

**Lower Mokelumne River Project
FERC Project No. 2916**

2008 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 2009

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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 (2008), and those it plans to implement in the current calendar year (2009), pursuant to the JSA, to protect and enhance the fishery resources and ecosystem of the lower Mokelumne River.

II. INTRODUCTION

This submittal is EBMUD's Project Operations Update Report¹ for 2008. EBMUD actions in 2008 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 watershed 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 2007).

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resource and ecosystem of the lower Mokelumne River. These areas are Flow, Water Quality, The 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 2008 calendar year and efforts planned for 2009.

III. STATUS OF THE LOWER MOKELUMNE RIVER SALMON POPULATION

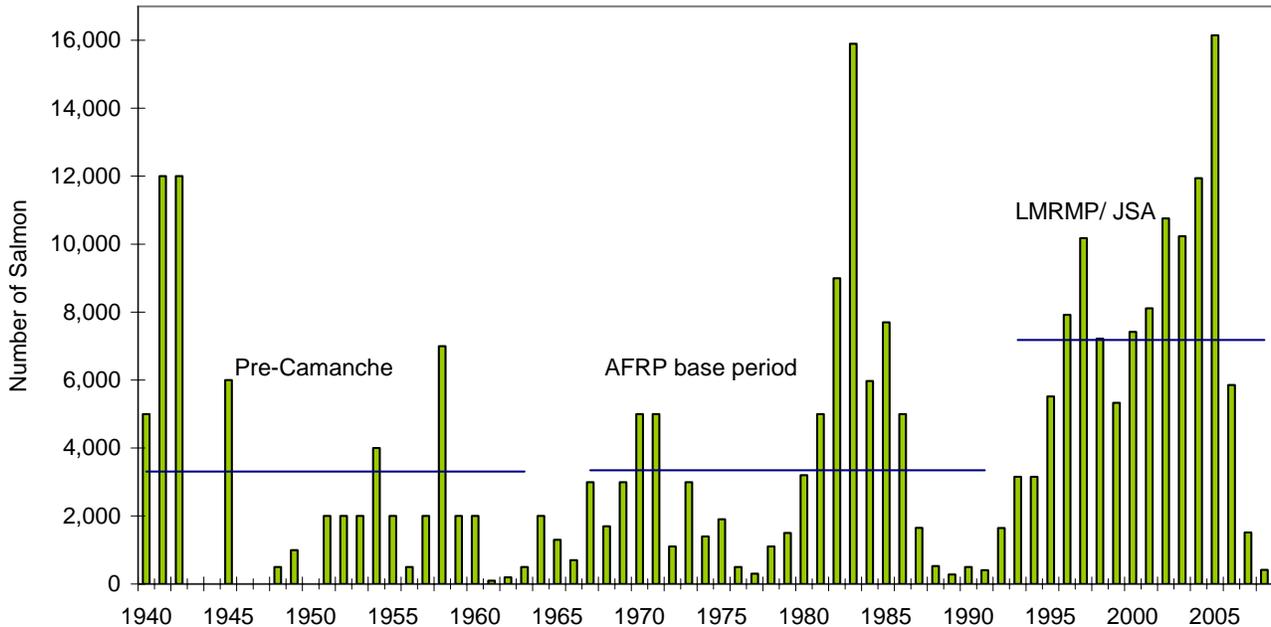
Through the 1990's and into 2008 the lower Mokelumne River Chinook salmon population continues to demonstrate characteristics consistent with long-term sustainability. The fall-run Chinook salmon escapement was 1,519 in 2007 and 412 in 2008 (see Table 1).

Table 1: Lower Mokelumne River Fall-Run Chinook Salmon Data, 1989-2008.

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

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.
4. The data for the most recent year may change as estimates are finalized and new information is analyzed.



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 (7181) is the average estimate at Woodbridge since voluntary flow improvements were initiated in 1993.

Figure 1: Lower Mokelumne River Fall-Run Chinook Salmon Escapement, 1940-2008.

Pacific salmon stocks have been stressed for decades by threats to their stream and estuary habitats, including water diversions, dams, urbanization, sedimentation, pollution and habitat modification 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 predicted a poor Chinook salmon return in 2007 (Peterson et al. 2006²). These same indicators predicted poor ocean conditions for juveniles in 2005 and intermediate conditions in 2006. The prediction for 2008 was for less than normal returns. 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	2005 Escapement	2006 Escapement	2007 Escapement	2008¹ Escapement
American	75,349	29,729	14,390	5,664
Feather	69,704	93,281	28,079 ²	14,628
Merced	2,921	2,150	481	444
Mokelumne	16,144	5,861	1,519	412
Sacramento	404,823	281,894	38,801	57,206
Stanislaus	3,500	3,022	312	1,085
Tuolumne	500	500	115	372

Notes:

1. Escapement data for 2008 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.

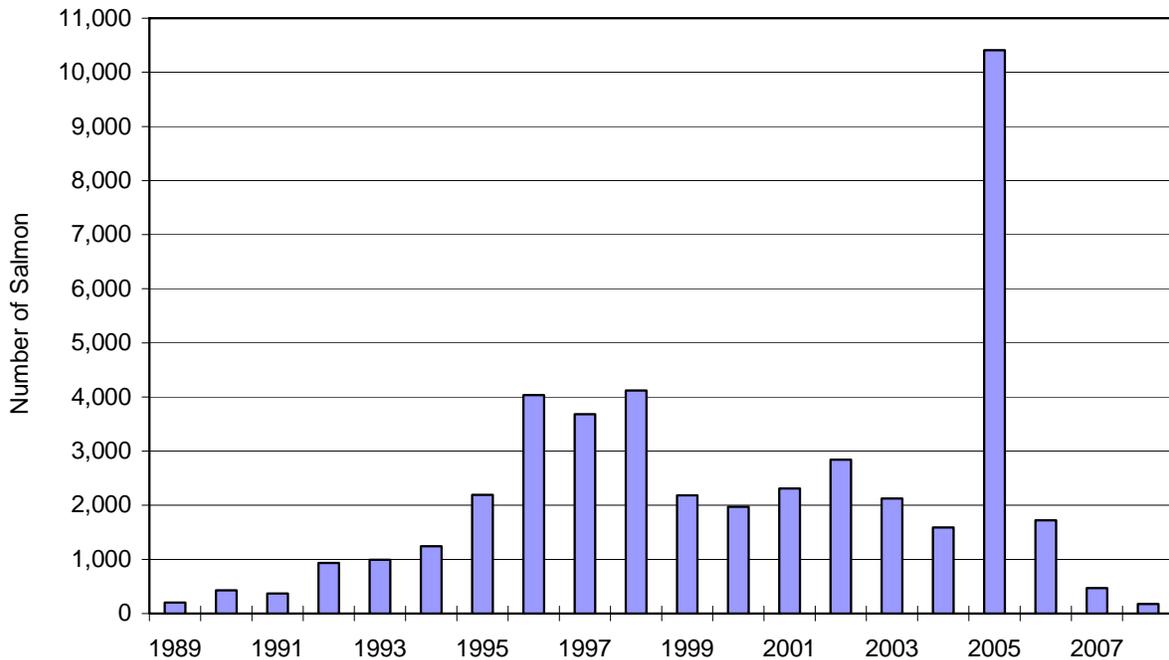


Figure 2: Fall-Run Chinook Salmon Natural Spawning in the Lower Mokelumne River, 1989-2008.

The Mokelumne River Fish Hatchery (MRFH), owned by the District and operated by the California Department of Fish and Game (CDFG), reported that the 2008 salmon return at the MRFH was 239 salmon. The return of salmon to the hatchery in 2008 resulted in an egg take of 290,485. A low egg take was expected because of poor ocean conditions for salmonids. The 2008 MRFH Annual Operations Plan anticipated that up to 4 million eggs would be imported from the American River Fish Hatchery. However, in November 2008 CDFG informed EBMUD that it had made a decision to not import any Chinook salmon eggs from the Nimbus Fish Hatchery (American River) and that this would result in a departure from the 2008 MRFH Annual Operations Plan. CDFG reversed its decision in December 2008 and said it would allow some importation to the MRFH. However, by the time the import ban decision was placed on hold Nimbus Fish Hatchery had already ceased taking eggs. Although the MRFH was able to use Mokelumne origin fish for all production goals from 2000-2006, in years with below average

returns it is necessary to import eggs to supplement production. CDFG's decision will result in a significant reduction in Chinook salmon production. 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 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 2008, and those actions planned for 2009, 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 2008 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 2008, EBMUD and USGS met and agreed to publish the Camanche release for water year 2009 as measured at Camanche Dam using its Accusonic flow meter. For water year 2009, EBMUD will continue to measure the stream flow below Camanche Dam at the McIntire Gage in addition to measurements collected with the Accusonic flow meter (see Appendix B). 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 2008 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 curtail its diversions to ensure that the minimum expected JSA bypass flows are met below Woodbridge Dam.

2008

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, 2007, EBMUD provided "Dry" JSA water year type Camanche Dam flow releases from October 1, 2007 through March 31, 2008. Pardee and Camanche actual total storage on November 5, 2007 was 378,380 acre-feet.

Based on the California Department of Water Resources (DWR) April 1, 2008 forecast of 478,000 acre-feet of unimpaired runoff into Pardee Reservoir, EBMUD operated under a "Dry" JSA water year type Camanche Dam flow releases from April 1, 2008 through September 30, 2008.

EBMUD is making, at a minimum, "Dry" JSA water year type Camanche Dam flow releases from October 1, 2008 through March 31, 2009. This is based on EBMUD's October 1,

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2008 forecast of total Pardee and Camanche storage on November 5, 2008. Pardee and Camanche actual total storage on November 5, 2008 was 304,400 acre-feet.

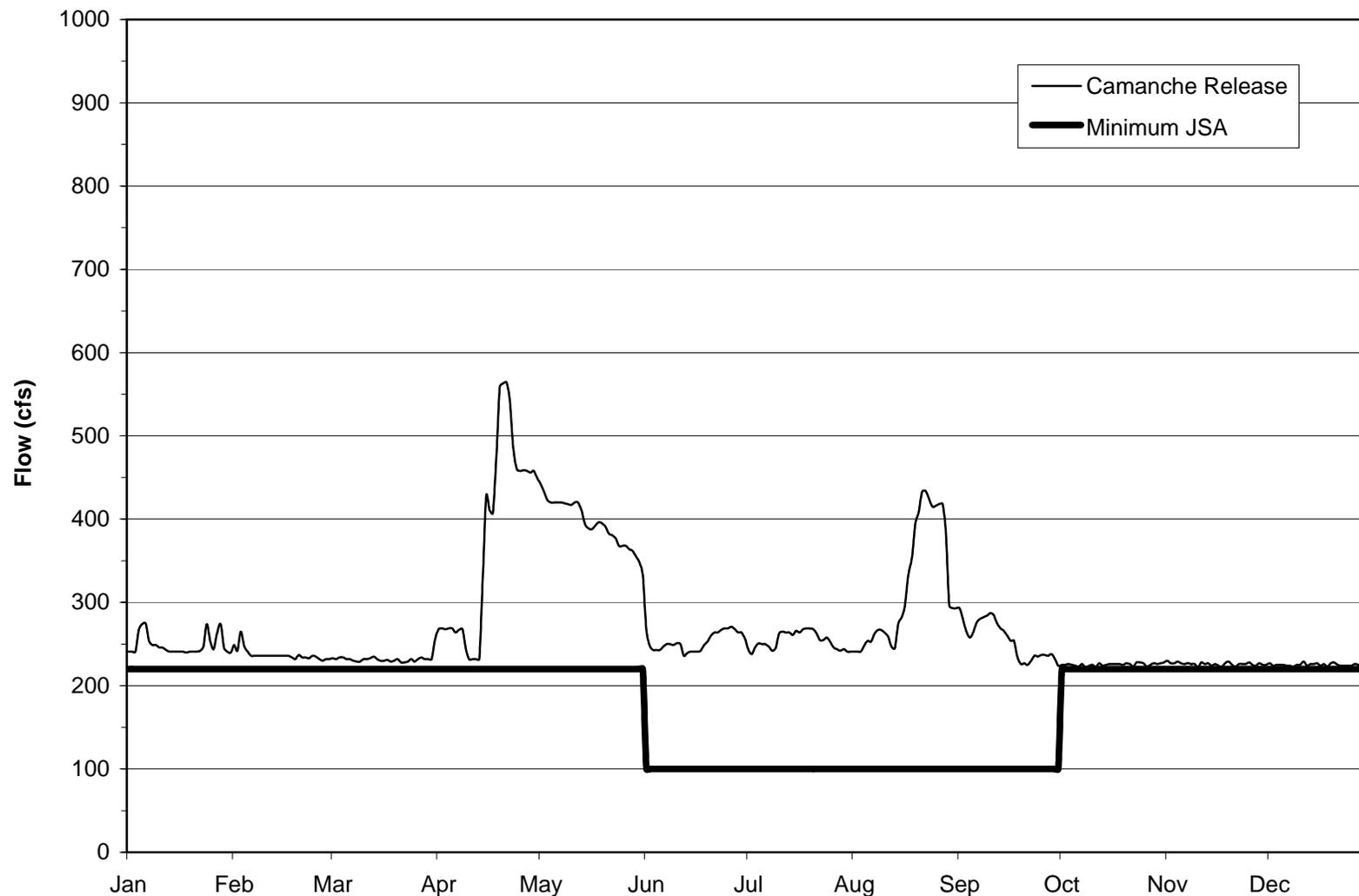
Calendar year 2008 actual Camanche Dam average daily flow releases and JSA agreed flow releases from Camanche Dam are shown in Table 3 and Figure 3, on the following pages. Calendar year 2008 actual average daily flow below Woodbridge Dam and JSA expected flow below Woodbridge Dam are shown in Table 4 and Figure 4.

TABLE 3. Calendar Year 2008 Release in Cubic Feet Per Second from Camanche Dam.

Date	Camanche Release	JSA Release												
01/01/08	241	220	03/16/08	230	220	05/30/08	348	220	08/13/08	245	100	10/27/08	225	220
01/02/08	241	220	03/17/08	231	220	05/31/08	333	220	08/14/08	275	100	10/28/08	227	220
01/03/08	241	220	03/18/08	229	220	06/01/08	267	100	08/15/08	282	100	10/29/08	226	220
01/04/08	267	220	03/19/08	230	220	06/02/08	248	100	08/16/08	297	100	10/30/08	227	220
01/05/08	274	220	03/20/08	232	220	06/03/08	243	100	08/17/08	333	100	10/31/08	228	220
01/06/08	275	220	03/21/08	228	220	06/04/08	243	100	08/18/08	354	100	11/01/08	230	220
01/07/08	254	220	03/22/08	228	220	06/05/08	243	100	08/19/08	394	100	11/02/08	227	220
01/08/08	249	220	03/23/08	229	220	06/06/08	247	100	08/20/08	408	100	11/03/08	227	220
01/09/08	249	220	03/24/08	232	220	06/07/08	250	100	08/21/08	433	100	11/04/08	229	220
01/10/08	246	220	03/25/08	229	220	06/08/08	250	100	08/22/08	434	100	11/05/08	227	220
01/11/08	246	220	03/26/08	232	220	06/09/08	249	100	08/23/08	425	100	11/06/08	226	220
01/12/08	243	220	03/27/08	234	220	06/10/08	251	100	08/24/08	415	100	11/07/08	227	220
01/13/08	241	220	03/28/08	232	220	06/11/08	250	100	08/25/08	416	100	11/08/08	226	220
01/14/08	241	220	03/29/08	232	220	06/12/08	236	100	08/26/08	418	100	11/09/08	226	220
01/15/08	241	220	03/30/08	232	220	06/13/08	239	100	08/27/08	418	100	11/10/08	222	220
01/16/08	241	220	03/31/08	255	220	06/14/08	241	100	08/28/08	381	100	11/11/08	228	220
01/17/08	241	220	04/01/08	268	220	06/15/08	241	100	08/29/08	296	100	11/12/08	226	220
01/18/08	240	220	04/02/08	269	220	06/16/08	241	100	08/30/08	293	100	11/13/08	227	220
01/19/08	241	220	04/03/08	268	220	06/17/08	242	100	08/31/08	293	100	11/14/08	224	220
01/20/08	241	220	04/04/08	269	220	06/18/08	249	100	09/01/08	293	100	11/15/08	226	220
01/21/08	241	220	04/05/08	269	220	06/19/08	253	100	09/02/08	280	100	11/16/08	224	220
01/22/08	242	220	04/06/08	264	220	06/20/08	260	100	09/03/08	265	100	11/17/08	223	220
01/23/08	247	220	04/07/08	267	220	06/21/08	264	100	09/04/08	258	100	11/18/08	227	220
01/24/08	274	220	04/08/08	268	220	06/22/08	264	100	09/05/08	264	100	11/19/08	229	220
01/25/08	253	220	04/09/08	245	220	06/23/08	267	100	09/06/08	276	100	11/20/08	225	220
01/26/08	244	220	04/10/08	232	220	06/24/08	269	100	09/07/08	280	100	11/21/08	223	220
01/27/08	263	220	04/11/08	232	220	06/25/08	269	100	09/08/08	282	100	11/22/08	226	220
01/28/08	274	220	04/12/08	232	220	06/26/08	271	100	09/09/08	284	100	11/23/08	226	220
01/29/08	246	220	04/13/08	232	220	06/27/08	268	100	09/10/08	287	100	11/24/08	226	220
01/30/08	241	220	04/14/08	333	220	06/28/08	264	100	09/11/08	285	100	11/25/08	228	220
01/31/08	240	220	04/15/08	428	220	06/29/08	264	100	09/12/08	275	100	11/26/08	225	220
02/01/08	249	220	04/16/08	411	220	06/30/08	256	100	09/13/08	269	100	11/27/08	224	220
02/02/08	242	220	04/17/08	407	220	07/01/08	243	100	09/14/08	266	100	11/28/08	227	220
02/03/08	265	220	04/18/08	477	220	07/02/08	238	100	09/15/08	260	100	11/29/08	225	220
02/04/08	247	220	04/19/08	559	220	07/03/08	246	100	09/16/08	254	100	11/30/08	225	220
02/05/08	241	220	04/20/08	563	220	07/04/08	251	100	09/17/08	254	100	12/01/08	227	220
02/06/08	236	220	04/21/08	564	220	07/05/08	250	100	09/18/08	235	100	12/02/08	224	220
02/07/08	236	220	04/22/08	540	220	07/06/08	250	100	09/19/08	226	100	12/03/08	225	220
02/08/08	236	220	04/23/08	485	220	07/07/08	247	100	09/20/08	227	100	12/04/08	225	220
02/09/08	236	220	04/24/08	460	220	07/08/08	242	100	09/21/08	225	100	12/05/08	225	220
02/10/08	236	220	04/25/08	458	220	07/09/08	245	100	09/22/08	230	100	12/06/08	224	220
02/11/08	236	220	04/26/08	459	220	07/10/08	263	100	09/23/08	236	100	12/07/08	224	220
02/12/08	236	220	04/27/08	458	220	07/11/08	265	100	09/24/08	235	100	12/08/08	223	220
02/13/08	236	220	04/28/08	456	220	07/12/08	264	100	09/25/08	237	100	12/09/08	225	220
02/14/08	236	220	04/29/08	458	220	07/13/08	264	100	09/26/08	237	100	12/10/08	225	220
02/15/08	236	220	04/30/08	449	220	07/14/08	261	100	09/27/08	236	100	12/11/08	229	220
02/16/08	236	220	05/01/08	442	220	07/15/08	266	100	09/28/08	238	100	12/12/08	224	220
02/17/08	236	220	05/02/08	433	220	07/16/08	264	100	09/29/08	232	100	12/13/08	226	220
02/18/08	234	220	05/03/08	423	220	07/17/08	268	100	09/30/08	224	100	12/14/08	226	220
02/19/08	232	220	05/04/08	420	220	07/18/08	269	100	10/01/08	225	220	12/15/08	227	220
02/20/08	237	220	05/05/08	420	220	07/19/08	269	100	10/02/08	225	220	12/16/08	224	220
02/21/08	234	220	05/06/08	420	220	07/20/08	268	100	10/03/08	226	220	12/17/08	226	220
02/22/08	234	220	05/07/08	420	220	07/21/08	263	100	10/04/08	225	220	12/18/08	223	220
02/23/08	233	220	05/08/08	419	220	07/22/08	255	100	10/05/08	224	220	12/19/08	227	220
02/24/08	236	220	05/09/08	418	220	07/23/08	255	100	10/06/08	223	220	12/20/08	228	220
02/25/08	235	220	05/10/08	417	220	07/24/08	258	100	10/07/08	226	220	12/21/08	225	220
02/26/08	232	220	05/11/08	420	220	07/25/08	253	100	10/08/08	222	220	12/22/08	224	220
02/27/08	230	220	05/12/08	420	220	07/26/08	246	100	10/09/08	224	220	12/23/08	224	220
02/28/08	232	220	05/13/08	410	220	07/27/08	244	100	10/10/08	225	220	12/24/08	224	220
02/29/08	232	220	05/14/08	394	220	07/28/08	242	100	10/11/08	223	220	12/25/08	224	220
03/01/08	233	220	05/15/08	389	220	07/29/08	244	100	10/12/08	227	220	12/26/08	226	220
03/02/08	232	220	05/16/08	388	220	07/30/08	241	100	10/13/08	224	220	12/27/08	225	220
03/03/08	234	220	05/17/08	392	220	07/31/08	241	100	10/14/08	225	220	12/28/08	221	220
03/04/08	234	220	05/18/08	396	220	08/01/08	241	100	10/15/08	226	220	12/29/08	225	220
03/05/08	232	220	05/19/08	395	220	08/02/08	241	100	10/16/08	226	220	12/30/08	226	220
03/06/08	232	220	05/20/08	391	220	08/03/08	241	100	10/17/08	226	220	12/31/08	227	220
03/07/08	230	220	05/21/08	383	220	08/04/08	248	100	10/18/08	226	220			
03/08/08	229	220	05/22/08	381	220	08/05/08	254	100	10/19/08	225	220			
03/09/08	229	220	05/23/08	377	220	08/06/08	253	100	10/20/08	227	220			
03/10/08	232	220	05/24/08	368	220	08/07/08	262	100	10/21/08	226	220			
03/11/08	232	220	05/25/08	368	220	08/08/08	267	100	10/22/08	223	220			
03/12/08	233	220	05/26/08	368	220	08/09/08	267	100	10/23/08	228	220			
03/13/08	235	220	05/27/08	364	220	08/10/08	264	100	10/24/08	228	220			
03/14/08	232	220	05/28/08	362	220	08/11/08	259	100	10/25/08	227	220			
03/15/08	230	220	05/29/08	355	220	08/12/08	247	100	10/26/08	223	220			

1. Releases in calendar year 2008 were made according to the "Dry" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Dry" year flow schedule from Oct. 1. through Dec. 31.
2. Flow data measured at USGS Gage #11323500 (Mokelumne River below Camanche Dam) from Jan 1 through Sept 30, and measured using Accusonic flow meter from Oct 1 through Dec 31.
3. Flow data are accurate to within +/- 5% from Jan 1 through Sept 30, and +/- 2% from Oct 1 through Dec 31 (new flow monitoring plan implemented).
4. Actual flow data has not yet been verified and published by the U.S. Geological Survey.

FIGURE 3. Calendar Year 2008 Release in Cubic Feet Per Second from Camanche Dam.



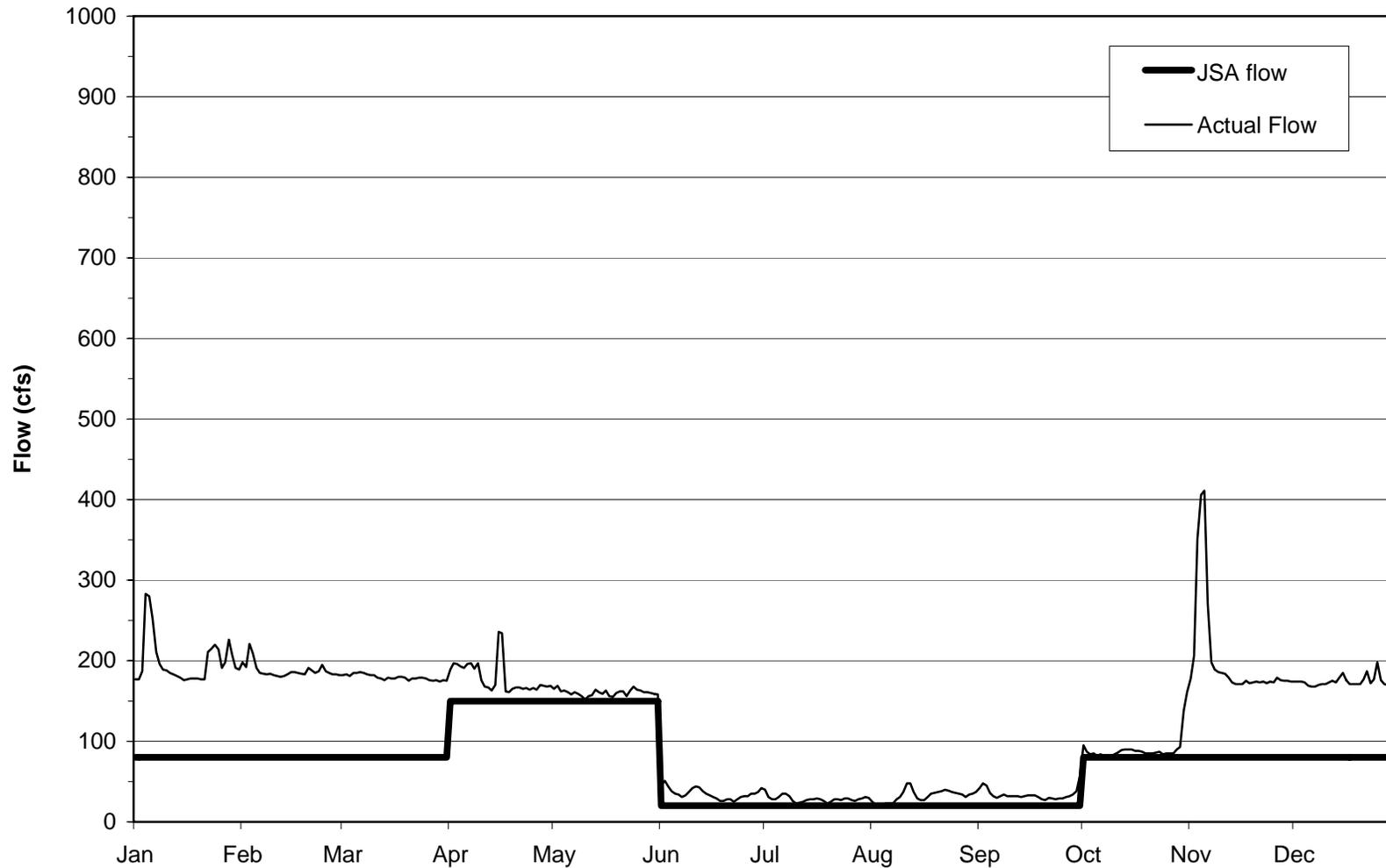
1. Releases in calendar year 2008 were made according to the "Dry" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Dry" year flow schedule from Oct 1. through Dec. 31.
2. Actual flow data has not been verified and published by the U.S. Geological Survey.

TABLE 4. Calendar Year 2008 Flow in Cubic Feet Per Second Below Woodbridge Dam.

JSA		JSA		JSA		JSA		JSA		JSA	
Date	Actual Flow	Expected Flow									
01/01/08	177	80	03/16/08	178	80	05/30/08	159	150	08/13/08	37	20
01/02/08	177	80	03/17/08	180	80	05/31/08	158	150	08/14/08	29	20
01/03/08	187	80	03/18/08	180	80	06/01/08	45	20	08/15/08	27	20
01/04/08	283	80	03/19/08	179	80	06/02/08	51	20	08/16/08	27	20
01/05/08	280	80	03/20/08	175	80	06/03/08	44	20	08/17/08	31	20
01/06/08	252	80	03/21/08	178	80	06/04/08	38	20	08/18/08	35	20
01/07/08	211	80	03/22/08	178	80	06/05/08	35	20	08/19/08	36	20
01/08/08	196	80	03/23/08	179	80	06/06/08	34	20	08/20/08	37	20
01/09/08	189	80	03/24/08	179	80	06/07/08	31	20	08/21/08	38	20
01/10/08	188	80	03/25/08	178	80	06/08/08	33	20	08/22/08	40	20
01/11/08	185	80	03/26/08	176	80	06/09/08	37	20	08/23/08	39	20
01/12/08	183	80	03/27/08	175	80	06/10/08	42	20	08/24/08	37	20
01/13/08	181	80	03/28/08	176	80	06/11/08	44	20	08/25/08	36	20
01/14/08	179	80	03/29/08	174	80	06/12/08	43	20	08/26/08	35	20
01/15/08	176	80	03/30/08	176	80	06/13/08	38	20	08/27/08	34	20
01/16/08	177	80	03/31/08	175	80	06/14/08	35	20	08/28/08	31	20
01/17/08	178	80	04/01/08	189	150	06/15/08	33	20	08/29/08	34	20
01/18/08	178	80	04/02/08	197	150	06/16/08	31	20	08/30/08	35	20
01/19/08	178	80	04/03/08	196	150	06/17/08	29	20	08/31/08	37	20
01/20/08	177	80	04/04/08	193	150	06/18/08	26	20	09/01/08	42	20
01/21/08	177	80	04/05/08	191	150	06/19/08	26	20	09/02/08	48	20
01/22/08	211	80	04/06/08	196	150	06/20/08	28	20	09/03/08	45	20
01/23/08	215	80	04/07/08	197	150	06/21/08	28	20	09/04/08	36	20
01/24/08	220	80	04/08/08	190	150	06/22/08	25	20	09/05/08	32	20
01/25/08	214	80	04/09/08	197	150	06/23/08	28	20	09/06/08	30	20
01/26/08	191	80	04/10/08	176	150	06/24/08	31	20	09/07/08	32	20
01/27/08	198	80	04/11/08	168	150	06/25/08	32	20	09/08/08	34	20
01/28/08	226	80	04/12/08	167	150	06/26/08	32	20	09/09/08	32	20
01/29/08	207	80	04/13/08	163	150	06/27/08	35	20	09/10/08	32	20
01/30/08	191	80	04/14/08	170	150	06/28/08	35	20	09/11/08	32	20
01/31/08	189	80	04/15/08	236	150	06/29/08	37	20	09/12/08	32	20
02/01/08	198	80	04/16/08	234	150	06/30/08	42	20	09/13/08	31	20
02/02/08	192	80	04/17/08	162	150	07/01/08	40	20	09/14/08	32	20
02/03/08	221	80	04/18/08	161	150	07/02/08	31	20	09/15/08	33	20
02/04/08	209	80	04/19/08	165	150	07/03/08	28	20	09/16/08	33	20
02/05/08	191	80	04/20/08	167	150	07/04/08	28	20	09/17/08	33	20
02/06/08	185	80	04/21/08	167	150	07/05/08	31	20	09/18/08	31	20
02/07/08	184	80	04/22/08	165	150	07/06/08	35	20	09/19/08	28	20
02/08/08	183	80	04/23/08	166	150	07/07/08	35	20	09/20/08	27	20
02/09/08	184	80	04/24/08	164	150	07/08/08	32	20	09/21/08	30	20
02/10/08	182	80	04/25/08	166	150	07/09/08	26	20	09/22/08	29	20
02/11/08	181	80	04/26/08	164	150	07/10/08	23	20	09/23/08	28	20
02/12/08	180	80	04/27/08	170	150	07/11/08	24	20	09/24/08	29	20
02/13/08	181	80	04/28/08	169	150	07/12/08	25	20	09/25/08	29	20
02/14/08	183	80	04/29/08	168	150	07/13/08	27	20	09/26/08	31	20
02/15/08	186	80	04/30/08	169	150	07/14/08	28	20	09/27/08	32	20
02/16/08	186	80	05/01/08	165	150	07/15/08	28	20	09/28/08	34	20
02/17/08	185	80	05/02/08	169	150	07/16/08	29	20	09/29/08	38	20
02/18/08	184	80	05/03/08	162	150	07/17/08	28	20	09/30/08	57	20
02/19/08	183	80	05/04/08	163	150	07/18/08	26	20	10/01/08	95	80
02/20/08	191	80	05/05/08	161	150	07/19/08	23	20	10/02/08	87	80
02/21/08	188	80	05/06/08	158	150	07/20/08	25	20	10/03/08	84	80
02/22/08	185	80	05/07/08	161	150	07/21/08	28	20	10/04/08	85	80
02/23/08	187	80	05/08/08	159	150	07/22/08	28	20	10/05/08	82	80
02/24/08	195	80	05/09/08	156	150	07/23/08	27	20	10/06/08	84	80
02/25/08	187	80	05/10/08	152	150	07/24/08	29	20	10/07/08	82	80
02/26/08	185	80	05/11/08	156	150	07/25/08	29	20	10/08/08	82	80
02/27/08	183	80	05/12/08	157	150	07/26/08	27	20	10/09/08	82	80
02/28/08	183	80	05/13/08	164	150	07/27/08	26	20	10/10/08	84	80
02/29/08	182	80	05/14/08	161	150	07/28/08	28	20	10/11/08	86	80
03/01/08	182	80	05/15/08	159	150	07/29/08	29	20	10/12/08	89	80
03/02/08	183	80	05/16/08	163	150	07/30/08	31	20	10/13/08	90	80
03/03/08	181	80	05/17/08	156	150	07/31/08	30	20	10/14/08	90	80
03/04/08	185	80	05/18/08	155	150	08/01/08	25	20	10/15/08	90	80
03/05/08	185	80	05/19/08	160	150	08/02/08	21	20	10/16/08	88	80
03/06/08	186	80	05/20/08	162	150	08/03/08	19	20	10/17/08	88	80
03/07/08	185	80	05/21/08	162	150	08/04/08	22	20	10/18/08	87	80
03/08/08	183	80	05/22/08	156	150	08/05/08	23	20	10/19/08	85	80
03/09/08	182	80	05/23/08	163	150	08/06/08	23	20	10/20/08	85	80
03/10/08	182	80	05/24/08	168	150	08/07/08	23	20	10/21/08	85	80
03/11/08	179	80	05/25/08	164	150	08/08/08	28	20	10/22/08	86	80
03/12/08	178	80	05/26/08	163	150	08/09/08	31	20	10/23/08	87	80
03/13/08	176	80	05/27/08	161	150	08/10/08	37	20	10/24/08	84	80
03/14/08	179	80	05/28/08	161	150	08/11/08	48	20	10/25/08	85	80
03/15/08	178	80	05/29/08	160	150	08/12/08	48	20	10/26/08	85	80

1. Expected flows past Woodbridge Dam in calendar year 2008 were according to the "Dry" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Dry" year flow schedule from Oct 1, through Dec. 31.
2. Flow data measured at USGS Gage #11325500 (Mokelumne River at Woodbridge).
3. Flow data are accurate to within +/- 5%.
4. Actual flow data has not yet been verified and published by the U.S. Geological Survey.

FIGURE 4. Calendar Year 2008 Flow in Cubic Feet Per Second Below Woodbridge Dam.



1. Releases in calendar year 2008 were made according to the "Dry" year JSA Mokelumne River minimum flow schedule from Jan. 1 to Mar. 31; "Dry" year flow schedule from Apr. 1 through Sept. 30; and "Dry" year flow schedule from Oct 1. through Dec. 31.
2. Actual flow data has not been verified and published by the U.S. Geological Survey.

During the 2008 calendar year no temporary flow deviations occurred from the JSA minimum flow release from Camanche Dam. One provisional, temporary flow deviation from the JSA expected flow below Woodridge Dam, based on the recorded 15-minute readings, occurred during the 2008 calendar year. The excursion was identified for August 3, 2008 after EBMUD applied a shift to the gaging station's stage-discharge record, based on a flow measurement made on August 4, 2008 (see Appendix C for a copy of the Woodbridge Irrigation District Notification Letter). Consequently, the average provisional daily flow on August 3, 2008 was 19 cfs.

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 on the following page. The provisional data has not been verified or published by the USGS and is subject to change.

*Lower Mokelumne River Project – FERC Project No. 2916
2008 Project Operations Report*

Date/ Time	Actual Flow Below Woodbridge Dam (cfs)	JSA Expected Flow (cfs)	Date/ Time	Actual Flow Below Woodbridge Dam (cfs)	JSA Expected Flow (cfs)
8/2/2008 14:30	20	20	8/3/2008 1:30	18	20
8/2/2008 14:45	19	20	8/3/2008 1:45	18	20
8/2/2008 15:00	19	20	8/3/2008 2:00	18	20
8/2/2008 15:15	19	20	8/3/2008 2:15	18	20
8/2/2008 15:30	19	20	8/3/2008 2:30	18	20
8/2/2008 15:45	19	20	8/3/2008 2:45	18	20
8/2/2008 16:00	19	20	8/3/2008 3:00	18	20
8/2/2008 16:15	19	20	8/3/2008 3:15	18	20
8/2/2008 16:30	19	20	8/3/2008 3:30	18	20
8/2/2008 16:45	19	20	8/3/2008 3:45	18	20
8/2/2008 17:00	19	20	8/3/2008 4:00	18	20
8/2/2008 17:15	19	20	8/3/2008 4:15	18	20
8/2/2008 17:30	19	20	8/3/2008 4:30	18	20
8/2/2008 17:45	19	20	8/3/2008 4:45	18	20
8/2/2008 18:00	19	20	8/3/2008 5:00	18	20
8/2/2008 18:15	19	20	8/3/2008 5:15	17	20
8/2/2008 18:30	19	20	8/3/2008 5:30	17	20
8/2/2008 18:45	19	20	8/3/2008 5:45	17	20
8/2/2008 19:00	19	20	8/3/2008 6:00	17	20
8/2/2008 19:15	19	20	8/3/2008 6:15	17	20
8/2/2008 19:30	19	20	8/3/2008 6:30	17	20
8/2/2008 19:45	19	20	8/3/2008 6:45	17	20
8/2/2008 20:00	19	20	8/3/2008 7:00	17	20
8/2/2008 20:15	19	20	8/3/2008 7:15	17	20
8/2/2008 20:30	19	20	8/3/2008 7:30	17	20
8/2/2008 20:45	19	20	8/3/2008 7:45	17	20
8/2/2008 21:00	19	20	8/3/2008 8:00	17	20
8/2/2008 21:15	19	20	8/3/2008 8:15	17	20
8/2/2008 21:30	19	20	8/3/2008 8:30	17	20
8/2/2008 21:45	19	20	8/3/2008 8:45	17	20
8/2/2008 22:00	19	20	8/3/2008 9:00	17	20
8/2/2008 22:15	19	20	8/3/2008 9:15	17	20
8/2/2008 22:30	19	20	8/3/2008 9:30	17	20
8/2/2008 22:45	19	20	8/3/2008 9:45	17	20
8/2/2008 23:00	19	20	8/3/2008 10:00	17	20
8/2/2008 23:15	19	20	8/3/2008 10:15	17	20
8/2/2008 23:30	19	20	8/3/2008 10:30	17	20
8/2/2008 23:45	19	20	8/3/2008 10:45	17	20
8/3/2008 0:00	18	20	8/3/2008 11:00	17	20
8/3/2008 0:15	18	20	8/3/2008 11:15	18	20
8/3/2008 0:30	18	20	8/3/2008 11:30	18	20
8/3/2008 0:45	18	20	8/3/2008 11:45	19	20
8/3/2008 1:00	18	20	8/3/2008 12:00	19	20
8/3/2008 1:15	18	20	8/3/2008 12:15	20	20

2009

EBMUD is committed, pursuant to the FERC Order, to “Dry” JSA year type Camanche Dam flow releases through March 31, 2009. 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, 2009 DWR Bulletin 120, the JSA water year type which will govern EBMUD’s flow schedule for the period April 1, 2009 through September 30, 2009. 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 2009. EBMUD will include finalized flow data in an Appendix of the report as it is verified and published by USGS. Refer to Appendix D for finalized flow data for the 2006 calendar year, and January through September, 2007.

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 cool 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.

2008

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 2008 Mokelumne River Water Average Daily Temperatures of the Release from Camanche Dam.

From April 1, 2008 through September 30, 2008 EBMUD operated under a “Dry” JSA water year type 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. In the spring of 2008 as we entered a second consecutive dry year, it appeared to EBMUD based on reservoir conditions and temperature modeling that it would be difficult to maintain 28,000 acre-feet of hypolimnion volume in Camanche Reservoir through October, and provide the coldest water releases possible in the lower Mokelumne River during October and November. Consequently, EBMUD developed two alternative management plans to operate Pardee and Camanche Reservoir in an integrated manner and presented the plans to the Partnership Steering Committee in July 2008. After consultation, CDFG and USFWS agreed on a plan under which EBMUD held back more

cold water in Pardee Reservoir during the summer months for release in the fall in order to minimize Camanche Reservoir release temperatures during the critical salmon spawning months. This operation resulted in slightly higher summer Camanche release temperatures and the hypolimnetic volume in Camanche Reservoir dropping below 28,000 acre-feet during portions of the summer, and, in return, resulted in successfully maintaining stratification in Camanche Reservoir, and providing cold water releases in the lower Mokelumne River through the critical spawning period from October through December. A record of this consultation and agreement is presented in Appendix E. EBMUD also provided bypass (sluice) flows from Camanche Reservoir to increase dissolved oxygen levels in the lower Mokelumne River when needed during 2008.

2009

In 2009, if dry conditions as that occurred in 2008 continue or worsen, EBMUD will implement a similar agreed upon plan to minimize Camanche Reservoir release temperatures during the critical salmon spawning fall months. 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.

2008

The HOS was activated on July 9, 2008 and was shut down on November 14, 2008. The HOS was effective in preventing hydrogen sulfide formation.

2009

In 2009 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 2008 Mokelumne River Temperatures Below Camanche Dam

Degrees - C



Notes: Siphoning operation through the High Level Outlet started on 5/29/2008 and ended on 7/17/2008. This action was taken to preserve the colder water in Camanche Reservoir.

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 July 17, 2008. Minutes of the PSC meeting are included in Appendix F. In September 2008, the PSC compiled and finalized a report that summarized the first ten years of JSA implementation. The report summarized the extensive efforts employed by the PSC in the last ten years to implement the JSA and recommended the following strategies for continued implementation:

- Operate Camanche and Pardee reservoirs to maintain best available water temperatures in the lower Mokelumne River for salmonid spawning, incubation, rearing and over-summering based on temperature model simulations and water availability.
- Provide flows in the lower Mokelumne River to enhance natural production of Chinook salmon and steelhead based on life history stage needs and water availability.
- Replenish gravel suitable for salmonid spawning habitat.
- Enhance and maintain the riparian corridor to improve streambank and channel rearing habitat for juvenile salmonids.
- Operate the Mokelumne River Fish Hatchery (MRFH) to maintain the genetic characteristics of the local, natural populations of fall-run Chinook salmon and California Central Valley steelhead and reduce the genetic risks that hatchery-origin fish may pose to naturally spawning populations.
- Evaluate the effects of the measures on Chinook salmon and steelhead in the lower Mokelumne River.

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 14 and October 14, 2008. In 2008 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 2008 and projects with activity in 2008.

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 \$766,934.70. The available earnings, after funds obligated to approved projects, were \$159,614.15 as of December 31, 2008.

In 2008, the Partnership Steering Committee approved funding for the following two stakeholder proposals:

- **EBMUD was awarded \$45,000 to purchase Vemco acoustic tags to continue acoustic telemetry studies.** The Project continues work initiated in 2008 to assess hatchery release location affect on migration rate, routes and survival of hatchery origin steelhead. The tags will be implanted by EBMUD staff in 100 hatchery steelhead yearling smolts, 50 to be released at New Hope Landing, and 50 to be released below the MRFH. Release timing will occur from February to April 2009, and in 10 reconditioned hatchery kelts and 10 2-year old hatchery steelhead to be released below the hatchery. EBMUD and others will collect the data on steelhead movements through July 2010.
- **EBMUD received conditional approval for \$42,532 in matching funds that was included in an EBMUD California River Parkways Grant application.** The proposed project along the lower Mokelumne River within the 65-care MRDUA would: (1) construct approximately 1.4 miles of barrier-free trail adjacent to the lower Mokelumne River; (2) rehabilitate approximately 1.7 miles of unauthorized user-created access trails; (3) install a car-top boat launch; (4) reorganize parking spaces and improve parking lot surfacing; (5) install additional facilities to support picnic activities; (6) improve and upgrade signage (rules/regulations and interpretive); (7) restore approximately 1 acre of seasonal floodplain habitat for native species; (8) remove approximately 12 acres of invasive nonnative species; and, (9) plant approximately 12 acres of native plant species to provide habitat for fish and wildlife species. Partnership funding will be authorized if EBMUD is awarded the California River Parkways grant in 2009.

Ongoing projects funded by the PSC with activity in 2008 for ecosystem protection and restoration in the lower Mokelumne River are summarized in Table 5 on the following page.

*Lower Mokelumne River Project – FERC Project No. 2916
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Table 5: Partnership Fund-Supported Projects – 2008 Activity Summary

Project Title	Project Sponsor	Project Description	Partnership Fund			Additional Funding	
			Date Approved by PSC	Anticipated Project Completion	Amount Obligated	Amount	Program
Cosumnes-Mokelumne River Floodplain Integrated Resource Mgmt Plan	Southeast Sacramento County Agricultural Water Authority	Feasibility study - ecosystem restoration/ flood hazard reduction	11/13/2000	COMPLETED	\$50,000	\$1,007,800	California Bay Delta Authority (CALFED) - Watershed Program
Gil Creek Riparian Improvement	Gil Creek Landowners (Dentone)	Riparian improvement on private land along Gil Creek	4/29/2005	COMPLETED	\$11,191		
Calvary Bible Church Riparian Restoration	Calvary Bible Church	Riparian restoration along LMR on church property	4/29/2005	anticipated Fall 2009	\$21,408		
Large Woody Material	University of California at Davis	Develop large woody material budget for LMR	3/29/2006	COMPLETED	\$25,663		
Hoffman Riparian Restoration	Center for Land Based Learning	Riparian restoration on the Hoffman Farm	9/5/2006	anticipated Summer 2009	\$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	anticipated Summer 2009	\$47,212		
Steelhead Acoustic Telemetry Study - 07/08	EBMUD	Purchase acoustic tags for steelhead acoustic telemetry study	10/19/2007	COMPLETED	\$35,000		

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 2008, 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 2008, 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 bimonthly and includes participation from private landowners, farmers, community groups, local government staff, and agency representatives, including representatives for EBMUD and the Partnership. In 2008, the Stewardship Steering Committee continued to work on initiatives to encourage the City of Lodi to seek third-party sustainability certification and develop a concept recreational waterway on the lower Mokelumne River. Additional information on the Stewardship Program, including the watershed owner's manual is available on the Internet at www.sjcrd.org.

5. Additional EBMUD Stakeholder Activities

2008

In 2008, 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 2008 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 2008, with funding from AFRP, EBMUD placed 4,850 cubic yards of anadromous fish spawning gravel in the lower Mokelumne River.
- Participation and sponsorship of the 12th-annual Sandhill Crane Festival in Lodi, CA on November 7-9, 2008. 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 five field trips to view bald eagles at Pardee Reservoir. (1997-present)
 - Participation in the 12th Annual Central Valley Birding Symposium in Stockton on November 21-22, 2008. EBMUD staff lead 2 field trips in the lower Mokelumne River area.
 - 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.
 - 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.

2009

In 2009, 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

2008

At the April 22, 2008 meeting of the Board of Directors, the District accepted the 2008 Water Supply Availability and Deficiency Report declaring that the District's water supply was deficient in meeting customer demands in 2008. Due to low Mokelumne River runoff in 2008, no surplus water was available in the 2008 calendar year and the District instituted a mandatory rationing program to reduce the district-wide demand by 15 percent. A copy of the letter of notification of the lack of the availability for sale of surplus Mokelumne River water is included in Appendix G 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.

2008

In 2008, 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 24 and July 7, 2008.

2009

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 most recent MRTAC meeting was held on January 27, 2009.

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 2008, 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.

3. Mokelumne River Symposium

Section H.3 of the JSA requires the Parties to sponsor periodic symposia to provide opportunities for scientists, biologists, and other professionals who have conducted studies or research on the Mokelumne River ecosystem to present their papers and participate in peer group discussions about the river corridor and its ecosystem.

EBMUD co-sponsored the 26th Annual Salmonid Restoration Conference held in Lodi, CA on March 5-8, 2008. EBMUD staff chaired a session, lead field tours of restoration activities in the lower Mokelumne River, and provided technical presentations. In 2008 staff presented the following talks and posters:

Setka J.D., Mulchaey, B. and Newcomb, T. 2008. Using GIS in salmonid spawning surveys: A valuable tool for designing projects and measuring success. Salmonid Restoration Federation Conference, February 2008.

Workman, M. and J. Merz. 2008. Evaluation of volitional release strategy for hatchery produced Fall-run Chinook salmon in the Lower Mokelumne River, California. Salmonid Restoration Federation Annual Meeting.

Workman, M. L., J.E. Merz, and W. Heady. 2008 . Lower Mokelumne River Steelhead Acoustic Studies 2007-2008. CalFed Science Conference.

Workman, M. L. 2008. If We Grow Them Will They Come? A Story of Steelhead on the Lower Mokelumne River. Central Valley Anglers Association.

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.

2008

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.

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- 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.

2009

EBMUD will continue similar research and monitoring activities in 2009. These efforts will be described in full in the calendar year 2009 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:

2008

- 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 2008, EBMUD placed 4,850 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 2007/2008, 2,226 (1921 at Vino Farms and 305 at other locations) 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.
- 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.

2009

Many of the above habitat improvement activities will continue in 2009. A full description of 2008 activities will be reported in calendar year 2009 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, 2008 and the removal is scheduled for March 31, 2009. It is anticipated that it will be installed and operated during the approximately same period in 2009.

V. APPENDICES

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

Appendix B: FERC’s Approval of the Flow Monitoring Plan at Camanche Dam

Appendix C: Woodbridge Irrigation District Notification Letter

Appendix D: USGS Verified Flow Data for 2006 and 2007

Appendix E: Lower Mokelumne River Partnership Memo

Appendix F: Meeting Minutes of the Partnership Steering Committee

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

APPENDIX A

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

The Lower Mokelumne River Watershed, California: Vertebrate Species Richness and Biodiversity Conservation in a Vineyard Dominated Working Landscape

*Kent Reeves, Yolo County Parks and Resources Department*¹

The lower Mokelumne River Watershed is a 28,000 hectare working landscape with greater than 70% of the land in agriculture production. Over 40% of the watershed is in vineyards, which account for 80% of the agriculture commodities produced in the region. The lower Mokelumne River potentially has 12 amphibian and 27 reptile species that may occur in the riparian habitat of the river. A herpetofauna inventory identified 3,858 individuals of 16 species (three amphibians and 13 reptiles) during a four-year survey period. Over 200 species of birds have been identified along the riparian corridor in the past 20 years. A total of 112 bird species were detected on point counts over three years of surveys. A total of 16 species of raptors were identified during roadside

surveys throughout the watershed from 1998 through 2002. Small/medium sized mammal populations were inventoried along the lower Mokelumne River from 2002 to 2004 using small mammal traps, track plates, coverboard arrays and drift fence arrays with pit traps. Potentially 43 small mammal species occur along the river. The inventory identified 1,136 individuals of 14 species during the survey period. This paper will discuss the collaboration and cooperation among stakeholders to develop a watershed stewardship plan; inventory methods to assess biodiversity; and conservation measures such as habitat restoration, conservation easements and the first programmatic Safe Harbor Agreement to protect, restore, and enhance biodiversity in California.

¹ Co-Authors: James Jones, Michelle Workman, and James Smith, East Bay Municipal Utility District; Brook Edwards, Restoration Resources; and Andrea Pfeffer, PRBO, Conservation Science

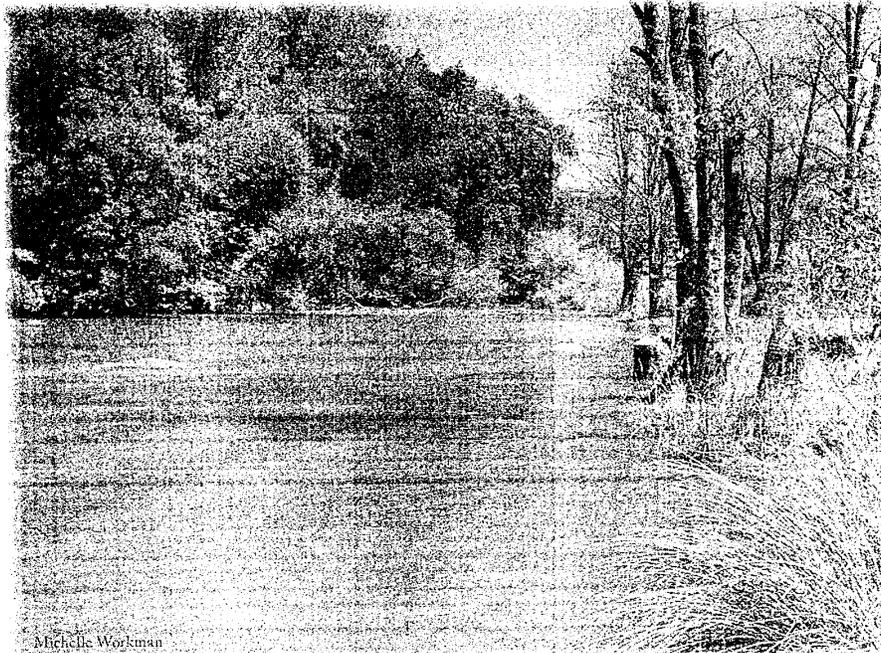
Fisheries Monitoring and Management Programs on the Mokelumne River

Thursday, March 6

Field Tour Coordinator: *Michelle Workman, East Bay Municipal Utility District*

The lower Mokelumne River supports populations of naturally reproducing fall-run Chinook salmon and Central Valley steelhead. The mitigation fish hatchery on site rears both species to mitigate for loss of spawning habitat associated with the construction of Camanche Dam. We will visit the hatchery facility and see how hatchery production plays a role in regulated river management. Wild population management is accomplished through a variety of projects aimed at increasing both

spawning and rearing habitat for salmonids. We will visit a gravel restoration site aimed at increasing spawning habitat, and floodplain inundation potential and two engineered side channels designed to provide juvenile rearing habitat. Monitoring of wild fish populations' response to these on ground efforts is critical to evaluate the success and failure of projects. We will visit a juvenile migration monitoring station and discuss various aspects of fisheries monitoring on the river.



Michelle Workman

Friday Evening Poster Session

A Century of Riparian Change in the Lower Mokelumne River

Brook R. Edwards, Restoration Resources, Steven J. Steinberg, and Kent A. Reeves

Riparian ecosystems are spatially and temporally dynamic systems shaped by fluvial and upland geomorphic processes. Restoration of these ecosystems requires an understanding of how the river's channel, floodplain and vegetation have changed due to natural processes and human alteration. This project conducted a time series spatial analysis (1910- 2001) of the lower Mokelumne River (LMR) using riparian-stream metrics to characterize the structural attributes of the riparian system. Historical aerial photographs and maps of the study area were rectified and important structural attributes of the river were quantified. Results of the study indicate that over 70% of the LMR floodplains have been cleared of riparian forest and shrub communities. Fragmentation of the riparian buffer ranged from a low of 3% to over 80%. Mean width of woody vegetation reached a low for most reaches in 1963, while lateral composition metrics indicate a high percentage of riparian forests were converted to agriculture. All secondary channels were removed

from the floodplain and over 80% of seasonal lakes were converted to agriculture. Channel width of reaches 1 and 2 declined, while reaches 3 and 4 increased. In addition, the natural pulse of instream flow from spring snowmelt in the upper reaches has been reduced by over 80% for the month of May, and bankfull discharge has experienced similar reductions. Currently, riparian vegetation adjacent to the river has regenerated in many areas and indicates a promising trend for restoration of the riparian buffer. Based on measurements from 1927, restoration efforts should strive to reduce buffer fragmentation to 5% or below, with a mean width of at least 30 m. The first 20-30 m of the buffer should be composed of at least 75% riparian forest and 20% riparian shrub. Restoration efforts can be monitored by applying the same set of metrics to future vegetation maps of the riparian corridor and correlations between vegetation structure and indicator species (fish, birds, mammals) can be investigated.

Engaging Watershed Communities in Salmonid Restoration

Saturday Morning Concurrent Session 2

Implementation of the Lower Mokelumne River Watershed Stewardship Plan: Lessons in Collaboration

John Brodie, San Joaquin County Resource Conservation District and Richard Leong, Watershed Planning Analyst, East Bay Municipal Utility District

One of the primary concerns about the lower Mokelumne River is that, as a highly controlled system, the river has lost much of its historic and natural function. The lower Mokelumne River is also considered impaired for copper and zinc and is on the 303(d) list for those two substances. More than 90% of land within the watershed is privately owned and agriculture is the predominant land use, though development pressure is converting many of these agricultural acres into home sites. Parts of the watershed also have non-native invasive species crowding out native riparian vegetation.

The guiding principle of the 2002 Lower Mokelumne River Watershed Stewardship Plan (LMRWSP) is that all of the constituents of the Lower Mokelumne River Watershed are interrelated. No single element or action stands alone. Good stewardship is about pointing a finger at ourselves and not at each other. The community must consider each chapter of the Lower Mokelumne River Watershed Stewardship Plan as a component of a broader picture—an overall approach to the good stewardship of the Lower Mokelumne River Watershed—an approach which depends on many different actions by many different individuals working towards a common goal. The Plan encourages all to take individual responsibility for maintaining and improving the resources of the Lower Mokelumne River Watershed and to get involved!

Implementation of the Plan is guided by the Lower Mokelumne River Stewardship Steering Committee—a community-based group consisting of all interested parties in the community and beyond. Stakeholders are not determined by the Committee, they are self-identified. Implementation of the plan has included activities such as:

- An agricultural water quality best management practices field day held in conjunction with government agencies and nongovernmental

organizations to meet their needs while promoting best management practices to reduce non-point source pollution that enters the river.

- Continued to work with the Student and Landowner Education Watershed Stewardship (SLEWS) program of the Center of Land-Based Learning by working with SLEWS staff to select restoration sites, the types of plants to be planted at the sites, and the students that would be involved with the program. The SLEWS program provides high school students with hands-on watershed stewardship experiences.
- Continued to work with the San Joaquin Watershed Education Partnership (SJWEP) to promote using the Mokelumne Watershed as a focal point for place-based learning activities.
- Collaboration with the Lower Mokelumne River Partnership (California Dept. of Fish and Game, East Bay Municipal Utility District, US Fish and Wildlife Service) to support the protection and enhancement of the anadromous fishery in the lower Mokelumne River consistent with the Partnership's Water Quality and Resource Management Program.
- Coordination of ongoing riparian restoration projects with a variety of private landowners along the lower Mokelumne River
- Establishment of a programmatic Safe Harbor Agreement (Valley Elderberry Longhorn Beetle)

The central focus of all the implementation elements of the Plan is to encourage community "ownership" of the watershed and to build strong collaborative partnerships between landowners, non-profits, government agencies, local businesses, etc. to establish and maintain a strong watershed stewardship network on the lower Mokelumne River.

Managing a Regulated River: Restoration, Monitoring and Management on the Mokelumne River

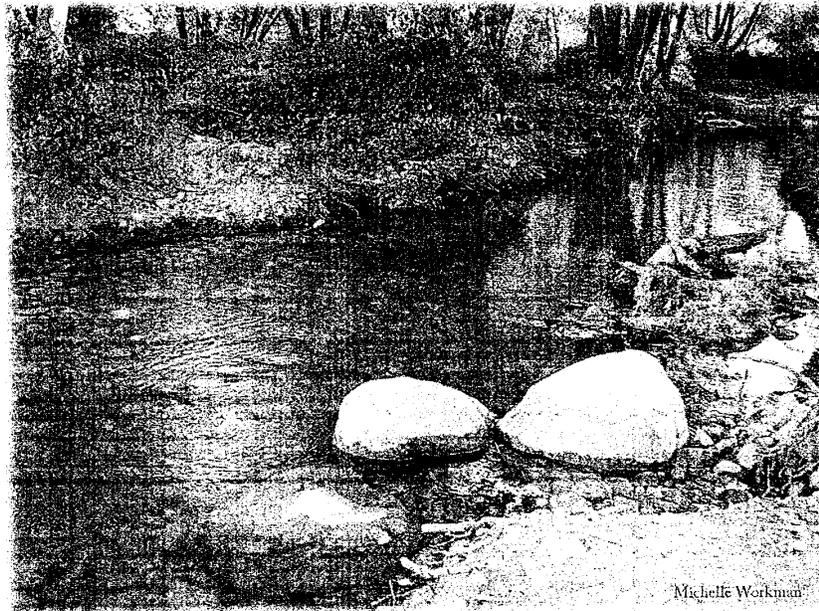
Saturday Afternoon Concurrent Session 2

Management Implications of Mokelumne River Salmon Origin (Hatchery Versus Wild)

J.D. Wikert, Anadromous Fish Restoration Program, US Fish and Wildlife Service

The Mokelumne River is one of four Central Valley watersheds with large salmonid production hatchery facilities. Concurrently, efforts are underway to restore natural production of Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*O. mykiss*.) Evidence continues to accumulate identifying adverse impacts of hatchery origin salmonids to wild or natural origin stocks. A recent

study demonstrated a loss of fitness of 40% in steelhead in one hatchery generation, and other authors have identified additional genetic and competition hazards to natural origin salmonids in the presence of those hatchery origin. The Mokelumne River hatchery and natural production data are analyzed and implications for management are discussed.



Michelle Workman

Managing a Regulated River: Restoration, Monitoring and Management on the Mokelumne River

Saturday Afternoon Concurrent Session 2

Evaluation of a Volitional Release Strategy for Hatchery-produced Fall-run Chinook Salmon in the Lower Mokelumne River, California

Michelle L. Workman (presenter,) East Bay Municipal Utility District and Joseph E. Merz, Cramer Fish Sciences

The authors evaluated the strategy of volitionally releasing hatchery-produced fall-run Chinook salmon in the regulated lower Mokelumne River by comparing volitionally and forced released hatchery-produced Chinook salmon ocean harvest, hatchery escapement, and straying rates; and, comparing development, habitat use, migration patterns and diets of naturally-produced and volitionally-released hatchery-produced Chinook salmon. Coded-wire tag recoveries from one brood year (2003) indicated volitionally-released hatchery-produced fish had higher ocean harvest rates and escapement to the Mokelumne River Fish Hatchery than forced released fish, with no significant difference in straying rates. Fish sampled by rotary screw trap and electrofishing (2003 to 2006) suggested volitionally-released fish grew and developed faster than their naturally-produced conspecifics, had less size variability, were less evenly dispersed, were found in fewer habitats (except during flooding), and emigrated significantly faster in all years. While hatchery-

produced juveniles had significantly more food items per stomach, naturally-produced juveniles had fuller stomachs contained larger and more diverse prey items and exhibited significantly more piscivory. Naturally-produced and volitionally-released hatchery fish both migrated at higher rates during the night except during 2004, a year with higher relative hatchery-produced fish abundance. Hatchery-produced fish abundance may trigger a behavioral effect on migration patterns in the naturally-produced population. Further assessment of subsequent release groups needs to be conducted before definitive conclusions regarding the effects of a volitional release strategy compared to a downstream forced release on natural river production can be made. If further evaluation supports a volitional release strategy, relative abundance of naturally-produced and volitionally released hatchery-produced fish and annual variation in the river environment will need careful consideration.

Managing a Regulated River: Restoration, Monitoring and Management on the Mokelumne River

Saturday Afternoon Concurrent Session 2

Geomorphic and Ecological Interactions of Large Wood, Pacific Salmonid Redds, and Habitat Units in the Lower Mokelumne River, California.

Anne E. Senter, University of California, Davis ¹

Large wood pieces (LW, >1 m length, >10 cm diameter) are important components of geomorphic and ecological dynamics within river systems. Physical presence of LW within the bankfull channel can influence hydraulic variability, sediment deposition and scour patterns, storage of organic matter, habitat creation, and nutrient sources for aquatic species. In regulated rivers hydrologic connectivity has been lost and ecosystem dynamics disrupted, yet lower reaches continue to serve as habitat and now as headwaters, for a myriad of species including anadromous salmonids returning to spawn. Because watershed connectivity has been severed, riparian zones highly altered, and LW removal remains common, LW levels are thought to be very low in regulated ecosystems. In our conceptual model it was conjectured that a dynamic and healthy ecosystem might have areas of low, optimal, and overabundances of wood, which might correlate respectively to low, optimal, and low redd abundances. On the other hand, in an ecosystem where connectivity is diminished an increase in the amount of LW may potentially convert otherwise unsuitable redd habitat to highly preferred redd habitat. In this research, interactions between LW, Pacific salmon redds, and hydraulic habitat units were explored along a 7.5 km reach on the Mokelumne River directly below Camanche Dam. Riffles and glides

were defined as shallow and fast (<3', >2.5 ft/s), and shallow and slow (<3', <2.5 ft/s), respectively. Runs and pools were defined as deep and fast (>3', >2.5 ft/s), and deep and slow (>3', <2.5 ft/s), respectively. Characteristics of 540 LW pieces, 650 redds, and habitat units were mapped during the 2006-07 spawning season. Large stretches of glide and pool zones dominated the study reach, while discrete units of riffles and glides were most prevalent. There were no significant differences in LW density across habitat types. Redd density was significantly higher in riffles than in runs, glides, and pools. Few redds were located in runs and none in pools. There were no areas where an overabundance of LW prohibited redd activity. Initial analysis suggests that redds located in glide zones may benefit from hydraulic variability provided by LW, while in riffles LW presence or absence is less important than depth and velocity of the geomorphic unit. Overall, in-stream geomorphic features appear to play the primary role in redd location, while LW may be an important secondary feature in marginal habitat units. Additional data analysis will report whether correlations exist between redd locations and wood locations in and across habitat units. Further research is needed to determine what quantity of LW might be considered optimal in below-dam ecosystems.

¹ Co-author: Gregory B. Pasternack, Department of Land, Air, and Water Resource, University of California, Davis

Managing a Regulated River: Restoration, Monitoring and Management on the Mokelumne River

Saturday Afternoon Concurrent Session 2

The Effects of Engineered Side Channel Habitat on Macroinvertebrate and Fish Populations in the Mokelumne River, California.

Walter Heady, PhD, Student, University of California, Santa Cruz

The Mokelumne River is a tributary to the Sacramento-San Joaquin Delta. The riparian areas of the Mokelumne River historically supported a diverse and dynamic ecosystem of oxbow lakes, seasonal wetlands, side channels and extensive, forested floodplains. Since California's gold rush in the mid 19th century, the river has been modified by mining, agriculture, forestry, levee and dam construction, and water diversion. The lower Mokelumne River (LMR) includes approximately 54 km of regulated river between Camanche Dam, a complete barrier to anadromous fish, and the Sacramento-San Joaquin Delta. Since 1927, approximately 190,000 m² of side channels have been eliminated in the 14.5 km section below Camanche Dam (Edwards et al. 2004), the extent of the remaining salmonid spawning reach in the LMR. Historically, side channels provided high-quality rearing habitat for juvenile Chinook salmon and steelhead.

In 2005, EBMUD, in cooperation with CDFG, and USFWS, acquired funds to engineer 1,915 m² of side channel habitat in the LMR. EBMUD conducted monitoring of abiotic and biotic factors following completion of the two engineered side channel habitats, constructed to flow at dam releases above 14.5 m³sec⁻¹. Here we analyzed physical features, macroinvertebrate colonization, and fish utilization within the two side channels. Drift and benthic macroinvertebrate samples and fish community data were collected monthly. Life-stage, weight and length were collected on all fish sampled and a sub-sample of diet was taken for steelhead and Chinook salmon. Steelhead and Chinook salmon were also checked for Passive Integrated Transponder (PIT) tags, coded

wire tags and hatchery markings. We examined ecological responses such as abundance, species richness, diversity, and community assembly for macroinvertebrates and fish. We also investigated differences in fish utilization and diet preferences between steelhead and Chinook salmon, wild and hatchery fish, and those found in the side channels relative to those found in the adjacent mainstem.

Aquatic macroinvertebrate abundance and taxonomic richness increased over the monitoring period. A pattern of succession was also observable in macroinvertebrate community structure. A suite of fish species utilized the side channel habitats including juvenile Chinook and steelhead. Juvenile salmonids seemed to respond to preferred diet items made available by the newly engineered habitats.

In this manner, there were observable differences between Chinook salmon and steelhead, hatchery and wild, as well as fish found in the mainstem compared to those utilizing the side channels. Restored side channel habitats like these provide beneficial rearing habitat for salmonids in regulated systems. Projects like this one aimed at increasing habitat heterogeneity and lateral habitat expansion increase potential rearing habitat in systems that are linearly limited by complete barriers such as dams. Lateral expansion of rearing habitat, may be a good manner to augment existing spawning habitat restoration efforts, thereby increasing benefit to populations of sensitive species. Restoration efforts such as these also help to increase habitat heterogeneity in degraded systems with a suite of ecological benefits.

**Managing a Regulated River: Restoration, Monitoring
and Management on the Mokelumne River**

Saturday Afternoon Concurrent Session 2

**Using GIS in Salmonid Spawning Surveys:
A Valuable Tool for Designing Projects and Measuring Success**

Jose Setka (presenter,) Bert Mulchaey, and Thomas Newcomb, East Bay Municipal Utility District

Since 1997, EBMUD Biologists have been using GPS units to map redd locations on the lower Mokelumne River. Improvements in GPS technology have expedited data collection, improved the accuracy of positions collected, and allowed for more precision in GIS analysis. The precision of the data allows for its use in developing complex models related to habitat restoration projects and activities. In this presentation we highlight three uses of the data including spawning gravel augmentation, gravel cleansing flows, and spatiotemporal distribution analysis of spawning locations. These examples will show the benefits of collecting precision data including rapid accessibility, integration with GIS software/analysis tools, and adaptability to modeling tools. Ultimately the information collected is used, along with data from other monitoring projects, to determine the success of river restoration efforts related to salmonid spawning.

**Managing a Regulated River: Restoration, Monitoring
and Management on the Mokelumne River**

Saturday Afternoon Concurrent Session 2

**A Comparative Study of Hatchery and Wild *Oncorhynchus mykiss*
in the Lower Mokelumne River California**

*Joseph E. Merz, Cramer Fish Sciences and Michelle. L. Workman*¹

We compare feeding, habitat use and migration patterns of hatchery-produced and wild *Oncorhynchus mykiss* in the regulated lower Mokelumne River. Fish sampled by rotary screw trap and electrofishing (2006-2007) suggested volitionally-released fish grew and developed faster than their naturally-produced conspecifics, had less size variability, were less evenly dispersed, were found in fewer habitats, and emigrated earlier in the season than their wild counterparts although individuals of both groups remained in-river beyond the scope of this study. Naturally-produced juveniles had fuller stomachs containing larger and more diverse prey items. The effects of origin on piscivory and behavioral interactions on migration patterns will be discussed.

¹ East Bay MUD

Lodi News-Sentinel

'I monitored water resources from the snowflake to the ocean'

Haugan retires after long career at EBMUD

By [Ross Farrow](#)

News-Sentinel Staff Writer

Updated: Tuesday, March 4, 2008 10:33 AM PST

Dennis Haugan has seen Camanche Dam overflow in 1986 and he's seen the Mokelumne River flowing at barely a trickle.

Through floods and droughts, Haugan has seen it all during his 43-year career in water.

He spent 25 years as a hydrographer for the East Bay Municipal Utility District

"They stuck a fork in me Thursday," Haugan said Monday.

Haugan spent his career with EBMUD determining how much river water flowed from the mountains and the Central Valley.

"I monitored water resources from the snowflake to the ocean," he said, though he focused primarily in the area between Camanche Dam and Thornton.

EBMUD is a major player in the Lodi area because the Oakland-based agency has the water rights to use the Mokelumne River for domestic water and sewer service to portions of Alameda and Contra Costa counties.

Haugan has also been active in Lodi, having served on the Planning Commission for four years and as a City Council write-in candidate in 2006. Using his ample wit, Haugan expressed his pride in receiving a whopping 138 votes in his City Council quest.

"I think I may have thanked each and every one of them," he said.

Haugan doesn't plan to run for council again, nor does he want to return to the Planning Commission. That's because he would have to cut his vacations short, and he wouldn't want to miss any meetings due to vacation.

Haugan came to Lodi to work for EBMUD after spending 18 years at Monterey County Flood Control. He "blames" his wife, Madeline, for their move to Lodi.

[Dennis Haugan at a glance](#)

Born: Oakland. Grew up in Modesto and lived in Castro Valley, Hayward, Fresno and Monterey before moving to Lodi in 1983.

Age: Will turn 63 on April 9.

Volunteer work: Lodi Street Faire since 1988, three years coaching senior Babe Ruth

and American Legion baseball, Lodi Chamber of Commerce board, committee chairman to build the fellowship hall at Emanuel Lutheran Church in the mid-1980s, Sandhill Crane Festival.

Family: Madeline, his wife of 43 years; daughter Karen McCauley of Lodi; son Christopher Haugen of Arizona; three grandchildren.

Source: Dennis Haugen

"She hated Monterey," Haugen said. "She was born in Fresno. She's a valley girl. She loves the heat."

Haugen said he is already accustomed to retirement, stating with pride that he wore his bathrobe until 11 a.m. on Monday. Then he put on a dress shirt, blue jeans and his trademark cowboy hat and ate lunch at Lodi Lake.

In his retirement, Haugen plans to remain involved with the Lodi Chamber of Commerce, become active again with the Sandhill Crane Festival and continue his volunteer work for the Lodi Street Faire. They will also spend more time socializing with friends throughout Lodi and traveling.

Especially traveling.

They've done plenty of that, but they always had to rush home and return to work, Dennis at EBMUD and Madeline at Lodi Funeral Home, where she was an administrative assistant for 18 years before retiring in October.

Dennis Haugen is especially excited about April 22, when he will fly a B-25 for 30 minutes over San Diego. It's the same model that Gen. Jimmy Doolittle flew over Japan in 1942. The ride comes courtesy of a retirement gift by his co-workers.

Future vacation trips include Route 66 and a big air show in Oshkosh, Wisc. One thing's for sure — they will take as long as they want. If they plan to be gone three weeks, but don't feel like coming home, they won't.

But he will continue to poke around Lodi as well.

"If you see a retired hydrographer in Levis, a broken-down cowboy hat and dusty boots, buy him a cup of coffee and visit with him about Lodi and the last 25 years, and the future 25 to come."

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

Recordnet.com

SALMON FISHING COULD BE HALTED

By [Alex Breitler](#)

March 14, 2008

Record Staff Writer

SACRAMENTO - Experts today will suggest shutting down all commercial and sport salmon fishing in California, Oregon and Washington as one way to deal with the salmon "disaster."

If that happens, it would be the first time the agency charged with managing West Coast fisheries cancels the April-to-November salmon season.

The Pacific Fishery Management Council has been meeting all week in Sacramento to explore theories behind the dramatic salmon decline.

A closure would be most painful in coastal towns heavily dependent on fishing dollars. Salmon fishing was a \$38.9 million industry in 2007.

But the Central Valley would be stung, too. Sport fishermen flock here each fall hoping to land silvery chinook, primarily from the Sacramento River or its tributaries.

"It's gonna be a major impact, believe me," said Steve Cooper of Stockton, past president of the group Delta Fly Fishers. "Around here, not a lot of people (fishing guides) will be losing their jobs over it. But there's a ton of people that go and fish the saltwater or go up to the Sacramento or even the American (rivers)."

The number of salmon returning to Valley rivers to spawn last fall was little better than one-third of 2006. The drop-off was blamed largely on unfavorable conditions in the Pacific Ocean.

Shutting down fishing wouldn't be a total shock. Salmon have been in decline for several years now. Fewer people are using professional charter boats for their excursions, and anglers aren't having particularly good luck. They caught on average less than one salmon every two days in 2007, worse than the two previous years.

"It's been so slow lately anyway," said Allison Shawnego at Hap's Bait in Rio Vista.

At Fisherman's Friend bait and tackle shop in Lodi, salmon lures stocked three years ago are still on the shelves, said employee Rick Frisk.

"It's a bummer," he said. "We've got to do something, even if it takes shutting the whole system down and letting the fish come up and do their thing."

Folks with lures and tackle boxes won't be the only ones affected by a closure.

Consumers who buy wild salmon at a store or restaurant will likely pay more. Last year, prices rose to a record \$5.27 per pound due to fishing restrictions.

Not to be ignored are the environmental consequences of a depleted salmon run.

"When the salmon are gone, that's the start of the river dying. I don't care if you're talking about sturgeon, striped bass, beavers, muskrats - anything," Cooper said.

A final end-of-season recommendation from the Pacific council will be made in April to the National Marine Fisheries Service. Even if fishing is closed, the number of salmon that return to spawn in 2008 may not be much higher than last year, officials warn.

"Hopefully, they'll get it straightened out," Cooper said. "And when they do, we'll go fishing."

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

RESTORATION

ZINS AND FINS AND FEATHERS

When John Ledbetter and his son Craig aren't growing or harvesting grapes for making chardonnay, cabernet sauvignon, zinfandel, pinot noir, or other organic wines, they are probably busy restoring the Mokelumne River. A few decades ago, John and his brother took over Vino Farms from their father, who had purchased the land in the early 1970s. Today, along with three of their children, they farm 4,500 acres in Lodi, operating the vineyards under the "Lodi Rules" principles, a sustainable farming program—certified by a third party—that, according to John, "takes in all three legs of the sustainability stool—people, economics, and the environment." The vineyard uses solar power for irrigation; equipment is run on biodiesel.

In April, they added restoration to their green practices, revegetating a 23-acre stretch along the Mokelumne River, in a project designed by River Partners and implemented with Vino Farms' manpower. The restoration targets both fish and wildlife—creating habitat for nesting and migrating songbirds like song sparrows, spotted towhees, yellow warblers, warbling vireos, black-headed grosbeaks, and yellow-breasted chats, and offering shade, cooler water, and woody debris and shelter for fish, says River Partners' Stacy Small, who adds that the project is being done in conjunction with EBMUD's salmon habitat enhancement efforts. "Riparian vegetation provides large wood, vegetation detritus, insects, and shade that benefit the aquatic community. The large wood traps and retains spawning gravel in the system, and provides a substrate for aquatic invertebrates and shelter for fish against predators and strong currents."

Says Small, "One of the problems on the Mokelumne is that much of the native vegetation has been cleared, and it's not re-establishing itself because of competition from invasive plants and altered flow patterns, so no young native trees are coming in on their own. A lot of the cottonwoods that are so important for fish habitat are decaying and growing old, but there's not a younger age class growing up behind them." Native species being planted include cottonwood, valley oak, live oak, red and arroyo willow, and an understory of native blackberry, elderberry, coyote bush, and California rose, says Small. "We're replacing a homogenous understory of non-native, invasive Himalayan blackberry with a more diverse native understory that should make it more difficult for non-native plants to re-invade." Goats and mechanical masticators were used to remove Himalayan blackberry before natives were planted in early April. Existing elderberries that had been overgrown by Himalayan blackberry



Vino Farms, pre-planting

are rebounding, says Small. Elderberries provide habitat for the endangered valley elderberry longhorn beetle, and the farmers doing restoration along the Mokelumne are part of a Safe Harbor Agreement that protects them from penalties if an elderberry bush has to be removed for some reason (see "Groundswell," ESTUARY, December 2006). One planting day involved students from the SLEWS (Student and Landowner Education and Watershed Stewardship) program, who planted and will monitor a native hedgerow, says Small.

But restoration takes more than desire and sweat equity. After applying for and receiving some initial funding from the Sand County Foundation and U.S. Fish & Wildlife, the Ledbetters attracted additional dollars from BurRec and the local resource conservation district; grant funds now total \$600,000, but not all of it will be needed, says Craig Ledbetter. The Ledbetters' project, and that of an upstream landowner as well as the Lange Twins downstream, have had a ripple effect, inspiring interest in restoration on the part of more than 50 landowners along the river, according to Yolo County Parks and Resources' Kent Reeves, who, while working for EBMUD, worked to develop that interest and recently sponsored a "Fins and Zins" workshop as part of the Salmonid Restoration Federation conference in March. To enable more restoration, a nonprofit is being set up, and \$5 million has been set aside for future projects. "It's just a matter of getting people to the money," says Craig Ledbetter.

Together with upstream and downstream restoration projects close to five miles of the Mokelumne has been restored so far on private land. What is motivating the Ledbetters? Says Craig, "We need the environment to make a living, so we need to do our part to take care of it. For this being a grape growing town, we're pretty progressive."

CONTACT: john@vinofarms.net; craig@vinofarms.net, ssmall@riverpartners.org LOV

CAPITOL BEAT

SPILL BILLS

The Cosco Busan crash last November that sent 50,000 gallons of oil into the Bay revealed a number of gaps in oil spill recovery—namely, that federal agencies should turn to local authorities to take the lead in cleanup and safety efforts. Taking lessons from this incident, legislators in Sacramento have been busily crafting laws to right the shortcomings.

Of seven bills, three deal with the California Department of Fish and Game's Office of Oil Spill Prevention and Response (OSPR). One bill, AB 2032, raises money for cleanup, levying a 25-cent fee on every barrel of oil produced or imported into California. A second provision in this bill tries to address the increasing size of container ships. After deepening their channels and capacity, the Port of Oakland and others will see more ships coming through, adding up to greater danger in the event of an accident. These larger ships have fuel compartments that hold nearly as much oil as an oil tanker. AB 2032 also increases the amount of insurance required for these vessels.

Non-agency scientists and other individuals tried to help soak up the oil by deploying newer technologies for cleanup that OSPR didn't have. AB 2547 would require OSPR to set aside \$5 million each year for purchases of modern equipment.

AB 2912 increases OSPR's responsibilities to include overseeing inland oil and chemical spills and raise the penalty for these spills to the level of maritime spills. Two other bills, AB 2031 and AB 2911, seek to address the logjam that resulted in hundreds of volunteers being turned away from shorelines in the days after the spill. AB 2031 would require OSPR to provide grants to local agencies so emergency officials could train volunteers in cleanup and recovery. AB 2911 would fund local agencies and organizations to train volunteers in bird and wildlife recovery in spills.

Another issue arising from the spill was the effects on fisheries. AB 2935 would require Fish and Game to shut down commercial and recreational fishing within the first 24 hours after a spill, determine whether fishing could go ahead within 48 hours, and then test fish and shellfish in affected waters within 7 days.

continued page 7

Lodi News-Sentinel

Regional Roundup

News-Sentinel welcomes new schools reporter

By [News-Sentinel Staff](#)

Updated: Wednesday, August 13, 2008 10:55 AM PDT

Farmers to get full water allotment after all

After hours of negotiations with three arbitrators, the East Bay Municipal Utility District agreed on Tuesday afternoon to give the Woodbridge Irrigation District its full allocation of water, after restricting its allotment due to the dry winter in Northern California, according to Woodbridge board President Bill Stokes.

The agreement means that farmers within the irrigation district — basically Woodbridge, Thornton and agricultural areas west and south of Lodi — will have access to 60,000 acre-feet of Mokelumne River water instead of the 39,000 acre-feet that EBMUD allocated.

Allocations are based on water rights determined by the state nearly a century ago. Woodbridge is entitled to 60,000 acre-feet during years that Pardee Reservoir in Calaveras County has 375,000 or more acre-feet.

EBMUD informed Woodbridge Irrigation District officials that Pardee had less than 375,000 acre-feet in July, so Woodbridge's allocation would go down to 39,000. But Woodbridge filed a protest, which resulted in arbitration. Each district selected its own arbitrator, and then they agreed on a third one, Stokes said.

EBMUD officials were unavailable for comment Tuesday afternoon.

Lodi News-Sentinel

Quenching a neighbor's thirst

Woodbridge sells Mokelumne water to East Bay

By [Ross Farrow](#)

News-Sentinel Staff Writer

Updated: Monday, September 15, 2008 11:27 PM PDT

The Woodbridge Irrigation District is helping residents in Alameda and Contra Costa counties with their critical water needs by selling them a little more than 6,000 acre-feet of water.

The irrigation district board approved the sale on Thursday, while the East Bay Municipal Utility District board approved it the previous day.

The deal calls for Woodbridge to sell at least 6,000 acre-feet for \$1.2 million. EBMUD will receive as much as 9,000 acre-feet, based on how much water Woodbridge has available. The additional cost is \$200 per acre-foot.

Woodbridge has between 6,000 and 7,000 acre-feet available to sell to EBMUD, according to John Wookey, Woodbridge irrigation District's assistant to the manager.

The deal is for this year only, through Oct. 15. EBMUD will use the water to help its 1.3 million East Bay customers who are subject to mandatory water rationing this year.

The Woodbridge district, which serves agricultural customers in Woodbridge, Thornton and areas west and south of Lodi, has water to sell EBMUD because Woodbridge had conserved water due to the dry winter, Wookey said.

Woodbridge's water savings dates back to July, when EBMUD informed Woodbridge officials that Woodbridge would get only 39,000 acre-feet of water from the Mokelumne River this year because Pardee Reservoir contained less than 375,000 acre-feet. Woodbridge normally gets 60,000 acre-feet during normal and wet winters. So WID cut down water allocations to its customers.

But Woodbridge Irrigation District filed a protest, claiming that Pardee had more water storage than EBMUD thought. After hours of negotiations with three arbitrators, the East Bay Municipal Utility District agreed in August to give the Woodbridge Irrigation District its full allocation of 60,000 acre-feet.

Since Woodbridge conserved water, thinking it would only get 39,000 acre-feet, the district had some extra water to sell to EBMUD.

Wookey said the water being sold across Altamont Pass isn't the same water that Lodi purchased from Woodbridge. Lodi has purchased five years worth of water at 60,000 acre-feet, but has "banked" the water because it doesn't have a water treatment plant yet to house the Woodbridge water.

Meanwhile, Ed Steffani, manager of the neighboring North San Joaquin Water Conservation District, criticized the Woodbridge-EBMUD deal because the Woodbridge water is leaving San Joaquin County.

North San Joaquin, which doesn't have the infrastructure to pump 20,000 acre-feet out of the Mokelumne River, has asked the city of Lodi to donate the water it purchased from Woodbridge to North San Joaquin to help replenish the parched groundwater basin in the northern and eastern part of the county. The Lodi City Council hasn't taken action on North San Joaquin's request.

Contact reporter [Ross Farrow](mailto:rossf@lodi-news.com) at rossf@lodi-news.com.

Lodi News-Sentinel

San Joaquin County supervisors may study raising dam on Bear River

By [Ross Farrow](#)

News-Sentinel Staff Writer

Updated: Tuesday, December 9, 2008 1:14 AM PST

The San Joaquin County Board of Supervisors today is set to consider a cost-sharing arrangement to investigate the expansion of Lower Bear Reservoir in upper Amador County.

The board, acting as the Mokelumne River Water and Power Authority, would team with the Amador Water Agency, Calaveras County Water District and the East Bay Municipal Utility District.

Each would spend \$30,000 for the study.

Bear River is a tributary to the Mokelumne River east of Jackson off Highway 88. The study will review whether raising lower Bear River Dam could provide additional water supply and power generation to the four parties.

The study, led by the Amador Water Agency, would determine how much water and electrical power each of the four agencies would generate from the dam, according to Mel Lytle, San Joaquin County's water resources manager. Lytle believes the dam has a capacity of 26,000 acre-feet of capacity. That compares to 350,000 acre-feet at Camanche Reservoir and 209,950 acre-feet at Pardee Dam. The study should be completed in a year to year-and-a-half.

The opportunity for the four agencies to work together could lead to bigger water-generating projects, Lytle said.

In other action today, the Mokelumne River Water and Power Authority will consider a change to an agreement with the U.S. Bureau of Reclamation allowing a 50-50 cost-share between San Joaquin County and the federal government to conduct another feasibility study, this one about the potential for Mokelumne River regional water storage.

The board will also consider a contract with engineer James C. Hanson to be the county's liaison with the State Water Resources Control Board and file water rights applications with the state.

Hanson would be paid \$180 to \$200 per hour, with his employees being paid lesser amounts. Hanson and his employees would be compensated at 58 cents per mile.

Today's board meeting will begin at 9 a.m. at the county courthouse, 222 E. Weber Ave., seventh floor, Stockton.

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

Recordnet.com

DFG: Two rivers hit goal for salmon eggs

By **Peter Ottesen**

Record Staff Writer

December 30, 2008 6:00 AM

In spite of a Chinook salmon run that virtually collapsed in the Sacramento River and its key tributaries in 2007, California Department of Fish and Game officials said that the Feather River and Nimbus (American River) hatcheries have met salmon egg collection goals for the fall run.

The hatcheries are key to sustaining Central Valley salmon stocks, and they took more than 16.9 million eggs for fish-rearing purposes.

The Mokelumne River Hatchery, however, did not meet its goal of 8 million to 9 million eggs.

"That our goals were met this year (on the Feather and American rivers) is a significant achievement," said Neil Manji, chief of DFG's Fisheries Branch. "Getting enough adult spawners back for egg production in 2008 was a major concern since in 2007, the Sacramento River fall-run Chinook was one of the lowest in recent history."

The Feather River Hatchery collected 10.2 million eggs to achieve its goal of releasing 6 million young salmon, and the Nimbus Hatchery on the American River collected 6.7 million eggs to meet its goal of releasing 4 million Sacramento fall-run smolts into the system.

The Mokelumne River Hatchery saw only 234 adult salmon returning to spawn this fall, producing 275,600 eggs. The average yearly return is approximately 5,500 adult salmon.

Some salmon eggs in excess of the Nimbus Hatchery goal will be transferred to the Mokelumne to help fill the void, DFG officials said. Information: Armando Quinones, (530) 894-8540.

Biggest fish

Larry Tofanelli caught the largest striped bass of the year among members of the California Striped Bass Association's Stockton Chapter, a 42-incher that weighed 31.2 pounds, hooked on the Sacramento River below Rio Vista.

Denizens of the deep

More than a dozen blue whales, the largest mammals in the world, were spotted this winter outside the Golden Gate, which is a good sign for Chinook salmon. Whales and salmon rely on

the same food source - krill - and blues require 4,000 pounds of the tiny shrimp a day to maintain their weight.

"Ocean conditions were good in 2008," said Roger Thomas, president of the Golden Gate Fishermen's Association. "The presence of blue whales meant there was an abundance of krill. My hope is that salmon flourished, too, and that plenty of 3-year-old kings will be thriving off California in 2010, allowing for recreational salmon fishing to re-open."

Show time

The 30th edition of the International Sportsmen's Exposition runs Jan. 8-11 at the San Mateo County Event Center and introduces a new wrinkle, the Discover Fly Fishing Center.

The ISE brings together more than 500 exhibiting companies, resorts and hunting and fishing destinations. Hours: 11 a.m. to 7 p.m. Thursday and Friday; 10 a.m. to 7 p.m. Saturday; and 10 a.m. to 5 p.m. Sunday. Information: sportsexpos.com.

Contact outdoors columnist Peter Ottesen at (209) 546-8269 or pottesen@recordnet.com.

APPENDIX B

**FERC'S APPROVAL OF THE FLOW MONITORING PLAN
AT CAMANCHE DAM**

RECEIVED
OCT 30 2008
WATER RESOURCES PLANNING DIV.

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections – San Francisco Regional Office
901 Market Street, Suite 350, San Francisco, California 94103
(415) 369-3300 Office (415) 369-3322 Facsimile

October 28, 2008

In reply refer to:
Project No. 2916-CA,
NATDAM No. CA00164

Ms. Priyanka Jain
Senior Civil Engineer
Water Resources Planning Division
East Bay Municipal Utility District
375 Eleventh Street
Oakland, CA 94607-4240

RE: Proposed Flow Monitoring Plan

Dear Ms. Jain:

We received your letter of October 1, 2008 regarding the proposed monitoring plan for measuring flow releases from Camanche Dam (part of FERC Project No. 2916) to the Mokelumne River. We understand that an acoustic velocity meter (AVM) will be used as the primary instrument to measure the combined flow from the dam's outlet works and spillway. We also understand that you will continue to collect the data at the McIntire stream gage during the 2009 water year to have one year of overlapping data, after which it will be used as a back-up.

We accept the proposed flow monitoring plan as submitted. We appreciate your continued cooperation and support in the administration of your project. If you have any questions, please contact Mr. Jonathan Yip at (415) 369-3398.

Sincerely,


(For) Ron Adhya, P. E.
Regional Engineer

APPENDIX C

WOODBIDGE IRRIGATION DISTRICT NOTIFICATION LETTER



January 23, 2009

Anders Christensen
General Manager
Woodbridge Irrigation District
18777 N. Lower Sacramento Road
Woodbridge, CA 95258

Subject: Lower Mokelumne River Project, FERC Project No. 2916
Preliminary flows at U.S. Geological Survey Gaging Station No.11325500
for the period of July 1, 2008 through December 31, 2008

Dear Andy:

The District will submit its 2008 Project Operations Report (Operations Report) by February 15, 2009 to the Federal 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). The Settlement Agreement refers to the March 23, 1998 Joint Settlement Agreement (JSA) among the East Bay Municipal Utility District, the United States Fish and Wildlife Service, and the California Department of Fish and Game.

As we discussed and agreed, the annual Operations Report will include provisional average daily flow data and any provisional, temporary flow deviations from the expected flow below Woodbridge Dam (USGS Gaging Station No.11325500), based on the recorded 15-minute readings. As we agreed, the annual Operations Report will report provisional, temporary flow deviations readings which fall below ten-percent of the expected flow.

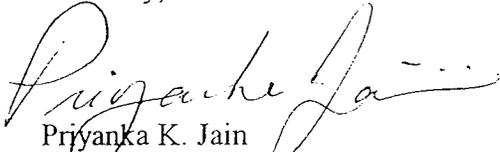
Based on 15-minute stage data recorded at the USGS Gage Stationing No. 11325500, during the January 2008 through December 2008 period, one provisional, temporary flow deviation from the expected flow below Woodbridge Dam occurred.

Between 2:30 pm on August 2, 2008 and 12:15 pm on August 3, 2008, the flow below Woodbridge dam, based on the recorded 15-minute readings, dropped below the JSA "expected flow" and reached a low value of 17 cfs. The excursion was identified for August 3, 2008 after a shift was completed in respond to a data-logger adjustment of 0.02 feet on August 4, 2008. Consequently, the average provisional daily flow on August 3, 2008 is 19 cfs; this data has not been verified or published by the USGS. The JSA "expected flow" below Woodbridge Dam for August 2008 was 20 cfs.

Mr. Anders Christensen
January 23, 2009
Page 2

I appreciate our continued communication regarding this matter. If you have any questions, please feel free to contact me at 510-287-1153 or pjain@ebmud.com.

Sincerely,

A handwritten signature in cursive script, appearing to read "Priyanka K. Jain".

Priyanka K. Jain
Senior Civil Engineer
Water Resources Projects

PKJ:EW:smc

APPENDIX D

USGS VERIFIED FLOW DATA FOR 2006 AND 2007

11323500 Mokelumne River below Camanche Dam, CA

DISCHARGE, CUBIC FEET PER SECOND
JANUARY TO DECEMBER 2006
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	787	2,100	508	1,580	4,520	3,080	1,370	1,340	422	1,250	348	343
2	906	1,680	524	1,550	4,510	2,890	1,370	1,340	422	1,130	348	343
3	1,090	1,480	528	1,690	4,520	2,720	1,330	1,340	418	911	348	346
4	1,580	1,470	517	3,010	4,520	2,550	1,320	1,330	415	696	344	348
5	3,340	1,470	514	4,230	4,520	2,480	1,310	1,330	415	492	343	350
6	3,480	1,470	796	4,460	4,510	2,480	1,310	1,320	421	380	346	350
7	3,470	1,470	982	4,930	4,530	2,480	1,310	1,210	417	375	345	348
8	3,460	1,470	957	5,090	4,530	2,480	1,310	1,000	422	382	343	348
9	3,460	1,470	951	5,080	4,360	2,670	1,310	785	422	392	343	353
10	3,460	1,470	946	5,100	4,090	2,810	1,320	579	419	390	343	353
11	3,470	1,470	946	5,110	3,990	2,810	1,320	447	415	350	343	353
12	3,460	1,470	946	5,110	3,980	2,840	1,320	428	414	365	343	350
13	3,460	1,470	946	5,110	3,980	2,860	1,320	429	416	371	344	348
14	3,470	1,460	948	5,120	4,000	2,850	1,320	432	415	370	345	352
15	3,460	1,460	947	5,120	4,010	2,850	1,320	429	415	377	343	347
16	3,470	1,460	943	5,150	3,890	2,760	1,320	425	415	376	346	343
17	3,480	1,450	946	5,130	3,690	2,690	1,320	421	415	362	348	345
18	3,490	1,460	942	5,120	3,490	2,690	1,320	421	414	353	343	348
19	3,490	1,440	939	5,110	3,390	2,630	1,330	422	409	353	344	350
20	3,480	1,450	942	5,110	3,390	2,460	1,330	422	647	360	348	350
21	3,480	1,340	939	5,110	3,400	2,380	1,330	428	1,070	365	348	353
22	3,480	1,130	938	5,110	3,400	2,300	1,330	426	1,260	369	348	353
23	3,490	930	938	5,100	3,400	2,110	1,330	430	1,260	370	348	353
24	3,490	771	939	5,100	3,610	2,010	1,340	428	1,260	373	348	353
25	3,320	730	981	5,100	3,920	2,020	1,340	428	1,510	359	348	353
26	3,080	730	948	5,110	3,870	2,010	1,330	432	1,710	348	348	353
27	3,040	618	947	4,940	3,780	1,900	1,330	428	1,710	348	349	358
28	3,040	515	977	4,630	3,780	1,810	1,350	431	1,460	347	345	353
29	3,030	---	1,210	4,530	3,680	1,690	1,340	433	1,260	348	344	353
30	2,860	---	1,460	4,520	3,470	1,470	1,340	432	1,260	348	344	353
31	2,490	---	1,580	---	3,270	---	1,340	420	---	348	---	353
Total	94,563	36,904	28,525	137,160	122,000	73,780	41,180	20,566	22,328	13,958	10,368	10,856
Mean	3,050	1,318	920	4,572	3,935	2,459	1,328	663	744	450	346	350
Max	3,490	2,100	1,580	5,150	4,530	3,080	1,370	1,340	1,710	1,250	349	358
Min	787	515	508	1,550	3,270	1,470	1,310	420	409	347	343	343
Ac-ft	187,600	73,200	56,580	272,100	242,000	146,300	81,680	40,790	44,290	27,690	20,560	21,530

11325500 Mokelumne River At Woodbridge, CA

DISCHARGE, CUBIC FEET PER SECOND
JANUARY TO DECEMBER 2006
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	786	2,280	432	1,320	4,490	3,140	1,140	965	105	859	325	303
2	802	1,900	586	1,280	4,470	2,950	1,120	954	107	848	310	305
3	906	1,580	522	1,360	4,440	2,750	1,120	952	111	706	309	303
4	936	1,470	516	1,600	4,400	2,530	1,070	953	101	529	308	327
5	1,880	1,420	517	2,870	4,420	2,340	1,060	978	100	378	307	317
6	3,010	1,380	598	3,600	4,430	2,280	1,060	986	108	247	305	308
7	3,240	1,370	857	3,950	4,420	2,260	1,050	984	100	178	301	306
8	3,350	1,370	898	4,270	4,420	2,240	1,030	824	103	205	302	306
9	3,390	1,370	883	4,390	4,400	2,250	1,030	628	101	192	302	327
10	3,400	1,370	882	4,490	4,310	2,450	1,010	446	110	186	304	333
11	3,390	1,370	881	4,540	4,080	2,550	989	244	110	195	310	311
12	3,380	1,370	883	4,670	3,920	2,590	996	183	115	240	305	336
13	3,360	1,370	873	4,790	3,910	2,580	999	165	109	245	311	312
14	3,400	1,380	884	4,850	3,900	2,570	970	169	129	227	312	308
15	3,390	1,380	875	4,660	3,850	2,570	981	152	140	230	302	312
16	3,390	1,380	870	4,810	3,840	2,530	988	149	125	231	301	306
17	3,400	1,370	885	4,790	3,770	2,420	990	137	135	234	302	307
18	3,430	1,370	871	4,820	3,610	2,350	989	150	152	195	303	303
19	3,460	1,370	865	4,910	3,410	2,340	990	138	157	209	303	306
20	3,440	1,360	879	4,920	3,330	2,240	971	142	196	200	303	307
21	3,450	1,340	871	4,920	3,310	2,070	956	121	496	195	303	308
22	3,450	1,200	861	4,910	3,340	2,020	952	123	828	194	304	312
23	3,460	1,040	859	4,920	3,310	1,880	965	115	818	193	304	305
24	3,460	861	860	4,920	3,300	1,730	960	109	852	187	305	305
25	3,450	754	923	4,910	3,450	1,690	966	94	895	197	307	304
26	3,260	731	899	4,910	3,680	1,690	952	114	1,160	198	307	306
27	3,030	725	875	4,910	3,690	1,660	953	120	1,200	198	305	330
28	2,960	586	875	4,850	3,610	1,510	938	109	1,180	195	308	315
29	2,950	---	912	4,680	3,590	1,470	964	102	929	192	308	310
30	2,930	---	1,140	4,550	3,500	1,290	968	96	891	451	307	309
31	2,690	---	1,240	---	3,330	---	961	102	---	536	---	308
Total	90,830	36,467	25,772	125,370	119,930	66,940	31,088	11,504	11,663	9,270	9,183	9,655
Mean	2,930	1,302	831	4,179	3,869	2,231	1,003	371	389	299	306	311
Max	3,460	2,280	1,240	4,920	4,490	3,140	1,140	986	1,200	859	325	336
Min	786	586	432	1,280	3,300	1,290	938	94	100	178	301	303
Ac-ft	180,200	72,330	51,120	248,700	237,900	132,800	61,660	22,820	23,130	18,390	18,210	19,150

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

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 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	52.7	46.7	47.0	48.1	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	3,100	2,870	2,890	2,860	12,160	10,000	11,100

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

APPENDIX E

LOWER MOKELUMNE RIVER PARTNERSHIP MEMO

The Lower Mokelumne River Partnership

Partnership Steering Committee:



California Department of Fish & Game

Sandra Morey
Regional Manager
1701 Nimbus Rd., Suite A
Rancho Cordova, CA 95670



East Bay Municipal Utility District

Alexander Coate
Director of Water & Natural Resources
375 Eleventh St., M.S. 901
Oakland, CA 94607



U.S. Fish & Wildlife Service

Michael Hoover
Asst. Field Supervisor
3310 El Camino Ave., Suite 130
Sacramento, CA 95821

To Protect and Enhance the Lower Mokelumne River Ecosystem

July 17, 2008

Memo to File:

The Lower Mokelumne River Partnership Steering Committee meeting was held on July 17, 2008 at the U.S. Fish and Wildlife Service office in Sacramento, California. One of the agenda items discussed was management of the available cold water in Camanche and Pardee reservoirs to provide optimum temperatures for the fisheries resources in the lower Mokelumne River in 2008. East Bay Municipal Utility District has analyzed the potential options for fisheries resource protection and is currently managing the available cold water to minimize release temperatures from Camanche Dam in October and November. This will include reducing the hypolimnetic volume (<16.4°C) in Camanche Reservoir to less than 28 TAF, increasing release temperatures in the lower Mokelumne River over the summer months, and discontinuing the operation of the siphon in the high level outlet at Camanche Reservoir. The Partnership Steering Committee determined that this operation scenario was the best approach to managing the available cold water to provide optimum benefits to the fisheries resource.

Alexander Coate
East Bay Municipal Utility District

Sandra Morey
California Department of Fish and Game

Michael Hoover
U.S. Fish and Wildlife Service

APPENDIX F

MEETING MINUTES OF THE PARTNERSHIP STEERING COMMITTEE

Mokelumne JSA Partnership Steering Committee
Notes from July 17, 2008 Meeting

Meeting Participants: Kathy Wood and Mike Hoover, USFWS; Sandra Morey and Mike Healey, CDFG; and Alex Coate, Richard Sykes, Clifford Chan, Jim Smith and Joe Miyamoto, EBMUD

Richard Sykes introduced himself as the new Manager of Natural Resources Department replacing Jon Myers. Kathy Wood introduced herself as the new Assistant Field Supervisor replacing Dave Harlow. Alex Coate provided opening comments noting the dry year water supply and reservoir conditions and that the JSA ten year review report was completed for comment ahead of schedule in order to accommodate the re-assignment of Jim Smith to the Mokelumne Watershed Master Plan.

Clifford Chan reviewed the water supply, reservoir storage, river temperatures and the volume of the Camanche Reservoir hypolimnion. Clifford presented two alternatives for transferring coldwater from Pardee into Camanche Reservoir. The steering committee approved the alternative that held back more cold water in Pardee Reservoir for release in October and November which would minimize Camanche Reservoir release temperatures during these months, and would result in higher summer release temperatures. Based on modeling of the approved alternative the Camanche Reservoir hypolimnion would drop below 28,000 acre feet, but the reservoir should remain stratified. The steering committee also approved suspending the Camanche upper outlet siphon because the approved alternative of holding more cold water in Pardee makes the need to release warmer water from the surface of Camanche during the summer months undesirable.

Jim Smith presented a summary of the key accomplishments over the first ten years of the JSA. Jim showed the goals and objectives of the JSA and the trends in the fall-run Chinook spawning escapement. Jim noted the peak natural spawning escapement occurred in 2005, the year surplus hatchery broodstock were returned to the river. Jim showed the recommended future actions which included adaptively managing the river flows, completing the hatchery and genetics management plan, creating riparian habitat, and managing the Camanche Reservoir coldwater pool based on a reservoir temperature model. Jim indicated a draft of the ten year review was distributed to members of the JSA technical coordinating committee at the December 2007 meeting and he incorporated comments provided by Mike Healey and David Hu in February 2008. The USFWS and CDFG requested one final review and the partners agreed to an August 15th deadline for review comments.

Kathy Wood asked if the District had a drought contingency plan. Alex responded the Board has a drought plan, enacted mandatory rationing in May 2008 with financial penalties for non-compliance beginning August 1st. Additionally, the District is completing the Freeport Regional Water Project with Sacramento County Water Agency in late 2009. The Freeport project will allow the District to receive water from the Sacramento River in dry years and in-so-doing allow more water to remain in the Mokelumne River. Kathy also asked if the District was accounting for climate change in

their water supply planning. Alex responded that the District is completing a Water Supply Management Program (WSMP) plan through the year 2040. The WSMP accounts for climate change in the water supply management program. The EBMUD Board provided direction on a preferred portfolio for the WSMP which includes rationing, conservation, recycling, groundwater banking and transfers for the near-term. For the longer term, the WSMP will evaluate either a regional desalination project or a combination of an enlarged Pardee and Lower Bear reservoirs and conjunctive use in San Joaquin County. It was noted in the context of earlier discussion that enlarging Pardee would increase the coldwater pool.

Submitted by: Joe Miyamoto

APPENDIX G

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



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May 5, 2008

Sandra Morey
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Mike Hoover
Deputy Assistant Field Supervisor
U. S. Fish & Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

Subject: Lack of Availability of Mokelumne River Water

Dear Ms. Morey:

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 2008 Water Supply Availability and Deficiency Report (Report) accepted by the District's Board of Directors at their April 22, 2008 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 2008 assessment, based on the Department of Water Resources' April 1st projected Mokelumne River runoff (63% of average), concludes that 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 dry 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,

A handwritten signature in black ink that reads 'Alexander R. Coate'.

Alexander R. Coate

ARC:LLT:EW:lr

Enclosure