LOWER MOKELUMNE RIVER PROJECT
WATER QUALITY AND RESOURCE MANAGEMENT PROGRAM

STATUS REPORT
October 2004

BACKGROUND

The Federal Energy Regulatory Commission's (FERC) November 27, 1998 Order "Approving Settlement Agreement and Amending License for the East Bay Municipal Utility District's Lower Mokelumne River Project No. 2916" required the East Bay Municipal Utility District (EBMUD) to file for Commission approval a plan for the final "Water Quality and Resource Management Program" (Program) described in the Agreement. The Program was jointly developed by EBMUD, the California Department of Fish & Game (CDFG), and the United States Fish & Wildlife Service (USFWS). It 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. It was approved by FERC in 2001.

The Settlement Agreement states that "The Parties [EBMUD, CDFG, and USFWS] agree that in the event that the flow and non-flow measures employed during the first six-year evaluation period fail to achieve the goals identified by the Partnership Steering Committee in the Water Quality and Resource Management Program, they will meet and attempt to reach consensus on new strategies for accomplishing the goals and objectives."

The following is a status report on the goals, implementation measures and performance criteria outlined in the Program.

PROGRAM STATUS

GOAL 1: Provide, to the extent feasible, habitat quality and availability in the lower Mokelumne River to maintain fishery, wildlife and riparian resources in good condition.

Measure 1A:Maintain water temperatures in the lower Mokelumne River to meet the life-history needs of aquatic organisms.

Performance Criterion 1A-1. Use best efforts to maintain a minimum of 28,000 acre-feet of hypolimnetic volume (the volume of water colder than 16.4º C as determined by weekly hydro-lab at CAMD) in Camanche Reservoir through October whenever Pardee Reservoir total volume is in excess of 100,000 acre-feet.

Using its best efforts, EBMUD maintained a minimum of 28,000 acre-feet of hypolimnetic volume in Camanche Reservoir through October (1999 through 2002, Table 1). Hypolimnetic volume at the end of October 2003 was 16,700

acre-feet, due to a dry winter followed by an unusually wet spring, which led to high springtime flood control releases that reduced the cold-water pool in Camanche Reservoir. The April 1, 2003 DWR water year forecast for the Mokelumne River was 475,000 acre-feet, indicating 2003 would be a dry year. Immediately after this forecast, the watershed received uncharacteristically high precipitation (three times the average April precipitation). By the end of May, the runoff forecast had increased to 675,000 acre-feet, requiring high flood control releases from Camanche Reservoir. Despite this unusual pattern of precipitation, runoff, and flood control releases in 2003, Camanche Reservoir remained stratified until normal turnover occurred during November.

Table 1. Hypolimnetic volume of water colder than 16.4ºC in Camanche Reservoir at the end of October.

DATE	CAMANCHE ELEVATION (feet)	RESERVOIR STORAGE (acre-feet)	HYPOLIMNETIC VOLUME (acre-feet)
10/28/99	220	312,130	34,000
11/1/00	221	316,580	31,400
10/31/01	202	204,640	52,300
10/30/02	210	249,550	63,600
10/29/03	216	287,800	16,700

Performance Criterion 1A-2. Operate the upper and lower level outlets in Camanche Reservoir to maintain the best possible release temperatures to meet the life-history needs of aquatic organisms based on EBMUD's operation plan prepared annually in March.

EBMUD has operated the upper and lower outlets in Camanche Reservoir to maintain the best possible release temperature to support anadromous salmonid populations in the lower Mokelumne River. Table 2 shows the Camanche Reservoir outlet operations and average daily water temperatures just below Woodbridge Irrigation District Dam from 1998 to date.

Table 2. Operation of High-level Outlet in Camanche Reservoir and Average Daily Water Temperatures below Woodbridge Irrigation District Dam.

YEAR	DATE OPEN	WATER TEMPERATURE BELOW WID DAM (ºC)	DATE CLOSED	WATER TEMPERATURE BELOW WID DAM (ºC)
1999	Jan 22	10.4	Jul 1	17.8
2000	Jan 20	11.9	May 23	17.7
2001	Apr 6	13.6	Apr 27	18.7
2002	Feb 22	12.8	May 17	17.1
2003	Jan 17	10.0	May 18	17.3
	Jun 14	16.4	Jul 14	18.4
2004	Feb 11	9.7	Jun 10	17.9

Measure 1-B: Maintain dissolved oxygen levels and reduce hydrogen sulfide levels in the Camanche Reservoir hypolimnion.

Performance Criterion 1-B-1. Operate the Hypolimnetic Oxygenation System when dissolved oxygen levels in the Camanche Reservoir hypolimnion drop to 2 ppm (as measured at CAMC) during the period May through October.

EBMUD manages the Hypolimnetic Oxygenation System in Camanche Reservoir to maintain dissolved oxygen levels to prevent the formation of hydrogen sulfide. Table 3 shows the HOS operation during the period 1998 to date.

Table 3. Operation of the Hypolimnetic Oxygenation System in Camanche Reservoir.

YEAR	SYSTEM ON	SYSTEM OFF	DAYS OPERATED
1999	July 12	November 29	140
2000	July 14	November 16	125
2001	July 20	November 23	126
2002	July 2	November 22	143
2003	July 25	September 29	66
	October 2	November 16	45
2004	July 16		

Measure 1-C: Increase summer and fall base flows in the lower Mokelumne River by developing new water supplies.

Performance Criterion 1-C-1. Increase instream flows beyond the flows specified in Attachment 1 of the Agreement by an amount equal to 20% of the actual yield (up to 20,000 acre-feet) of additional water supplies developed by EBMUD from new facilities. Said gainsharing water shall be available in accord with Section F.2 of the Agreement.

Sacramento County and EBMUD, in close coordination with the U.S. Bureau of Reclamation and the City of Sacramento, are developing a joint water project on the Sacramento River near the community of Freeport. When the project is completed, additional water supply will be made available pursuant to the gainsharing provision of the Settlement Agreement.

Measure 1-D: Improve opportunities for the lower Mokelumne River from Camanche Dam downstream to the San Joaquin River to seasonally inundate the floodplain.

Performance Criterion 1-D-1. Examine how revisions to the flood control requirements of the U.S. Army Corps of Engineers and the pattern of the flood flow releases could be modified to support restoration of ecological processes, and not create undue risk of flood damage.

The University of California, Davis (UCD) has conducted research on key drivers of biotic integrity of the Cosumnes River floodplain to model flows designed to support restoration of ecological processes (Appendix A-1). Research conducted by UCD for EBMUD indicates that floodplain restoration potential on the lower

Mokelumne River is highest in the downstream-most reach of the river near its confluence with the Cosumnes River and Dry Creek (Appendix A-2). This information, combined with the results of the study identified below (Performance Criterion 1-D-2) will enable EBMUD to examine how the pattern of flood flow releases could be modified to support restoration of ecological processes in the lower Mokelumne River without creating undue risk of flood damage and maintaining hypolimnetic volume and adequate water temperatures.

Performance Criterion 1-D-2. Conduct a feasibility study to identify activities to minimize flood-related damage and improve flood plain habitats and processes. Activities considered for implementation will be those that respect private property rights, protect water rights and maintain economic viability of landowners and water users. The activities will be identified through a cooperative planning effort that will include landowners, local governments, land and water users, and interested public.

The California Bay-Delta Authority has awarded a $1.2 million grant to the Southeast Sacramento County Agricultural Water Authority to conduct a feasibility study of floodplain restoration and groundwater recharge in the lower Mokelumne and Cosumnes rivers in cooperation with, and support from EBMUD, The Nature Conservancy, Sacramento County, Sacramento Area Flood Control Agency, and the University of California, Davis (Appendix A-3). The Settlement Agreement Partnership is funding a portion ($50,000) of this effort. This project began in 2004.

Performance Criterion 1-D-3. Modify the minimum flow regime, in accord with Section F.1 of the Agreement, to optimize the conditions for ecosystem values provided the total quantity of water released in any given year will not be less than the quantity of water provided by the flow requirements specified in Attachment 1 of the Agreement.

EBMUD, with concurrence of the Parties and NOAA Fisheries, modified the minimum flow regime in April and May 2004 to accommodate the Woodbridge Irrigation District's project to improve fish passage at Woodbridge Dam.

Measure 1-E: Maintain and enhance high quality habitat conditions for terrestrial riparian communities and shaded riverine aquatic habitat.

Performance Criterion 1-E-1. Identify and map the aquatic and terrestrial components of the riparian system from Camanche Dam downstream to tidewater and cooperate with others to identify and map these components downstream to the San Joaquin River.

EBMUD mapped the aquatic and terrestrial riparian system from Camanche Dam downstream to the confluence of the San Joaquin River in 2004. Examples are presented in Appendix A (A-4 & A-5), with the complete data set in GIS format (ArcView©) available upon request.

Performance Criterion 1-E-2. Continue monitoring invertebrates, fish, amphibian, reptile, mammal, raptor and neotropical bird communities in the lower Mokelumne River from Camanche Dam downstream to tidewater and cooperate with others to monitor these communities downstream to the San Joaquin River.

EBMUD conducted surveys and inventories of invertebrates, fish, amphibian, reptile, mammal, raptor and neotropical bird communities in the lower Mokelumne River (Appendix A-6 through A-11).

Performance Criterion 1-E-3. Develop a cooperative program with local interests to improve land management and livestock grazing practices along riparian zones to reduce streambank erosion and fine sediment input.

EBMUD has worked closely with the San Joaquin County Resource Conservation District (RCD) to develop and implement projects to improve land management and livestock grazing practices along riparian zones to reduce streambank erosion and fine sediment input. In 2003, a major project, funded by EBMUD, the California Bay-Delta Authority, and the National Fish and Wildlife Foundation, was implemented on Murphy Creek, a tributary to the lower Mokelumne River. That project resulted in removal of fish passage barriers (including a livestock watering pond and dam), restoration of streambanks, removal of non-native invasive plant species, and fencing to exclude and control livestock grazing. EBMUD continues to work with the San Joaquin County RCD and local landowners to improve land management and livestock grazing practices along riparian zones to reduce streambank erosion and fine sediment input. The Settlement Agreement Partnership provided partial funding for the Lower Mokelumne River Watershed coordinator.

Measure 1-F: Reduce the adverse effects of invasive riparian plants on native species and ecosystem processes.

Performance Criterion 1-F-1. Develop and implement a coordinated control program to reduce or eliminate invasive plant species from the riparian corridor along the lower Mokelumne River.

EBMUD completed an evaluation of the extent of invasive plant species in the lower Mokelumne River and potential control measures (Appendix A-12). EBMUD continues to work with the San Joaquin County RCD, the U.S. Fish and Wildlife Service and local landowners to reduce or eliminate invasive plant species from the riparian corridor along the lower Mokelumne River.

GOAL 2: Contribute towards the state and federal fishery restoration goals as defined in the California Salmon, Steelhead Trout and Anadromous Fisheries Program Act and the Central Valley Project Improvement Act.

Measure 2-A: Support the assessment of the overall effectiveness of actions implemented pursuant to the Central Valley Project Improvement Act in meeting Anadromous Fisheries Restoration Program production targets.

Performance Criterion 2-A-1. Continue the daily enumeration of migrating adult chinook salmon and steelhead by video monitoring and trapping at Woodbridge Dam (or other appropriate methods). The enumeration begins in August and continues through March.

EBMUD continues to monitor migrating adult chinook salmon and steelhead at the Woodbridge Irrigation District Dam. A metadata description is provided in Appendix A (A-13) and a complete data set (Oracle®) is available upon request.

Performance Criterion 2-A-2. Continue conducting weekly redd surveys in the lower Mokelumne River between Camanche Dam and the Elliott Road bridge from October through April.

EBMUD continues to conduct weekly redd surveys in the lower Mokelumne River between Camanche Dam and the Elliott Road bridge from October through April. A summary of weekly redd surveys is presented in Appendix A (A-14).

Measure 2-B: Support the assessment of the relative effectiveness of water management modifications, structural modifications, habitat restoration and fish screen installations to meet Anadromous Fisheries Restoration Program targets.

Performance Criterion 2-B-1. Continue estimating the emigration of juvenile chinook salmon and steelhead by trapping at Woodbridge Dam and operation of the rotary screw traps below Woodbridge Dam (or other appropriate methods) and marking a portion of the natural outmigrants. The trapping begins in December and continues through July.

EBMUD continues to monitor migrating juvenile chinook salmon and steelhead at the Woodbridge Irrigation District Dam. A metadata description is provided in Appendix A (A-13) and a complete data set (Oracle®) is available upon request.

Performance Criterion 2-B-2. Continue monitoring CAMC and CAMD in Camanche Reservoir to measure temperature, pH, dissolved oxygen, conductivity, oxidation-reduction potential, and turbidity. In addition, collect monthly water quality samples at CAMC and CAMD to analyze for volatile suspended solids (VSS), total suspended solids (TSS), nutrients (total and dissolved phosphorus and nitrogen), chlorophyll (corrected and uncorrected for phaeopigments), and phytoplankton and zooplankton abundance and taxonomic composition (to genus).

EBMUD continues to monitor water quality constituents at CAMC and CAMD. None of the constituents monitored exceeded the water quality objectives for aquatic life recommended by the California Regional Water Quality Control

Board, Central Valley Region, except for dissolved oxygen and pH (Appendix A-15). It is recommended that monitoring of dissolved oxygen, pH, and temperature continue in the lower Mokelumne River below Camanche Dam and the remaining constituent sampling program be discontinued.

Performance Criterion 2-B-3. Collect monthly water quality samples in the lower Mokelumne River at the Elliott Road Bridge to analyze for VSS, TSS, nutrients (total and dissolved phosphorus and nitrogen), chlorophyll (corrected and uncorrected for phaeopigments), and phytoplankton and zooplankton abundance and taxonomic composition (to genus). In addition, the samples are analyzed for hardness, Al, Cd, Cr, Cu, Fe, Ni, Pb, Zn, Hg, Ti, pH and turbidity.

EBMUD continues to monitor water quality constituents in the lower Mokelumne River at the Elliott Road Bridge. None of the constituents monitored exceeded the water quality objectives for aquatic life recommended by the California Regional Water Quality Control Board, Central Valley Region except for concentrations of copper (Cu) and zinc (Zn) (Appendix A-15). It is recommended that monitoring of copper and zinc continue in the lower Mokelumne River below Camanche Dam and the remaining constituent sampling program be discontinued.

Performance Criterion 2-B-4. Collect monthly water quality samples at CAMA and PENN20 in Camanche Reservoir to analyze for TSS, hardness, Al, Cd, Cr, Cu, Fe, Ni, Pb, Zn, Hg, Ti, pH, and turbidity.

EBMUD continues to monitor water quality constituents at CAMA and PENN20. None of the constituents monitored exceeded the water quality objectives for aquatic life recommended by the California Regional Water Quality Control Board, Central Valley Region except for concentrations of copper (Cu) and zinc (Zn) (Appendix A-15). It is recommended that monitoring of copper and zinc continue in the lower Mokelumne River below Camanche Dam and the remaining constituent sampling program be discontinued.

Measure 2-C: Maintain processes that provide for adequate sediment supply, channel meandering, and other fluvial geomorphologic attributes.

Performance Criterion 2-C-1. When river flows allow it, provide average annual supplementation of approximately 1,200 cubic yards of suitably sized spawning gravel in the active stream channel to maintain and enhance spawning areas and to replace gravel that is transported downstream.

EBMUD continues to provide annual supplementation of suitably sized spawning gravel in the lower Mokelumne River. Since 1990, EBMUD has placed approximately 16,360 yds^3 of spawning gravel (Table 4).

Table 4. Gravel supplementation in the lower Mokelumne River

YEAR	GRAVEL PLACED (yds^3)
1990	260
1992	300
1993	500
1994	100
1996	700
1997	1,500
1998	1,200
1999	1,600
2000	1,200
2001	1,800
2002	2,100
2003	2,300
2004	2,800

Performance Criterion 2-C-2. Continue monitoring spawning reach substrate characteristics, including channel configuration and gradient; substrate size; intergravel permeability, dissolved oxygen content, and temperature; and macroinvertebrate community structure (composition and abundance).

EBMUD monitored physical parameters of enhancement sites (pre- and post-placement) from 1998 to 2003 (Appendix A-16). In addition, the University of California, Davis and EBMUD developed the Spawning Habitat Integrated Rehabilitation Approach, a science-based framework for reach-scale rehabilitation of salmonid spawning habitat in regulated rivers, which is the basis for gravel supplementation in the lower Mokelumne River (Appendix A-17 & A-18).

Measure 2-D: Reduce entrainment of juvenile fish into water diversions to increase survival and contribute to restoration goals.

Performance Criterion 2-D-1. Work cooperatively with the Woodbridge Irrigation District to install state-of-the-art fish screens and fish bypass system at Woodbridge Dam.

The Parties and NOAA Fisheries have worked cooperatively with the Woodbridge Irrigation District since 1996 on the development and design of state-of-the-art fish screens and fish bypass system at Woodbridge Dam. Analysis conducted by Woodbridge Irrigation District (Appendix A-19) concluded that relocation of the fish screens to the right abutment of the new dam is not warranted and that modifying the screens and bypass system at the existing intake location would meet the necessary screening criteria. Construction of a new fish bypass system began in 2004 and should be completed and operational by 2006. Modification of the existing fish screens is contingent on obtaining sufficient funding.

Performance Criterion 2-D-2. Work cooperatively with riparian diverters to install state-of-the-art fish screens where appropriate in the lower Mokelumne River between Camanche Dam and the San Joaquin River.

The Parties will continue to explore the potential for installing state-of-the-art fish screens where appropriate in the lower Mokelumne River between Camanche Dam and the San Joaquin River.

Performance Criterion 2-D-3. Work cooperatively with the North San Joaquin Conservation District to evaluate the installation of permanent fish screens on their diversions.

The Parties will continue to explore the potential for installing state-of-the-art fish screens on the North San Joaquin Conservation District diversions in the lower Mokelumne River.

Measure 2-E: Manage flow releases to prevent stranding of juvenile fish and exposure of redds.

Performance Criterion 2-E-1. Except in case of emergencies or when flood control releases are being made, average daily flow releases from Camanche Dam will not decrease by more than 50 cfs per day during the period October 16 through March 31, and by not more than 100 cfs per day at other times of the year.

Except when flood control releases were being made, average daily flow releases from Camanche Dam did not decrease by more than 50 cfs per day during the period October 16 through March 31, and by not more than 100 cfs per day at other times of the year as reported annually to FERC.

Measure 2-F: Improve anadromous fish passage at dams and diversions below Camanche Dam.

Performance Criterion 2-F-1. Work cooperatively with the Woodbridge Irrigation District to improve fish passage at Woodbridge Dam.

Construction of new fish ladders should be complete by early 2005 and the fish bypass system should be complete by 2006.

Performance Criterion 2-F-2. Work cooperatively with the Woodbridge Irrigation District and the City of Lodi to isolate the City of Lodi's Lake Lodi to improve salmon and steelhead passage and juvenile fish survival.

Analysis by Woodbridge Irrigation District (Appendix A-19) concluded that the question of how much predation occurs within the reservoir remains unresolved.

No fish barrier separating recreational Lodi Lake from the river reach impounded behind Woodbridge Dam is proposed by WID at this time.

Measure 2-G: Reduce the loss of juvenile anadromous fish caused by hydraulic conditions created by man-made structures within or directly adjacent to the lower Mokelumne River.

Performance Criterion 2-G-1. Modify and improve the fish bypass at the Woodbridge canal.

Construction of a new fish bypass system should be completed and operational by 2006.

Performance Criterion 2-G-2. Reduce the impact of predators on juvenile salmonids below Woodbridge Dam by modifying the stream channel below the dam and/or implementing a controlled recreational fishery.

Modifications to the tailwater portion of the new Woodbridge Dam to diffuse the energy of water flowing past the dam to help reduce the formation of a pool to harbor predators should be completed and operational by 2006.

Performance Criterion 2-G-3. Construct a fish barrier separating recreational Lodi Lake from the river reach seasonally impounded behind Woodbridge Dam.

Analysis by Woodbridge Irrigation District (Appendix A-19) concluded that the question of how much predation occurs within the reservoir remains unresolved, and no fish barrier separating recreational Lodi Lake from the river reach impounded behind Woodbridge Dam is proposed by WID at this time.

GOAL 3: Sustain the long-term viability of the salmon and steelhead fishery while protecting the genetic diversity of naturally producing populations in the lower Mokelumne River.

Measure 3-A: Continue operation of the Mokelumne River Fish Hatchery to meet the mitigation requirements to supplement natural production and sustain a viable commercial and recreational fishery.

Performance Criterion 3-A-1. Reconstruct the hatchery in accordance with the 1996 Hatchery Master Plan and the final design in consultation with CDFG, USFWS and NMFS.

The hatchery underwent a $12.5 million upgrade funded by EBMUD in 2001 and 2002. The design of the new hatchery was a cooperative effort between EBMUD and the California Department of Fish and Game (CDFG), and incorporates some elements of the Natural Rearing Enhancement System (NATURES Program), suggested by NOAA Fisheries.

In 2000, EBMUD awarded a contract for construction of the hatchery upgrade project. Fish production at the facility continued during the construction period. Beginning in the fall of 2001, all the fish were spawned, and the eggs incubated, in the newly modified hatchery building, which has improved adult holding, sorting, and egg-taking facilities. The expanded hatchery has 60 raceway ponds with enough capacity to meet CDFG's production goals. In addition to the upgraded fish facilities, a new administration building and shop were also part of the expansion. The hatchery reconstruction was completed in fall 2002, and a dedication ceremony was held at the hatchery on October 4, 2002.

Performance Criterion 3-A-2. Operate the hatchery in accord with CDFG Best Management Practices.

The hatchery is operated by CDFG in accordance with specific goals and constraints developed by CDFG.

Performance Criterion 3-A-3. Implement a protocol that will ensure notification of the parties of any abnormal losses and remedial actions taken.

An inter-agency communication protocol was developed by the Parties in 1999 (Appendix A-20).

Performance Criterion 3-A-4. Monitor temperature, pH, dissolved oxygen, conductivity, oxidation-reduction potential, total and volatile suspended solids, total and dissolved phosphorous and nitrogen, and turbidity of the Mokelumne River Fish Hatchery water supply and effluent.

EBMUD continues to monitor water quality constituents of the Mokelumne River Fish Hatchery water supply and effluent. None of the constituents monitored exceeded the water quality objectives recommended by the California Regional Water Quality Control Board, Central Valley Region, except for measures of dissolved oxygen and pH (Appendix A-15). It is recommended that monitoring of dissolved oxygen, and pH continue in the Mokelumne River Fish Hatchery water supply and effluent and the remaining constituent sampling program be discontinued.

Performance Criterion 3-A-5. Operate the hatchery to provide the flexibility necessary to conduct focused research to better integrate hatchery management practices with natural production.

EBMUD and CDFG initiated a three-year evaluation of volitionally releasing Chinook salmon from the hatchery in 2003. This research is designed to determine the effect of a volitional release strategy on escapement to the hatchery. In addition, a ladder control structure was installed in 2003 to evaluate the benefits of controlling adult access to the hatchery to facilitate natural production.

Measure 3-B: Employ methods to limit straying of hatchery-produced fish and the possible reduction of the genetic integrity of naturally produced fish.

Performance Criterion 3-B-1. Develop a cooperative program to evaluate the benefits of changing release locations in the Mokelumne River of salmon and steelhead produced at the Mokelumne River Fish Hatchery.

EBMUD examined the potential effects of various hatchery release strategies practiced at the Mokelumne River Fish Hatchery on natural populations of fall-run chinook salmon, *Oncorhynchus tshawytscha*, in the lower Mokelumne River (Appendix A-21) and continues to work cooperatively with the California Department of Fish and Game to evaluate the benefits of changing release locations in the Mokelumne River of salmon and steelhead produced at the Mokelumne River Fish Hatchery.

Performance Criterion 3-B-2. Develop a plan to reduce the importation of eggs and fry from other hatcheries.

The practice of transporting eggs and juvenile salmon from out-of-basin to incubate and/or rear in Mokelumne River Fish Hatchery and subsequent release in the Mokelumne River occurred from the start of operation of the hatchery through brood year 1999. Since brood year 1999, all fall-run chinook salmon incubated and reared at the Mokelumne River Fish Hatchery have been Mokelumne River stock. Steelhead stock continues to be a combination of Mokelumne River and out-of-basin stock. CDFG has discontinued transferring steelhead stock from the Nimbus Hatchery.

Performance Criterion 3-B-3. Continue coded-wire tagging representative lots of chinook salmon released from the Mokelumne River Fish Hatchery and expand or modify the program if a statewide strategy is developed to constant fractional mark or coded-wire tag all salmon released from California fish hatcheries in cooperation with commercial salmon trawlers, the Resource Agencies and the California Fish and Game Commission.

EBMUD has coded-wire tagged and released over 3 million chinook salmon produced at the Mokelumne River Fish Hatchery since 1996 (brood year 1995). All data on releases and recoveries are available at the Regional Mark Processing Center of the Pacific States Marine Fisheries Commission.

Performance Criterion 3-B-4. Develop a cooperative plan to reduce impacts of imported fish released in Camanche and Pardee reservoirs.

EBMUD will begin planting only non-viable trout in Camanche Reservoir in July 2005 (Appendix A-22).

Measure 3-C: Develop harvest management strategies that allow naturally produced fish to increase their reproductive potential.

Performance Criterion 3-C-1. Implement enforcement efforts to reduce or eliminate illegal salmon and steelhead harvest in the lower Mokelumne River.

The Partnership (EBMUD, CDFG, and USFWS) has provided $60,000 for fiscal years 2002 through 2005 to support additional CDFG enforcement efforts in the lower Mokelumne River.

Performance Criterion 3-C-2. Mark and tag all hatchery-produced steelhead and establish a selective fishery in the lower Mokelumne River.

All steelhead production at the Mokelumne River Fish Hatchery has been marked (adipose fin clip) since 1997. Approximately 172,000 steelhead were marked (adipose fin clip) and coded-wire tagged in 2004.

CONCLUSION

The Partnership Steering Committee, composed of one representative each from CDFG, USFWS and EBMUD, developed the Water Quality and Resource Management Program (Program) to define reasonable goals, measures, performance criteria and responsive actions associated with the implementation of the Settlement Agreement. Based on the six-year review of the Program contained in this Status Report, the Parties conclude that the flow and non-flow measures identified in the Program are achieving the goals identified by the Partnership Steering Committee, and the Parties will continue to employ the measures identified in the Program. In April 2008 the Parties will begin developing a 10-year report that describes the short and long term goals and milestones reached.

APPENDIX A

1. Modification of Flood Flow Releases to Support Restoration of Ecological Processes
2. Floodplain Restoration Potential on the Lower Mokelumne River, California
3. Cosumnes and Mokelumne River Floodplains Integrated Resources Management Plan
4. Riverine Habitat Characterization of the Lower Mokelumne River, California
5. Terrestrial Vegetation Communities along the Lower Mokelumne River, California
6. Use of Macroinvertebrates as an Indicator of Chinook Salmon (*Oncorhynchus tshawytscha*) Spawning Habitat Quality in the Lower Mokelumne River, California
7. Lower Mokelumne River Fish Community Survey. 1 January 1997 through 30 June 2004
8. Lower Mokelumne River Amphibian and Reptile Inventory
9. Lower Mokelumne River Small Mammal Inventory
10. Survey of Falcons, Kites, Hawks and Owls in the Lower Mokelumne River Watershed, Sacramento and San Joaquin Counties, California
11. Lower Mokelumne River Riparian Bird Surveys
12. Non-native Invasive Plant Communities along the Lower Mokelumne River, California
13. Data Dictionary/Metadata File for Oracle® Fisheries Migration Database
14. Summary of Fall-run Chinook Salmon and Steelhead Trout Spawning in the Lower Mokelumne River, California 1996-2003
15. Lower Mokelumne River Water Quality Monitoring Program, December 1999 – June 2004
16. Lower Mokelumne River Salmonid Spawning Habitat Improvement Project Monitoring
17. Spawning Habitat Rehabilitation
18. Spawning Habitat Enhancement for Pacific Salmon (*Oncorhynchus* spp) in a Regulated River
19. Peer Review of the Proposed Fish Protection Screening Facility
20. Interagency communication protocol
21. Escapement, Ocean Harvest and Straying of Hatchery and Naturally Reared Chinook Salmon in the Mokelumne River, California
22. Fish Planting Contract for Camanche Reservoir