.

"The information the survey crews collect is vital to understanding the dynamics of the salmon fishery resource and for setting seasons in the future," said Mike Brown, a DFG environmental scientist who leads the salmon survey project. "The collection of salmon heads imbedded with tiny coded wire tags provides a history of how each hatchery release has fared and gives us information that can help guide salmon management in future years."

Funding for the survey comes mostly from the federal Sport Fishing Restoration Act, which is funded from a hidden tax on all sporting equipment for fishing and hunting, Brown said. The remainder of the funding is a state match, which comes from the Bay-Delta Sport Fishing Enhancement stamp.

"The study will run as long as we can keep it going," Brown said. "It's a high department priority. We need to have this type of survey in order to keep salmon fisheries going."

Before Camanche and Pardee dams were built, historical records indicate there were fall and spring salmon runs on the Mokelumne, according to a study, see the link here, written by Ronald Yoshiyama, Eric Gerstung, Frank Fisher and Peter Moyle.

"In what is probably the earliest record of salmon in the Mokelumne River, the fur trapper Jedediah Smith, having encamped on "Rock River" (Mokelumne River), wrote in his journal for 22 January 1828: 'Several Indians came to camp and I gave them some tobacco. They brought with them some fine salmon some of which would weigh 15 or 20 pounds. I bought three of them and one of the men killed a deer ...,'" the study said.

District 2 Supervisor Steve Wilensky was ecstatic last December when he spoke with the Enterprise about the unprecedented resurgence of salmon in the Mokelumne.

"Three years ago (about 400) salmon returned to the Mokelumne," Wilensky said.

After negotiations, gates in the Delta properly positioned during spawning time to allow more fish to get back to their native sands.

"That year 4,000 salmon returned," Wilensky said. "That's nothing. This year they closed the gates for 10 days to see what would happen – 20,000 had been counted and they were still coming. No river in California history has had that kind of exponential change as a result of human intervention or the cessation in that short of time with that huge of increase. That's record breaking."

Wilensky hopes the DFG will stay committed to restoring the salmon run on the Mokelumne.

"We think that's the ultimate goal," he said. "To restore the Mokelumne and develop a huge salmon run would be quite a legacy. I think that's a real big deal."

How many of the salmon returning the Mokelumne are native as compared to the number hatchery raised was unclear as of press time Monday. Some people believe the vast majority of returning salmon are raised in the hatchery and wild salmon populations are not sustaining themselves.

Whether hatchery raised or wild, Brown said keeping good records on how many salmon are being caught in the rivers in and around the Central Valley is very important.

"This is the first year the Mokelumne will be open for salmon fishing since its closure in 2008," Brown added. "When the salmon stocks declined systemwide, we closed every single river in the Central Valley. In 2010, we opened up the Sacramento side. We weren't sure about the Mokelumne. This is the first year we were comfortable opening (the Mokelumne) back up."

During the 2011 Central Valley fall run Chinook salmon sport fishery survey, crews contacted more than 4,000 fishing parties, measured 2,805 salmon and collected 652 salmon heads with coded wire tags in them. This and other baseline information were fed into a computer program that estimated the total effort and harvest of Chinook salmon in the 2011 Central Valley river sport fishery.

Those results showed about 60,500 salmon were caught and kept and 10,990 salmon were released for a total catch of 71,489. Seventy percent of the salmon kept were two-year-olds, also known as "jacks."

Anglers fished on average about 14 hours to catch a salmon, with 843,098 hours spent fishing.

The 2012 salmon season is anticipated to be more productive than 2011. The season runs from July to December.

Since 2007, 25 percent of salmon smolts released at each of the five Central Valley salmon hatcheries had their adipose fin clipped and a tiny coded wire tag inserted into the fleshy portion of their snout.

Samplers check each salmon to see if its adipose fin, the small fleshy lobe on the fish's back between the dorsal fin and the tail fin, is missing. If it is missing, the fish bears a coded wire tag. During the survey, samplers carry large plastic bags for anglers' to carry salmon after heads are removed. Upon request, the angler survey will provide the angler with a recognition letter containing information about their catch, including hatchery origin, age and release information. Although anglers on occasion do not want samplers to take the head off their catch, most voluntarily comply once the reason for the collection is explained.

Anglers can review a summary of the Central Valley Fall-Run Sports Fishery for 2011 on

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Anglers can review a summary of the Central Valley Fall-Run Sports Fishery for 2011 as a related link above.

Contact Joel Metzger at joel@calaverasenterprise.com

Why Coke cares about Mokelumne

By ***Alex Breitler***
Record Staff Writer
October 28, 2012 12:00 AM

It is 170 miles from the headwaters of the Mokelumne River to the Bay Area plant where Coca-Cola makes millions of bottled beverages every year.

But the world's largest soft drink company said it has a vested interest in that river.

And it has backed that up with a $200,000 check.

Coke recently paid that sum to help the U.S. Forest Service restore fragile meadows in the Indian Valley area, nine miles southwest of Carson Pass in the Mokelumne watershed. The restored meadows will soak up more snowmelt and release it slowly over the course of the dry season, rather than all at once during the spring.

Why does Coke care about the Mokelumne? That bottle in your fridge might well be courtesy of the river, which the East Bay Municipal Utility District diverts into aqueducts burrowing directly beneath Stockton and through the Delta.

Coke said the meadow restoration will offset about 90 percent of the water in the drinks produced at its San Leandro plant. That's part of a bigger plan to be "water neutral" across Earth by 2020.

"It does cost money, but for us we consider it an investment into our long-term sustainability," said Jon Radtke, Coke's water resource manager. "It's a business decision for us. We need (the water), the whole community needs it."

The company has been accused at times of depleting water resources in the course of producing billions of drinks.

It takes 1.75 liters of water to produce a 1-liter beverage. The extra water is needed to sanitize the bottles, Radtke said.

Coke is not pledging to offset all of the water it uses, but rather all of the water that directly goes into its beverages. Radtke said the company is about 35 percent of the way to that goal.

Far from the plant, the meadows at Indian Valley had been degraded over the years from both human activities and natural conditions. The stream through the meadow had eroded, and the groundwater level had dropped.

Ensuring the survival of Chinook salmon

Dan Evans/News-Sentinel

Cynthia Pierce of the Department of Fish and Game scoops out eggs from a mature female salmon at the Mokelumne Fish Hatchery on Thursday, Dec. 13, 2012.

Posted: Thursday, December 20, 2012 12:00 am | *Updated: 6:14 am, Thu Dec 20, 2012.*

In a warehouse filled with large basins of cold water, where the smell of fish fills the air, about a dozen biologists help bring life to the next generation of salmon.

In recent years, the Chinook salmon population in California has shrunk dramatically.

Each spawning season, Department of Fish and Game biologists at the Mokelumne Fish Hatchery dispatch hundreds of salmon to grow the population by hundreds of thousands.

With hammer-swings followed by dull thuds, mature salmon are killed. The lifeless salmon are then rinsed clean of blood with hoses. Eggs are cut from the bellies of females and mixed with milt from males.

The fertilized eggs are raised in basins until they become smolt. They are then tagged and released into the Delta.

The process, though a somewhat brutal end for the adult salmon, is necessary to keep the population of salmon up.

In the spring, more than 300,000 salmon will be released into the Delta.

APPENDIX B

CORRESPONDENCE RELATED TO THE 2012 ADAPTIVE MANAGEMENT FLOW CHANGE—FALL 2012 ATTRACTION FLOW

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4700

FEB 1 2012

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

Dear Mr. Miyamoto:

This letter is in response to your request for NOAA's National Marine Fisheries Service (NMFS) support of the Joint Settlement Agreement (JSA) Adaptive Management Flow Change on the Mokelumne River. The request was made on January 24, 2012, at the Mokelumne River Technical Advisory Committee meeting, which NMFS attended.

NMFS is not a signatory to the JSA nor have we consulted under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), with the appropriate federal agency or East Bay Municipal Utilities District (EBMUD) regarding the effects to steelhead from the current JSA flow schedule. NMFS provided technical assistance to EBMUD regarding flow changes in May 2009 and again in April 2010. This is the third year NMFS is providing our opinion as technical assistance. NMFS' response is provided as technical assistance with EBMUD, and is not intended to take the place of formal comments or consultation as required under the ESA, and does not provide incidental take authorization pursuant to section 7(b) (4) and section 7(o) (2) of the ESA.

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

EBMUD proposes to reduce the JSA required release for March and potentially April, May and June 2012 based upon JSA water year type for April-October 2012 of either "Below Normal" or "Dry." Under these conditions, there will be limited water available above the JSA minimum levels in October 2012 with which to conduct the experimental pulse flows that appear to help reduce straying rates for Mokelumne origin Chinook salmon. The pulse flow would occur during the first two weeks of October, adaptively coordinated for maximum effect contingent on fish presence within the Mokelumne system and operations on other river systems, such as the American River.

Scenario 1: "Below Normal" April-October 2012 Water Year Type

The proposed adaptive flow change would come from a reduction of spring flows March - June 2012. The proposal would: 1) reduce the required JSA Camanche release from 325 to 250 cubic feet per second (cfs) in March, 2) reduce the required JSA Camanche release from 300 to 250 cfs in April - June, 3) reduce the expected flows below Woodbridge Dam from 150 to 100 cfs in April and 200 to 150 cfs in May - June and 4) provide approximately 14 TAF of water for a pulse flow in October for migrating adult Chinook salmon.

Scenario 2: "Dry" April-October 2012 Water Year Type

The proposed adaptive flow change would come from a reduction of spring flows in only March. The proposal would: 1) reduce the required JSA Camanche release from 325 to 250 cfs in March, with no change in the expected flows below Woodbridge Dam and 2) provide approximately 4 to 5 TAF of water for a pulse flow in October for migrating adult Chinook salmon.

In an effort to adaptively manage the flows and monitor potential impacts to downstream salmonids, EBMUD proposes to monitor water temperatures below Woodbridge Dam during May and June of 2012, as has been done in previous years. If water temperatures exceed 22 degrees Celsius, JSA parties and NMFS will be notified and measures will be taken to reduce temperature impacts. NMFS agrees that the flows should be adaptively managed and using temperature as an indicator for monitoring potential impacts to salmonids. The fall pulse flow may benefit adult CV steelhead returning to the Mokelumne River but likely does not optimize migration flows throughout the steelhead migration period. We will continue to provide technical assist as best we can. We look forward to working with EBMUD on a long-term management strategy for anadromous fish on the Mokelumne River.

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

Sincerely,

Maria Rea

Maria Rea
Central Valley Office Supervisor

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

The Lower Mokelumne River Partnership

Partnership Steering Committee:

California Department of Fish & Game

Kent Smith
Regional Manager
1701 Nimbus Rd., Suite A
Rancho Cordova, CA 95670

EBMUD

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
Deputy Field Supervisor
2800 Cottage Way, Rm. W2605
Sacramento, CA 95825

To Protect and Enhance the Lower Mokelumne River Ecosystem

February 2, 2012

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 March and potentially April, May and June of 2012 in order to provide an attraction pulse flow for the fall run Chinook salmon during the month of October 2012. For the reasons set forth below, this fall 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 Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS) and, as required by FERC, the National Oceanic and Atmospheric Administration (NOAA) Fisheries.

In spite of the recent rainfall in January, dry conditions in November, December, and January indicate that runoff on the Mokelumne will be either "Below Normal" or "Dry" as defined in D-1641. Under these conditions, there will be little or no water available above the JSA minimum levels in October 2012 with which to conduct the pulse flows. Because of this potential condition, the PCC recommends an adaptive management operations plan to reduce releases and/or expected flows below Woodbridge Dam in March 2012 and potentially April - June 2012 below JSA minimum levels in order to conserve a volume of water (4-14 TAF) to be used as an attraction pulse flow in October 2012.

We, the Partnership Steering Committee, and the NMFS believe that the adaptive management action should start as soon as possible after March 1 in order to benefit from the preceding October–March period that was designated as a "Normal and Above" 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 the 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 March rather than in April). There is little downside from the pre-approval because if the April 1st DWR forecast determines that the April-September water year type is other than "Below Normal", the approved adaptive management action for April-September would not be implemented.

Enclosed are letters of concurence with the modified flow schedule from the Lower Mokelumne River Partnership's Steering Committee (California Department of Fish and Game, U.S. Fish and Wildlife Service, and EBMUD) and NOAA Fisheries.

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, e-mail rsykes@ebmud.com or Lena Tam, Manager of Water Resources Planning at (510) 287-1240, e-mail ltam@ebmud.com.

Sincerely,

Richard G. Sykes
Partnership Steering Committee
Lower Mokelumne River Partnership

Attachments

cc: B. Evoy, SWRCB
Hon. K Bose, FERC
R. Finucane, FERC
A, Christensen, WID
D. Welsh, USFWS
D. Ratcliff, USFWS
K. Smith, CDFG
R. Vincik, CDFG
M. Rea, NMFS
M. Guiterrez, NMFS
J. Miyamoto, EBMUD
J. Setka, EBMUD
R. Leong, EBMUD
L. Tam, EBMUD

2012 Adaptive Management Flow Change on the Mokelumne River
Table 1 – "Below Normal" Water Year Type Scenario
Table 2 – "Dry" Water Year Type Scenario
January 30, 2012

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

Standard Operation Plan for 2012 Below Normal Water Year Type (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	JSA Required Camanche Release	JSA Expected Flow below Woodbridge
March	Normal/Above	330	265	325	100
April	Below Normal	325	165	300**	150
May	Below Normal	485	215	250	200
June	Below Normal	525	215	250	200
October	Above Normal	330	180	325	100

Proposed Adaptive Management Operation Plan to modify JSA releases for 2012 Below Normal Year Type (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	255	190	250	100
April	Below Normal	270	115	250**	100
May	Below Normal	435	165	250	150
June	Below Normal	475	165	250	150
October	Above Normal	555	385	325 + 13,700 AF for pulse flow	100 + 13,700 AF for pulse flow

**Includes JSA Attachment 1 Normal and Above Year Flow – Mokelumne River Minimum Flow Schedule (footnote 5) and assumes March 31, 2012 storage of 30 TAF <= BMAS < 40 TAF

TABLE 2 – Standard and Proposed Adaptive Management Operation Plans – Dry Water Year Type

Standard Operation Plan for 2012 Dry Water Year Type (cfs)

Month	JSA Year Type	Projected Flow		Standard Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	330	250	325	100
October	Below Normal	265	115	250	100

Proposed Adaptive Management Operation Plan to modify JSA releases for 2012 Dry Year Type (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	255	185	250	100
October	Below Normal	340	185	250 + 4,600 AF for pulse flow	100 + 4,600 AF for pulse flow

Table 1 provides details of a modified October releases assuming Below Normal Water Year October 2012 and Table 2 assuming Dry Water Year October 2012 The actual water year will depend on the projected combined Pardee and Camanche reservoir storage on November 5, 2012.

The April – September 2012 water year is expected to be Below Normal. However, if runoff projections change this adaptive management action will be re-evaluated or terminated with the flow schedule returned to the standard JSA flows. Any flows saved prior to termination of the adaptive management action will be reserved and released in the fall per a schedule developed by CDFG, USFWS, and EBMUD.

EAST BAY
MUNICIPAL UTILITY DISTRICT

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

January 30, 2012

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

Mr. Kent Smith
California Dept. of Fish and Game
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

SUBJECT: Adaptive Management Flow Change on the Mokelumne River

Dear Mr. Welsh and Mr. Smith:

This letter is written to authorize the recommendation made by US Fish & Wildlife Service (USFWS), California Department of Fish & Game (CDFG), National Marine Fisheries Service (NMFS) and East Bay Municipal Utility District (EBMUD) staff during the January 24, 2012 meeting of the Mokelumne River Technical Advisory Committee (MRTAC) that included all Joint Settlement Agreement (JSA) Partnership Coordinating Committee (PCC) members.

In spite of the recent rainfall last week, dry conditions in November, December, and January indicate that runoff on the Mokelumne will be either "Below Normal" or "Dry" as defined in D-1641. Under these conditions, there will be limited water available above the JSA minimum levels in October 2012 with which to conduct the experimental pulse flows which appear to help reduce straying rates for Mokelumne origin Chinook salmon. Because of this potential condition, the PCC recommends an adaptive management operations plan to reduce releases and/or expected flows below Woodbridge Dam in March 2012 and potentially April - June 2012 below JSA minimum levels in order to conserve a volume of water (4-14 TAF) to be used as an attraction pulse flow in October 2012. This action could also benefit the Camanche hypolimnion depending upon the time of release in October.

The PCC, and the NMFS representative to the coordinating committee believe that the adaptive management action should start as soon as possible after March 1, 2012 in order to benefit from the preceding October–March period that was designated as a "Normal and Above" 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 April rather than in May). There is little downside from the pre-approval because if the April 1st DWR forecast determines that the April-September water year type is other than "Below Normal", the approved adaptive management action for April-September would not be implemented.

JSA Flows. EBMUD's Joint Settlement Agreement (JSA) with the CDFG and the USFWS includes a schedule of minimum flow releases from Camanche Dam based on water year type. (Attachment 1) Based on the probable DWR April 1st 2012 runoff forecast for April – September, the 2012 JSA year type will likely be designated as "Dry", but could be "Below Normal" under the wettest of scenarios for the remainder of the water year. For the months of April, May and June in Below Normal year types, the JSA release from Camanche Dam is 250 cfs with expected flows below Woodbridge Dam of 150 cfs in April and 200 cfs in May and June. The JSA also includes a provision for additional releases from Camanche during April, May and June if the storage in Camanche and Pardee Reservoirs is within 40 thousand acre-feet (TAF) of the maximum allowable for the end of the prior month. Given current storage conditions and average precipitation levels over the next 45 days, this provision could be triggered in 2012, meaning that there would be an increase in the required JSA flow from Camanche in April from 250 cfs to up to 300 cfs. No changes would be expected in May and June.

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 CDFG and USFWS (and also including NOAA Fisheries 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 a 2009 adaptive management flow change. Our agencies also recommended a similar action in 2010 but the late rains that year provided enough runoff that there was no need to reduce the JSA flows.

Proposed 2012 Adaptive Management Flow Change. As of January 24, 2012, runoff this year is expected to be approximately 410,000 AF on assuming median (50% exceedance) precipitation for the remainder of the water year which would result in a Dry JSA water year type. Should additional rains come to reach 10% exceedance precipitation, then the runoff projection would be 740,000 AF resulting in a Below Normal JSA water year type. Additionally, Camanche and Pardee Reservoirs are not expected to be at full allowable storage as we enter the next water year. These conditions trigger a Below Normal Water Year designation with resultant JSA flow requirements. Often in Below Normal Water Years, flood control releases are made in the fall, but because of dry conditions in December and January this particular year adaptive management flows are being proposed. This adaptive management flow change would not be necessary if the runoff was closer to the normal pattern.

Based on the PCC (resource agencies and EBMUD staff) recommendation, a 2012 adaptive management flow change is proposed as noted in the attached Table 1 and 2.

Table 1 shows the standard JSA and proposed adaptive management operation plans and JSA releases for a Below Normal Water Year. The water for the proposed adaptive flow change would come from a reduction of spring flows March - June 2012. The proposal would: 1) reduce the required JSA Camanche release from 325 to 250 cfs in March, 2) reduce the required JSA Camanche release from 300 to 250 cfs in April - June, 3) reduce the expected flows below Woodbridge Dam from 150 to 100 cfs in April and 200 to 150 cfs in May - June and 4) provide approximately 14 TAF of water for a pulse flow in October.

Table 2 shows the standard JSA and proposed adaptive management operations plan and JSA releases for a Dry Water Year. The water for the proposed adaptive flow change would come from a reduction of spring flows in only March. The proposal would : 1) reduce the required JSA Camanche release from 325 to 250 cfs in March, with no change in the expected flows below Woodbridge Dam and 2) provide approximately 4 to 5 TAF of water for a pulse flow in October.

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

The 2009 and 2010 fall pulse flows appear to have been beneficial to reducing Mokelumne origin salmonids from straying into the American River. Many other factors contribute to straying including DCC operations, hatchery planting practices and weather, but the very limited information indicates a positive response to the pulse flows. During 2009 and 2010, 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 in 2009. EBMUD will conduct the same monitoring and meet the same notification condition contained in NMFS' 2009 support letter (attached) for similar adaptive management action.

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

If you concur with these adaptive management actions, please sign and date the proposed plan in the signature block below Tables 1 and 2 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 Joe Miyamoto at 510-287-2021.

Sincerely,

Richard G. Sykes
Manager of Natural Resources

RGS:rll

Attachment

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

PARTNERSHIP STEERING COMMITTEE APPROVAL OF PCC RECOMMENDATION

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

Standard Operation Plan for 2012 Below Normal Water Year Type (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	JSA Required Camanche Release	JSA Expected Flow below Woodbridge
March	Normal/Above	330	265	325	100
April	Below Normal	325	165	300**	150
May	Below Normal	485	215	250	200
June	Below Normal	525	215	250	200
October	Above Normal	330	180	325	100

Proposed Adaptive Management Operation Plan to modify JSA releases for 2012 Below Normal Year Type (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	255	190	250	100
April	Below Normal	270	115	250**	100
May	Below Normal	435	165	250	150
June	Below Normal	475	165	250	150
October	Above Normal	555	385	325 + 13,700 AF for pulse flow	100 + 13,700 AF for pulse flow

**Includes JSA Attachment 1 Normal and Above Year Flow – Mokelumne River Minimum Flow Schedule (footnote 5) and assumes March 31, 2012 storage of 30 TAF <= BMAS < 40 TAF

TABLE 2 – Standard and Proposed Adaptive Management Operation Plans – Dry Water Year Type

Standard Operation Plan for 2012 Dry Water Year Type (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	330	250	325	100
October	Below Normal	265	115	250	100

Proposed Adaptive Management Operation Plan to modify JSA releases for 2012 Dry Year Type (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	255	185	250	100
October	Below Normal	340	185	250 + 4,600 AF for pulse flow	100 + 4,600 AF for pulse flow

Table 1 provides details of a modified October releases assuming Below Normal Water Year October 2012 and Table 2 assuming Dry Water Year October 2012 The actual water year will depend on the projected combined Pardee and Camanche reservoir storage on November 5, 2011.

The April – September 2012 water year being "Dry" is probable. 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 CDFG, USFWS, and EBMUD.

The agencies below authorize and concur with the proposed 2012 adaptive management proposal.

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

Date: 1-30-12

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

Date:_____

Kent Smith, Region II Manager
California Department of Fish and Game

Date:_____

Table 1 provides details of a modified October releases assuming Below Normal Water Year October 2012 and Table 2 assuming Dry Water Year October 2012 The actual water year will depend on the projected combined Pardee and Camanche reservoir storage on November 5, 2011.

The April – September 2012 water year being "Dry" is probable. 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 CDFG, USFWS, and EBMUD.

The agencies below authorize and concur with the proposed 2012 adaptive management proposal.

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

Date: 1-30-12

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

Date:

Kent Smith, Region II Manager
California Department of Fish and Game

Date: 2/1/12

Table 1 provides details of a modified October releases assuming Below Normal Water Year October 2012 and Table 2 assuming Dry Water Year October 2012 The actual water year will depend on the projected combined Pardee and Camanche reservoir storage on November 5, 2011.

The April – September 2012 water year being "Dry" is probable. 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 CDFG, USFWS, and EBMUD.

The agencies below authorize and concur with the proposed 2012 adaptive management proposal.

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

Date: 1-30-12

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

Date: 1/31/12

Kent Smith, Region II Manager
California Department of Fish and Game

Date:

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4700

FEB 1 2012

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

Dear Mr. Miyamoto:

This letter is in response to your request for NOAA's National Marine Fisheries Service (NMFS) support of the Joint Settlement Agreement (JSA) Adaptive Management Flow Change on the Mokelumne River. The request was made on January 24, 2012, at the Mokelumne River Technical Advisory Committee meeting, which NMFS attended.

NMFS is not a signatory to the JSA nor have we consulted under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), with the appropriate federal agency or East Bay Municipal Utilities District (EBMUD) regarding the effects to steelhead from the current JSA flow schedule. NMFS provided technical assistance to EBMUD regarding flow changes in May 2009 and again in April 2010. This is the third year NMFS is providing our opinion as technical assistance. NMFS' response is provided as technical assistance with EBMUD, and is not intended to take the place of formal comments or consultation as required under the ESA, and does not provide incidental take authorization pursuant to section 7(b) (4) and section 7(o) (2) of the ESA.

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

EBMUD proposes to reduce the JSA required release for March and potentially April, May and June 2012 based upon JSA water year type for April-October 2012 of either "Below Normal" or "Dry." Under these conditions, there will be limited water available above the JSA minimum levels in October 2012 with which to conduct the experimental pulse flows that appear to help reduce straying rates for Mokelumne origin Chinook salmon. The pulse flow would occur during the first two weeks of October, adaptively coordinated for maximum effect contingent on fish presence within the Mokelumne system and operations on other river systems, such as the American River.

Scenario 1: "Below Normal" April-October 2012 Water Year Type

The proposed adaptive flow change would come from a reduction of spring flows March - June 2012. The proposal would: 1) reduce the required JSA Camanche release from 325 to 250 cubic feet per second (cfs) in March, 2) reduce the required JSA Camanche release from 300 to 250 cfs in April - June, 3) reduce the expected flows below Woodbridge Dam from 150 to 100 cfs in April and 200 to 150 cfs in May - June and 4) provide approximately 14 TAF of water for a pulse flow in October for migrating adult Chinook salmon.

Scenario 2: "Dry" April-October 2012 Water Year Type

The proposed adaptive flow change would come from a reduction of spring flows in only March. The proposal would: 1) reduce the required JSA Camanche release from 325 to 250 cfs in March, with no change in the expected flows below Woodbridge Dam and 2) provide approximately 4 to 5 TAF of water for a pulse flow in October for migrating adult Chinook salmon.

In an effort to adaptively manage the flows and monitor potential impacts to downstream salmonids, EBMUD proposes to monitor water temperatures below Woodbridge Dam during May and June of 2012, as has been done in previous years. If water temperatures exceed 22 degrees Celsius, JSA parties and NMFS will be notified and measures will be taken to reduce temperature impacts. NMFS agrees that the flows should be adaptively managed and using temperature as an indicator for monitoring potential impacts to salmonids. The fall pulse flow may benefit adult CV steelhead returning to the Mokelumne River but likely does not optimize migration flows throughout the steelhead migration period. We will continue to provide technical assist as best we can. We look forward to working with EBMUD on a long-term management strategy for anadromous fish on the Mokelumne River.

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

Sincerely,

Maria Rea

Maria Rea
Central Valley Office Supervisor

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

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

February 24, 2012

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:

2012 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 2, 2012 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). In D-1641, the State Water Board found that it would not be in the public interest to require more water from the Mokelumne River system than will be provided under the Joint Settlement Agreement (JSA). 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 releases 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 Game (DFG) and the U.S. Fish and Wildlife Service (USFWS).

Similar to a request to modify flows approved in 2010, as a result of recommendations from the Mokelumne River JSA Coordinating Committee, EBMUD requests to reduce the minimum flow requirement during March 2012 and potentially during April, May, and June for later release in

October. The release of additional water in October of 2010 will increase Chinook salmon attraction flows on the Mokelumne River. The enclosed Tables 1 and 2 show the standard and proposed adaptive management operation plans for below normal and dry water year types, respectively.

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 also submitted written concurrence to the operations plan from DFG and USFWS, dated February 1, 2012 and January 31, 2012, respectively. EBMUD also submitted a letter from the National Oceanic and Atmospheric Administration (NOAA) Fisheries indicating that flows should be adaptively managed using temperature as an indicator for monitoring potential impacts to salmonids. EBMUD indicates that the proposed action will follow the same monitoring and reporting conditions as the 2010 action.

I hereby approve EBMUD's *Proposed Operations Plan to Modify JSA Releases in 2012 (*as shown in the enclosed Tables 1 and 2) pursuant to the following monitoring and reporting conditions (similar to the 2010 conditions):

1. EBMUD shall provide the State Water Board and the USFWS's Energy Coordinator with a summary of mean daily water temperatures and flow from the Golf gauging station within the two weeks following the newly proposed JSA for reduction in March 2012 and April, May, and June 2012, if applicable.

2. 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 USFWS Energy Coordinator.

3. EBMUD shall provide notification to NOAA Fisheries when water temperatures below Woodbridge Dam exceed 22° C during the flow reduction period.

4. At the conclusion of the pulse flow period, EBMUD shall provide the State Water Board with: (1) the amount of water conserved in March 2012 and April, May, and June, if applicable, 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 rsatkowski@waterboards.ca.gov. Written correspondence should be addressed as follows: State Water Resources Control Board, Division of Water Rights, Attn: Rich Satkowski, P.O. Box 2000, Sacramento, CA 95812.

Sincerely,

Thomas Howard

Thomas Howard
Executive Director

Enclosures

cc: See next page.

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

Mr. Kent Smith
California Department of Fish and Game
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

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

2012 Adaptive Management Flow Change on the Mokelumne River
Table 1 – "Below Normal" Water Year Type Scenario
Table 2 – "Dry" Water Year Type Scenario
January 30, 2012

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

Standard Operation Plan for 2012 Below Normal Water Year Type (cfs)

Month	JSA Year Type	Projected Flow		Standard Operation Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	JSA Required Camanche Release	JSA Expected Flow below Woodbridge
March	Normal/Above	330	265	325	100
April	Below Normal	325	165	300**	150
May	Below Normal	485	215	250	200
June	Below Normal	525	215	250	200
October	Above Normal	330	180	325	100

Proposed Adaptive Management Operation Plan to modify JSA releases for 2012 Below Normal Year Type (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	255	190	250	100
April	Below Normal	270	115	250**	100
May	Below Normal	435	165	250	150
June	Below Normal	475	165	250	150
October	Above Normal	555	385	325 + 13,700 AF for pulse flow	100 + 13,700 AF for pulse flow

**Includes JSA Attachment 1 Normal and Above Year Flow – Mokelumne River Minimum Flow Schedule (footnote 5) and assumes March 31, 2012 storage of 30 TAF <= BMAS < 40 TAF

TABLE 2 – Standard and Proposed Adaptive Management Operation Plans – Dry Water Year Type

Standard Operation Plan for 2012 Dry Water Year Type (cfs)

Month	JSA Year Type	Projected Flow		Standard Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	330	250	325	100
October	Below Normal	265	115	250	100

Proposed Adaptive Management Operation Plan to modify JSA releases for 2012 Dry Year Type (cfs)

Month	JSA Year Type	Projected Flow		Adaptive Management Plan JSA Required Flow	
		Camanche Release	Flow below Woodbridge	Camanche Release	Flow below Woodbridge
March	Normal/Above	255	185	250	100
October	Below Normal	340	185	250 + 4,600 AF for pulse flow	100 + 4,600 AF for pulse flow

Table 1 provides details of a modified October releases assuming Below Normal Water Year October 2012 and Table 2 assuming Dry Water Year October 2012 The actual water year will depend on the projected combined Pardee and Camanche reservoir storage on November 5, 2012.

The April – September 2012 water year is expected to be Below Normal. However, if runoff projections change this adaptive management action will be re-evaluated or terminated with the flow schedule returned to the standard JSA flows. Any flows saved prior to termination of the adaptive management action will be reserved and released in the fall per a schedule developed by CDFG, USFWS, and EBMUD.

The Lower Mokelumne River Partnership

Partnership Steering Committee:

California Department of Fish & Game

Kent Smith
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

Daniel Welsh
Asst. Field Supervisor
3310 El Camino Ave., Suite 130
Sacramento, CA 95821

To Protect and Enhance the Lower Mokelumne River Ecosystem

April 9, 2012

State Water Resources Control Board
Division of Water Rights
Attn: Rich Satkowski
P.O. Box 2000
Sacramento, CA 95812

Subject: 2012 Adaptive Management Flow Change -- Summary of Mean Daily Water Temperatures and Flow from the Golf Gauging Station

Dear Mr. Satkowski:

On February 24, 2012 the State Water Resources Control Board (SWRCB) approved an adaptive management flow change for the lower Mokelumne River to reduce the March JSA Camanche releases from 325 to 250 cfs to provide a fall 2012 attraction flow. A condition of the approval requires EBMUD to provide you with a summary of the mean daily water temperatures and flow from the Golf gauging station within two weeks the JSA flow reduction in March and April, May and June 2012 if applicable. Since the DWR April 1st forecast will be a *Dry* or *Critically Dry* JSA water year type, we have modified the JSA flow schedule for March *only*.

The attached table provides a summary of the actual Camanche releases and flows (cfs) below Woodbridge Dam for March as measured at the Golf gauging station and the average daily water temperature (°C). The modified flow schedule was initiated on March 1, 2012 following EBMUD's receipt of the approval for the modified JSA flow schedule from the State Water Resources Control Board. The actual Camanche releases and flows below Woodbridge Dam exceeded the modified flow schedule and mean daily water temperatures were below 20 °C through the flow reduction period in 2012. The total water savings from the March flow reduction was 4,512 acre feet that will be released as a fall pulse flow in addition to the October JSA required flows.

We will hold initial discussions on the planning of the fall pulse flow at the July 2012 Mokelumne River Technical Advisory Committee meeting. We anticipate at least one technical representative from each of the partnership agencies and NOAA Fisheries will attend the meeting.

If you have any questions or concerns, please call me at (510) 287-2021.

Very truly yours,

Richard G. Sykes
Partnership Steering Committee
Enclosure

cc: JSA Partnership Steering Committee
JSA Partnership Coordinating Committee
Monica Gutierrez, NOAA Fisheries

2012 Joint Settlement Agreement (JSA) Adaptive Management Flows

Date	JSA Required Camanche Release (cfs)	Actual Camanche Release (cfs)	JSA Expected Flow below Woodbridge (cfs)	Actual Flow below Woodbridge (cfs)	Average Water Temperature below Woodbridge °C
3/1/2012	325	298 (1)	100	235	10.3
3/2/2012	325	265	100	208	10.4
3/3/2012	325	256	100	171	10.7
3/4/2012	325	256	100	163	11.4
3/5/2012	325	255	100	155	12.3
3/6/2012	325	255	100	169	12.6
3/7/2012	325	255	100	158	12.3
3/8/2012	325	255	100	159	12.4
3/9/2012	325	255	100	158	12.3
3/10/2012	325	255	100	158	12.4
3/11/2012	325	255	100	169	12.5
3/12/2012	325	255	100	174	12.8
3/13/2012	325	256	100	181	12.8
3/14/2012	325	256	100	193	12.8
3/15/2012	325	255	100	180	13.0
3/16/2012	325	255	100	212	13.0
3/17/2012	325	256	100	217	12.7
3/18/2012	325	255	100	190	12.4
3/19/2012	325	255	100	188	11.9
3/20/2012	325	255	100	170	12.0
3/21/2012	325	254	100	179	12.7
3/22/2012	325	254	100	183	13.3
3/23/2012	325	256	100	179	13.8
3/24/2012	325	255	100	181	14.1
3/25/2012	325	255	100	200	13.4
3/26/2012	325	256	100	175	13.1
3/27/2012	325	256	100	193	12.9
3/28/2012	325	257	100	197	12.8
3/29/2012	325	257	100	180	13.2
3/30/2012	325	256	100	180	13.8
3/31/2012	325	256	100	191	14.2

Note: (1) Camanche Reservoir Release was reduced per JSA Adaptive Management Program approved by the State Water Resources Control Board.

Date	Action	Savings Basis	Savings (Acre-ft)
1-Mar	50 cfs reduction @ 8:00 am	50 cfs for 16 hours	66
2-Mar	25 cfs reduction @ 8:00 am	50 cfs for 8 hours & 75 cfs for 16 hours	132
31-Mar	Continuation of 75 cfs reduction March 3 -31	75 cfs for 29 days	4,314
		Total	4,512

Water Operations Department
Water Supply Engineering

EAST BAY
MUNICIPAL UTILITY DISTRICT

WATERSHED HEADQUARTERS

November 20, 2012

Ms. Debbie Giglio-Willoughby
Energy Coordinator, U.S. Fish & Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Subject: 2012 Adaptive Management Flow Change – Coordination and Implementation of Fall Pulse Flow

Dear Ms. Giglio-Willoughby:

Earlier this year an adaptive management flow change was approved on the lower Mokelumne River under which the JSA flows were modified for March 2012 (Dry Year Scenario 2) to provide a fall 2012 attraction flow. As you may recall the JSA Partnership, which includes the USFWS, requested this JSA adaptive management action in its February 2, 2012 letter to the SWRCB. Enclosed is the February 24, 2012 approval letter from the SWRCB. The following efforts were made to satisfy condition 2 in the approval letter by coordinating the scheduling of the fall pulse flows based on pulse flows released in other San Joaquin tributaries, the presence of salmon in the Woodbridge Dam video monitoring system, and the historic average run timing in the San Joaquin River tributaries.

Discussions on the planning of the fall pulse flows were held at the July 17, 2012 Mokelumne River Technical Advisory Committee meeting and September 27, 2012 Partnership Coordinating Committee meeting (Attachment A). Coordination of the fall pulse flows with the San Joaquin River tributaries was through the USFWS and CDFG (attachment B). Another factor in the timing of the Mokelumne pulse flow was the possible closure of the Delta Cross Channel Gates during the first half of October which represented the best chance in meeting Delta water quality conditions under D-1641. Unfortunately dry conditions prevailed eliminating any possible gate closures in fall 2012.

The first salmon was observed in the video monitoring system at Woodbridge Dam on October 1, 2012, three salmon on October 2nd, eight salmon on October 3rd and 31 more salmon on October 5th and 6th.

The first of five fall pulse flows was initiated on October 8, 2012. Attachment C provides a summary of Camanche release changes and resultant flows past Woodbridge Dam during the pulse flow period October 8 through November 8.

As indicated in my April 9, 2012 letter, the actual water savings from the spring flow reduction was 4,512 acre feet. The actual amount of the water released in the fall through a series of pulse flows was 4,549 acre feet. If you have any questions or concerns, please call me at (510) 287-2021.

Very truly yours,

Joseph J. Miyamoto

JOSEPH J. MIYAMOTO
Manager of Fisheries and Wildlife

JJM:bhw
Attachments

500 SAN PABLO DAM ROAD . ORINDA . CA 94563 . (510) 287-0459 . FAX (925) 254-8320

ATTACHMENT A

Mokelumne River
JSA Partnership Coordinating Committee Meeting

September 27, 2012
Lodi Conference Room
1 Winemasters Way, Suite K, Lodi, CA

9:00 am to 11:00 am

Pre-meeting: September 19, 2011
Oakland AB - Conference room 3A/B, 1:30 pm to 2:30pm

AGENDA

1. Water Supply and Reservoir Operations – Damon Hom
2. Mokelumne River Ecosystems Benefits Program – Kelli McCune
3. Camanche Permit Extension review – Richard Sykes
4. Fishing regulations for Lower Mokelumne River – Richard Sykes
5. Management of Camanche Hypolimnion – Ben Bray
6. Spawning Gravel Restoration – Robyn Bilski
7. DCC gate operations and Mokelumne Pulse Flow study plan – Jose Setka & Josh Israel, USBR
8. Hatchery Annual Operations Plan – Laird Marshall, CDFG
9. Recovery plan update – Monica Gutierrez, NMFS
10. Date and agenda for December PSC meeting - All
11. Status of Partnership Fund – Rick Leong
    a. Fund balance
    b. Status of current Partnership funded projects
    c. Review Partnership Fund funding projects
12. Lower Mokelumne River Watershed Stewardship Committee report – Rick Leong
13. Plans for CWT – Jose Setka
    a. Plans for inland recoveries
    b. Acoustic telemetry
        1. Hatchery Chinook smolts
        2. Plans for tagging naturally produced Chinook smolts and hatchery yearlings

Mokelumne River
JSA Partnership Coordinating Committee Meeting
Sign In Sheet
9/27/12

Name	Organization	Phone	Email
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ATTACHMENT B

Email November 8, 2012

Hi Joe,

Attached please find a summary of our fall pulse flow coordination. I didn't have the Mokelumne numbers in the spreadsheet that I have, so the table and figure are limited to the other SJR tribs, but their schedules were all based on the earlier Mokelumne schedule that you all provided us.

Thanks and let me know if you have any questions...
Donnie

Donald Ratcliff
Anadromous Fish Restoration &
Region 8 Fish Passage Programs
U.S. Fish and Wildlife Service
850 S. Guild Ave, Ste. 105
Lodi, CA 95240

Summary of 2012 San Joaquin Tributary Fall Flow Coordination

To balance the effectiveness of fall attraction flows (also referred to as pulse flows) throughout the San Joaquin River and tributaries with possible water quality impacts resulting from a potential closure of the Delta Cross Channel (DCC), U.S. Fish and Wildlife Service (Service) personnel began coordination and planning efforts with our partners and appropriate regulatory and water management entities throughout the potentially impacted areas.

Starting with the knowledge that a fall attraction flow and potential DCC closure would certainly be conducted through the ongoing long-term study related to adaptive management of water operations on the Mokelumne River (coordinated by the Lower Mokelumne River Joint Settlement Agreement Coordinating and Steering Committees, the U.S. Bureau of Reclamation and the California Department of Water Resources), staff with the Service's Anadromous Fish Restoration Program (AFRP) began to gather information on potential volumes of water and release timing available for the major San Joaquin tributaries Mokelumne, Calaveras, Stanislaus, Tuolumne and Merced rivers). Staff from California Department of Fish and Game (Region 4) and relevant management entities from each watershed were contacted and worked with AFRP personnel to provide updated estimates of available water throughout the summer and early fall of 2012.

Based on the potential available water estimates for each system, estimated travel time of released water through each tributary, estimated travel time of water through the mainstem San Joaquin River to Vernalis and historic average return times of fall-run Chinook salmon for each tributary, several alternatives were developed in coordination with Service staff from the Water Operations Division of the Bay Delta Fish and Wildlife Office. Once the Mokelumne River release schedule was finalized, AFRP staff and our partners finalized an alternative that would maximize benefits to returning Chinook salmon and minimize potential water quality impacts following a possible DCC closure. The scenario that was chosen aimed to maximize combined flows at Vernalis between approximately October 22nd and October 26th, 2012 to provide the best balance between attracting returning adult San Joaquin origin salmon and reducing water quality concerns from the potential DCC closure that likely would have occurred sometime between October 5th and October 20th, 2012.
Table 1 is a summary of releases from each San Joaquin tributary that had available water for a fall attraction flow, minus the Mokelumne River. Figure 1 is a graphical representation of the tributary releases and the resulting estimated San Joaquin River flow at Vernalis.

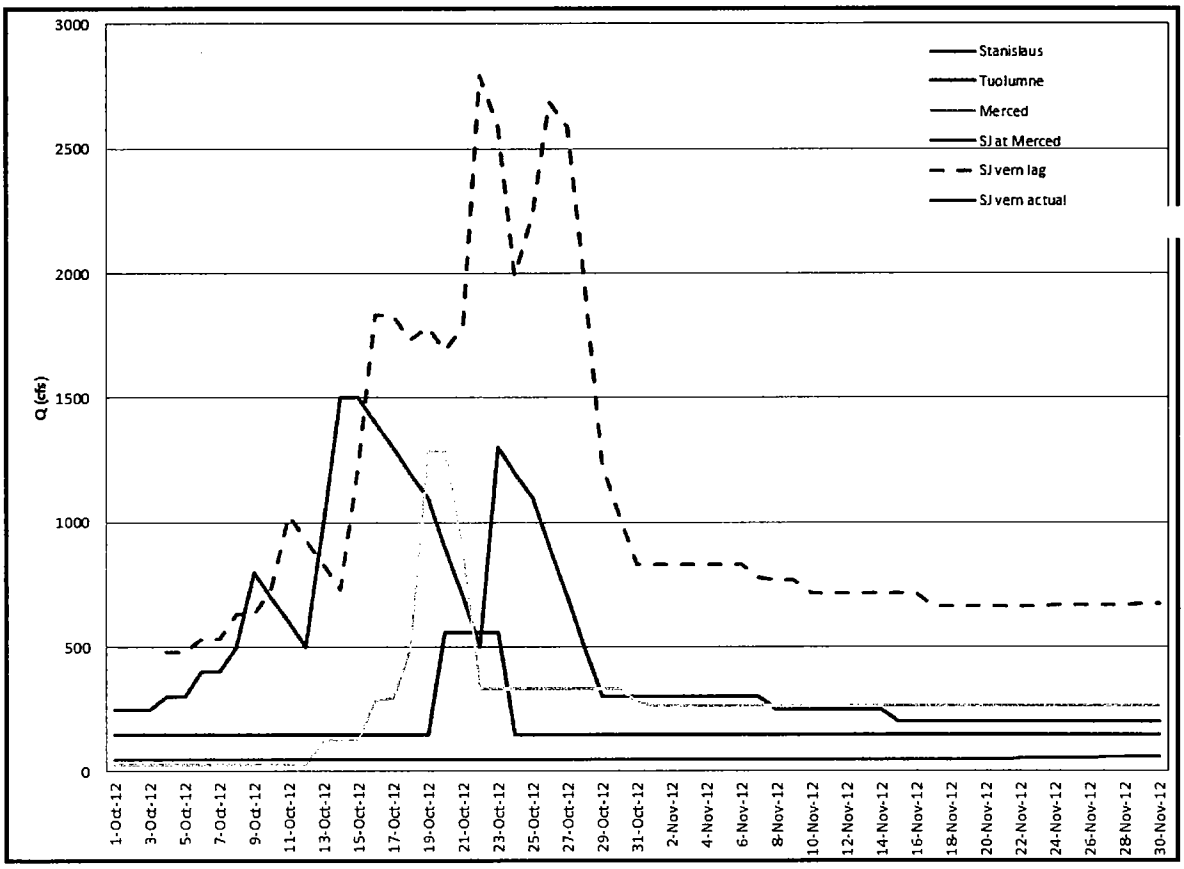
Table 1. Daily release schedules, cumulative pulse flow and total flow amounts, and estimated daily San Joaquin River flow.

	Stanislaus	Cum Pulse	Cum Total	Tuloumne	Cum Pulse	Cum Total	Merced	Cum Pulse	Cum Total	SJR above	SJR Vernalis
		AF	AF		AF	AF		AF	AF	Merced	lag estimate
10/01/12	250	0	496	150	0	298	30	0	60	50	
10/02/12	250	0	992	150	0	595	30	0	119	50	
10/03/12	250	0	1488	150	0	893	30	0	179	50	
10/04/12	300	99	2083	150	0	1190	30	0	238	50	480
10/05/12	300	198	2678	150	0	1488	30	0	298	50	480
10/06/12	400	496	3471	150	0	1785	30	0	357	50	530
10/07/12	400	793	4264	150	0	2083	30	0	417	50	530
10/08/12	500	1289	5256	150	0	2380	30	0	476	50	630
10/09/12	800	2380	6843	150	0	2678	30	0	536	50	630
10/10/12	700	3273	8231	150	0	2975	30	0	595	50	730
10/11/12	600	3967	9421	150	0	3273	30	0	655	50	1030
10/12/12	500	4463	10413	150	0	3570	30	0	714	50	930
10/13/12	1000	5950	12396	150	0	3868	130	198	972	50	830
10/14/12	1500	8429	15371	150	0	4165	130	198	1230	50	730
10/15/12	1500	10958	18346	150	0	4463	130	198	1488	50	1230
10/16/12	1400	13289	21123	150	0	4760	285	397	2053	50	1830
10/17/12	1300	15421	23702	150	0	5058	293	413	2634	50	1830
10/18/12	1200	17355	26082	150	0	5355	485	793	3596	50	1730
10/19/12	1100	19090	28263	150	0	5653	1285	2380	6145	50	1785
10/20/12	900	20429	30048	557	807	6757	1285	2380	8693	50	1693
10/21/12	700	21371	31437	557	1614	7862	885	1587	10449	50	1785
10/22/12	500	21917	32429	557	2422	8967	330	486	11103	50	2792
10/23/12	1300	24049	35007	557	3229	10072	330	486	11758	50	2592
10/24/12	1200	25983	37387	150	3229	10369	330	486	12412	50	1992
10/25/12	1100	27718	39569	150	3229	10667	330	486	13067	50	2237
10/26/12	900	29057	41354	150	3229	10964	330	486	13721	50	2685
10/27/12	700	29999	42742	150	3229	11262	330	486	14376	50	2585
10/28/12	500	30544	43734	150	3229	11559	330	486	15030	50	1985
10/29/12	300	30693	44329	150	3229	11857	330	486	15685	50	1230
10/30/12	300	30842	44924	150	3229	12154	330	486	16339	50	1030
10/31/12	300	30991	45519	150	3229	12452	280	387	16895	50	830
11/01/12	300	31189	46114	150	3229	12749	265	476	17420	50	830
11/02/12	300	31387	46709	150	3229	13047	265	565	17946	50	830
11/03/12	300	31586	47304	150	3229	13344	265	655	18471	50	830
11/04/12	300	31784	47899	150	3229	13642	265	744	18997	50	830
11/05/12	300	31982	48494	150	3229	13939	265	833	19523	50	830

Table 1 (continued). Daily release schedules, cumulative pulse flow and total flow amounts, and estimated daily San Joaquin River flow.

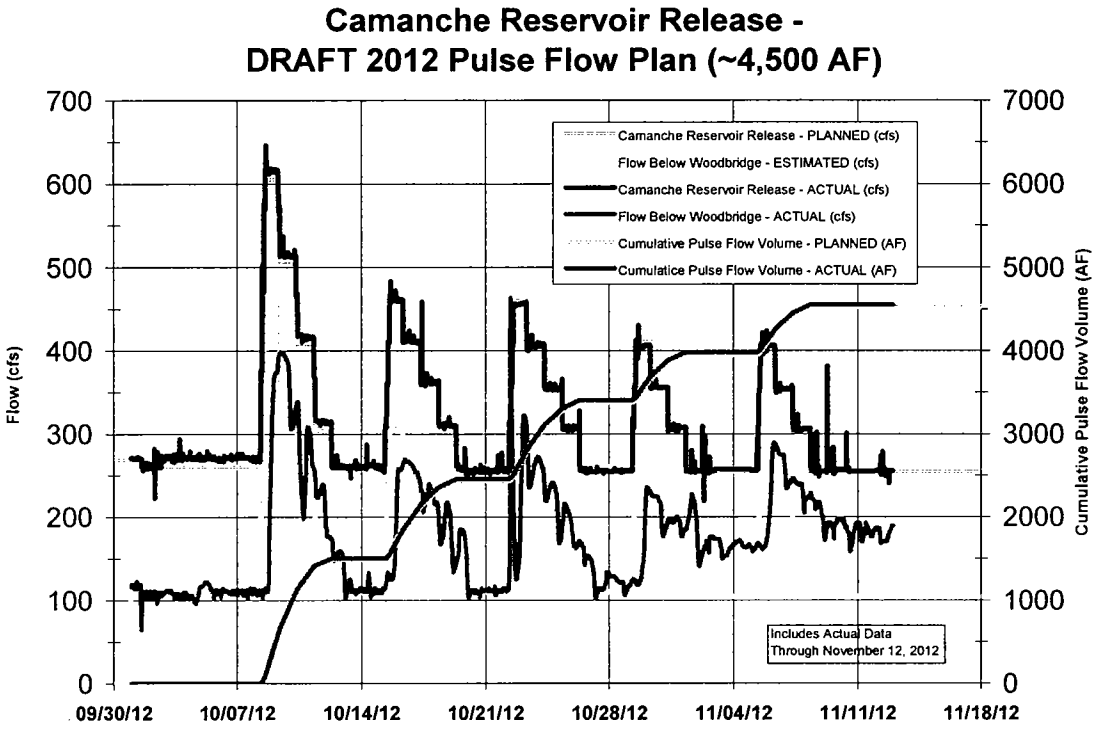
	Stanislaus	Cum Pulse	Cum Total	Tuloumne	Cum Pulse	Cum Total	Merced	Cum Pulse	Cum Total	SJR above	SJR Vernalis
		AF	AF		AF	AF		AF	AF	Merced	lag estimate
11/06/12	300	32181	49089	150	3229	14237	265	922	20048	50	830
11/07/12	300	32379	49684	150	3229	14534	265	1012	20574	50	780
11/08/12	250	32478	50180	150	3229	14832	265	1101	21099	50	765
11/09/12	250	32577	50676	150	3229	15129	265	1190	21625	50	765
11/10/12	250	32676	51172	150	3229	15427	265	1279	22151	50	715
11/11/12	250	32776	51668	150	3229	15724	265	1369	22676	50	715
11/12/12	250	32875	52163	150	3229	16022	265	1458	23202	50	715
11/13/12	250	32974	52659	150	3229	16319	265	1547	23727	50	715
11/14/12	250	33073	53155	150	3229	16617	265	1636	24253	50	715
11/15/12	200	33073	53552	150	3229	16914	265	1726	24779	50	715
11/16/12	200	33073	53948	150	3229	17212	265	1815	25304	50	715
11/17/12	200	33073	54345	150	3229	17509	265	1904	25830	50	665
11/18/12	200	33073	54742	150	3229	17807	265	1993	26355	50	665
11/19/12	200	33073	55138	150	3229	18104	265	2083	26881	50	665
11/20/12	200	33073	55535	150	3229	18402	265	2172	27407	50	665
11/21/12	200	33073	55932	150	3229	18699	265	2261	27932	51	665
11/22/12	200	33073	56329	150	3229	18997	265	2350	28458	52	665
11/23/12	200	33073	56725	150	3229	19294	265	2440	28983	53	665
11/24/12	200	33073	57122	150	3229	19592	265	2529	29509	54	666
11/25/12	200	33073	57519	150	3229	19890	265	2618	30035	55	667
11/26/12	200	33073	57915	150	3229	20187	265	2707	30560	56	668
11/27/12	200	33073	58312	150	3229	20485	265	2797	31086	57	669
11/28/12	200	33073	58709	150	3229	20782	265	2886	31611	58	670
11/29/12	200	33073	59105	150	3229	21080	265	2975	32137	59	671
11/30/12	200	33073	59502	150	3229	21377	265	3064	32663	60	672

Figure 1. Daily flows of San Joaquin tributaries and estimated daily flow of mainstem San Joaquin River at Vernalis.



ATTACHMENT C

		Actual Daily Data Based on 15 Minute Average Flow Data			
Date	Day	Pulse Volume (AF)	Pulse Flow (cfs)	Camanche Reservoir Release (cfs)	Flow Below Woodbridge (cfs)
10/1/2012	Monday	0	0	267	111
10/2/2012	Tuesday	0	0	264	107
10/3/2012	Wednesday	0	0	272	107
10/4/2012	Thursday	0	0	272	105
10/5/2012	Friday	0	0	271	115
10/6/2012	Saturday	0	0	270	110
10/7/2012	Sunday	0	0	272	110
10/8/2012	Monday	377	190	460	136
10/9/2012	Tuesday	564	285	554	381
10/10/2012	Wednesday	364	184	454	284
10/11/2012	Thursday	165	83	353	250
10/12/2012	Friday	29	15	278	164
10/13/2012	Saturday	0	0	260	114
10/14/2012	Sunday	0	0	261	112
10/15/2012	Monday	214	108	367	128
10/16/2012	Tuesday	334	169	428	261
10/17/2012	Wednesday	239	121	381	234
10/18/2012	Thursday	136	69	329	202
10/19/2012	Friday	33	17	276	161
10/20/2012	Saturday	0	0	255	110
10/21/2012	Sunday	0	0	256	111
10/22/2012	Monday	211	107	362	171
10/23/2012	Tuesday	333	168	423	271
10/24/2012	Wednesday	234	118	373	242
10/25/2012	Thursday	135	68	323	195
10/26/2012	Friday	36	18	274	160
10/27/2012	Saturday	0	0	255	120
10/28/2012	Sunday	0	0	255	122
10/29/2012	Monday	172	87	342	124
10/30/2012	Tuesday	234	118	373	222
10/31/2012	Wednesday	134	68	322	192
11/1/2012	Thursday	36	18	274	198
11/2/2012	Friday	0	0	257	164
11/3/2012	Saturday	0	0	257	161
11/4/2012	Sunday	0	0	257	167
11/5/2012	Monday	168	85	341	166
11/6/2012	Tuesday	231	117	372	266
11/7/2012	Wednesday	133	67	322	238
11/8/2012	Thursday	36	18	275	219
11/9/2012	Friday	0	0	258	190
11/10/2012	Saturday	0	0	256	184
11/11/2012	Sunday	0	0	255	183
11/12/2012	Monday	0	0	256	179


Camanche Reservoir Release -
DRAFT 2012 Pulse Flow Plan (~4,500 AF)
Flow (cfs)
Cumulative Pulse Flow Volume (AF)
700
600
500
400
300
200
100
0
7000
6000
5000
4000
3000
2000
1000
0
09/30/12
10/07/12
10/14/12
10/21/12
10/28/12
11/04/12
11/11/12
11/18/12
Camanche Reservoir Release - PLANNED (cfs)
Flow Below Woodbridge - ESTIMATED (cfs)
Camanche Reservoir Release - ACTUAL (cfs)
Flow Below Woodbridge - ACTUAL (cfs)
Cumulative Pulse Flow Volume - PLANNED (AF)
Cumulatice Pulse Flow Volume - ACTUAL (AF)
Includes Actual Data
Through November 12, 2012

Cc: Tina Bartlett, CDFG
Dan Welsh, USFWS
Robert Vincik, CDFG
Joe Johnson, CDFG
Donnie Ratcliff, USFWS
Richard Sykes, EBMUD
Joe Miyamoto, EBMUD
Monica Gutierrez, NOAA

Bcc:

Lena Tam, EBMUD
Priyanka Jain, EBMUD
Damon Ham, EBMUD
Fred Etheridge, EBMUD
Rey Encarcion, EBMUD
Jose Setka, EBMUD
Rick Leong, EBMUD

APPENDIX C

USGS VERIFIED FLOW DATA FOR 2010 AND 2011

11323500 Mokelumne River below Camanche Dam, CA

DISCHARGE, CUBIC FEET PER SECOND
JANUARY TO DECEMBER 2010
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	329	331	424	405	1,430	1,030	886	602	398	803	600	798
2	329	331	444	406	1,410	1,340	1,230	603	400	798	599	799
3	330	331	401	406	1,410	1,400	1,400	602	398	800	600	799
4	330	331	350	405	1,400	1,390	1,410	547	401	799	600	799
5	330	332	332	405	1,400	1,390	1,410	444	404	1,030	598	797
6	331	333	331	406	1,400	1,390	1,410	401	404	1,430	595	798
7	330	332	331	407	1,410	1,330	1,310	401	404	1,370	597	800
8	331	333	333	408	1,410	1,230	977	401	403	976	599	798
9	332	332	334	408	1,410	1,130	804	403	401	801	600	799
10	331	332	333	407	1,370	1,040	803	400	400	801	681	987
11	328	332	331	407	1,420	932	803	401	400	801	931	1,190
12	331	331	331	415	1,420	829	802	405	400	1,030	1,000	1,200
13	333	331	332	426	1,420	800	803	401	400	1,430	999	1,130
14	332	331	332	426	1,420	802	804	404	400	1,830	1,000	1,370
15	332	331	332	418	1,420	801	804	400	400	2,230	790	1,660
16	331	331	332	406	1,420	800	801	401	400	2,400	599	1,800
17	330	331	334	406	1,370	805	799	402	400	2,400	599	1,870
18	331	331	332	406	1,310	801	809	401	399	2,170	597	2,210
19	330	332	331	407	1,260	801	803	401	398	1,780	714	2,400
20	331	331	331	407	1,210	802	802	401	400	1,370	800	2,590
21	332	332	332	406	1,170	801	802	401	399	973	798	2,950
22	330	332	331	406	1,120	802	805	400	398	801	799	2,990
23	331	332	331	406	1,100	802	803	352	398	799	799	2,890
24	331	331	332	406	1,030	800	801	330	398	798	801	2,800
25	330	333	331	406	928	800	804	330	399	1,030	800	2,800
26	331	332	330	407	830	802	802	330	399	1,430	798	2,800
27	331	332	331	629	799	803	801	360	403	1,370	800	2,690
28	331	331	331	1,030	799	805	731	399	401	968	798	2,590
29	331	------	332	1,360	799	801	632	399	628	662	798	2,590
30	331	------	332	1,450	804	804	572	399	803	599	798	2,590
31	331	------	364	------	801	------	603	399	------	600	------	2,590
Total	10,252	9,285	10,608	15,093	37,900	28,863	27,826	12,920	12,636	37,079	22,087	55,874
Mean	331	332	342	503	1,223	962	898	417	421	1,196	736	1,802
Max	333	333	444	1,450	1,430	1,400	1,410	603	803	2,400	1,000	2,990
Min	328	331	330	405	799	800	572	330	398	599	595	797
Ac-ft	20,330	18,420	21,040	29,940	75,170	57,250	55,190	25,630	25,060	73,550	43,810	110,830

11323500 Mokelumne River below Camanche Dam, CA

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

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

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 2010
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	267	270	198	298	1,230	698	589	365	137	541	526	723
2	266	271	126	315	1,230	999	746	354	131	569	566	730
3	266	271	142	315	1,230	1,180	1,070	355	129	594	547	722
4	265	272	352	325	1,230	1,190	1,140	325	144	611	538	727
5	264	306	264	345	1,230	1,180	1,160	234	157	657	540	746
6	266	290	252	317	1,220	1,200	1,150	177	152	979	536	735
7	266	285	244	275	1,220	1,200	1,120	168	149	1,280	560	720
8	266	277	247	316	1,220	1,110	944	169	143	1,010	538	729
9	267	295	251	313	1,230	1,020	641	146	146	689	535	733
10	267	278	260	310	1,260	923	593	148	148	650	543	730
11	265	273	250	323	1,220	824	584	134	149	645	695	1,010
12	271	271	264	314	1,250	725	592	155	162	660	873	1,060
13	283	268	257	320	1,250	646	572	157	171	984	887	1,050
14	265	268	250	318	1,240	641	551	160	172	1,320	890	1,080
15	266	267	253	321	1,240	625	535	160	184	1,670	876	1,350
16	265	291	251	310	1,240	607	531	161	193	2,020	583	1,620
17	273	270	248	308	1,230	614	536	149	181	2,150	537	1,660
18	280	267	256	310	1,170	612	557	137	171	2,140	531	1,850
19	282	266	249	306	1,130	604	571	151	180	1,850	548	2,240
20	290	268	247	337	1,070	615	551	165	175	1,480	730	2,330
21	298	272	250	323	1,030	615	539	160	178	1,120	743	2,600
22	312	261	224	316	969	613	524	162	171	790	713	2,870
23	281	286	247	310	919	593	529	150	174	739	753	2,920
24	269	291	248	310	922	597	523	71	182	777	748	2,790
25	273	271	248	306	851	601	523	57	190	754	704	2,780
26	275	240	220	311	756	588	535	48	185	1,050	710	2,840
27	271	289	218	283	678	586	529	43	185	1,330	723	2,810
28	270	333	250	529	673	609	507	124	192	1,080	711	2,660
29	271	----	248	897	660	590	403	134	207	738	694	2,670
30	274	----	257	1,210	670	579	312	137	503	559	708	2,640
31	270	----	262	----	668	----	330	144	----	532	----	2,610
Total	8,464	7,767	7,533	11,091	33,136	23,184	19,987	5,200	5,341	31,968	19,786	52,735
Mean	273	277	243	370	1,069	773	645	168	178	1,031	660	1,701
Max	312	333	352	1,210	1,260	1,200	1,160	365	503	2,150	890	2,920
Min	264	240	126	275	660	579	312	43	129	532	526	720
Ac-ft	16,790	15,410	14,940	22,000	65,730	45,990	39,640	10,310	10,590	63,410	39,250	104,600

11325500 Mokelumne River At Woodbridge, CA

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

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

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 11, 2012
1:30 pm – 3:30 pm

Attendance: US FWS: Dan Welsh*, Donnie Ratcliff
CDFG: Tina Bartlett*, Robert Vincik, Joe Johnson
NMFS: Monica Gutierrez, Rhonda Reed
EBMUD: Richard Sykes*, Joe Miyamoto, Jose Setka, Rick Leong, Ana Ulloa
**JSA Steering Committee representatives*

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

Self-introductions were made.

1. JSA Adaptive Management Flow Modification: (Joe Miyamoto) Joe reviewed background information regarding JSA water year types and how it is determined twice a year (Oct-Mar and Apr-Sep periods). The JSA water year type designation for the period of October 2011 – March 2012 was "Normal and Above", April 2012 – September 2012 was "Dry", and October 2012 – March 2013 is "Below Normal". He also briefly reviewed the USACE flood requirements for Pardee and Camanche.

   Joe described the process for the 5 pulse flows that occurred in late October – early November 2012. He stated that the water released in the pulse flows came from the retention of approximately 4,500 acre feet of water in March.

   Joe reviewed river temperatures and precipitation for the period of October 2011 – December 2012. He also stated that at this time, it is still uncertain if adaptive management flows need to be requested for 2013 and will depend on the amount of precipitation that might fall in the remaining months of winter and early spring.

2. DCC Gate Closure Study (Jose Setka and Robert Vincik): Jose explained that this project is being conducted by the Bureau of Reclamation and the Lower Mokelumne River Partnership to examine the potential influences of these variables on straying: (1) planting locations, (2) pulse flows, and (3) DCC operations. The NEPA work has been completed. Jose explained that OCAP and State Board water quality parameters are the triggers for DCC operations and then showed a map identifying focus areas for the study. In two recent years, the Partnership has been able to successfully have the DCC closed 2-days and another year there was a 10-day closure. There was no closure in 2012 due to water quality conditions. This study is planned for 5 years (2012 being the first year).

   Next Robert provided an update on the 2012 adult acoustic telemetry study associated with the DCC study. He said that in 2011, 38 adult salmon were floy tagged and 21 (out of the 38) were identified as being coded-wire tagged due to an ad-clip and acoustically tagged. Robert explained that using this data, straying estimates were developed. In 2008 and 2009, straying rates were approximately 75% and 56% respectively (no DCC closure). In 2010 (2-day DCC closure) the straying rate was approximately 25%. In 2011 (10-day closure) the straying rate dropped to approximately 7%. Robert also provided information on the 2012 acoustic tagging program. 85 adult Chinook were captured and floy tagged. 56 of the 85 were also acoustically tagged to monitor movement. Data is still preliminary for 2012 as more data is anticipated.

3. Results of Fall Attraction Flows (Jose Setka):. Jose presented slides with data from 2008 thru 2012 (preliminary) showing the positive relationship between the fall pulse flows and the numbers of salmon counted at Woodbridge Dam.

4. 2012 Mokelumne River Returns, Redd Count, and Egg Take (Jose Setka): Jose reported that returns for 2012 as of 11 December 2012 were 12,002. The 2012 egg take at the MRFH was a little over 9 million of which approximately 5 million was taken for hatchery inventory. Jose stated that the 2012 redd count was 1,219 as of 8 December 2012. He also reviewed annual redd count totals since 1990.

   Jose also provided a brief update on the Murphy Creek project (small dam and invasive species removal). Jose presented photos of salmon that have returned to Murphy Creek. Murphy Creek is a small tributary of the Mokelumne

River downstream of Camanche Dam. Jose recognized the private landowners, particularly Bev Sparrowk, for their active partnership in the project.

5. Juvenile Salmonid Tagging Programs (Joe Miyamoto) Joe shared information on the upcoming juvenile salmonid tagging program. Out of the 5.4 M juvenile salmon produced last spring, 1.35 M were coded-wire tagged. Joe stated that 100K yearling Chinook were produced and 92% were coded-wire tagged. The yearling plus steelhead were divided into two different rearing groups, non-enhanced and enhanced raceway rearing with 50 fish from each group fitted with acoustic tags. Joe explained that the enhanced rearing consists of the addition of physical structure into the raceways to provide habitat variation to better mimic natural conditions. He also reported that the number of enhancement Chinook to be produced will be reduced to 1 M (compared to the 2 M produced in past years).

6. 2012 Spawning Gravel Restoration (Jose Setka) Jose reported that 65,432 short tons of gravel material have been placed in the lower Mokelumne since 1990. In 2012, 3,574 cubic yards of gravel was placed in and adjacent to the 2011 project area. Jose said that this year was the last year of AFRP funding for gravel under the existing grant agreement. Donnie reported it is doubtful that there will be funding in 2013, but this could change for 2014.

7. Update on HSRG (Joe Johnson) Joe stated that funding for implementation of California Hatchery Scientific Review Group (HSRG) recommendations is still being sought.

8. Update on JSA Partnership Fund and Activities (Rick Leong): Rick reported that, as of December 2012, the available balance of the Fund was approximately $153K. Two current projects are being implemented and moving forward (City of Lodi education project and the Heritage Oak Winery project). Rick explained that the Heritage Oak Winery restoration project is also part of the current Mokelumne Watershed Environmental Benefits pilot project led by Sustainable Conservation and the Environmental Defense Fund. Rick also reported that the 2012 Frank Beeler Watershed Stewardship Award was presented to Vino Farms at the 2012 EBMUD Pardee BBQ event earlier in the year.

9. Update on Camanche Permit Extension (Richard Sykes) Richard updated the Steering Committee on the progress of the draft EIR for the Camanche Permit Extension. Richard and Ana Ulloa will probably distribute draft sections of the document to Steering Committee members for review in January 2013. Ana explained that EBMUD would like to address/resolve any agencies' questions/ concerns before EBMUD releases the DEIR for public review in March 2013. Richard said that a meeting will be scheduled with partnership agencies, possibly in mid-February, to discuss the document. Jim Smith, EBMUD Supervising Fisheries and Wildlife Biologist, is the primary author and will lead the discussion and answer questions.

10. Updates from Steering Committee Members: Tina Bartlett reminded everyone that the California Dept. of Fish & Game will be known as the California Dept. of Fish & Wildlife as of Jan. 1 2013. Rhonda Reed commented that straying and the relationship between natural production and hatchery production is very important to NOAA Fisheries. Rhonda also stated that work that is being done on the lower Mokelumne is resulting in important data that could influence the entire Central Valley. Joe Johnson commented that the DCC study is very important and we need to keep the momentum going.

11. Meeting Adjournment: The meeting adjourned at 3:35 p.m.

Respectfully submitted by: Rick Leong

APPENDIX E

NOTIFICATION OF AVAILABILITY FOR SALE OF SURPLUS MOKELUMNE RIVER WATER

EBMUD

AGENDA NO. 8.

MEETING DATE April 24, 2012

TITLE **WATER SUPPLY AVAILABILITY AND DEFICIENCY REPORT 2012**

☒ MOTION ☐ RESOLUTION ☐ ORDINANCE

RECOMMENDED ACTION

File the Water Supply Availability and Deficiency Report in conformance with Policy 9.03, and declare that the District's water supply is sufficient for meeting customer demands in 2012.

SUMMARY

This annual Water Supply Availability and Deficiency Report is prepared and submitted to the Board of Directors as required under District Policy 9.03. This report evaluates the adequacy of current year (2012) water supply, and assesses the District's ability to reliably meet demands through the year 2040. In low water years, this annual report provides the basis for the Board's consideration of possible demand management measures. In years of excess supply, this report provides the basis for the Board's determination of additional availability of water.

This 2012 assessment concludes that water year 2012 is a dry year and that the projected runoff requires "Dry" year flows in the lower Mokelumne River under the District's Joint Settlement Agreement (JSA). This determination is based on Department of Water Resources' April 1st projected Mokelumne River runoff of 350,000 acre feet or about 47% of average. As a related consequence, Woodbridge Irrigation District will receive 60,000 acre-feet; Jackson Valley Irrigation District will receive its maximum entitlement of 3,850 acre feet; and North San Joaquin Water Conservation District, a junior water right holder, will receive no water this year. In addition, no flood control releases are anticipated and no water surplus to District needs will be available.

The median forecast for the September 30th total system storage will not lead to implementation of demand management measures even though the projected runoff for this water year is low. This is primarily due to the very full condition of our reservoirs at the start of the water year. In addition, based on the District's Interim Drought Management Program guidelines, the need for dry-year supplemental water supplies will not be triggered and customer rationing will not be required. The District will continue to monitor the water supply situation and encourage efficient water use whenever possible to minimize impacts should next year be dry. The 2012 assessment continues to show that the District will require additional supplemental supplies to achieve a reliable drought water supply through 2040.

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

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

2012 WATER SUPPLY AND DEMAND ASSESSMENT

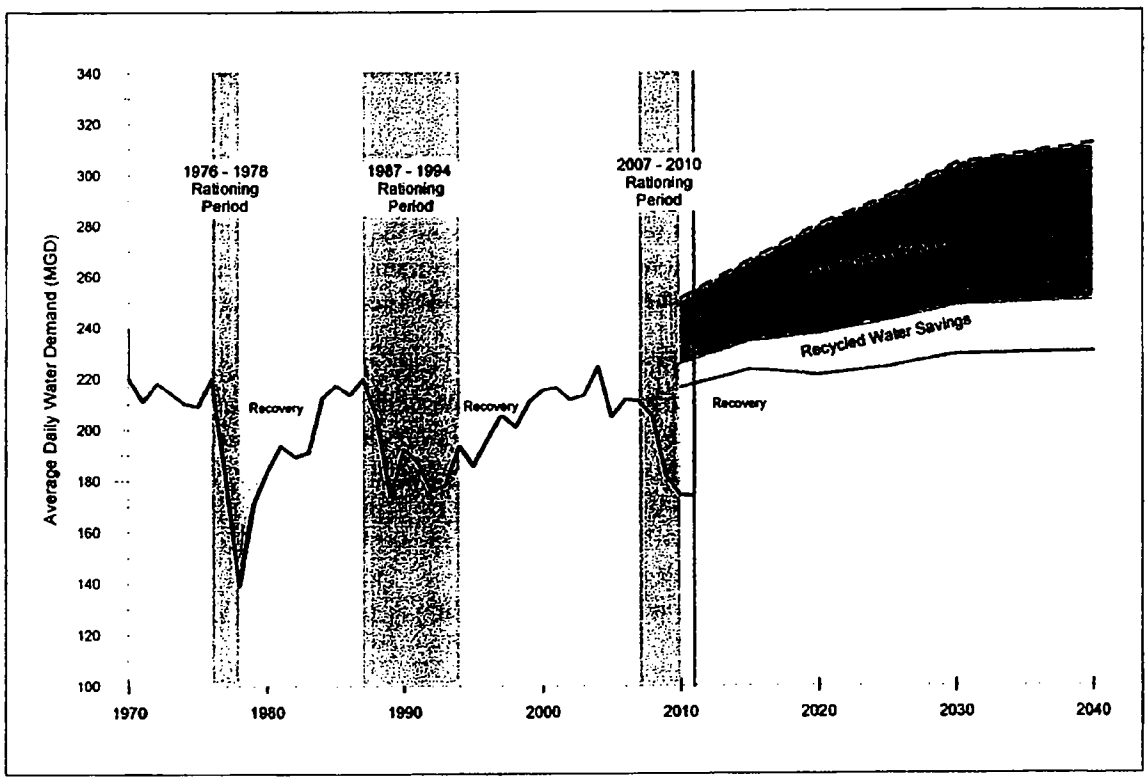
Current year water supply availability is determined by forecasting the amount of water that will be stored in District reservoirs on September 30th which marks the end of the "water year." This forecast is a two-step calculation. First, the amount of total system storage as of September 30th is determined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

Precipitation from July 1 through mid-April typically represents most of the total amount for the season. Precipitation as of April 17 in the Mokelumne Basin is 63% of average, and precipitation in the East Bay watersheds is 79% of average. Based on current rainfall and dry to median precipitation to follow, the current median runoff projection is 350 TAF. For comparison, an average year yields 750 TAF of runoff. Because EBMUD was able to refill its reservoirs during the 2011 water year and due to below average customer water demand water, the corresponding median total system storage at the end of September 2012 is projected to be 520 TAF.

INTERIM WATER SUPPLY AND DEMAND ASSESSMENT

During the 2007-2010 rationing period, EBMUD customers were subjected to mandatory and voluntary water use restrictions. The residual rationing effect of the recent drought management program and the suppressed demand from the downturn in the economy led EBMUD to adopt Interim Drought Management Program Guidelines. These interim guidelines recognize that demand is below the planning level during a recovery period. During this time, while demand is below the planning level of demand, a sufficient water supply defers the need for additional dry-year supplemental water. It is anticipated that the demands will return to pre-drought levels around 2020 (see Figure 1).

Figure 1. Historical and Projected Demand



PLANNING LEVEL WATER SUPPLY AND DEMAND ASSESSMENT THROUGH 2040

To assess the adequacy of the District's water supplies through 2040, this report compares projected future Service Area demands to an analysis of the reliability of future water supplies.

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 for 2020, 2030 and 2040 are shown in Table 1 and 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.

Table 1. Projected Customer Demand

	2020	2030	2040
Planning Level of Demand	221 MGD	229 MGD	230 MGD

The Allowable Maximum Level of Demand (AMLD) is the demand that the system can sustain under the planned worst case drought scenario. The AMLD is calculated using the District's hydrologic model applying the following assumptions:

- The existing supplemental supplies through the Freeport Regional Water Facility and Bayside Groundwater Phase 1 Facility will be available;
- Customer rationing is assumed not to exceed 15% during the three-year drought sequence, per the District's Long Term Drought Management Program Guidelines as outlined in Chapter 3 of the Urban Water Management Plan 2010 and consistent with the WSMP 2040;
- 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 Army Corps of Engineers flood control requirements.

Based on these assumptions, the hydrologic model calculates an AMLD of 189 MGD for the 2040 level of demand. The AMLD for 2020, 2030 and 2040 are shown in the Table 2.

If conservation and recycling programs do not achieve targets, or if additional dry-year supplemental supplies are not developed, the gap between the planning level of demand and AMLD will increase in future years. This increase occurs as senior water right holders increase water diversions under their entitlements and the District's demand increases. Accordingly, without the dry-year supplemental supplies, the District's current water supply will not be adequate to meet customer water demands during future severe drought conditions while maintaining a 15% rationing limit. The AMLD without new supplemental supplies does not change between 2020 and 2030 as diversions by upstream users are projected to increase only modestly during this time.

Table 2. Projected Allowable Maximum Level of Demand

	2020	2030	2040
Planning Level of Demand	221 MGD	229 MGD	230 MGD
AMLD without new supplemental supplies and 15% rationing	205 MGD	205 MGD	189 MGD

2012 CHRON BINDER

EAST BAY MUNICIPAL UTILITY DISTRICT

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

April 30, 2012

Mr. Kent Smith
Regional Manager
Department of Fish and Game
1701 Nimbus Road
Rancho Cordova, CA 95670

Mr. 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 Mr. Smith 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 2012 hydrologic conditions and the District' storage levels, there will be no water that is surplus to the District needs.

Enclosed is a copy of the 2012 Water Supply Availability and Deficiency Report (Report) accepted by the District's Board of Directors at their April 24, 2012 meeting. In low water years, this annual report provides the basis for the Board's consideration of demand management measures. In other years, this report provides the basis for the Board's determination of sufficient water supply. The 2012 assessment, based on the Department of Water Resources' April 1 projected Mokelumne River runoff (47% of average), concludes that water year 2012 is a dry year. Predictably, no flood control releases are anticipated this year. Pursuant to the JSA, the District will provide flow releases to the lower Mokelumne River according to the "Dry" year water type. As per the adaptive management plan approved by the State Water Resources Control Board in February of this year, approximately 4,150 acre-feet of water was held back during the month of March (through a reduction in JSA minimum required releases). This water will be reserved for pulse flow releases in the fall.

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.

Lena L. Tam
Manager of Water Resources Planning

LLT:PKJ:EW:dec

Enclosure

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

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