Lower Mokelumne River Project
FERC Project No. 2916

2009 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 2010

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

AFRP	Anadromous Fish Restoration Program
CBDA	California Bay Delta Authority
CDFG	California Department of Fish and Game
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
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 Game (CDFG), 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 (2009), and those it plans to implement in the current calendar year (2010), 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 2009. EBMUD actions in 2009 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, CDFG, 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 has made efforts to restore, enhance, and protect the fisheries

[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 thru 2008).

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. Section V contains the appendices. Sections III and IV describe efforts made during the 2009 calendar year and efforts planned for 2010.

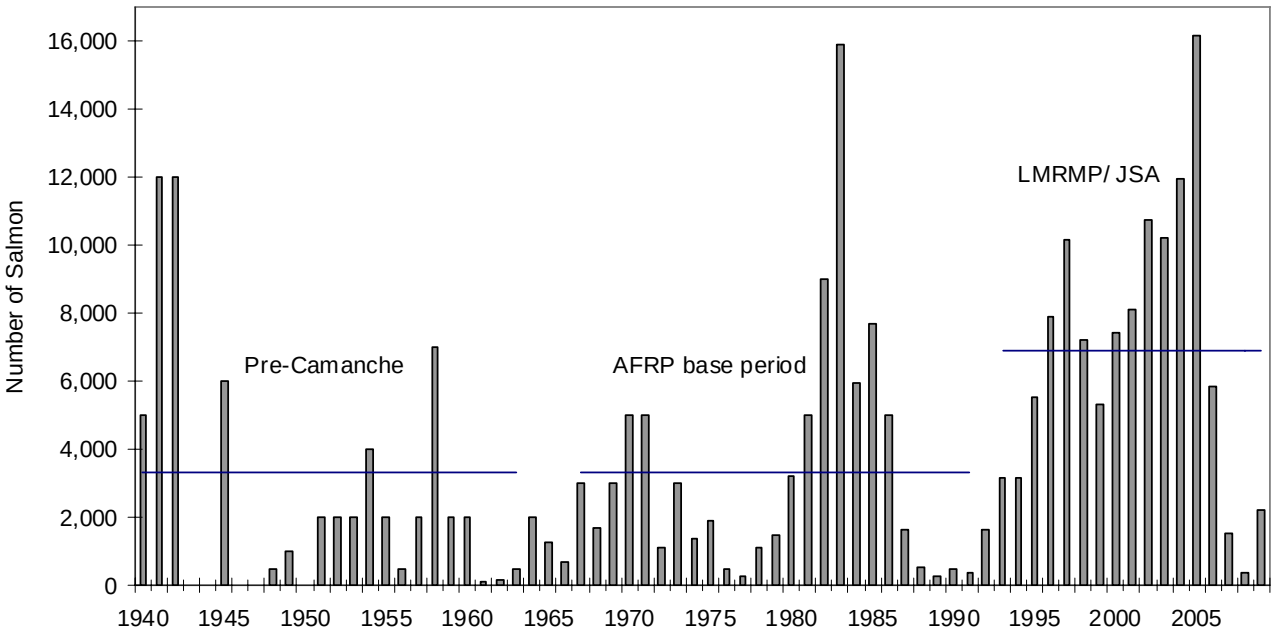
III. STATUS OF THE LOWER MOKELUMNE RIVER SALMON POPULATION

Through the 1990's and into 2009 the lower Mokelumne River Chinook salmon population continues to demonstrate characteristics consistent with long-term sustainability. The fall-run Chinook salmon escapement was 2,232 in 2009 (see Table 1).

Table 1: Lower Mokelumne River Fall-Run Chinook Salmon Data, 1989-2009.

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

Notes:
1. Escapement monitoring generally occurs from August through January, but dates vary each year.
2. Hatchery Returns: count by CDFG at the Mokelumne River Fish Hatchery.
3. Estimates were not segregated into fry and smolts.



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 (6890) is the average estimate at Woodbridge since voluntary flow improvements were initiated in 1993.

Figure 1: Lower Mokelumne River Fall-Run Chinook Salmon Escapement, 1940-2009.

Pacific salmon stocks have been stressed for decades by threats to their stream and estuary habitats, including water diversions, dams, urbanization, sedimentation, pollution, habitat modification and droughts which supports non-native species and their subsequent predation on salmon; however, Pacific salmon abundance has 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. The most recent cool cycle appears to have lasted from 1998-2003, coinciding with vastly improved salmon returns in California. Since 2004, water temperatures off the coast have risen and food availability for salmon has declined. 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]). These indicators predicted poor ocean conditions for juveniles from 2003-2006 with conditions improving in 2007. While the oceanic conditions were improving in 2007, the salmon returns prediction for 2009 was for less than normal returns. Oceanic conditions in 2008 were greatly improved, which may be indicative of good returns in 2010. In addition to providing a forecasting tool for salmon returns, these metrics provide insight into the understanding of how variations in ocean conditions affect recruitment of salmon. This was reflected in the escapement of fall-run Chinook salmon in the lower Mokelumne River (see Figure 1 and Figure 2) as well as other rivers in Central California (see Table 2).

Table 2: Escapement of Fall-Run Chinook Salmon in Central California Rivers.

River	2006 Escapement	2007 Escapement	2008 Escapement	2009[1] Escapement
American	29,729	14,390	5,698	8,482
Feather	93,281	28,079[2]	14,628	14,793[2]
Merced	2,150	481	468	701
Mokelumne	5,861	1,519	412	2,232
Sacramento	281,894	38,801	57,206	29,664
Stanislaus	3,022	312	1,392	748
Tuolumne	500	115	372	200

Notes:

1. Escapement data for 2009 is a preliminary estimate.
2. Data includes in-river spring-run.

[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.

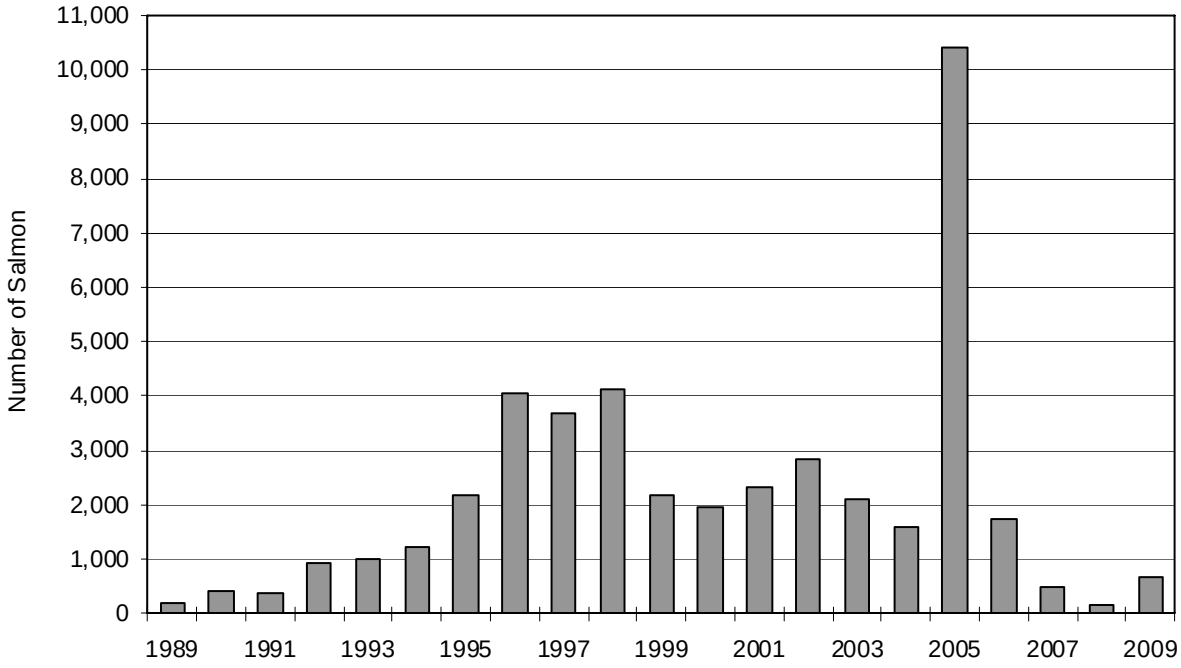


Figure 2: Fall-Run Chinook Salmon Natural Spawning in the Lower Mokelumne River, 1989-2009.

The Mokelumne River Fish Hatchery (MRFH), owned by the District and operated by the California Department of Fish and Game (CDFG), reported that the 2009 salmon return at the MRFH was 1,552 salmon. The 2009 MRFH Annual Operations Plan called for a second year of no egg transfers from other hatcheries. After negotiations with CDFG, USFWS, and NMFS approval was given for a pilot project to transfer eggs from Mokelumne River origin fish captured at Nimbus Hatchery on the American River. Real-time coded wire tag reading was used to identify and pair Mokelumne River origin fish. The return of salmon to the MRFH and Nimbus hatchery in 2009 yielded 2 million eggs from salmon returning to MRFH, and 366,000 eggs from Mokelumne River origin adults collected at Nimbus. While some Mokelumne River origin eggs were transferred from Nimbus, CDFG's decision to continue the ban on egg transfers will continue to result in a significant reduction in Chinook salmon production at MRFH. Moreover, there will likely be a long-term effect on the escapement numbers to the Mokelumne

River, recreational fisheries, and commercial fisheries. 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 2009, and those actions planned for 2010, are described in this section.

A. FLOW

Consultation with CDFG 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 2009 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. In 2009, EBMUD and USGS met and agreed to publish the Camanche release for water year 2010 as measured at Camanche Dam using its Accusonic flow meters at the dam. For water year 2010, EBMUD will also measure the stream flow below Camanche Dam at the McIntire Gage in addition 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 2009 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.

2009

In accordance with the November 27, 1998 FERC approval of the JSA, and based upon EBMUD's forecast of total Pardee and Camanche storage on November 5, 2008, EBMUD provided "Dry" JSA water year type Camanche Dam flow releases from October 1, 2008 through March 31, 2009. Pardee and Camanche actual total storage on November 5, 2008 was 304,870 acre-feet.

Based on the California Department of Water Resources (DWR) April 1, 2009 forecast of 588,000 acre-feet of unimpaired runoff into Pardee Reservoir, EBMUD operated under a "Below Normal" JSA water year type Camanche Dam flow releases from April 1, 2009 through September 30, 2009.

EBMUD is making, at a minimum, "Normal & Above" JSA water year type Camanche Dam flow releases from October 1, 2009 through March 31, 2010. This is based on EBMUD's October 1, 2009 forecast of total Pardee and Camanche storage on November 5, 2009 of 460,000

acre feet. Pardee and Camanche actual total storage on November 5, 2009 was 456,650 acre-feet.

Calendar year 2009 actual Camanche Dam average daily flow releases and JSA agreed flow releases from Camanche Dam are shown in Table 3 and Figure 3, on the following pages. Calendar year 2009 actual average daily flow below Woodbridge Dam and JSA expected flow below Woodbridge Dam are shown in Table 4 and Figure 4.

Adaptive Management

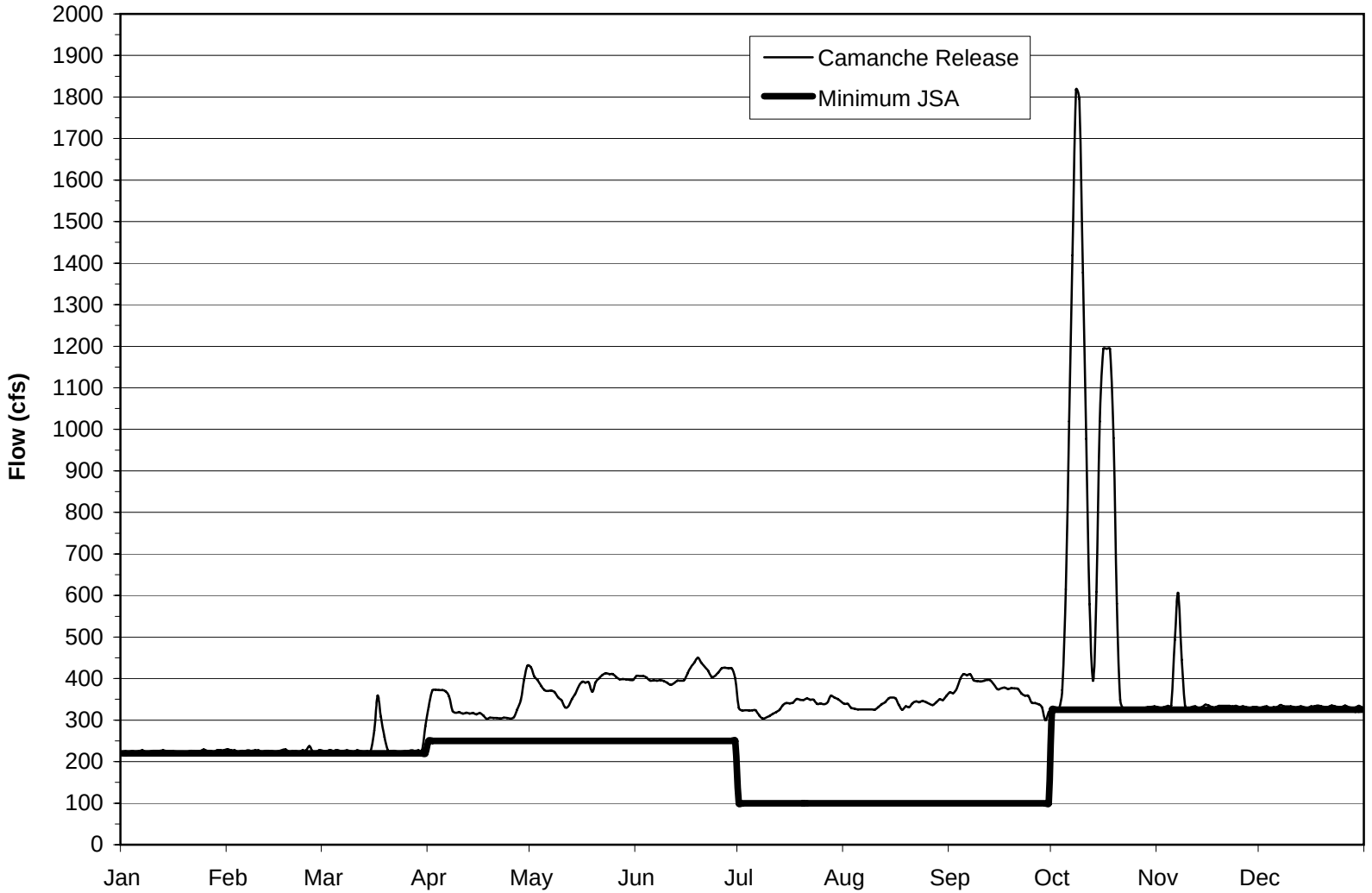
The JSA contains an adaptive management provision related to minimum flows which allows for changes in the schedule in order to optimize fishery habitat and other ecosystem values, provided that the total quantity of water released in any given year will not be less than the quantity of water provided by the flow requirements for that type of year. In order to conserve a volume of water to be used as an attraction pulse flow in the fall months, since 2009 was a dry year and sufficient water for a pulse release would not be available, EBMUD proposed to reduce the releases to the lower Mokelumne River during a portion of the spring/early summer months. With the concurrence of the JSA partners and NOAA Fisheries and approval of the State Water Resources Control Board (see Appendix B), EBMUD reallocated 5,193 acre feet of water from May and June 2009 for a pulse flow in October 2009 to provide an additional attraction cue for adult salmon to migrate into the Mokelumne River. The timing of the pulse flow was coordinated with the USFWS and CDFG and all of the reallocated water was added to flood control releases to provide a gravel cleansing flow. Because of an early and significant October storm event, a second pulse flow was added using additional flood control releases.

TABLE 3. Calendar Year 2009 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
01/01/09	223	220	03/17/09	359	220	05/31/09	397	250	08/14/09	352	100	10/28/09	329	325
01/02/09	224	220	03/18/09	308	220	06/01/09	406	250	08/15/09	354	100	10/29/09	331	325
01/03/09	223	220	03/19/09	259	220	06/02/09	406	250	08/16/09	352	100	10/30/09	332	325
01/04/09	225	220	03/20/09	227	220	06/03/09	406	250	08/17/09	336	100	10/31/09	333	325
01/05/09	224	220	03/21/09	225	220	06/04/09	402	250	08/18/09	325	100	11/01/09	331	325
01/06/09	225	220	03/22/09	226	220	06/05/09	395	250	08/19/09	333	100	11/02/09	330	325
01/07/09	227	220	03/23/09	223	220	06/06/09	396	250	08/20/09	331	100	11/03/09	332	325
01/08/09	223	220	03/24/09	224	220	06/07/09	395	250	08/21/09	340	100	11/04/09	334	325
01/09/09	224	220	03/25/09	225	220	06/08/09	396	250	08/22/09	345	100	11/05/09	335	325
01/10/09	226	220	03/26/09	225	220	06/09/09	394	250	08/23/09	343	100	11/06/09	493	325
01/11/09	226	220	03/27/09	227	220	06/10/09	390	250	08/24/09	346	100	11/07/09	606	325
01/12/09	226	220	03/28/09	226	220	06/11/09	385	250	08/25/09	343	100	11/08/09	445	325
01/13/09	227	220	03/29/09	227	220	06/12/09	389	250	08/26/09	339	100	11/09/09	334	325
01/14/09	225	220	03/30/09	227	220	06/13/09	395	250	08/27/09	336	100	11/10/09	329	325
01/15/09	225	220	03/31/09	285	220	06/14/09	395	250	08/28/09	343	100	11/11/09	332	325
01/16/09	225	220	04/01/09	332	250	06/15/09	396	250	08/29/09	350	100	11/12/09	333	325
01/17/09	224	220	04/02/09	371	250	06/16/09	412	250	08/30/09	348	100	11/13/09	329	325
01/18/09	224	220	04/03/09	373	250	06/17/09	428	250	08/31/09	359	100	11/14/09	332	325
01/19/09	224	220	04/04/09	372	250	06/18/09	439	250	09/01/09	367	100	11/15/09	337	325
01/20/09	223	220	04/05/09	372	250	06/19/09	450	250	09/02/09	365	100	11/16/09	335	325
01/21/09	226	220	04/06/09	369	250	06/20/09	438	250	09/03/09	376	100	11/17/09	331	325
01/22/09	225	220	04/07/09	357	250	06/21/09	429	250	09/04/09	399	100	11/18/09	331	325
01/23/09	225	220	04/08/09	322	250	06/22/09	419	250	09/05/09	411	100	11/19/09	334	325
01/24/09	226	220	04/09/09	318	250	06/23/09	404	250	09/06/09	408	100	11/20/09	334	325
01/25/09	229	220	04/10/09	319	250	06/24/09	406	250	09/07/09	410	100	11/21/09	334	325
01/26/09	226	220	04/11/09	316	250	06/25/09	415	250	09/08/09	396	100	11/22/09	334	325
01/27/09	226	220	04/12/09	318	250	06/26/09	425	250	09/09/09	394	100	11/23/09	333	325
01/28/09	224	220	04/13/09	316	250	06/27/09	426	250	09/10/09	393	100	11/24/09	334	325
01/29/09	228	220	04/14/09	317	250	06/28/09	425	250	09/11/09	395	100	11/25/09	332	325
01/30/09	227	220	04/15/09	314	250	06/29/09	424	250	09/12/09	397	100	11/26/09	333	325
01/31/09	228	220	04/16/09	317	250	06/30/09	400	250	09/13/09	395	100	11/27/09	331	325
02/01/09	230	220	04/17/09	311	250	07/01/09	330	100	09/14/09	384	100	11/28/09	330	325
02/02/09	227	220	04/18/09	303	250	07/02/09	323	100	09/15/09	374	100	11/29/09	332	325
02/03/09	227	220	04/19/09	306	250	07/03/09	324	100	09/16/09	376	100	11/30/09	332	325
02/04/09	223	220	04/20/09	305	250	07/04/09	323	100	09/17/09	378	100	12/01/09	330	325
02/05/09	226	220	04/21/09	305	250	07/05/09	324	100	09/18/09	375	100	12/02/09	332	325
02/06/09	225	220	04/22/09	304	250	07/06/09	324	100	09/19/09	377	100	12/03/09	333	325
02/07/09	227	220	04/23/09	306	250	07/07/09	311	100	09/20/09	376	100	12/04/09	329	325
02/08/09	226	220	04/24/09	305	250	07/08/09	304	100	09/21/09	375	100	12/05/09	331	325
02/09/09	227	220	04/25/09	304	250	07/09/09	306	100	09/22/09	364	100	12/06/09	331	325
02/10/09	227	220	04/26/09	307	250	07/10/09	310	100	09/23/09	359	100	12/07/09	336	325
02/11/09	224	220	04/27/09	326	250	07/11/09	315	100	09/24/09	358	100	12/08/09	333	325
02/12/09	226	220	04/28/09	348	250	07/12/09	319	100	09/25/09	342	100	12/09/09	333	325
02/13/09	226	220	04/29/09	398	250	07/13/09	325	100	09/26/09	341	100	12/10/09	333	325
02/14/09	225	220	04/30/09	431	250	07/14/09	336	100	09/27/09	338	100	12/11/09	332	325
02/15/09	224	220	05/01/09	427	250	07/15/09	341	100	09/28/09	332	100	12/12/09	331	325
02/16/09	225	220	05/02/09	405	250	07/16/09	340	100	09/29/09	300	100	12/13/09	333	325
02/17/09	228	220	05/03/09	396	250	07/17/09	342	100	09/30/09	320	100	12/14/09	331	325
02/18/09	229	220	05/04/09	382	250	07/18/09	351	100	10/01/09	324	325	12/15/09	329	325
02/19/09	224	220	05/05/09	372	250	07/19/09	349	100	10/02/09	327	325	12/16/09	333	325
02/20/09	225	220	05/06/09	370	250	07/20/09	348	100	10/03/09	326	325	12/17/09	333	325
02/21/09	225	220	05/07/09	371	250	07/21/09	352	100	10/04/09	372	325	12/18/09	335	325
02/22/09	224	220	05/08/09	367	250	07/22/09	349	100	10/05/09	615	325	12/19/09	333	325
02/23/09	227	220	05/09/09	355	250	07/23/09	349	100	10/06/09	1019	325	12/20/09	332	325
02/24/09	227	220	05/10/09	347	250	07/24/09	339	100	10/07/09	1419	325	12/21/09	332	325
02/25/09	237	220	05/11/09	331	250	07/25/09	340	100	10/08/09	1817	325	12/22/09	335	325
02/26/09	223	220	05/12/09	333	250	07/26/09	338	100	10/09/09	1795	325	12/23/09	333	325
02/27/09	224	220	05/13/09	350	250	07/27/09	342	100	10/10/09	1377	325	12/24/09	332	325
02/28/09	228	220	05/14/09	363	250	07/28/09	358	100	10/11/09	977	325	12/25/09	332	325
03/01/09	226	220	05/15/09	380	250	07/29/09	355	100	10/12/09	579	325	12/26/09	335	325
03/02/09	225	220	05/16/09	392	250	07/30/09	351	100	10/13/09	395	325	12/27/09	332	325
03/03/09	228	220	05/17/09	390	250	07/31/09	345	100	10/14/09	609	325	12/28/09	330	325
03/04/09	226	220	05/18/09	391	250	08/01/09	339	100	10/15/09	1019	325	12/29/09	330	325
03/05/09	228	220	05/19/09	368	250	08/02/09	339	100	10/16/09	1194	325	12/30/09	334	325
03/06/09	226	220	05/20/09	391	250	08/03/09	330	100	10/17/09	1194	325	12/31/09	331	325
03/07/09	226	220	05/21/09	401	250	08/04/09	328	100	10/18/09	1194	325			
03/08/09	227	220	05/22/09	409	250	08/05/09	326	100	10/19/09	979	325			
03/09/09	225	220	05/23/09	413	250	08/06/09	326	100	10/20/09	580	325			
03/10/09	224	220	05/24/09	411	250	08/07/09	326	100	10/21/09	349	325			
03/11/09	227	220	05/25/09	411	250	08/08/09	326	100	10/22/09	326	325			
03/12/09	225	220	05/26/09	404	250	08/09/09	326	100	10/23/09	329	325			
03/13/09	224	220	05/27/09	398	250	08/10/09	325	100	10/24/09	329	325			
03/14/09	225	220	05/28/09	399	250	08/11/09	332	100	10/25/09	328	325			
03/15/09	226	220	05/29/09	398	250	08/12/09	338	100	10/26/09	328	325			
03/16/09	275	220	05/30/09	397	250	08/13/09	343	100	10/27/09	328	325			

1. Releases in calendar year 2009 were made according to the "Dry" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Below Normal" year flow schedule from Apr. 1 through Sept. 30; and "Normal/Above" year flow schedule from Oct. 1. through Dec. 31.
2. Flow data measured at USGS Gage #11323500 (Mokelumne River below Camanche Dam) using Accusonic flow meter.
3. Meter reading measurements are accurate to within +/- 2%.
4. Actual flow data has not yet been verified and published by the U.S. Geological Survey.
5. On Oct. 1 the average daily flow recorded as the release from Camanche Dam was 324 cfs, one cfs below the JSA minimum flow. The release flow was recorded at 324 cfs due to a one-time transition from analog data transfer to digital data transfer within the SCADA system. The average daily flow measure at McIntire Gage below Camanche Dam was 330 cfs on Oct. 1.

FIGURE 3. Calendar Year 2009 Release in Cubic Feet Per Second from Camanche Dam.



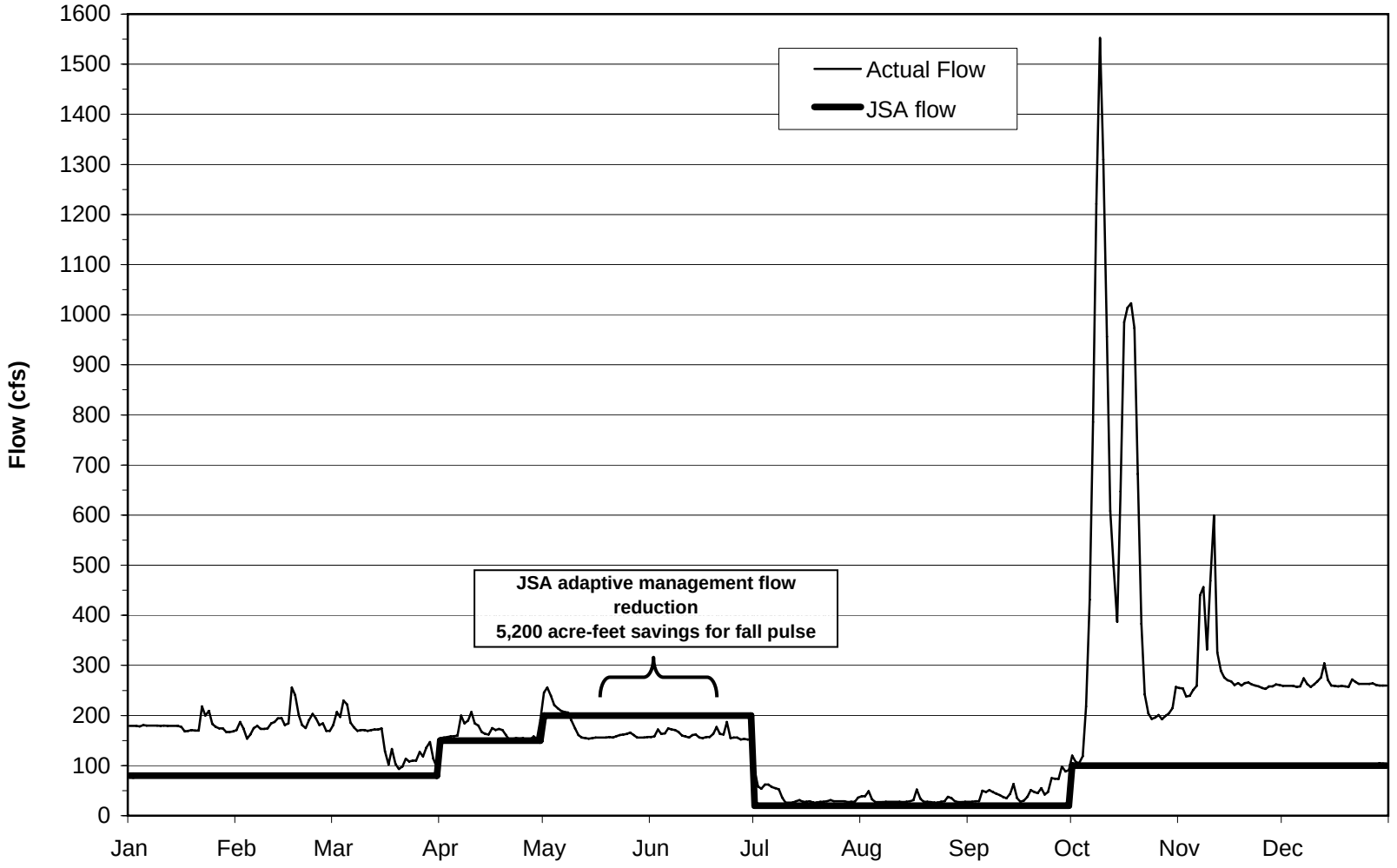
1. Releases in calendar year 2009 were made according to the "Dry" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Below Normal" year flow schedule from Apr. 1 through Sept. 30; and "Normal/Above" year flow schedule from Oct 1. through Dec. 31.
2. Actual flow data has not been verified and published by the U.S. Geological Survey.

TABLE 4. Calendar Year 2009 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
01/01/09	179	80	03/17/09	102	80	05/31/09	157	200	08/14/09	28	20	10/28/09	199	100
01/02/09	179	80	03/18/09	133	80	06/01/09	157	200	08/15/09	29	20	10/29/09	204	100
01/03/09	179	80	03/19/09	103	80	06/02/09	158	200	08/16/09	31	20	10/30/09	215	100
01/04/09	178	80	03/20/09	93	80	06/03/09	172	200	08/17/09	52	20	10/31/09	257	100
01/05/09	181	80	03/21/09	98	80	06/04/09	163	200	08/18/09	34	20	11/01/09	255	100
01/06/09	180	80	03/22/09	114	80	06/05/09	164	200	08/19/09	28	20	11/02/09	254	100
01/07/09	180	80	03/23/09	108	80	06/06/09	174	200	08/20/09	28	20	11/03/09	238	100
01/08/09	180	80	03/24/09	110	80	06/07/09	172	200	08/21/09	27	20	11/04/09	239	100
01/09/09	180	80	03/25/09	110	80	06/08/09	171	200	08/22/09	26	20	11/05/09	251	100
01/10/09	179	80	03/26/09	127	80	06/09/09	167	200	08/23/09	26	20	11/06/09	259	100
01/11/09	180	80	03/27/09	118	80	06/10/09	160	200	08/24/09	28	20	11/07/09	440	100
01/12/09	179	80	03/28/09	136	80	06/11/09	158	200	08/25/09	29	20	11/08/09	456	100
01/13/09	179	80	03/29/09	147	80	06/12/09	156	200	08/26/09	38	20	11/09/09	332	100
01/14/09	179	80	03/30/09	114	80	06/13/09	161	200	08/27/09	35	20	11/10/09	469	100
01/15/09	179	80	03/31/09	96	80	06/14/09	162	200	08/28/09	29	20	11/11/09	599	100
01/16/09	177	80	04/01/09	155	150	06/15/09	156	200	08/29/09	27	20	11/12/09	326	100
01/17/09	168	80	04/02/09	156	150	06/16/09	155	200	08/30/09	27	20	11/13/09	289	100
01/18/09	169	80	04/03/09	157	150	06/17/09	157	200	08/31/09	28	20	11/14/09	276	100
01/19/09	171	80	04/04/09	158	150	06/18/09	157	200	09/01/09	28	20	11/15/09	270	100
01/20/09	170	80	04/05/09	159	150	06/19/09	163	200	09/02/09	28	20	11/16/09	268	100
01/21/09	170	80	04/06/09	160	150	06/20/09	177	200	09/03/09	29	20	11/17/09	261	100
01/22/09	218	80	04/07/09	200	150	06/21/09	163	200	09/04/09	29	20	11/18/09	265	100
01/23/09	200	80	04/08/09	184	150	06/22/09	162	200	09/05/09	50	20	11/19/09	260	100
01/24/09	209	80	04/09/09	190	150	06/23/09	187	200	09/06/09	47	20	11/20/09	265	100
01/25/09	183	80	04/10/09	207	150	06/24/09	155	200	09/07/09	51	20	11/21/09	266	100
01/26/09	177	80	04/11/09	184	150	06/25/09	156	200	09/08/09	47	20	11/22/09	262	100
01/27/09	174	80	04/12/09	180	150	06/26/09	156	200	09/09/09	44	20	11/23/09	260	100
01/28/09	174	80	04/13/09	167	150	06/27/09	152	200	09/10/09	41	20	11/24/09	258	100
01/29/09	167	80	04/14/09	163	150	06/28/09	153	200	09/11/09	37	20	11/25/09	255	100
01/30/09	167	80	04/15/09	162	150	06/29/09	152	200	09/12/09	35	20	11/26/09	253	100
01/31/09	168	80	04/16/09	175	150	06/30/09	152	200	09/13/09	44	20	11/27/09	258	100
02/01/09	171	80	04/17/09	171	150	07/01/09	90	20	09/14/09	63	20	11/28/09	258	100
02/02/09	187	80	04/18/09	173	150	07/02/09	58	20	09/15/09	35	20	11/29/09	262	100
02/03/09	174	80	04/19/09	171	150	07/03/09	54	20	09/16/09	28	20	11/30/09	261	100
02/04/09	154	80	04/20/09	161	150	07/04/09	62	20	09/17/09	30	20	12/01/09	259	100
02/05/09	162	80	04/21/09	151	150	07/05/09	62	20	09/18/09	38	20	12/02/09	259	100
02/06/09	175	80	04/22/09	153	150	07/06/09	57	20	09/19/09	51	20	12/03/09	259	100
02/07/09	179	80	04/23/09	155	150	07/07/09	55	20	09/20/09	47	20	12/04/09	259	100
02/08/09	173	80	04/24/09	154	150	07/08/09	53	20	09/21/09	45	20	12/05/09	257	100
02/09/09	173	80	04/25/09	155	150	07/09/09	36	20	09/22/09	55	20	12/06/09	258	100
02/10/09	174	80	04/26/09	150	150	07/10/09	26	20	09/23/09	42	20	12/07/09	274	100
02/11/09	184	80	04/27/09	152	150	07/11/09	26	20	09/24/09	47	20	12/08/09	263	100
02/12/09	187	80	04/28/09	158	150	07/12/09	26	20	09/25/09	75	20	12/09/09	257	100
02/13/09	194	80	04/29/09	153	150	07/13/09	29	20	09/26/09	74	20	12/10/09	262	100
02/14/09	195	80	04/30/09	191	150	07/14/09	31	20	09/27/09	73	20	12/11/09	268	100
02/15/09	181	80	05/01/09	246	200	07/15/09	28	20	09/28/09	98	20	12/12/09	276	100
02/16/09	184	80	05/02/09	256	200	07/16/09	28	20	09/29/09	88	20	12/13/09	304	100
02/17/09	256	80	05/03/09	239	200	07/17/09	29	20	09/30/09	91	20	12/14/09	271	100
02/18/09	241	80	05/04/09	221	200	07/18/09	26	20	10/01/09	120	100	12/15/09	260	100
02/19/09	201	80	05/05/09	214	200	07/19/09	26	20	10/02/09	107	100	12/16/09	259	100
02/20/09	181	80	05/06/09	209	200	07/20/09	28	20	10/03/09	105	100	12/17/09	258	100
02/21/09	175	80	05/07/09	207	200	07/21/09	28	20	10/04/09	119	100	12/18/09	259	100
02/22/09	191	80	05/08/09	206	200	07/22/09	29	20	10/05/09	218	100	12/19/09	258	100
02/23/09	203	80	05/09/09	190	200	07/23/09	31	20	10/06/09	431	100	12/20/09	257	100
02/24/09	194	80	05/10/09	174	200	07/24/09	29	20	10/07/09	786	100	12/21/09	272	100
02/25/09	181	80	05/11/09	161	200	07/25/09	29	20	10/08/09	1221	100	12/22/09	267	100
02/26/09	184	80	05/12/09	156	200	07/26/09	29	20	10/09/09	1552	100	12/23/09	263	100
02/27/09	169	80	05/13/09	155	200	07/27/09	29	20	10/10/09	1310	100	12/24/09	263	100
02/28/09	169	80	05/14/09	154	200	07/28/09	27	20	10/11/09	956	100	12/25/09	263	100
03/01/09	181	80	05/15/09	155	200	07/29/09	28	20	10/12/09	608	100	12/26/09	263	100
03/02/09	207	80	05/16/09	156	200	07/30/09	28	20	10/13/09	497	100	12/27/09	264	100
03/03/09	197	80	05/17/09	156	200	07/31/09	36	20	10/14/09	387	100	12/28/09	261	100
03/04/09	230	80	05/18/09	156	200	08/01/09	39	20	10/15/09	647	100	12/29/09	260	100
03/05/09	222	80	05/19/09	156	200	08/02/09	39	20	10/16/09	985	100	12/30/09	260	100
03/06/09	186	80	05/20/09	157	200	08/03/09	49	20	10/17/09	1014	100	12/31/09	260	100
03/07/09	176	80	05/21/09	156	200	08/04/09	33	20	10/18/09	1023	100			
03/08/09	169	80	05/22/09	159	200	08/05/09	27	20	10/19/09	973	100			
03/09/09	171	80	05/23/09	161	200	08/06/09	27	20	10/20/09	682	100			
03/10/09	171	80	05/24/09	162	200	08/07/09	27	20	10/21/09	383	100			
03/11/09	169	80	05/25/09	163	200	08/08/09	28	20	10/22/09	242	100			
03/12/09	171	80	05/26/09	166	200	08/09/09	28	20	10/23/09	204	100			
03/13/09	172	80	05/27/09	161	200	08/10/09	28	20	10/24/09	193	100			
03/14/09	172	80	05/28/09	156	200	08/11/09	28	20	10/25/09	196	100			
03/15/09	174	80	05/29/09	156	200	08/12/09	28	20	10/26/09	201	100			
03/16/09	129	80	05/30/09	156	200	08/13/09	27	20	10/27/09	193	100			

1. Expected flows past Woodbridge Dam in calendar year 2009 were according to the "Dry" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Below Normal" year flow schedule from Apr. 1 through Sept. 30; and "Normal/Above" year flow schedule from Oct 1. through Dec. 31.
2. Flow data measured at USGS Gage #11325500 (Mokelumne River at Woodbridge).
3. Individual discharge measurements are accurate to within +- 5%.
4. Actual flow data has not yet been verified and published by the U.S. Geological Survey.
5. JSA Adaptive Management included a temporary reduction from the expected flow below Woodbridge Dam through the months of May and June from 200 to 150 cfs in order to conserve a volume of water to be released in October.

FIGURE 4. Calendar Year 2009 Flow in Cubic Feet Per Second Below Woodbridge Dam.



1. Releases in calendar year 2009 were made according to the "Dry" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Below Normal" year flow schedule from Apr. 1 through Sept. 30; and "normal/Above" 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.

During the 2009 calendar year two provisional, temporary flow deviations occurred from the JSA minimum flow release from Camanche Dam. In May 2009 a temporary flow deviation from the minimum JSA Camanche release occurred due to a temporary power outage. At 8:23 PM on May 19, 2009, there was an electrical equipment failure at the Camanche Power House that resulted in a brief reduction in flow to the Lower Mokelumne River. Due to lack of power, there were no readings recorded from the Accusonic flow meters during the event. The release just prior to the event as measured by the Accusonic flow meters was recorded at 390 cfs. Standby personnel responded on scene and bypassed the failed power system at 9:58 PM and within minutes reading measured by the Accusonic flow meters were restored to pre-event flows. Resource agencies were notified of the event.

River flow information during the event is limited to McIntire Gage readings. River flows at the McIntire gage, one mile downstream from Camanche Dam, for each 15 minute reading are show in the table below. By working with Woodbridge Irrigation District, flows below Woodbridge never fell below the JSA expected flow of 150 CFS.

Date/ Time	Actual Flow at McIntire Gage[1] (cfs)	JSA Camanche Minimum Release (cfs)
5/19/09 20:00	389	200
5/19/09 20:15	389	200
5/19/09 20:30	389	200
5/19/09 20:45	378	200
5/19/09 21:00	323	200
5/19/09 21:15	246	200
5/19/09 21:30	190	200
5/19/09 21:45	154	200
5/19/09 22:00	142	200
5/19/09 22:15	138	200
5/19/09 22:30	134	200
5/19/09 22:45	134	200
5/19/09 23:00	313	200
5/19/09 23:15	436	200
5/19/09 23:30	404	200
5/19/09 23:45	389	200
5/20/09 24:00	384	200

[1] Camanche release as measured by the Accusonic flow meters not available during the event.

In February 2009 a temporary flow deviation below the minimum JSA Camanche release occurred due to a PG&E transmission line outage requiring a large release flow to be transferred from generation to sluice. Total Camanche Dam releases fell below JSA required flows for approximately 1 and ¾ hours until dispatched staff arrived at the power house and made field adjustments to fine tune releases to the required flow. Fifteen-minute readings of the Camanche Dam Releases at the USGS Gaging Station No. 1132350 Mokelumne River at Camanche Dam, as measured by the accusonic flow meter, during the provisional, temporary flow deviation are shown in a table below.

Date/ Time	Actual Flow at Camanche Dam (cfs)	JSA Camanche Minimum Release (cfs)
2/26/2009 6:00	225	220
2/26/2009 6:15	276	220
2/26/2009 6:30	211	220
2/26/2009 6:45	201	220
2/26/2009 7:00	201	220
2/26/2009 7:15	217	220
2/26/2009 7:30	212	220
2/26/2009 7:45	198	220
2/26/2009 8:00	198	220
2/26/2009 8:15	220	220
2/26/2009 8:30	226	220
2/26/2009 8:45	220	220
2/26/2009 9:00	223	220

During the 2009 calendar year three provisional, temporary flow deviation, each lasting for approximately a period of one hour, from the JSA expected flow below Woodridge Dam, based on the recorded 15-minute readings, occurred during the filling operation of Lake Lodi over the course of about 24 hours. The release from Camanche Dam never fell below the minimum flow during these deviations. In addition, the daily average expected flow below Woodridge Dam did not fall below the minimum during this period. 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 a table below.

Date/ Time	Actual Flow Below Woodbridge Dam (cfs)	JSA Expected Flow (cfs)
3/17/09 18:15	123	80
3/17/09 18:30	110	80
3/17/09 18:45	68	80
3/17/09 19:00	48	80
3/17/09 19:15	52	80
3/17/09 19:30	67	80
3/17/09 19:45	88	80
3/17/09 20:00	114	80

Date/ Time	Actual Flow Below Woodbridge Dam (cfs)	JSA Expected Flow (cfs)
3/18/09 6:30	107	80
3/18/09 6:45	102	80
3/18/09 7:00	79	80
3/18/09 7:15	67	80
3/18/09 7:30	68	80
3/18/09 7:45	92	80
3/18/09 8:00	113	80

Date/ Time	Actual Flow Below Woodbridge Dam (cfs)	JSA Expected Flow (cfs)
3/18/09 14:30	93	80
3/18/09 14:45	86	80
3/18/09 15:00	85	80
3/18/09 15:15	71	80
3/18/09 15:30	59	80
3/18/09 15:45	62	80
3/18/09 16:00	89	80
3/18/09 16:15	110	80

2010

EBMUD is committed, pursuant to the FERC Order, to "Normal & Above" JSA year type Camanche Dam flow releases through March 31, 2010. 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, 2010 DWR Bulletin 120, the JSA water year type which will govern EBMUD's flow schedule for the period April 1, 2010 through September 30, 2010. EBMUD will report to the FERC in the February 2010 report on the flow releases made in accordance with the JSA during the entire calendar year 2010. 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 2007 calendar year, and January through September, 2008.

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, the use of EBMUD's Hypolimnetic Oxygenation System (HOS), and the use of supplemental chillers and filtering equipment at the hatchery facility. 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 developed and implemented an adaptive reservoir operations plan (which includes management of cold water in the reservoir, reservoir water quality monitoring, weekly review of conditions, modeling and forecasting conditions, and scheduling of operations) that effectively meets the water temperature needs in the MRFH and the lower Mokelumne River under all but extreme drought conditions. EBMUD manages temperatures in water released from Camanche Reservoir by keeping Camanche Reservoir thermally stratified until its surface waters naturally cools usually in November. 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. The cold hypolimnetic water is also conserved in the spring, when Camanche Reservoir stratifies, by releasing warmer surface water.

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.

2009

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 5, Calendar Year 2009 Mokelumne River Water Average Daily Temperatures of the Release from Camanche Dam.

From April 1, 2009 through September 30, 2009 EBMUD operated under a "Below Normal" JSA water year type, except for 5,193 acre feet of water reallocated from May and June for an October pulse flow (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 2009.

2010

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 state-of-the-art 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.

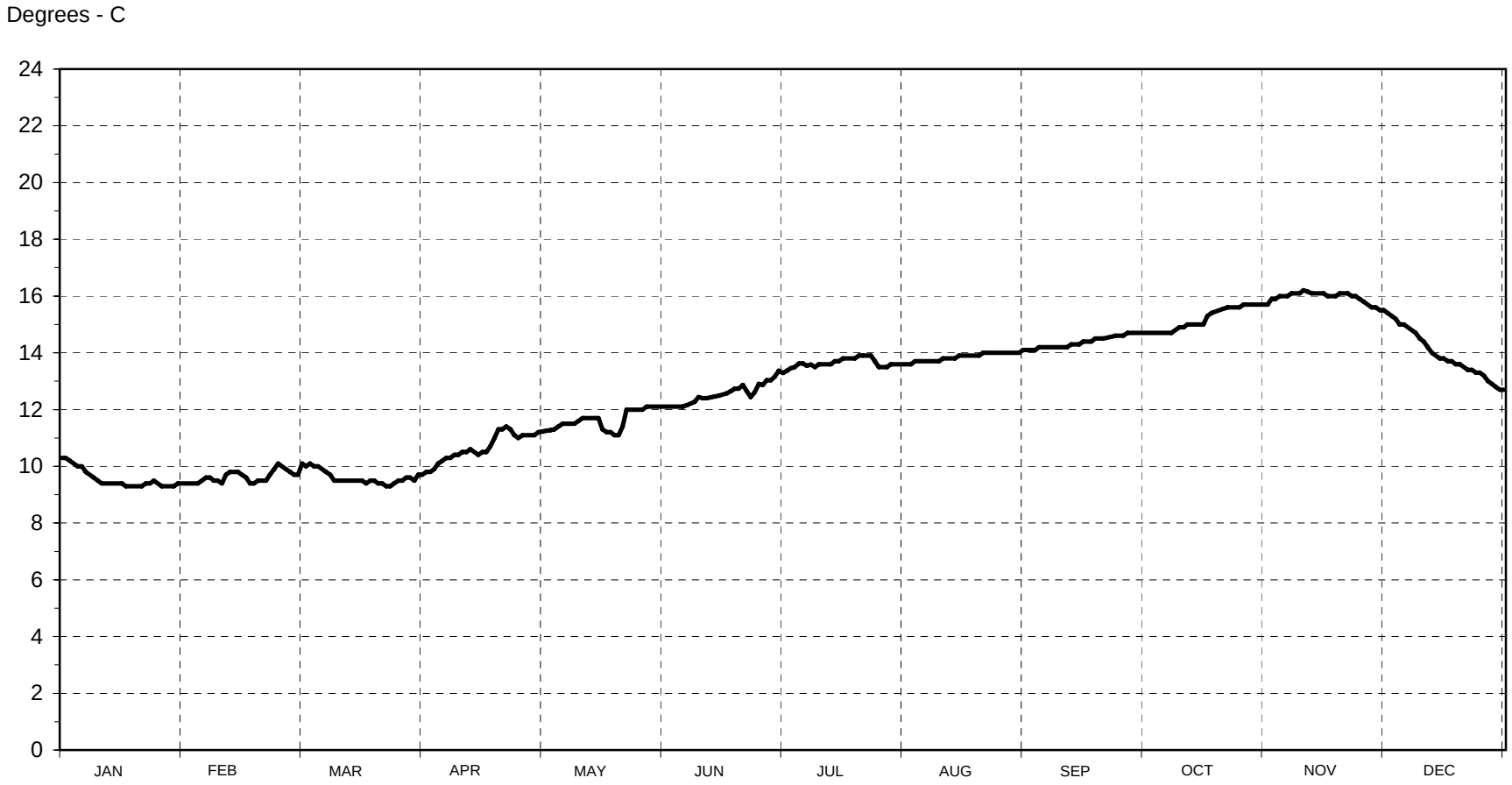
2009

The HOS was activated on July 9, 2009 and was shut down on November 16, 2009. The HOS was effective in preventing hydrogen sulfide formation.

2010

In 2010 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 5. Calendar Year 2009 Mokelumne River Temperatures Below Camanche Dam



Notes: High Level Outlet Operations: opened on 4/2/2009 and closed on 5/15/2009.

C. THE LOWER MOKELUMNE RIVER PARTNERSHIP

1. The Partnership Steering Committee

The Partnership Steering Committee (PSC), (consisting of representatives from EBMUD, CDFG, and USFWS) met on December 16, 2009. 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 22 and September 29, 2009. In 2009 the PSC approved two projects, for a total of 25 projects since 1999, for Partnership funding. See Section IV.C.2 of this report for projects approved for Partnership funding in 2009 and projects with activity in 2009.

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 $791,451. The available earnings, after funds obligated to approved projects, were $191,599 as of December 31, 2009.

In 2009, the Partnership Steering Committee approved funding for the following two stakeholder proposals:

- **The Lower Mokelumne River Watershed Stewardship Steering Committee (c/o California Wine Education Foundation) received conditional approval for $2,000 for establishing a watershed stewardship 501(c)(3) non-profit organization.** The Stewardship Steering Committee, currently associated with the San Joaquin County Resources Conservation District, is the community-based watershed stewardship group that has partnered with the Lower Mokelumne River Partnership on many restoration projects on the river. The establishment of a 501(c)(3) non-profit corporation will increase the Stewardship Steering Committee's independence and allow for the flexibility to raise funds using other avenues rather than soley relying on government grants to sustain this community-based watershed

stewardship effort into the future. Partnership funding is conditional upon the Stewardship Steering Committee being able to raise the remainder of the required funding to implement the 501(c)(3) process to establish a non-profit corporation (estimated to be between $5K-$7K). The Stewardship Steering Committee is currently seeking additional funds from local individuals and business organizations for the additional funds required.

- **EBMUD received $1,635 to purchase plants to be used in conjunction with the spawning habitat enhancement project within the Mokelumne Day Use Area.** The University of California, Davis, US Fish and Wildlife Service, and East Bay Municipal Utility District (EBMUD) have completed a gravel bed rehabilitation project from the fish barrier fence below Camanche Dam to Murphy creek. The project bed elevation of the river has risen three feet, resulting in the expansion of river surface and inundation of one acre of riparian habitat. This planting project will re-establish the riparian habitat above the new river inundation level.

Ongoing projects funded by the PSC with activity in 2009 for ecosystem protection and restoration in the lower Mokelumne River are summarized in Table 5 on the following page.

Table 5: Partnership Fund-Supported Projects 2000 – 2009 Activity Summary

Project Title	Project Sponsor	Project Description	Partnership Fund			Additional Funding	
			Date Approved by PSC	Anticipated Project Completion	Amount Obligated	Amount	Program
Calvary Bible Church Riparian Restoration	Calvary Bible Church	Riparian restoration along LMR on church property	4/29/2005	COMPLETED	$21,408		
Hoffman Riparian Restoration	Center for Land Based Learning	Riparian restoration on the Hoffman Farm	9/5/2006	COMPLETED	$14,988		
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	anticipated Summer 2010	$30,000	$183,425	California Dept. of Conservation - Watershed Coordinator
Watershed Education and Riparian Restoration - Grant Cash Match	San Joaquin County Resource Conservation District	Cash match for Dept of Water Resources CALFED grant	5/2/2007	anticipated Summer 2010	$60,000	$890,655	California Bay Delta Authority (CALFED) - Watershed Program
Invasive Species Removal - Murphy Creek	Murphy Creek Landowners (Sparrowk)	Removal of invasive Himalayan Blackberry from Murphy Ck restoration site	5/2/2007	COMPLETED	$47,212		
Steelhead Acoustic Telemetry Study - 08/09	EBMUD	Purchase acoustic tags for steelhead acoustic telemetry study	11/4/2008	COMPLETED	$45,000		
MRDUA River Access and Habitat Restoration	EBMUD	Cash match for CA Resources Agency CA River Parkways grant	11/4/2008	*Conditional approval - grant apps still under review	$42,531		
LMR Watershed Stewardship 501(c)(3) Organization	LMR Stewardship Committee	Formation of 501(c)(3)	4/22/2009	*Conditional approval - requires add'l funding from other community sources	$2,000	?	Individuals, community groups, local business, etc.
Riparian Habitat Restoration MRDUA	EBMUD	Purchase plants for 1-acre site associated with ongoing spawning habitat enhancement activities	4/22/2009	Winter 2009/2010	$1,635		

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 CDFG began implementing the specific WQRMP measures in 1999. These measures, including the ones implemented in 2009, 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 2009, 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 2009, the Stewardship Steering Committee continued to work on the initiative to establish a 501(c)(3) non-profit organization to further strengthen the Stewardship Steering Committee and develop long-term sustainability of the group. 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

2009

In 2009, 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 2009 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 2009, with funding from AFRP, EBMUD placed 5,321 cubic yards of anadromous fish spawning gravel in the lower Mokelumne River, as explained in Section VI.F.1 of this report.

- Participation and sponsorship of the 13th-annual Sandhill Crane Festival in Lodi, CA on November 6-8, 2009. The festival provides information and education as well as field trips to various locations along the lower Mokelumne River. The Sandhill Crane Festivals seek to promote broad public awareness of lower Mokelumne River natural resource values. Besides funding, EBMUD staff leads three field trips to view bald eagles at Pardee Reservoir. (1997-present)
- Participation in the 13th Annual Central Valley Birding Symposium in Stockton on November 19-22, 2009. 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. (time frame?)
- 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)
- Continuing as a study partner for the Cosumnes and Mokelumne Rivers Floodplain Integrated Resource Management Plan on the lower Mokelumne and Cosumnes Rivers. (See Section IV.F of this report)

- 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 Coastal Clean-up events. EBMUD provided dumpster, watercraft and personnel for the event.

2010

In 2010, 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

2009

At the April 28, 2009 meeting of the Board of Directors, the District accepted the 2009 Water Supply Availability and Deficiency Report. Due to low Mokelumne River runoff in 2009, this was the third consecutive year in which EBMUD imposed a drought management program on its customers and consequently no surplus water was available in the 2009 calendar year. A copy of the letter of notification to the Resource Agencies of the lack of the availability for sale of surplus Mokelumne River water 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, CDFG, 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.

2009

In 2009, the MRTAC met semiannually (alternating quarterly meetings between the MRTAC and the PCC). Representatives from CDFG, EBMUD, USFWS, and NOAA Fisheries, participated in the MRTAC meetings held on January 27 and July 29, 2009.

2010

Pursuant to Section H.1 of the JSA, EBMUD, USFWS, and CDFG 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 2, 2010.

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 2009, 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 electronic database is shared with the Bay Delta and Tributaries (BDAT) Project site (http://baydelta.water.ca.gov). BDAT contains environmental data concerning the San Francisco Bay-Delta and provides public access to that data. Over fifty organizations contribute data voluntarily to this project. The database includes biological, water quality, and meteorological data. These can be used to gauge the health of the estuary and to manage water and environmental resources. BDAT is a part of the California Environmental Data Exchange Network (CEDEN), which includes projects and organizations from all parts of the state.

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.

2009

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 carcass surveys in the lower Mokelumne River and 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 the 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 hydroacoustic tag study of steelhead in the lower Mokelumne River to assess population size and distribution.
- Continuing seasonal electrofishing and seining surveys of the lower Mokelumne River fish community.
- Cooperation with the state-wide Constant Fraction Marking (coded-wire tagging) of Chinook salmon released from the Mokelumne River Fish Hatchery.

2010

EBMUD will continue similar research and monitoring activities in 2010. These efforts will be described in full in the calendar year 2010 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:

2009

- 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 2009, EBMUD placed 5,321 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 $100,000 and EBMUD provided $25,000 to fund the project. The weekly redd survey results indicate that anadromous fish are using the enhancement gravel.
- 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 streambank erosion and fine sediment input. EBMUD continues working with winegrape and walnut growers to enhance and restore riparian vegetation. In 2009, 220(170 at Hoffman Farms and 50 at Lange Twins Vineyard) trees and shrubs (white alder, *Alnus rhombifolia*; California box elder, *Acer negundo californica*; Fremont cottonwood, *Populus fremontii*; valley oak, *Quercus lobata*; interior live oak, *Quercus wislizenii*; Oregon ash, *Fraxinus latifolia*; red willow, *Salix laevigata*; narrowleaf willow, *Salix exigua*; buckeye, *Aesculus californica*; western sycamore, *Platanus racemosa*; black willow, *Salix gooddingii*; buttonwillow, *Cephalanthus occidentalis*; western redbud, *Cercis occidentalis*; Toyon, *Heteromeles arbutifolia*; wild grape, *Vitis californica*; California wild rose, *Rosa californica*; coyote bush, *Baccharis pilularis*; coffee berry, *Rhamnus californica*; California blackberry, *Rubus ursinus*; and blue elderberry, *Sambucus mexicana*) 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 sponsored by the Institute for Fisheries Research. The tour involved local land owners, governmental officials, and regulatory agencies.
- Continuing to expand the Student and Landowner Education and Watershed Stewardship (SLEWS) program to include five additional landowners (Vino Farm and Hoffman).
- 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.

2010

Many of the above habitat improvement activities will continue in 2010. A full description of 2009 activities will be reported in calendar year 2010 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 7, 2009 and the removal is scheduled for March 31, 2010. It is anticipated that it will be installed and operated during the approximately same period in 2010.

V. APPENDICES

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

Appendix B: Correspondence Related to the 2009 Adaptive Management Flow Change

Appendix C: USGS Verified Flow Data for 2007 and 2008

Appendix D: Meeting Minutes of the Partnership Steering Committee

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

APPENDIX A

SAMPLE OF LOWER MOKELUMNE RIVER RELATED STORIES FROM LOCAL PRESS

EBMUD's District Log
December 4, 2009

Safe Harbor – A Better Way

EBMUD's historic Mokelumne Safe Harbor Agreement (SHA) is a 30-year commitment to improve our extensive Mokelumne River lands and enhance habitat for three endangered species: the Valley Elderberry Long-Horned Beetle, California Tiger Salamander, and Red Legged Frog. Under the agreement— signed with the US Fish and Wildlife Service this past June and hailed as the largest of its kind for a public agency—EBMUD plans to develop and improve habitat to support these species.
Staff working on the agreement come from many parts of the District, stretching from the Mokelumne area to Oakland. The first big project developed under the agreement was construction of a spawning habitat pond (for native amphibians) west of Camanche Reservoir. Key in that effort were Mokelumne Watershed and Recreation Manager Kent Lambert, Pardee Superintendent Pat Lydon, Supervising Biologist Jose Setka and their staffs. "I am impressed to see the high caliber of environmental stewardship that is accomplished when we all collaborate," said Lambert. "This agreement provides a perfect framework for that collaboration."

Ranger Supervisor Chris Swann, in consultation District Biologist James Jones and others, helped plan the successful project that brought in staff from Pardee Section, Mokelumne Watershed and Recreation, and Lodi Fish and Wildlife. Each group brought their special expertise to the mix. "This was an ideal project to begin our SHA commitment. The location was right, the conditions were good, the infrastructure was in place, and the staff was eager," reflected Lydon.

Todd Cearley and Pardee Section's Civil Crew were instrumental in planning the project as well. Said Cearley, "We've had a lot of experience with treatment and other industrial ponds, but have never built a natural one. Despite some early concerns, this one turned out pretty nice."

To best support native amphibians, the pond was specifically designed to include rearing areas, structure for egg laying, and deep escape zones. "The pond should dry up in the late summer each year to thwart non-native Bull Frogs from colonizing the site," said Biologist Jones, who added a series of landforms designed to attract burrowing rodents. The burrows are ideal habitat for native amphibians seeking refuge from the high temperatures and low humidity of summer. This same tract of land also was targeted as a mitigation site for the Folsom South Canal Project, where over 200 native trees were planted in early November. In a textbook collaborative effort, support for the two projects flowed seamlessly through the efforts of a wide variety of District staff and contractors to efficiently use resources for both ventures.
The Safe Harbor Agreement is a 30-year commitment to, in effect, continue the environmental stewardship called for in EBMUD's mission statement.

"As the District finishes our part of this first SHA project, we hand the baton over to Nature for the finish work," notes Lambert. "I look forward to seeing this pond provide opportunities for threatened and endangered wildlife in the area, as well as becoming a new outdoor classroom for local school groups. Great job to all involved!"

River's rebirth: Efforts to restore lower Mokelumne paying off

By Alex Breitler
November 30, 2009
Record Staff Writer

LOCKEFORD - A few miles downstream from Camanche Dam, where the foothills flatten and the green Mokelumne River swims a little lazy, a wild rose blooms on land owned by a grape grower.

The pink blossom is among the most colorful in a 22-acre riparian restoration area at Vino Farms. It offers assurance that the river has, in a few short years, regained some of what it lost over a century of neglect.

Like many streams, the Mokelumne has been diminished by dams and poisoned by toxic mines.

Like many streams, arguments persist over how much of its flows should be diverted for cities or farms.

Like many streams, the number of salmon returning to spawn has plummeted in four years, from tens of thousands to mere hundreds.

But a series of restoration efforts - spurred by some unusual alliances between private landowners, government officials and water diverters - appears to give the lower "Moke" a fighting chance.

San Francisco-based Institute for Fisheries Resources, an advocacy group, showcased the Mokelumne on a recent tour as an example for other rivers.

"A couple of landowners get together, and you can really make a difference on several miles of river," said John Ledbetter, partner at Vino Farms off Peltier Road.

Recipe: Add rocks

But let's take this journey from the top - at Camanche, where the water district that diverts most of the Mokelumne's flows to the Bay Area has poured thousands of truckloads of gravel into the stream since 1991.

Their goal: to create gravel bars in the stream where salmon can lay their eggs.

This is the end of the road for migrating fish, which can't pass beyond the dam. That same obstruction prevents upstream rocks and gravel from washing into the lower river.

The $1 million gravel project appears to be helping, said Robyn Bilski, a biologist with the East Bay Municipal Utilities District.

Anywhere from 40 percent to 60 percent of the salmon nests recently found by biologists were in areas enhanced by gravel, Bilski said.

The district's hatchery at the base of the dam has seen salmon returns decrease from 16,128 in 2005 to 412 last year. This year is better, with about 1,600 fall-run fish counted as of mid-November. Officials have released pulse flows from the dam to mimic natural conditions and to urge the fish upstream.

"Last year's returns were pretty much unacceptable," said Jose Setka, the district's supervising biologist.

Refuge found

There is reason for hope a short distance downstream, where Murphy Creek feeds the Mokelumne from the rangeland to the north.

A dam on this one-hop creek once blocked salmon from spawning between its narrow banks. It was removed in 2003; now officials say they've seen baby salmon upstream of the dam site during the months of January and February.

"We wanted to get the salmon back in the creek," said landowner Beverly Sparrowk, who with other landowners worked with East Bay MUD to remove the impediment.

"It was just a real community deal," she said. "It was really something."

Fly fishermen helped plant native vegetation on the banks of the creek. It looks so different these days that on one recent morning Sparrowk had a hard time finding where the dam once stood.

Landowners pitch in

Her land is not the only area sprouting with native growth. Several farmers on the Mokelumne itself have agreed to similar projects, from Vino Farms east of Lodi to El Rio Farms and the Lange Twins vineyards, seven or eight miles to the west.

Vino Farms started in 2007, bringing in 400 goats, masticators and hand crews to remove thorny blackberries from a sliver of flood-prone land which, while adjacent to productive vineyards, had largely been ignored.

Tearing out the invasive tangles made room for native cottonwoods, some of which are already 30 feet tall.

About $426,000 in grants funded the project. There was so much assistance that money had to be turned away, said Vino's Chris Storm.

While they'll never be able to farm the restored land, there "really isn't any conflict" between the ongoing agricultural operations and the new thriving woodlands, Ledbetter said.

Eye on the future

A lower Mokelumne River steering committee is looking to form a new nonprofit organization, so it can seek grants for more restoration work. To this point, the San Joaquin County Resource Conservation District has spearheaded fundraising; at first two landowners were interested in restoration, and now there are upwards of 50, the district says.

That's key, since most of the land adjacent to the river is private, said Steve Mayo, senior habitat planner for the San Joaquin Council of Governments.

His organization seeks willing farmers to conserve land, offsetting the impact of development elsewhere.

"The landowners are very conscious of the jewels that we have here," Mayo said. "These people love the land."

Contact reporter Alex Breitler at (209) 546-8295 or abreitler@recordnet.com.

Girl Scouts Partner for Habitat Restoration

Girl Scout Troop 2029 helped to continue efforts to restore habitat at Sandpoint property along the Mokelumne River.

To start off the afternoon, co-host James Jones, Wildlife Biologist from East Bay Municipal Utility District (EBMUD), led the Girl Scouts on a nature walk along the Mokelumne riverbank to point out native plant species, owl and wood duck boxes, mature elderberry plants, and a honey bee hive!

With shovels, cartons, and stakes in hand, the Girl Scouts learned how to properly plant a potted elderberry. They worked for about an hour to plant all of the elderberry bushes.

Troop 2029 and their parents generously volunteered their time, efforts, and hard work to help with the restoration work along the Mokelumne. The girls now have a hand in converting an old vineyard and sandy bottom field into a wonderfully biologically diverse riparian habitat area, a significant contribution to the ecological health of the watershed.

Photos of Troop 2029 working hard:

A little history on restoration efforts on the Sandpoint property:

In 2004, we removed the old tokay vineyard that our grandfather planted and decided to embark on a habitat restoration project that would expand the riparian corridor along the Mokelumne. With our own efforts and the help of a CalFed grant, invasive plant species were replaced by native oaks, wild roses, buckeyes, willows, box elders, and elderberries bushes.

In 2006, LangeTwins was the first signee of California's first programmatic Safe Harbor Agreement, allowing us to plant the Mexican elderberry bush, host plant of the Valley Elderberry Beetle, a protected plant under the Endangered Species Act. Had we not been able to work together with our partners, who included EBMUD, Environmental Defense, the Lower Mokelumne River Stewardship Steering Committee, San Joaquin County Resource Conservation District, and US Fish & Wildlife Service, we would not have been able to plant the elderberry bushes and also continue our normal farming operations nearby, due to significant restrictions under the Endangered Species Act.

In the end, the Safe Harbor Agreement was a win-win for both private land stewards and our government agencies, and the result was hundreds of plantings of the elderberry bush, and hopefully the return of the endangered beetle to our watershed.

Water surges in Mokelumne River yield more salmon

By Jordan Guinn
News-Sentinel Staff Writer
Thursday, November 19, 2009 6:11 AM PST

In early October, East Bay Municipal Utility District sent surges of water from the Camanche Reservoir down the Mokelumne River to coax Chinook salmon from the inner bay or the Delta into the river.

The surges, or pulse flows, have been considered successful as nearly four times the salmon are in the river as this time last year.

"It's definitely up," said Jose Setka, supervising fisheries and wildlife biologist for EBMUD. "We counted roughly 1,600 past Woodbridge as of Nov. 8."

Setka said the pulse flows are just one way they are trying to beef up the river's salmon population.

"Last year was such a bad year, we emptied out the toolbox," he said.

The salmon population in the Mokelumne River has steadily dwindled in recent years. In 2005, there were an estimated 16,000 salmon in the river.

Besides the pulse flows, EBMUD is working with Nimbus fish hatchery to find Mokelumne salmon and bring their fertilized eggs back to the Mokelumne River hatchery.

Since eggs of unknown origin aren't allowed to be transferred from one hatchery to another, precautions must be taken to ensure the right eggs are being taken.

Setka said juvenile fish are fitted with a computerized wire tag that identifies where they come from. When the time comes for them to spawn, the fertilized eggs are removed and taken to the appropriate hatchery.

While the pulse flows have helped create a more successful salmon run, Setka said more work needs to be done to make the season ideal.

"Meeting the hatchery's mitigation goal of 3.4 million fish produced would be ideal," Setka said. He added that seeing 4,200 salmon run down the river would make the season excellent.

Last year, there were an estimated 400 Chinook salmon in the Mokelumne River. EBMUD won't give its final estimate until the end of the season in midto late-December. The estimates are done electronically and manually.

He said EBMUD will rely on carcass surveys to finish off their estimates.

Since Woodbridge Dam has been lowered, the cameras at the fish ladders are turned off and they are now unable to track them that way.

The high-stage fish ladder is useful when the lake is high, but when it is low there are no cameras available for the low-stage fish ladders. There used to be one several years ago, but it was damaged and has not yet been replaced. Setka said he and his associates have been seeing a lot of salmon that are two years old. He said it is a good indicator of next year's run. However, he did not say when people could expect to be able to fish for salmon in the Mokelumne.

While encouraged by the increased numbers in the Mokelumne due to the pulse flows, one local fishing advocate is not going to get too excited until the final tallies come in.

"We've been plagued with several years of abysmal runs," said Bill Jennings, executive director for the California Sportfishing Protection Alliance. "It doesn't solve the overall problem."

Jennings said the pulse flows were helpful because releasing slugs of quality water down the river will trigger migrations up it.

"Surprise — you release water and fish come," he said. "Generally speaking, you provide ample water of sufficient quality and you have fish; something water agencies too frequently fail to acknowledge."

He believes having a pulse flow was better than not having one, but is still troubled by dwindling salmon numbers and how the population is at risk of not being self-sustaining. He attributes the shrinking population in the region to Camanche Reservoir and Pardee Dam, which were constructed on spawning grounds.

"It's been a general trend downward since Pardee and Camanche were built," he said. "You are talking about a remnant of magnificent fisheries that existed before EBMUD started sucking this watershed dry."

Contact reporter Jordan Guinn at jordang@lodinews.com.

IN THE FIELD

8 Million Chinook Tagged

The Department of Fish and Game's new system tracks 8 million juvenile fall-run chinook salmon raised in Central Valley hatcheries.

Information from coded wire tags implanted in the young fish will be expected to help fisheries managers make decisions regarding California's multi-million dollar commercial and sport salmon fishery.

Information on salmon survival and return is critical to fisheries personnel as they attempt to stop the depletion of Central Valley fall-run chinook stocks. This year's salmon fishing closures of salmon stocks cost the state an estimated $279 million in lost revenue and 2,690 jobs.

Using four state-of-the-art AutoFish System processing trailers, up to 350,000 young salmon a day were marked and tagged. Spearheaded by the DFG, the cooperative program includes the U.S. Fish and Wildlife Service and the Pacific States Marine Fisheries Commission. The CALFED Ecosystem Restoration Program provided more than $6.7 million for initial equipment purchases during the first two years of project operations in 2007 and 2008.

During 2009, operational costs of the program were funded by the U.S. Bureau of Reclamation, the California Department of Water Resources and the East Bay Municipal Utilities District.

The marking and tagging process took place at the Nimbus Salmon Hatchery in Rancho Cordova along with the Feather River, Mokelumne River and Coleman National Fish hatcheries.

"This important project will produce strategic information on Central Valley salmon," said DFG State Fisheries Manager Neil Manji. "It also provides consistency in helping biologists track harvest rates in the ocean and inland fisheries."

The data collected will be used to calculate the proportion of spawning hatchery and natural fish returning to the Central Valley, which affects season setting and harvest quotas in California's multimillion dollar commercial and sport salmon fishery.

"This collaborative project will yield critical data for improving the long-term management of fall-run chinook," said Manji.

The state met its goal of tagging and releasing 8 million fish. Central Valley hatcheries release more than 32 million fall-run chinook salmon annually. ❑

By Don Vachini

SALMON: Invasive species greatest threat to Northwest juveniles
(03/05/2009)

Patrick Reis, E&E reporter

Invasive species pose the greatest threat to salmon in the Pacific Northwest, according to a new study.

While other detriments such as dams, habitat loss, fish hatcheries and river pollution get more attention, the biggest impacts on salmon numbers are from invasive fish, birds, amphibians and plants, according to a study from researchers at the National Oceanic and Atmospheric Administration's Northwest Fisheries Science Center in Seattle.

As juvenile salmon make their way downstream to the ocean, a significant portion are snapped up by non-native fish such as the catfish, crappie, largemouth bass, smallmouth bass, walleye and yellow perch, the report said. For some of the species, salmonids are a major part of their diet.

New research suggests that predation on Pacific Northwest salmon by invasive species may pose a serious threat to the species' long-term health and sustainability. Photo courtesy of Oregon State University.

Invasives are cited in federal documents as contributing to the decline of 71 percent of all of the Pacific Northwest's endangered fish species, according to the study, which was published in the journal *BioScience*.

Despite the threat, a tiny portion of salmon restoration resources is spent on invasive species.

The Bonneville Power Administration -- which is required by law to mitigate damage done to salmon by its 31 dams in the Columbia River Basin -- spent $385 million between 2007 and 2009 on research, restoration and enhancement projects for salmon, but 0.3 percent of that was directed toward research on invasive species and less than 1 percent was spent on efforts to control them, the report said.

"These non-natives are here -- we're not going to get rid of them," said the report's lead author, Beth Sanderson. "But they are managing the native predators, and in my opinion, that means we could manage non-native predators."

Sanderson cited a program in which anglers are paid a bounty to catch pike minnow, a native predator whose numbers have swelled in reservoirs created by dams, as an potential option for limiting invasive populations. But such efforts are complicated because many of the invasives -- particularly bass and walleye -- are popular among recreational fishers, and any efforts to limit their numbers could meet resistance.

"I think with a little bit more work and a little bit more thought, there might be a way to mitigate some of those predators and preserve some of the recreational value," Sanderson said.

Independent observers agree that invasive species are a problem but say that efforts to address them will fall short without a broader focus on habitat improvement.

"There's no question that invasives are a major threat, right along with hydropower and a loss of habitat," said Jim Martin, former chief of fisheries for the Oregon Department of Fish and Wildlife.

But Martin said the effects of native and invasive predatory fish were being exacerbated by dams, development and climate change. Dams and development create stagnant pools of warm water that are ideal hunting habitat for salmon predators. At the same time, warming alpine temperatures associated with climate change are reducing mountain snowpack necessary to maintain the swift, cold streams juvenile salmon depend on to safely reach the ocean.

So long as river conditions favor predators, efforts spent on eradicating invasives are unlikely to be successful, Martin said.

APPENDIX B

CORRESPONDENCE RELATED TO THE 2009 ADAPTIVE MANAGEMENT FLOW CHANGE

EAST BAY
MUNICIPAL UTILITY DISTRICT

May 5, 2009

Dorothy Rice
Executive Director
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812
Email: DRice@waterboards.ca.gov

VIA FACSIMILE: (916) 341-5621

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

Dear Ms. Rice:

The East Bay Municipal Utility District (EBMUD) seeks your concurrence with the recommended changes to the Operations Plan provided as Attachment 1, modifying releases to the lower Mokelumne River in May and June of 2009 in order to provide an attraction pulse flow for the fall run Chinook salmon during the month of October 2009. 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), US Fish and Wildlife Service (USFWS) and, as required by FERC, the National Oceanic and Atmospheric Administration (NOAA) Fisheries.

This year will be the third consecutive year in which EBMUD will impose a drought management program on its customers and will be required to release either "Dry" or "Below Normal" year type flows to the lower Mokelumne River. In order to conserve a volume of water to be used as an attraction pulse flow in the fall months, EBMUD is proposing to reduce the releases to the lower Mokelumne River during a portion of the spring/early summer months.

Based on the April 1st Department of Water Resources snow surveys, the D-1641 April through September year type is "Below Normal." The flow schedule under D-1641 for a "Below Normal" year type prescribes a release from Camanche Dam of 250 cfs for the months of April, May, and June; flow below Woodbridge Dam is expected at 150 cfs in April and 200 cfs in May and June. The subsequent D-1641 October through March year type is based on the projected combined Pardee and Camanche storage on November 5, 2009.

EBMUD requests that the SWRCB approve a temporary reduction from the expected flow below WID's Dam required under D-1641 through the months of May and June from 200 to 150 cfs (50 cfs per day reduction) in order to conserve a volume of water to be released in October as an attraction pulse flow, as shown in the Operations Plan. The total quantity of water released will not be less than the quantity of water provided by the flow requirements in the calendar year.

Because the water supply forecast is based on the California Department of Water Resources' April 1st forecast, this request to reschedule the releases starting as early as possible in May is submitted with less than 30 days advance notice. We have endeavored to respond to emerging hydrological information and believe there is still sufficient time for your consideration to approve this adaptive management request. It is anticipated that the fall 2009 pulse release provided by this proposed adaptive management operation will offset some of the adverse impacts of Delta operations activities that impact Chinook salmon returns to the Mokelumne River, and may lead to less straying than was seen in the 2008 return. EBMUD, and representatives of the Department of Fish and Game, U.S. Fish and Wildlife Service, and the National Marine Fisheries Service who guide fishery management decisions on the Mokelumne River, believe that this action will better position the Mokelumne River to rebound from last year's low return. Attached are the documents of approval and support from the resource agencies for this action. The Resources Agencies placed a few conditions upon their concurrence with our proposal. They requested notification if water temperatures below Woodbridge Dam exceed 22° C during the flow reduction period; a summary of the mean daily water temperatures and flows at the Golf course gauging station; and, determination by EBMUD of the date for the pulse flow based on detection of returning Chinook in the Delta and other area rivers and coordination with pulse flows on other river systems.

The quantity of water for the flow reallocation will depend upon how much water is actually saved once the SWRCB gives its concurrence. If the delayed flow reduction schedule had started on May 1st, the savings would have been about 6,039 AF.

Enclosed are letters of concurrence with the modified flow schedule from the Department of Fish and Game, US Fish and Wildlife Service, 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)287-1240, e-mail ltam@ebmud.com, or Fred Etheridge of EBMUD's Water Rights Section at (510) 287-0816, e-mail fetherid@ebmud.com.

Very Truly Yours,

Lena L. Tam

Lena L. Tam
Manager of Water Resources Planning

LLT:PKJ:EW:smc

Attachments

cc: Victoria Whitney, Chief of Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

Ron Adhya, Regional Engineer
FERC San Francisco Regional Office
901 Market Street, Suite 350
San Francisco, CA 94103-1778

Magalie R. Salas, Secretary
John K. Novak, Biological Resources Branch
FERC Washington D.C. Office
Mail Code: DLC HL-11.2
888 First Street, N.E.
Washington, DC 20426

Anders Christensen, Manager
Woodbridge Irrigation District
18777 North Lower Sacramento Road
Woodbridge, CA 95258

Attachment 1

Operations Plan to Modify Mokelumne River Flows

EBMUD Current Operation Plan under Below Normal Water Year Type

Month	Camanche Release	JSA Required Camanche Release	Projected Flow Below Woodbridge Dam	JSA Expected Flow Below Woodbridge Dam
April	335	250	160	150
May	500	250	210	200
June	545	250	210	200
October		250	110	100

EBMUD Proposed Operations Plan to modify JSA releases

Month	Camanche Release	JSA Required Camanche Release	Projected Flow Below Woodbridge Dam	JSA Expected Flow Below Woodbridge Dam
April	335	250	160	150
May	450	200	160	150
June	495	200	160	150
October		250 - 850		100 - 700

Detail of Modified Fall releases assuming Below Normal Water Year October 2009

October	Camanche Release (cfs)	Below WID Flow (cfs)	Flow Above Minimum JSA Camanche Release
1 - 5	250	100	0
6	500	350	250
7	850	700	600
8	850	700	600
9	750	600	500
10	650	500	400
11	550	400	300
12	450	300	200
13	350	200	100
14 - 31	250	100	0

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

State Water Resources Control Board

Executive Office
Charles R. Hoppin, Chairman
1001 I Street • Sacramento, California • 95814 • 916.341.5615
P.O. Box 100 • Sacramento, California • 95812-0100
Fax 916.341.5621 • www.waterboards.ca.gov

Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

MAY 08 2009

Lena L. Tam
Manager of Water Resources Planning
East Bay Municipal Utility District
375 Eleventh Street
Oakland, CA 94607-4240

Dear Ms. Tam:

APPROVAL OF MODIFICATION OF MOKELUMNE RIVER FLOWS PURSUANT TO WATER RIGHT DECISION 1641, WATER RIGHT LICENSE 11109 AND PERMIT 10478 (APPLICATIONS 4228 AND 13156) OF EAST BAY MUNICIPAL UTILITY DISTRICT

The State Water Resources Control Board (State Water Board), Division of Water Rights (Division), has reviewed East Bay Municipal Utility District's (EBMUD) May 5, 2009 request to modify required releases from Camanche Reservoir to the lower Mokelumne River in May and June of 2009. EBMUD is required to release certain quantities of water from Camanche Reservoir to the lower Mokelumne River pursuant to Water Right Decision 1641 (D-1641) which amended EBMUD's water right License 11109 and Permit 10478.

EBMUD is requesting modification of required releases from Camanche Reservoir in May and June of 2009 from 250 cubic feet per second (cfs) to 200 cfs. This will result in approximately 6,000 acre-feet of stored water that would be used in October to provide pulse flows for fall run Chinook salmon in the lower Mokelumne River. EBMUD's proposed flow release regime is provided in Attachment 1.

EBMUD's modification request is made pursuant to an adaptive management provision contained in D1641 that allows EBMUD to reschedule or modify specified flow releases from Camanche Reservoir subject to certain conditions (p. 176, Paragraph 5). The term reads as follows:

> 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 SWRCB an operations plan acceptable to the Executive Director of the SWRCB 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 DFG and the USFWS.

EBMUD has indicated that its proposed modification 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 modification. Further, EBMUD contacted Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS) and NOAA National Marine Fisheries Service (NMFS) to seek their concurrence regarding the modification of release flows.

On April 8, 2009, EBMUD received approval from DFG. DFG's approval did not request any additional conditions beyond those listed in Attachment 1. On May 1, 2009, USFWS provided its concurrence with the modified releases subject to the following conditions:

1. EBMUD will provide 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 May and June 2009.

2. EBMUD will 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 with the pulse flows released in other river systems as much as possible. EBMUD will provide the information to USFWS's Energy Coordinator.

On May 1, 2009, NMFS supported the flow modifications subject to the following condition:

EBMUD will provide notification to NMFS when water temperatures below Woodbridge Dam exceed 22°C during the flow reduction period.

I hereby approve EBMUD's proposed *Operations Plan to Modify Mokelumne River Flows* as listed in Attachment 1. This approval is subject to compliance with the three conditions noted above. Please provide copies of the flow and temperature data referenced in Condition 1 to the State Water Board's Division of Water Rights (Division). At the conclusion of the pulse flow period, please also provide the Division with: (1) the amount of water conserved in May and June 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.

Should you have any further questions regarding this matter, please contact Victoria Whitney, Deputy Director for Water Rights at (916) 341-5302.

Sincerely,

Dorothy Rice
Executive Director

Attachment

cc: M. Kathleen Wood
Assistant Field Supervisor
U.S. Department of the Interior
Fish and Wildlife Service
2800 Cottage Way, Room w-2605
Sacramento, CA 95825-1846

Kathy Hill
Environmental Program Manager
California Department of Fish and Game
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670

Maria Rea
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacarmento, CA 95814-4706

Ron Adhya, Regional Engineer
FERC San Francisco Regional Office
901 Market Street, Suite 350
San Francisco, CA 94103-1778

Magalie R. Salas, Secretary
John K. Novak, Biological Resources Branch
FERC Washington D.C. Office
Mail Code: DLC HL-11.2
888 First Street, N.E.
Washington, DC 20426

Anders Christensen, Manager
Woodbridge Irrigation District
18777 North Lower Sacramento Road
Woodbridge, CA 95258

Attachment 1

Operations Plan to Modify Mokelumne River Flows

EBMUD Current Operation Plan under Below Normal Water Year Type

Month	Camanche Release	JSA Required Camanche Release	Projected Flow Below Woodbridge Dam	JSA Expected Flow Below Woodbridge Dam
April	335	250	160	150
May	500	250	210	200
June	545	250	210	200
October		250	110	100

EBMUD Proposed Operations Plan to modify JSA releases

Month	Camanche Release	JSA Required Camanche Release	Projected Flow Below Woodbridge Dam	JSA Expected Flow Below Woodbridge Dam
April	335	250	160	150
May	450	200	160	150
June	495	200	160	150
October		250 - 850		100 - 700

Detail of Modified Fall releases assuming Below Normal Water Year October 2009

October	Camanche Release (cfs)	Below WID Flow (cfs)	Flow Above Minimum JSA Camanche Release
1 - 5	250	100	0
6	500	350	250
7	850	700	600
8	850	700	600
9	750	600	500
10	650	500	400
11	550	400	300
12	450	300	200
13	350	200	100
14 - 31	250	100	0

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

California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
916-358-2900

April 8, 2009

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

Mr. Miyamoto:

The Department of Fish and Game has reviewed your proposal to reallocate the Mokelumne River Joint Settlement Agreement (JSA) flows from a "Below Normal" water year. Your request to reschedule the JSA flows from a "Below Normal" water year along the Mokelumne River beginning in early May, 2009 will save approximately 6,000 acre-feet of water which subsequently will be used as a pulse flow during the month of October, 2009.

This proposal is consistent with the adaptive management provision of the JSA between the Fish and Wildlife Service, East Bay Municipal Utility District, and the Department of Fish and Game to increase opportunities for optimizing fishery habitat and other ecosystem values in response to changing river conditions. Rescheduling the JSA flow objectives are carried out with concurrence of these agencies (including NOAA Fisheries per Federal Energy Regulatory Commission's adopting order) provided the total water released in any given year is not less than the quantity of water provided by the JSA flow schedule for a specific water year type.

In response to your request, the Department of Fish and Game concurs with EBMUD's proposed reallocation of the Mokelumne River JSA flows for release as an October pulse flow.

If you have any further questions or concerns, please contact Mr. Michael Healey at (916) 358-4334, or mhealey@dfg.ca.gov.

Sincerely,

Kathy Hill
Environmental Program Manager

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:

MAY 1 2009

Joseph J. Miyamoto
Fisheries and Wildlife Manager
East Bay Municipal Utilities District
500 San Pablo Dam Road
Orinda, California 94563

Subject: Request to Modify Mokelumne River Minimum Instream Flows from 1996 Joint Settlement Agreement, Lower Mokelumne River Hydroelectric Project, FERC No. 2916

Dear Mr. Miyamoto:

The U.S. Fish and Wildlife Service (Service) has reviewed your April 23, 2009 e-mail proposal (Attachment A) to reallocate the Mokelumne River Joint Settlement Agreement (JSA) flows from a "Below Normal" water year. The East Bay Municipal Utility District (EBMUD) proposal would reduce the expected flows below Woodbridge Dam to 150 cfs in May and June of 2009 in order to save approximately 6,000 acre feet of water to provide for a pulse flow in the fall. The EBMUD proposed operation plan to modify JSA releases and the proposed fall pulse schedule were submitted with your April 23, 2009 email (Attachment A). The purpose of the proposed pulse flow is to clean spawning gravels of sediment and encroaching vegetation and attract returning adult Chinook salmon to the lower Mokelumne River.

We agree that this proposal is consistent with the adaptive management provision Section F(1) of the JSA between the Service, East Bay Municipal Utility District (EBMUD), and the California Department of Fish and Game (CDFG) to increase opportunities for optimizing fishery habitat and other ecosystem values in response to changing river conditions. To accomplish this objective, the JSA provides that EBMUD may reschedule the JSA flows with prior written concurrence of CDFG and the Service 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.

In response to your April 23, 2009 e-mail request, the Service concurs with EBMUD's proposed reallocation of the Mokelumne River JSA flows for release as an October 2009 pulse flow under the following conditions:

1. EBMUD will provide the Service'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 flow reduction in May and June, 2009.

2. EBMUD will determine the final date of implementation of the pulse flow which will be based on the detection of returning adult Chinook salmon in the Sacramento-San Joaquin Delta and other area rivers. Furthermore, implementation should be coordinated with the pulse flows released in other river systems as much as possible.

If you have any further questions or concerns, please contact Debbie Giglio-Willoughby at (916) 414-6600.

Sincerely,

M Kathleen Wood

M. Kathleen Wood
Assistant Field Supervisor

Attachments

"Miyamoto, Joe"
<miyamoto@ebmud.com>
04/23/2009 04:31 PM

To <deborah_giglio@fws.gov>
cc <rvincik@dfg.ca.gov>, <donald_ratcliff@fws.gov>, <michelle_workman@fws.gov>, <michael_hoover@fws.gov>, "Kathy Hill"
bcc
Subject Adaptive Management of JSA Flows

Debbie,

This request results from a discussion at the April 22 Joint Settlement Agreement Partnership Coordinating Committee (PCC). The PCC discussed an adaptive management change to the standard release schedule to shift water from May and June until the fall for a pulse release to better attract returning Chinook salmon. The three members of the PCC agreed that this change was worthwhile and provides a potential benefit with little risk of adverse consequences. The California Department of Fish and Game has already provided written approval of this change. A similar request has been sent to NOAA Fisheries. The details are noted below.

Based on the DWR April 1st runoff forecast of 588,000 acre feet (AF), the April – September 2009 JSA year type is designated as "Below Normal". For the months of April, May and June in Below Normal year types, the JSA release from Camanche Dam is 250 cfs with expected flows below Woodbridge Dam of 150 cfs in April and 200 cfs in May and June. The subsequent October – March 2009 JSA year type will be based on the projected combined Pardee and Camanche storage on November 5, 2009.

We are requesting your agency's written concurrence to the proposal we developed to modify JSA releases to the lower Mokelumne River in order to provide a fall 2009 pulse flow. The water for the proposed pulse flow would come from a reduction of spring flows in May and June 2009. The EBMUD proposal would reduce the expected flows below Woodbridge Dam to 150 cfs in May and June in order to save approximately 6,000 acre feet of water to provide the pulse flow in the fall. To ensure we meet the 150 cfs flow below Woodbridge Dam the actual operations will be for a projected flow of 150 to 160 cfs.

EBMUD **Current** Operation Plan under Below Normal Water Year Type

Month	Camanche Reservoir	JSA Required Camanche Release	JSA Expected Flow Below Woodbridge

ATTACHMENT B

	elease	he Release	Woodbridge Dam
April	335	250	150
May	500	250	200
June	545	250	200
October	275	250	100

EBMUD **Proposed** Operations Plan to modify JSA releases

Month	Camanche Release	JSA Required Camanche Release	JSA Expected Flow Below Woodbridge Dam
April	335	250	150
M	4	20	150

a y	5 0	0	
J u n e	4 9 5	20 0	150
O ct o b er	2 7 5 - 8 5 0	25 0 pl us 6,0 00 A F for pul se flo w	100 plu s 6,0 00 AF for puls e flow

The following is the proposed pulse flow schedule. The actual timing of the pulse flow will be adaptively coordinated for maximum effect contingent on fish presence within the Mokelumne system and operations on other river systems. All of the pulse flow will need to be released no later than November 5th.

Camanche Release (cfs)	Below WID Flow (cfs)
250	100
500	350
850	700
850	700
750	600
650	500
550	400
450	300
350	200
250	100

The schedule assumes a Below Normal water year beginning in October. The actual water year will depend on the projected combined Pardee and Camanche reservoir storage on November 5, 2009. If the October – March 2009 JSA year type ends up "Dry," the required Camanche release would be 220 cfs (rather than 250 cfs) with an expected flow below Woodbridge Dam of 80 cfs (rather than 100 cfs); consequently, the pulse flow would be decreased by 20-30 cfs.

The following are river flow and temperature graphs for the Golf Course gaging station below Woodbridge Dam for the months of May and June from 1994 through 2007. These graphs illustrate that an increase of 0.5°C in mean daily water temperature is anticipated due to a 50 cfs flow reduction in May and June. The actual temperature change will depend on meteorological conditions.

Figure 1: In-Stream Mean Daily Flow and Mean Daily Water Temperature, May and June, Station Golf, Period of Record: 1994-2007. Note: discharge is plotted on log scale.

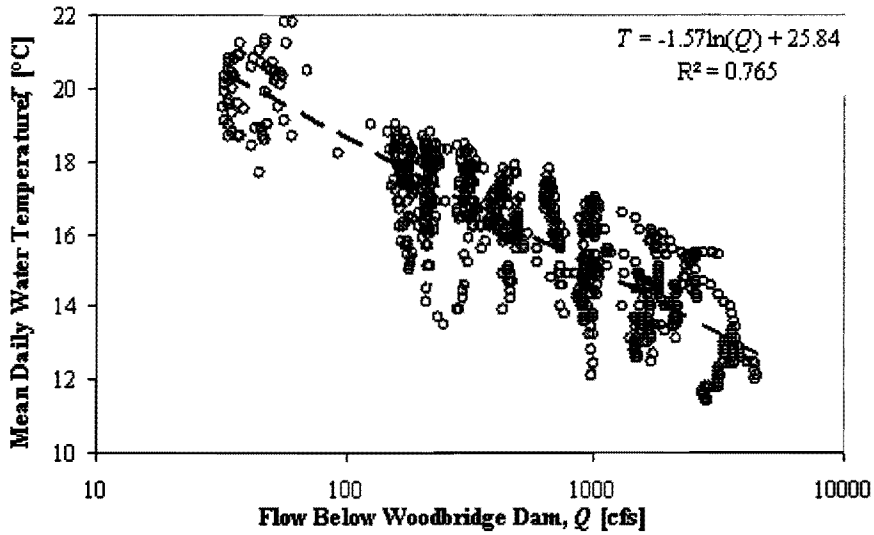
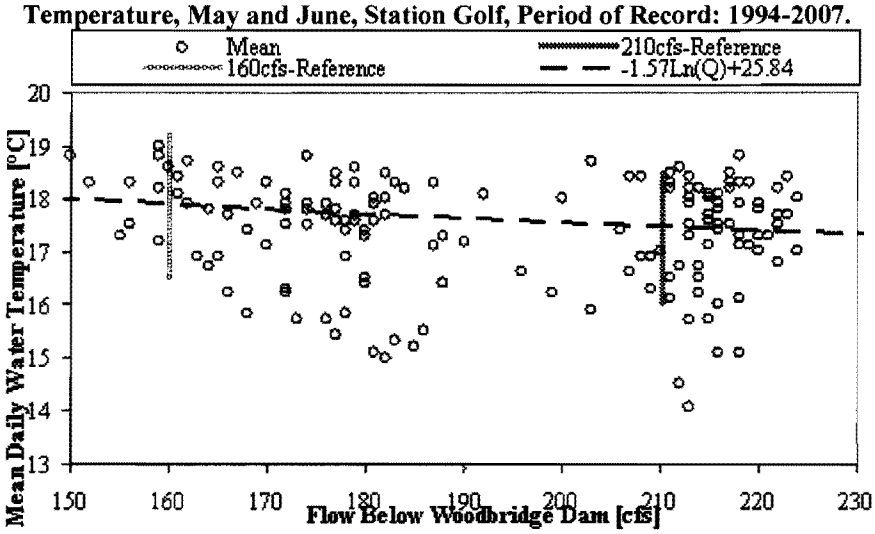


Figure 2: In-Stream Mean Daily Flow from 150cfs to 230cfs and Mean Daily Water Temperature, May and June, Station Golf, Period of Record: 1994-2007.



This proposal is consistent with the adaptive management provision in Section F(1) of the Joint Settlement Agreement between our agencies to increase the opportunity to optimize fishery habitat and other ecosystem values to be responsive to changing river conditions. 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 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.

Subject to your written concurrence to the proposed plan, EBMUD will submit the plan to the Executive Director of the State Water Resources Control Board, as required by Decision 1641. We are requesting your written concurrence to the plan as soon as possible and we will be asking the State Board to waive the 30 day notice.

Thanks for your consideration,
Joe Miyamoto

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Sacramento Area Office
650 Capitol Mall, Suite 8-300
Sacramento, California 95814-4706

MAY 1 2009

Mr. 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 Services' (NMFS) support of a change to the Mokelumne River Joint Settlement Agreement (JSA) flow schedule during May, June and October of 2009. NMFS' response is provided as technical assistance and does not constitute consultation under the Endangered Species Act (ESA).

The Mokelumne River is within the Central Valley steelhead (*Oncorhynchus mykiss*) Distinct Population Segment, which is listed as threatened under the ESA (January 5, 2006; 71 FR 834). Fall-run Chinook salmon (*O. tshawytscha*), a NMFS Species of Concern, also occupy the Mokelumne River. The Mokelumne River is designated as critical habitat for Central Valley steelhead as well as Essential Fish Habitat for Pacific Salmon under the Magneson-Stevens Fishery Conservation and Management Act.

East Bay Municipal Utility District (EBMUD) proposes to reduce the JSA required release for May and June from 250 cubic feet per second (cfs) to 200 cfs. The 6,000 acre feet of stored water would be used during October to provide a pulse flow for migrating adult Chinook salmon. The pulse flow would likely 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.

This request was initially made by EBMUD in an email on April 8, 2009, at which time NMFS requested information regarding water temperature impacts below Woodbridge Dam during May and June. An analysis of potential water temperature impacts was presented at the April 22, 2009, Joint Settlement Agreement Partnership Coordinating Committee. Water temperature data anticipates an increase of 0.5°C in mean daily water temperature due to the 50 cfs river flow reduction in May and June. The actual temperature change will depend on meteorological conditions. Even with this increase in water temperature, the water temperature below Woodbridge Dam will likely stay within the tolerance range for steelhead. NMFS requests that EBMUD notify us if water temperatures below Woodbridge Dam exceed 22° C during the flow reduction period.

NMFS commends EBMUD for adaptively managing the JSA flow schedule to optimize migration and spawning opportunities for Chinook salmon. The fall pulse flow may benefit adult steelhead returning to the Mokelumne River but certainly does not optimize migration flows throughout the steelhead migration period. Please be aware that NMFS is not a signatory to the JSA nor have we consulted under ESA with the Federal Energy Regulatory Commission or EBMUD regarding the effects to steelhead from the current JSA flow schedule.

If you have any questions or concerns regarding this correspondence, please contact Erin Strange of my staff by phone at 916-930-3653 or by email at Erin.Strange@noaa.gov.

Sincerely,

for Maria Rea
Sacramento Area Office Supervisor

cc Copy to the file: ARN151422SWR2000SA5807
NMFS-PRD, Long Beach, CA
Ramon Martin, FWS-AFRP, 4001 N. Wilson Way, Stockton, California, 95205
Deborah Giglio-Willoughby, U.S. Fish and Wildlife Service, 2800 Cottage Way, Suite W-2605, Sacramento, California, 95825.
Sandra Morey, California Department of Fish and Game – Region 2, 1701 Nimbus Road, Rancho Cordova, California, 95670

EAST BAY
MUNICIPAL UTILITY DISTRICT

November 3, 2009

Dorothy Rice
Executive Director
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812
Email: DRice@waterboards.ca.gov

VIA FACSIMILE: (916) 341-5621

SUBJECT: SWRCB Approval of the 2009 Adaptive Management Flow Change Resulting in Modification of Mokelumne River Flows Pursuant to D-1641

Dear Ms. Rice:

This letter constitutes East Bay Municipal Utility District's (EBMUD) submittal of the data requested in the State Water Resources Control Board's (SWRCB) May 8, 2009 "Approval of Modification of Mokelumne River Flows Pursuant to Water Right Decision 1641 (D-1641) Water Right License 11109 and Permit 10478 (Applications 4228 and 13156) of the East Bay Municipal Utility District" (Approval).

In the Approval, the SWRCB concurred with an adaptive management flow change whereby the D-1641 expected flow below Woodbridge Irrigation District's Dam through the months of May and June would be reduced in order to conserve a volume of water to be released in October as an attraction pulse flow, provided that the total quantity of water released in the year would not be less than the quantity of water provided by the flow requirements in the calendar year.

The Approval was subject to compliance with three conditions requested by U.S. Fish and Wildlife Service (USFWS) and NOAA National Marine Fisheries Service (NMFS), which were met by EBMUD, and submittal of the following data to the SWRCB:

1. The total quantity of water saved as a result of May and June flow reductions was 5,193 acre feet, as summarized in the enclosed letter to the USFWS Energy Coordinator (Attachment 1). All of the water saved was released in October as part of the pulse flow.

2. The total quantity of water released in October, above the minimum Camanche Release required under D-1641, was 22,988 acre feet, as summarized in the attached Table 1, 2009 Camanche Reservoir Pulse Flow. The magnitude of the

difference between the amount of water saved from the spring 2009 adaptive management flow reduction and the greater amount of water released in October above the minimum Camanche Release can be attributed to significantly higher than anticipated flows in the river due to early storms and PG&E Operations and lower than anticipated aqueduct draft volume due in part to EBMUD's customer water conservation efforts, including water rationing, which have reduced demand from what it would otherwise be.

3. Resulting flows in the river during the pulse flow event are summarized in the attached Table 1, 2009 Camanche Reservoir Pulse Flow.

In addition the enclosed letter to the USFWS Energy Coordinator includes a summary of mean daily water temperature and flow from the Golf gauging station, also requested by the SWRCB.

Should you have any questions regarding this matter, please call me at (510) 287-1240, e-mail ltam@ebmud.com, or Fred Etheridge of EBMUD's Water Rights Section at (510) 287-0816, e-mail fetherid@ebmud.com.

Very Truly Yours,

Lena L. Tam

Lena L. Tam
Manager of Water Resources Planning

LLT:PKJ:EW:smc

Attachment

cc: Victoria Whitney, Chief of Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

Magalie R. Salas, Secretary
John K. Novak, Biological Resources Branch
FERC Washington D.C. Office
Mail Code: DLC HL-11.2
888 First Street, N.E.
Washington, DC 20426

Ron Adhya, Regional Engineer
FERC San Francisco Regional Office
901 Market Street, Suite 350
San Francisco, CA 94103-1778

Anders Christensen, Manager
Woodbridge Irrigation District
18777 North Lower Sacramento Road
Woodbridge, CA 95258

Table 1 – 2009 Camanche Reservoir Pulse Flow

	JSA Required Camanche Release (cfs)	* Actual Camanche Release (cfs)	JSA Expected Flow below Woodbridge (cfs)	* Actual Flow below Woodbridge (cfs)
10/1/2009	325	324	100	120
10/2/2009	325	327	100	107
10/3/2009	325	326	100	105
10/4/2009	325	372	100	119
10/5/2009	325	615	100	218
10/6/2009	325	1019	100	431
10/7/2009	325	1419	100	786
10/8/2009	325	1817	100	1221
10/9/2009	325	1795	100	1552
10/10/2009	325	1377	100	1310
10/11/2009	325	977	100	956
10/12/2009	325	579	100	608
10/13/2009	325	395	100	497
10/14/2009	325	609	100	387
10/15/2009	325	1019	100	647
10/16/2009	325	1194	100	985
10/17/2009	325	1194	100	1014
10/18/2009	325	1194	100	1023
10/19/2009	325	979	100	973
10/20/2009	325	580	100	682
10/21/2009	325	349	100	383

* Data are preliminary and are subject to revision

Date	Camanche Reservoir Release Action	Release above Minimum (acre-feet)
4-Oct	Increased from 330 cfs to 400 cfs at 8:00 AM	93
5-Oct	Increased from 400 cfs to 600 cfs at 8:00 AM and from 600 cfs to 800 cfs at 2:00 PM	569
6-Oct	Increased from 800 cfs to 1000 cfs at 8:00 AM and from 1000 cfs to 1200 cfs at 2:00 PM	1362
7-Oct	Increased from 1200 cfs to 1400 cfs at 8:00 AM and from 1400 cfs to 1600 cfs at 2:00 PM	2155
8-Oct	Increased from 1600 cfs to 1800 cfs at 8:00 AM and from 1800 cfs to 2000 cfs at 2:00 PM	2949
9-Oct	Decreased from 2000 cfs to 1800 cfs at 8:00 AM and from 1800 cfs to 1600 cfs at 2:00 PM	2883
10-Oct	Decreased from 1600 cfs to 1400 cfs at 8:00 AM and from 1400 cfs to 1200 cfs at 2:00 PM	2089
11-Oct	Decreased from 1200 cfs to 1000 cfs at 8:00 AM and from 1000 cfs to 800 cfs at 2:00 PM	1296
12-Oct	Decreased from 800 cfs to 600 cfs at 8:00 AM and from 600 cfs to 400 cfs at 2:00 PM	502
13-Oct	No change	139
14-Oct	Increased from 400 cfs to 600 cfs at 8:00 AM and from 600 cfs to 800 cfs at 2:00 PM	569
15-Oct	Increased from 800 cfs to 1000 cfs at 8:00 AM and from 1000 cfs to 1200 cfs at 2:00 PM	1362
16-Oct	No change	1726
17-Oct	No change	1726
18-Oct	No change	1726
19-Oct	Decreased from 1200 cfs to 1000 cfs at 8:00 AM and from 1000 cfs to 800 cfs at 2:00 PM	1296
20-Oct	Decreased from 800 cfs to 600 cfs at 8:00 AM and from 600 cfs to 400 cfs at 2:00 PM	502
21-Oct	Decreased from 400 cfs to 330 cfs at 8:00 AM	46
	Total	22988

Attachment 1

EAST BAY
MUNICIPAL UTILITY DISTRICT

WATERSHED HEADQUARTERS

July 8, 2009

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

Subject: 2009 Adaptive Management Flow Change -- Summary of Mean Daily Water Temperatures and Flow from the Golf Gauging Station

Dear Ms. Giglio-Willoughby:

Earlier this year an adaptive management flow change was approved on the lower Mokelumne River under which the JSA flows would be modified in May-June 2009 to provide a fall 2009 attraction flow. Condition 1 of the U.S. Fish and Wildlife Service's May 1, 2009 letter of concurrence to the adaptive management flow change requires EBMUD to provide you with a summary of the mean daily water temperatures and flow from the Golf gauging station for the months of May and June 2009. The attached table provides a summary of the actual flow (cfs) below Woodbridge Dam as measured at the Golf gauging station and the average daily water temperature (°C). The modified flow schedule was initiated on May 8, 2009 following EBMUD's receipt of the approval for the modified JSA flows from the State Water Resources Control Board. The actual flows below Woodbridge exceeded the modified flows of 150 cfs and mean daily water temperatures were below 20 °C through June 2009. The total water savings from the May and June flow reduction was 5,193 acre feet that will be released as a fall pulse flow.

We will hold initial discussions on the planning of the fall pulse flow at the July 29, 2009 Mokelumne River Technical Advisory Committee meeting. At least one technical representative from each of the partnership agencies and NOAA Fisheries indicated a positive response to attend the meeting. I will also be attending the IEP Central Valley Salmonid Project Work Team meeting on July 22, 2009 to see what is being planned for pulse flows on other river systems.

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
Flow temp summary transmital ltr to FWS 7-1-09.doc

Enclosure

cc: JSA Coordinating Committee
JSA Steering Committee
Erin Strange, NOAA Fisheries

cc: Sandy Morey, CDFG
Alexander Coate, EBMUD
Kathy Wood, USFWS
Robert Vincik, CDFG
Donnie Ratcliff, USFWS
Joe Miyamoto, EBMUD
Erin Strange, NOAA

bcc: Kathy Hill, CDFG
Mike Healey, CDFG
Richard Sykes, EBMUD
Lena Tam, EBMUD
Priyanka Jain, EBMUD
Kevin Richards, EBMUD
Fred Etheridge, EBMUD
Joe Young, EBMUD
Jose Setka, EBMUD
Rick Leong, EBMUD

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

2009 Joint Settlement Agreement (JSA) Adaptive Management Flows

	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)
5/1/2009	250	428	200	251	14.9
5/2/2009	250	405	200	261	14.7
5/3/2009	250	398	200	244	14.6
5/4/2009	250	383	200	221	14.4
5/5/2009	250	372	200	214	14.8
5/6/2009	250	370	200	209	15.9
5/7/2009	250	372	200	207	16.9
5/8/2009	250	368	200*	206	17.5
5/9/2009	200	353	150	191	17.8
5/10/2009	200	346	150	175	17.9
5/11/2009	200	330	150	167	17.9
5/12/2009	200	333	150	158	17.7
5/13/2009	200	350	150	157	18.1
5/14/2009	200	363	150	155	18.0
5/15/2009	200	380	150	156	18.2
5/16/2009	200	392	150	158	18.8
5/17/2009	200	390	150	158	19.6
5/18/2009	200	392	150	158	19.5
5/19/2009	200	386	150	158	18.9
5/20/2009	200	391	150	159	18.2
5/21/2009	200	403	150	158	17.9
5/22/2009	200	410	150	160	17.8
5/23/2009	200	413	150	163	17.7
5/24/2009	200	412	150	164	17.6
5/25/2009	200	412	150	165	17.3
5/26/2009	200	404	150	167	17.4
5/27/2009	200	399	150	163	17.9
5/28/2009	200	399	150	157	18.4
5/29/2009	200	398	150	158	18.6
5/30/2009	200	397	150	157	18.2
5/31/2009	200	398	150	158	18.0
6/1/2009	200	406	150	159	17.8
6/2/2009	200	406	150	160	17.5
6/3/2009	200	406	150	173	17.2
6/4/2009	200	403	150	165	17.1
6/5/2009	200	395	150	165	16.8
6/6/2009	200	396	150	165	16.9
6/7/2009	200	395	150	174	17.1
6/8/2009	200	396	150	172	17.2
6/9/2009	200	404	150	169	17.6
6/10/2009	200	389	150	161	17.5
6/11/2009	200	385	150	160	17.5
6/12/2009	200	389	150	162	17.6
6/13/2009	200	395	150	164	17.7
6/14/2009	200	395	150	159	17.7
6/15/2009	200	396	150	158	17.8
6/16/2009	200	412	150	157	17.9
6/17/2009	200	428	150	159	18.1
6/18/2009	200	439	150	159	18.3
6/19/2009	200	450	150	165	18.3
6/20/2009	200	438	150	178	18.6
6/21/2009	200	429	150	164	18.1
6/22/2009	200	419	150	164	17.6
6/23/2009	200	404	150	188	18.0
6/24/2009	200	407	150	156	18.7
6/25/2009	200	415	150	157	18.6
6/26/2009	200	425	150	157	19.0
6/27/2009	200	427	150	153	19.0
6/28/2009	200	425	150	155	19.3
6/29/2009	200	424	150	153	19.8
6/30/2009	200	400	150	154	19.6

* Flow Below Woodbridge was reduced per JSA Adaptive Management Program approved by the State Water Resources Control Board on May 8, 2009

Date	Action	Savings Basis	Savings (acre-feet)
8-May	25 cfs reduction @ 3:30 PM	25 cfs for 8.5 hours	18
9-May	Continuation of 25 cfs savings	25 cfs for 24 hours	50
10-May	Additional 25 cfs reduction @ 3:00 PM	25 cfs for 15 hours & 50 cfs for 9 hours	68
30-Jun	Continuation of 50 cfs savings May 11 - June 30	50 cfs for 24 hours for 51 days	5058
		Total	5193

APPENDIX C

USGS VERIFIED FLOW DATA FOR 2007 AND 2008

11323500 Mokelumne River below Camanche Dam, CA

DISCHARGE, CUBIC FEET PER SECOND
JANUARY TO DECEMBER 2007
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	353	348	353	354	343	289	358	343	353	262	229	236
2	353	347	353	336	338	289	358	343	353	232	232	237
3	352	348	353	322	354	289	358	351	353	234	232	239
4	354	348	353	323	353	289	358	353	353	237	232	239
5	353	347	353	323	353	289	358	353	343	236	232	236
6	353	348	349	322	353	294	358	350	336	236	233	236
7	353	348	348	318	341	293	358	352	338	232	236	239
8	353	348	348	318	328	299	358	353	338	233	236	236
9	353	348	348	320	335	308	358	346	341	232	229	232
10	353	354	348	319	347	308	358	344	343	232	227	232
11	353	353	348	321	348	315	357	341	340	232	232	231
12	353	348	348	322	348	328	356	338	338	240	231	228
13	350	346	347	320	348	337	358	338	333	233	227	232
14	351	346	396	320	350	362	358	341	328	235	227	236
15	353	350	414	320	346	378	358	343	328	235	227	240
16	353	348	372	321	356	378	353	340	328	236	227	241
17	351	347	348	322	374	378	343	338	327	236	227	241
18	353	344	348	327	383	376	345	338	327	236	227	245
19	353	343	348	320	384	369	348	338	328	233	227	243
20	353	344	348	303	384	355	347	338	328	233	229	247
21	356	353	348	303	384	352	348	338	328	232	232	241
22	353	362	348	303	384	359	348	338	328	233	236	241
23	353	356	349	303	383	368	343	338	328	232	236	241
24	356	353	348	303	383	368	350	341	330	232	236	241
25	348	357	348	303	385	361	346	338	336	232	236	241
26	348	372	349	308	394	352	343	338	334	232	238	241
27	348	368	351	326	394	350	343	338	331	232	234	241
28	349	365	353	337	394	352	344	338	328	232	236	241
29	352	---	353	336	397	358	343	338	320	231	236	241
30	353	---	353	338	398	358	343	345	318	228	236	241
31	350	---	353	---	359	---	343	353	---	227	---	241
Total	10,919	9,839	10,976	9,611	11,321	10,101	10,897	10,624	10,037	7,258	6,955	7,397
Mean	352	351	354	320	365	337	352	343	335	234	232	239
Max	356	372	414	354	398	378	358	353	353	262	238	247
Min	348	343	347	303	328	289	343	338	318	227	227	228
Ac-ft	21,660	19,520	21,770	19,060	22,460	20,040	21,610	21,070	19,910	14,400	13,800	14,670

11325500 Mokelumne River At Woodbridge, CA

DISCHARGE, CUBIC FEET PER SECOND
JANUARY TO DECEMBER 2007
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	308	294	304	233	184	94	52	40	43	718	161	167
2	308	299	296	220	179	61	56	45	54	376	160	169
3	305	300	296	197	180	57	41	38	55	211	158	172
4	312	300	295	186	186	54	49	46	58	198	157	175
5	310	301	296	177	182	49	54	55	59	187	162	171
6	304	301	291	167	183	44	47	61	56	183	164	178
7	304	302	290	160	196	46	40	60	54	173	164	225
8	304	305	292	169	176	47	44	56	44	176	165	183
9	304	316	293	172	165	39	57	56	48	176	165	177
10	303	350	293	171	174	48	59	43	48	193	166	177
11	304	335	292	203	182	52	58	50	47	178	199	176
12	304	306	279	182	181	56	56	50	48	181	173	176
13	301	304	282	176	178	51	50	49	46	180	167	176
14	300	298	284	210	174	48	51	48	38	174	168	176
15	302	300	290	204	179	57	57	49	41	174	167	175
16	274	298	219	202	172	61	59	44	43	174	169	177
17	319	299	177	202	174	48	45	40	45	175	168	185
18	303	298	172	206	177	58	39	39	36	173	169	203
19	295	298	174	202	182	70	36	47	37	172	170	186
20	295	296	158	197	174	55	33	43	45	171	169	205
21	297	294	177	198	176	53	40	38	42	170	170	182
22	301	313	172	230	181	52	46	51	56	171	170	179
23	297	304	214	201	178	50	49	43	53	169	170	178
24	301	296	226	185	169	52	43	43	50	163	173	177
25	305	308	228	177	172	55	46	47	49	162	174	177
26	299	328	237	174	170	49	44	47	48	158	174	178
27	301	335	236	177	187	42	39	50	49	160	170	179
28	304	317	231	173	179	46	34	52	50	162	168	180
29	298	---	233	174	183	45	34	43	48	162	167	181
30	304	---	208	173	192	43	37	42	52	156	163	179
31	300	---	205	---	182	---	52	42	---	157	---	178
Total	9,366	8,595	7,640	5,698	5,547	1,582	1,447	1,457	1,442	6,133	5,040	5,597
Mean	302	307	246	190	179	53	47	47	48	198	168	181
Max	319	350	304	233	196	94	59	61	59	718	199	225
Min	274	294	158	160	165	39	33	38	36	156	157	167
Ac-ft	18,580	17,050	15,150	11,300	11,000	3,140	2,870	2,890	2,860	12,160	10,000	11,100

11323500 Mokelumne River below Camanche Dam, CA

DISCHARGE, CUBIC FEET PER SECOND
JANUARY TO DECEMBER 2008
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	241	249	233	268	442	267	243	241	293	224	229	227
2	241	242	232	269	433	248	238	241	280	225	226	224
3	241	265	234	268	423	243	246	241	265	226	227	225
4	267	247	234	269	420	243	251	248	258	225	228	225
5	274	241	232	269	420	243	250	254	264	224	226	225
6	275	236	232	264	420	247	250	253	276	223	225	224
7	254	236	230	267	420	250	247	262	280	225	227	225
8	249	236	229	268	419	250	242	267	282	222	226	223
9	249	236	229	245	418	249	245	267	284	224	225	225
10	246	236	232	232	417	251	263	264	287	224	221	224
11	246	236	232	232	420	250	265	259	285	224	226	229
12	243	236	233	232	420	236	264	247	275	226	225	223
13	241	236	235	232	410	239	264	245	269	224	226	225
14	241	236	232	333	394	241	261	275	266	225	224	225
15	241	236	230	428	389	241	266	282	260	226	224	226
16	241	236	230	411	388	241	264	297	254	226	223	224
17	241	236	231	407	392	242	268	333	254	226	222	226
18	240	234	229	477	396	249	269	354	235	226	226	223
19	241	232	230	559	395	253	269	394	226	225	228	227
20	241	237	232	563	391	260	268	408	227	227	224	226
21	241	234	228	564	383	264	263	433	225	225	222	225
22	242	234	228	540	381	264	255	434	230	224	225	224
23	247	233	229	485	377	267	255	425	236	227	226	224
24	274	236	232	460	368	269	258	415	235	227	224	224
25	253	235	229	458	368	269	253	416	237	226	227	223
26	244	232	232	459	368	271	246	418	237	223	225	225
27	263	230	234	458	364	268	244	418	236	225	224	225
28	274	232	232	456	362	264	242	381	238	226	226	221
29	246	232	232	458	355	264	244	296	232	226	225	225
30	241	---	232	449	348	256	241	293	224	226	225	225
31	240	---	255	---	333	---	241	293	---	226	---	226
Total	7,718	6,877	7,194	11,280	12,234	7,599	7,875	9,854	7,650	6,978	6,757	6,968
Mean	249	237	232	376	395	253	254	318	255	225	225	225
Max	275	265	255	564	442	271	269	434	293	227	229	229
Min	240	230	228	232	333	236	238	241	224	222	221	221
Ac-ft	15,310	13,640	14,270	22,370	24,270	15,070	15,620	19,550	15,170	13,840	13,400	13,820

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

11325500 Mokelumne River At Woodbridge, CA

DISCHARGE, CUBIC FEET PER SECOND
JANUARY TO DECEMBER 2008
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	177	198	182	189	165	45	40	25	42	94	182	178
2	177	192	183	197	169	51	31	21	48	86	214	178
3	187	221	181	196	162	44	28	19	45	84	351	178
4	283	209	185	193	163	38	28	22	36	84	407	177
5	280	191	185	191	161	35	31	23	32	84	429	172
6	252	185	186	196	158	34	35	23	30	85	312	171
7	211	184	185	197	161	31	35	23	32	84	208	170
8	196	183	183	190	159	31	32	28	34	84	198	172
9	189	184	182	197	156	36	26	31	32	84	194	173
10	188	182	182	176	152	40	23	37	32	84	192	173
11	185	181	179	168	156	41	24	48	32	85	191	175
12	183	180	178	167	157	41	25	48	32	87	186	178
13	181	181	176	163	164	36	27	37	31	88	178	175
14	179	183	179	170	161	31	28	29	32	87	177	181
15	176	186	178	236	159	30	28	27	33	88	175	179
16	177	186	178	234	163	30	29	27	33	87	175	168
17	178	185	180	162	156	29	28	31	33	86	180	163
18	178	184	180	161	155	26	26	35	31	85	178	163
19	178	183	179	165	160	26	23	36	28	84	177	163
20	177	191	175	167	162	28	25	37	27	84	178	163
21	177	188	178	167	162	28	28	38	30	84	177	170
22	211	185	178	165	156	25	28	40	29	85	178	182
23	215	187	179	166	163	28	27	39	28	86	176	165
24	220	195	179	164	168	31	29	37	29	83	178	171
25	214	187	178	166	164	32	29	36	29	84	177	207
26	191	185	176	164	163	32	27	35	31	84	184	185
27	198	183	175	170	161	35	26	34	32	84	180	180
28	226	183	176	169	161	35	28	31	34	89	179	178
29	207	182	174	168	160	37	29	34	38	91	178	178
30	191	---	176	169	159	42	31	35	57	141	178	179
31	189	---	175	---	158	---	30	37	---	165	---	179
Total	6,171	5,444	5,560	5,383	4,974	1,028	884	1,003	1,012	2,790	6,267	5,424
Mean	199	188	179	179	160	34	29	32	34	90	209	175
Max	283	221	186	236	169	51	40	48	57	165	429	207
Min	176	180	174	161	152	25	23	19	27	83	175	163
Ac-ft	12,240	10,800	11,030	10,680	9,870	2,040	1,750	1,990	2,010	5,530	12,430	10,760

Flow data from October through December has 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 16, 2009
2:30 pm – 4:00 pm

Attendance: US FWS: Kathy Wood, Donnie Ratcliff, Dan Welsh
CDFG: Robert Vincek
EBMUD: Alex Coate, Richard Sykes, Joe Miyamoto, Jose Setka, and Rick Leong

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

1. Approval of Agenda: The meeting agenda was approved by the Committee.

2. 2009 Mokelumne River returns, redd counts, and egg take: Jose Setka presented information on the return numbers for the Mokelumne River as of mid-December. The estimated total escapement for 2009 Fall-run Chinook is 2,087 (1,485 to hatchery, 602 in river). As of December 9th, a total of 223 redds have been counted. The egg take at the hatchery to-date is approximately 2M (this is compared to 250K+ taken last season to date).

3. Results of fall attraction/gravel cleansing flow: Jose Setka then presented information on the fall attraction/gravel cleansing flow that was conducted this year in Fall 2009. Jose said that the last pulse flow occurred in 2006 and since then, aquatic vegetation has had the chance to establish in spawning areas. Shields equation was used to develop expected bed entrainment levels that were used to be an indicator of potential vegetation reduction levels following the pulse. Jose stated that monitoring that followed the event showed a reduction of aquatic vegetation in spawning areas, but at a much lower level than predicted. Pulse duration and channel complexity are two potential reasons for not achieving predicted results. Jose also stated that it was found that channel depths and velocities that are preferred by Chinook salmon are in the range where aquatic vegetation was found.

4. Review of adaptive management of flows and process: Joe Miyamoto provided background information on the process that took place to plan and obtain approvals to implement the 2009 fall attraction/gravel cleansing flow. The Committee all agreed that the primary area needing improvement was that approvals and decisions should be made much earlier in the year to avoid short timelines for all partners involved. Kathy Wood agreed that conducting as much communication between the agencies via email as possible would also help. Richard Sykes suggested April 1 as a possible target date to have adaptive management plans in place for any given year.

5. Transfer of eggs from Nimbus Hatchery: Jose Setka gave a presentation on the real-time coded-wire tag recovery and reading process that was conducted at Nimbus Hatchery to identify Mokelumne Hatchery-origin fish that have strayed. Jose stated that based upon real-time coded-wire tag recovery data collected through December 14th at Nimbus that approximately 38% of the fish were of Mokelumne Hatchery-origin. The process resulted in the fertilization and transfer of 366K eggs to the Mokelumne Hatchery. Jose also stated that it was a collaborative effort with staff participating from various agencies (EBMUD, CDFG staff from Mokelumne and Nimbus hatcheries plus the Ocean Salmon Project, and the Pacific States Fisheries Commission).

6. Hatchery summit meeting: Richard Sykes explained that it was his understanding that NOAA Fisheries and CDFG staff have met to discuss the overall hatchery program in the state. Richard stated that EBMUD was interested in being part of that discussion so that those who are on the ground operating the hatcheries will be in the communication loop. Richard said that overarching decisions that can affect the hatchery program statewide need to include coordination and communication with those operating the hatcheries prior to these decisions becoming final. This has

not always been the case in the past. Richard recommended that a "hatchery summit" meeting for the Mokelumne hatchery be scheduled in early 2010 and all the interested agencies invited, including but not limited to, EBMUD, CDFG, USFWS, and NOAA Fisheries. The members of the Committee supported this recommendation.

ACTION ITEM: Richard Sykes will follow-up on this item by contacting Kent Smith to discuss preparing a draft agenda and scheduling the meeting.

7. National Marine Fisheries Service Participation in the Steering Committee: Kathy Wood asked why NMFS was not part of this Steering Committee Meeting. Several Committee members stated that this had been a question that has come up in their own staff discussions and both DFG and EBMUD had already concluded that NMFS should be invited to these meetings The whole Committee recognized the important contribution that NMFS staff provides to the management and decision-making process on the lower Mokelumne River. It was agreed that a representative from NMFS would be invited to future Partnership Steering Committee meetings consistent with NMFS's ongoing participation at the Partnership Coordinating Committee and Mokelumne River Technical Advisory Committee meetings. Robert Vincek stated that Maria Rea has expressed an interest in the collaborative efforts on the lower Mokelumne River and that she might be interested in serving as the NMFS representative at Partnership Steering Committee meetings.

   ACTION ITEM: NMFS staff representative will be invited to participate in future Partnership Steering Committee meetings. Richard Sykes will follow-up with Maria Rea of NMFS.

8. 2009 spawning gravel restoration: Jose Setka presented background information on the spawning gravel restoration project on the lower Mokelumne River and gravel restoration activities in 2009. Jose reported that 5,321 cubic yards of gravel was placed in 2009 and it is anticipated that approximately 4,000 cubic yards will be placed in 2010. Donnie Ratcliff stated that AFRP funding for this work has been secured through 2012.

9. BDCP and 2-Gate Project: Joe Miyamoto presented information on the Bay Delta Conservation Plan, most of which is available on the BDCP Steering Committee website. He also commented on the 2-Gate project and the Delta Corridors proposal. Joe stated that the EBMUD concern is on potential negative impacts from any or all BDCP program alternatives that entrain Mokelumne salmonids into the water conveyance corridor and effects operations of the Delta Cross Channel might have on the migration, straying and survival of Mokelumne salmon and steelhead. The Delta Corridors proposal includes an option to re-route the Mokelumne River more directly to the Sacramento River via Lost and Middle sloughs, Snodgrass Slough and Meadows Slough.

   ACTION ITEM: Kathy Wood will forward copies of EBMUD comment letters to Dan Welsh

10. Update on schedules for the Freeport Regional Water Project and Camanche Permit Extension: Alex Coate shared that it is anticipated that the Freeport regional water project will be in operational status in Summer 2010. Alex stated that the process for obtaining a permit extension for Camanche Reservoir continues. The target for CEQA completion is 2010 and EBMUD will provide an administrative draft to USFWS, NMFS, and CDFG for review and discussion when it is completed.

11. Updates from Steering Committee members: Kathy Wood shared information on the California Landscape Conservation Cooperative (California LCC) – a process to utilize partnerships to address the issue of climate change and impacts to the state. Kathy said that the initial goal is to identify the science needs to begin to address climate change in the state and that it will be very important to utilize existing partnerships that are already working, such as the Lower Mokelumne River Partnership, to serve as a framework for establishing the California LCC. She stated that existing Habitat Conservation Plans are another example of existing partnerships that could contribute greatly to the LCC effort.

12. Update on Partnership-funded activities: Jose Setka stated that the current available balance in the Partnership Fund is approximately $188K. Jose also stated that Partnership-funded riparian restoration at the Mokelumne Day-Use Area is in progress and that the Partnership-supported proposal for the formation of a 501(c)(3) by the Lower Mokelumne River is waiting on the Stewardship committee's efforts to garner more financial support partners.

13. Meeting Adjournment: The meeting adjourned at 4:10 pm.

    Respectfully submitted by: Rick Leong

APPENDIX E

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

EAST BAY
MUNICIPAL UTILITY DISTRICT

ALEXANDER R. COATE
DIRECTOR OF WATER AND NATURAL RESOURCES
(510) 287-1663
acoate@ebmud.com

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

May 14, 2009

Sandra Morey
Regional Manager
Department of Fish and Game
1701 Nimbus Road
Rancho Cordova, CA 95670

Kathy Wood
Assistant Field Supervisor
U. S. Fish & Wildlife Service
2800 Cottage Way, Room 2605
Sacramento, CA 95825

Subject: Lack of Availability of Mokelumne River Water

Dear Ms. Morey and Ms. Wood:

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 for sale of surplus Mokelumne River Water.

Enclosed is a copy of the 2009 Water Supply Availability and Deficiency Report (Report) accepted by the District's Board of Directors at their April 28, 2009 meeting. In low water years, this annual report provides the basis for the Board's consideration of demand management measures. In years of excess supply, this report provides the basis for the Board's determination of surplus water supply for sale. The 2009 assessment, based on the Department of Water Resources' April 1st projected Mokelumne River runoff (77% of average), concludes that voluntary conservation measures to reduce water use will be needed this year. Predictably, no flood control releases are anticipated this year and the District has no surplus water available for sale. Pursuant to the JSA, the District will provide flow releases to the lower Mokelumne River according to the below normal year water type.

If you have any questions regarding this matter, please contact Lena L. Tam, Manager of Water Resources Planning at (510) 287-1240.

Sincerely,

Alexander R. Coate

ARC:LLT:smc

Enclosure

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . FAX (510) 287-0541
P.O. BOX 24055 . OAKLAND . CA 94623-1055

PRINTED ON RECYCLED AND RECYCLABLE PAPER