EXECUTIVE SUMMARY

ES.1 BACKGROUND

The San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay/Delta Estuary) is a critically important part of California's natural environment and economy. In recognition of the serious problems facing the region and the complex resource management decisions that must be made, the Federal government and the State of California are working together to stabilize, protect, and restore ecological health and improve water management for beneficial uses in and from the Bay/Delta Estuary. The San Joaquin River Group Authority (Authority or SJRGA) is working with the State and Federal governments to facilitate meeting these needs as related to the San Joaquin River: increased instream flows, the 1995 State Water Resources Control Board (SWRCB) Water Quality Control Plan (WQCP) flow objectives at Vernalis, and the Delta Smelt Biological Opinion.

As part of these ongoing efforts, the Draft San Joaquin River Agreement (SJRA)[1] was developed as an alternative that provides a level of protection equivalent to the San Joaquin River flow objectives contained in the State Water Resources Control Board's 1995 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (1995 WQCP: SWRCB 1995). Discussion over the flow objectives led to a proactive problem-solving process to develop an adaptive fishery management plan and the water supplies (from willing sellers on the San Joaquin River system) to support that plan. The SJRA includes the Vernalis Adaptive Management Plan (VAMP).

The SJRA identifies where the water to support the VAMP study would be obtained, specifically from the San Joaquin River Group Authority whose members are making the water available[2]. It is a "performance agreement" (VAMP flows) and a water acquisition (other flows) wherein the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and the Department of Water

---

1 The SJRA proposes, among other things, a San Joaquin River flow and State Water Project/Central Valley Project export study during the April-May Pulse Flow Period and a mechanism by which the SWRCB can issue an order to implement the San Joaquin River portion of the 1995 Water Quality Control Plan for the Bay/Delta Estuary. Implement means to provide the flows and establish the pumping regimen called for in the SJRA which the parties to the SJRA intend will provide environmental benefits in the lower San Joaquin River and Delta at a level of protection equivalent to the San Joaquin River Portion of the 1995 WQCP.

2 Members of the San Joaquin River Group Authority (Authority) are: Modesto Irrigation District (MID), Turlock Irrigation District (TID), South San Joaquin Irrigation District (SSJID), San Joaquin River Exchange Contractors Water Authority (Exchange Contractors), Merced Irrigation District (Merced ID), Oakdale Irrigation District (OID), and the Friant Water Users Authority. Willing sellers for the proposed action are: MID, TID, SSJID, Exchange Contractors, Merced ID, and OID.

Resources (DWR) pay the Authority to ensure that water supplies are available for instream flows as needed up to prescribed limits.

There are two appendixes to the SJRA that relate to the proposed action. Appendix A is the VAMP, a conceptual framework for protection and experimental determination of juvenile chinook salmon survival within the lower San Joaquin River, the adaptive management study. Appendix B provides for planning and operation coordination for VAMP.
The SJRA was completed in April 1998, and its implementation requires that the NEPA and CEQA documentation be completed by March 1, 1999. This Final Environmental Impact Statement / Environmental Impact Report (EIS/EIR) is prepared in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

The affected portions of the San Joaquin River and its tributaries (Stanislaus, Tuolumne, and Merced rivers) are located in the Central Valley of California. The rivers and related storage and conveyance facilities are located in the following counties: Fresno, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tuolumne, and Calaveras.

ES.2 PROJECT PURPOSE AND NEED

The purpose of the proposed project is to acquire water identified in the SJRA and use the water for:

- a pulse flow for a 31-day period at Vernalis during April and May, and

- other flows identified by the Central Valley Project Improvement Act (CVPIA) water acquisition plan, with concurrence by the Fish and Wildlife Service (Service), to facilitate migration and attraction of anadromous fish including fall attraction flows and other flows as needed by the adaptive management study, with concurrence by the Service, to support anadromous fish and environmental benefits in the project area.

This water is needed to support VAMP and to provide protective measures for fall-run chinook salmon in the San Joaquin River. The adaptive management study means that the flow requirement would change annually in response to hydrologic and biologic conditions. As a result, varying amounts of water would be needed. The additional water for other flows would be used for ramping around the pulse flow to assist in protection of salmon redds, to assist in control of water temperature, and to assist in improving water quality. Since the water released would increase instream flows in the lower San Joaquin River, it also improves compliance with the 1995 WQCP Vernalis objectives and with the San Joaquin River component of Delta Smelt Biological Opinion. (See Section ES.4 for additional information on the sources, amounts, and timing of the flows.)

Section 3406(b)(1) of the CVPIA requires the development of a program that will make all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991. As one element of the Draft Anadromous

Fish Restoration Program (AFRP), Reclamation has a need to obtain water on the Stanislaus, Tuolumne, Merced, and Lower San Joaquin rivers to provide additional flows at times that will facilitate migration, attraction, production, and survival of anadromous fish on these rivers in accordance with specific fish, wildlife, and habitat restoration purposes authorized by the CVPIA.

Reclamation proposes to contract for water on the San Joaquin River and its tributaries under P.L. 102-575, Title 34, Section 3406(b)(3) of the CVPIA. Water may be acquired by Reclamation to meet fish and wildlife needs within the San Joaquin Valley under the authority of Sections 3406(b)(3) of the CVPIA. The CVPIA amended the purposes of the Central Valley Project (CVP) to achieve a reasonable balance among competing demands for use of CVP water for fish and wildlife, agriculture, municipal and industrial, and power contractors.

The State Water Resources Control Board (SWRCB) approved the final *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* in May 1995. The 1995 WQCP includes objectives for Delta outflow, Sacramento and San Joaquin River flows, salinity, dissolved oxygen, and State Water Project (SWP) and Central Valley Project (CVP) operations. It presents a combination of Delta inflow and outflow objectives, water quality objectives, and project operation criteria. These requirements are specified temporally and vary depending on the hydrologic condition and the biological needs of various fish species.

The March 6, 1995 Biological Opinion (Opinion) for Threatened Delta Smelt, Delta Smelt critical habitat, and the proposed Threatened Sacramento Splittail approved Reclamation's operations to provide flows and pursue acquisition of additional water (acquired flow) in order to provide San Joaquin River flows at Vernalis in excess of those exported by the CVP and SWP (USFWS 1995). Any such enhancement flows would be in excess of those attributable to CVP New Melones releases, unregulated accretions, or unstorable flows, and would not be exported at the Delta pumping facilities. As a result of this Opinion, Reclamation has a requirement to acquire water within the San Joaquin River Watershed to maximize the ability of the CVP to meet this commitment.

ES.3 PUBLIC AND AGENCY INVOLVEMENT

Reclamation and the Authority distributed a Notice of Preparation of a Joint EIS/EIR on supplying water to meet the flow objectives for the proposed VAMP on November 25, 1997 to about 160 agencies and individuals. The notice announced three public scoping meetings for January 6–8, 1998, and requested that comments on the content of this EIS/EIR be submitted by January 16, 1998. Issues raised at the meetings and in comment letters are discussed in each section of Chapter 4, Environmental Consequences and Mitigation Measures. Public review of the Draft EIS/EIR was conducted over the period September 25, 1998 to November 10, 1998. (See Appendix H, Responses to Comments.) Recirculation of the Draft EIS/EIR is not necessary, because all of the comments received resulted in minor modifications to the Draft EIS/EIR. This Final EIS/EIR has been sent to all agencies and individuals who commented on the Draft EIS/EIR.

Reclamation has also issued a newsletter covering topics related to the San Joaquin River Agreement. The first newsletter was published in May 1998, a second was distributed in September 1998 to 225 agencies and individuals, and a third newsletter was sent to 250 agencies and individuals in January 1999. Information on the proposed action is also available on Reclamation's web page (www.mp.usbr.gov), and the detailed model results for the hydrologic analysis are available upon request.

The principal mechanism for agency involvement in the EIS/EIR is the San Joaquin River Agreement Joint Steering/Cooperating Agency Committee. Participating agencies are described in Chapter 5, Consultation and Coordination.

ES.4 ALTERNATIVES CONSIDERED AND PREFERRED ALTERNATIVE

The proposed action/proposed project is a 12-year, long-term water supply program, outlined in the San Joaquin River Agreement, for instream flows in the San Joaquin River system and has three components:

- VAMP Flow: Water from the Authority, for achieving the VAMP 31-day pulse flow (April-May), is provided by the Authority member agencies and is capped at 110,000 acre-feet in any year (Table 2.1-1 in Section 2.1). There is also the potential for additional water from willing sellers who are members of the Authority for VAMP implementation above the 110,000 acre-feet.

- October Flow: Additional water (12,500 acre-feet) from Merced Irrigation District (Merced ID) would be available for delivery during October of all years.

- OID: Additional water (15,000 acre-feet) from Oakdale Irrigation District (OID) would be available, plus the difference between water committed to the VAMP pulse flow by OID (11,000 acre-feet) and what is actually used. This water provided by OID would be used for various fish and wildlife benefits including additional instream flows on the Stanislaus during the months when fish are present, ramping of flow changes on the Stanislaus following high flow periods, implementing pre-VAMP and post-VAMP ramping objectives during the spring flow period, water for fall attraction flows, temperature control in the lower Stanislaus River during the summer and fall periods, and/or banked in New Melones Reservoir for the purpose of using the additional water to augment flows in subsequent dry years. The final decision for the use of this water for fish and wildlife purposes would be made by the Service annually, following consultation with other Federal and State agencies.

The proposed project is for the Authority to make water available over the period 1999–2010 for release to the San Joaquin River and its tributaries. The quantity and precise timing of the proposed releases vary depending on hydrologic conditions.

In addition to the no action and proposed action, one other alternative was determined to meet the project's purpose and need, the SWRCB Water Right Priority System Alternative. This alternative is assumed to be Flow Alternative 3 in the SWRCB's *Draft Environmental Impact Report for Implementation of the 1995 Bay/Delta Water Quality Control Plan* (DEIR; SWRCB 1997). This alternative has the capabilities to meet the SWRCB's 1995 Water Quality Control Plan Vernalis flow objectives assigned to water right holders based on a water right priority system. Under this alternative, up to 38 water right holders share responsibility to implement flow objectives. Junior appropriative water right holders are required to cease diversions before senior appropriative water right holders are affected (based on the "first-in-time, first-in-right" principle). This alternative would involve different water right holders than the proposed action and different quantities of water being released into the San Joaquin River system.

ES.5 SUMMARY OF SIGNIFICANT ENVIRONMENTAL EFFECTS AND MITIGATION

Table ES-1 provides a summary of all of the environmental effects and mitigation for both the proposed action and the alternative action. Impact statements are often abbreviated; see Chapter 4 for the complete statements of impact. The Mitigation Monitoring Program required by CEQA is described in Appendix G. Symbols used in the table are:

S:	Significant adverse impact	LS:	Less-than-significant adverse impact
SU:	Significant unavoidable adverse impact	N:	No adverse impact
PS:	Potentially significant adverse impact	B:	Beneficial impact
PSU:	Potentially significant unavoidable adverse impact	na:	Not applicable

Table ES-1: SUMMARY COMPARISON OF ALTERNATIVE IMPACTS

Impact	Proposed Action		Alternative Action	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Surface Water				
Water Deliveries				
Deliveries reduced to Merced Irrigation District during critically dry years and under below normal or dry hydrologic conditions under certain sequential hydrologic conditions; however, implementation of a conjunctive use program would augment surface water supplies.	PS	LS	na	na
Deliveries reduced to Oakdale Irrigation District during critically dry years; however, implementation of	PS	LS	na	na

conjunctive use, reclamation, and increased efficiencies would augment surface water supplies.				
Average annual deliveries reduced within the San Joaquin River Basin by 62,000 acre-feet; at times, complete curtailment of junior water rights appropriators. Mitigation unknown.	na	na	PS	PS

Table ES-1: SUMMARY COMPARISON OF ALTERNATIVE IMPACTS (CONT.)

Impact	Proposed Action		Alternative Action	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Water Storage				
Carryover water storage improved for New Melones Reservoir.	B	na	B	na
Carryover water storage reduced for New Don Pedro Reservoir.	LS	na	SU	na
Carryover water storage reduced for Lake McClure during below normal or dry hydrologic conditions.	PSU	na	PSU	na
Water Quality				
Exceedence of water quality standards reduced on San Joaquin River at Vernalis in October.	B	na	na	na
Exceedence of salinity standards reduced on San Joaquin River at Vernalis in June and July, and potentially in November or August.	B	na	na	na
Salinities reduced with April or May pulse flow.	B	na	na	na
Water quality would improve at Vernalis from November through March.	na	na	B	na
Exceedence of salinity standards increased on San Joaquin River at Vernalis in June, July, and August. Mitigation would require additional releases from New Melones.	na	na	PS	LS
Groundwater				
Overdrafting				
No groundwater from the SSJID service area would be used to provide water for pulse flow; overdrafting would be unaffected.	N	na	na	na
A minor amount of groundwater from the OID service area	LS	na	na	na

(up to 15,000 acre-feet) would be used to provide water for instream flows, but the groundwater would be recharged by inflow from the Stanislaus River.				
No groundwater from the Modesto Groundwater Basin would be used to provide water for the pulse flow.	N	na	na	na
No groundwater from the Turlock Groundwater Basin would be used to provide water for the pulse flow.	N	na	na	na
Groundwater could indirectly be used to replace surface water used for the flows from the Merced ID (up to 67,500 acre-feet, 12% of the typical annual production); however, implementation of conjunctive use, reclamation, and increased efficiencies would augment groundwater supplies.	PS	LS	na	na
Groundwater from the Exchange Contractors service area could provide all of the water for the pulse flow (up to 11,000 acre-feet, 2.2% of the Delta Mendota Basin production rate).	LS	na	na	na
Groundwater may be used to supplement surface water deliveries in order to achieve the 1995 WQCP Vernalis flow objectives; however, implementation of conjunctive use, reclamation, and increased efficiencies would augment groundwater supplies.	na	na	PS	LS
Water Levels				
No groundwater from the SSJID service area would be used to provide water for pulse flow; water levels would be unaffected.	N	na	na	na
Up to 15,000 acre-feet of groundwater from the OID service area would be used to provide water for instream flows, but the groundwater would be recharged by inflow from the Stanislaus River; the water levels would be unaffected.	N	na	na	na
No groundwater would be used to provide water for the pulse flow from MID; water levels in the Modesto Groundwater Basin would be unaffected.	N	na	na	na
No groundwater from the Turlock Groundwater Basin would be used to provide water for the pulse flow; water levels would be unaffected.	N	na	na	na
Groundwater from the Merced Groundwater Basin could indirectly be used to replace surface water for the flows (up to 67,500 acre-feet, 12% of the typical annual production);	PS	LS	na	na

however, implementation of conjunctive use, reclamation, and increased efficiencies would augment groundwater supplies.				
Groundwater from the Exchange Contractors service area could provide all of the water for the pulse flow (up to 11,000 acre-feet, 2.2% of the Delta Mendota Basin production rate).	LS	na	na	na
Groundwater may be used to supplement surface water deliveries in order to achieve the 1995 WQCP Vernalis flow objectives; however, implementation of conjunctive use, reclamation, and increased efficiencies would mitigate use of groundwater.	na	na	PS	LS
Water Quality				
No groundwater from the SSJID service area would be used to provide water for pulse flow; there would be no impact on water quality.	N	na	na	na
A minor amount of groundwater from the OID service area would be used to provide water for instream flows, but the groundwater would be recharged by inflow from the Stanislaus River; there would be no impact on water quality.	N	na	na	na
No groundwater from the Modesto Groundwater Basin would be used to provide water for the pulse flow; there would be no impact on water quality.	N	na	na	na
No groundwater from the Turlock Groundwater Basin would be used to provide water for pulse flow; there would be no impact on water quality.	N	na	na	na
Groundwater from the Merced Groundwater Basin could indirectly be used to replace surface water for the flows; TDS levels may increase slightly.	LS	na	na	na
Groundwater could provide all of the water for the pulse flow from the Exchange Contractors service area; TDS levels may increase slightly.	LS	na	na	na
Groundwater may be used to supplement surface water deliveries in order to achieve the 1995 WQCP Vernalis flow objectives; there could be an impact on water quality; however, limiting or restricting groundwater pumping in restricted areas, conjunctive use, and increased efficiencies could augment groundwater supplies.	na	na	PS	LS
Subsidence				

No groundwater from the SSJID service area would be used to provide water for pulse flow; there would be no impact on subsidence.	N	na	na	na
Up to 15,000 acre-feet of groundwater from the OID service area would be used to provide water for instream flows, but the groundwater would be recharged by inflow from the Stanislaus River; there would be no impact on subsidence.	N	na	na	na
No groundwater from the Modesto Groundwater Basin would be used to provide water for the pulse flow; there would be no impact on subsidence.	N	na	na	na
No groundwater from the Turlock Groundwater Basin would be used to provide water for pulse flow; there would be no impact on subsidence.	N	na	na	na
Groundwater (up to 67,500 acre-feet) from the Merced Groundwater Basin could indirectly be used to replace surface water for the flows; there could be an impact on subsidence. However, limiting groundwater pumping in highly overdrafted areas, importing water, and developing or expanding recharge areas would reduce the impact.	PS	LS	na	na
Groundwater (up to 11,000 acre-feet) could provide all of the water for the pulse flow from the Exchange Contractors; the impact on subsidence is less than significant.	LS	na	na	na
Approximately 62,000 acre-feet of groundwater may be used to supplement surface water deliveries in order to achieve the 1995 WQCP Vernalis flow objectives; there could be an impact on subsidence. However, limiting groundwater pumping in highly overdrafted areas, importing water, and developing or expanding recharge areas could reduce the impact to less than significant.	na	na	PS	LS
Agricultural Subsurface Drainage				
The 31-day pulse flow and other flows would not have an impact on agricultural seepage.	N	na	na	na
Raised water levels in the San Joaquin River could affect seepage, but groundwater pumped to replace reductions in surface water deliveries would produce a less-than-significant effect on agricultural drainage.	na	na	LS	na
Terrestrial Resources				

Riparian Vegetation				
May pulse flows interfere with Fremont cottonwood initiation; most likely operation would be for pulse flows to begin mid-April. Ramping flows to minimize flow changes are part of the proposed project.	LS	na	LS	na
Stable summer base flows would increase likelihood of invasion by narrowleaf willow, but FERC mandated flows in the Tuolumne would preclude such an impact.	LS	na	LS	na
No threatened or endangered plant species and no relic vegetation types would be affected.	LS	na	LS	na
Wildlife				
Ramping rates and April pulse flows would reduce loss of wildlife habitat and decrease the potential for riparian corridor fragmentation.	LS	na	LS	na
The impacts to wildlife, especially TES species would be insignificant.	LS	na	LS	na
Aquatic Resources				
Factors Affecting Distribution and Abundance of Aquatic Resources				
Water quality improved; no adverse impacts on aquatic resources.	N	na	N	na
Chinook Salmon				
Flow changes on all rivers would result in non- measurable or less-than-significant impacts to fall-run chinook salmon.	N/LS	na	LS	na
Flows increased in April/May and October on all rivers that benefit emigrating salmon smolts and immigrating adults.	B	na	na	na
Rapid changes in flows in the spring and fall may affect juvenile salmon and salmon redds; however, ramping of flows would ensure the impacts would be less than significant.	PS	LS	na	na
Impacts to female fecundity in November from possibly high water temperature would have a low frequency of occurrence.	LS	na	na	na

Minimal effects on water temperature in Merced River. Decreasing seasonal air temperature dominates release temperatures.	LS	na	na	na
Reduced flows in February on the Merced River and in May on the Stanislaus River in critically dry periods would affect juvenile salmon. Mitigation could include increased smolt production.	na	na	PS	LS
Steelhead				
Steelhead found only in the Stanislaus River. Flows increased during most months, in all water year types.	B	na	na	na
Reduced flows in May on the Stanislaus River during critically dry periods could affect juvenile steelhead. Mitigation could include increased smolt production.	na	na	PS	LS
Occasional flow increases during summer months on the Stanislaus River would benefit over-summering juveniles.	na	na	B	na
Striped Bass				
Flows increased during the spawning period, especially during dry and critically dry years.	B	na	na	na
Flows reduced in the Merced River during above normal and wet years with a potential reduction of available spawning.	LS	na	na	na
Flows increased during the spawning period in the Merced River.	na	na	B	na
Flows reduced in the Stanislaus and Tuolumne rivers during the spawning period.	na	na	LS	na
Increased flows in the summer months may benefit maturing striped bass fry in offsite locations (within the Delta).	na	na	B	na
Splittail				
Flows increased during the spawning period, especially during dry and critically dry years.	B	na	na	na
Flows decreased on the Merced River during the spawning period during above normal and wet years.	LS	na	na	na
Flows increased during the spawning period in the Merced River.	na	na	B	na
Flows reduced in the Stanislaus and Tuolumne rivers	na	na	LS	na

during the spawning period.				
Increased flows in the summer months of the critically dry period may benefit young splittails in all rivers.	na	na	B	na
Reservoir Species				
No impacts to largemouth bass.	N	na	na	na
Habitat impacted at New Don Pedro Reservoir and Lake McClure.	na	na	LS	na
Habitat impacted at New Melones Reservoir.	na	na	B	na
Delta smelt and longfin smelt				
Flows provided by the proposed action would be in compliance with the 1995 Biological Opinion for the operation of the CVP and SWP. No significant impacts to delta or longfin smelt would occur during the spring or fall pulse flows or with the alternative action's increased flows.	N	na	N	na
Land Use				
Population and Population Density				
No adverse impacts on local populations or local population growth.	N	na	na	na
No impacts on municipal users, therefore no impact to population density.	N	na	na	na
Users with junior water rights who serve municipal water users would have deliveries curtailed 20 to 60% of the time in April-May. Groundwater could be used to replace surface water reductions.	na	na	PS	LS
Population densities under constrained growth would remain stable.	na	na	LS	na
Regional Economy and Employment				
Short-term impacts on jobs from reduced farm production avoided by substituting groundwater for surface water supplies.	LS	na	na	na
Job losses less than significant, but output and income losses could be significant. Mitigation measures include groundwater substitution, conjunctive use, conservation, and tailwater recovery.	na	na	S	LS

Agricultural Land Use				
Potential reduction of 104,500 acre-feet of Authority's water to irrigation customers could adversely impact cropping patterns and productivity. However, most of this surface water would be replaced by groundwater including conjunctive use water or come from carryover storage.	PS	LS	na	na
Reduced deliveries by Merced ID could adversely affect agricultural production in the short term, but this decline in productivity would be mitigated through a conjunctive use project and by groundwater pumping by individual farmers.	PS	LS	na	na
Cropping patterns could change and crop production could be reduced. Mitigation measures include alternative sources of water.	na	na	PS	LS
Cultural Resources				
Reservoirs				
Recreation use increased at New Melones during critically dry years; potential for cultural resource damage could increase.	LS	na	LS	na
Recreation use not affected at New Don Pedro Reservoir and Lake McClure, so no indirect impact.	na	na	N	na
Lower reservoir levels at New Don Pedro Reservoir may expose potential cultural resources to impact from recreationists.	na	na	LS	na
Rivers				
No adverse impacts to cultural resources on San Joaquin, Stanislaus, or Tuolumne rivers.	N	na	na	na
Frequency of streamflows below critical flow decreased in critical, dry, and below normal years on Merced River; recreation use could increase and therefore could increase potential for cultural resource damage.	LS	na	na	na
Frequency of flows above the critical threshold increase on the San Joaquin River, but the short-term impact on cultural resources is less than significant.	na	na	LS	na
During critical water years, recreation use could increase or decrease on the San Joaquin River depending on the various critical thresholds or optimal ranges; the short-term impact on cultural resources is less than significant.	na	na	LS	na

Recreation use is beneficially impacted on the Stanislaus River and could, therefore, increase the potential for damage to cultural resources. Mitigation measures could include implementation of a protection plan.	na	na	PS	LS
Recreation				
Reservoirs				
No adverse impact to recreationists at any of the reservoirs.	N	na	na	na
Reservoir levels increased at New Melones in critical years in September.	B	na	B	na
Reservoir levels decreased at New Don Pedro Reservoir during critical water years.	na	na	LS	na
No impacts on reservoir levels at Lake McClure.	na	na	N	na
Rivers				
Frequency of streamflows below critical flow decreased in critical, dry, and below normal years on Merced River.	B	na	na	na
No adverse impacts to recreation on San Joaquin, Stanislaus, or Tuolumne rivers.	N	na	na	na
Frequency of streamflows above critical flow increased in all years on San Joaquin River; however, the recreation opportunities above this threshold are unknown.	na	na	PSU	na
During critically dry years, San Joaquin River streamflows would provide both beneficial and adverse impacts to recreationists.	na	na	LS	na
Frequency of streamflows in optimal ranges for boating increased on the Stanislaus River.	na	na	B	na
No adverse impacts to recreation on Tuolumne or Merced rivers.	na	na	N	na
Energy Resources				
Reservoirs				
Storage increased at New Melones Reservoir during June, July, and August thus increasing potential for hydropower generation.	B	na	na	na
Storage decreased at New Don Pedro Reservoir during peak power production months thus decreasing potential for hydropower generation.	LS	na	na	na

Storage decreased greater than 10% at Lake McClure in critical, dry, and below normal years during peak power production months thus decreasing potential for hydropower generation.	PSU	na	na	na
There are less-than-significant impacts to potential hydropower production on any of the reservoirs.	na	na	LS	na
Rivers				
Releases increased on Stanislaus River could increase hydropower generation.	LS	na	na	na
Releases increased on Tuolumne River could increase hydropower generation.	B	na	na	na
Flows decreased more than 10% on Merced River in above normal years in June thus decreasing potential for hydropower generation.	PSU	na	na	na
There are less-than-significant impacts to potential hydropower production on the Stanislaus, Tuolumne, or Merced rivers.	na	na	LS	na
No hydropower generation is generated on the lower San Joaquin River so there are no impacts.	N	na	N	na
Indian Trust Assets				
Reservoirs				
Indian Trust Assets are not located at any of the reservoirs.	N	na	N	na
Rivers				
Indian Trust Assets do not occur along any of the rivers in the project area.	N	na	N	na
Environmental Justice				
Aquatic Resources				
Beneficial impacts to fisheries would not affect environmental justice.	N	na	N	na
Recreation Resources				
Beneficial impacts to recreation in rivers and reservoirs would not affect environmental justice.	N	na	na	na
Less-than-significant adverse impacts to New Don Pedro Reservoir during critical water years would not impact environmental justice.	na	na	N	na

Potentially significant adverse or beneficial impacts to recreationists on the San Joaquin River would not impact environmental justice.	na	na	N	na
There are no impacts on either the Stanislaus, Tuolumne, or Merced rivers.	na	na	N	na

S: Significant adverse impact
SU: Significantly unavoidable adverse impact
PS: Potentially significant adverse impact
PSU: Potentially significant unavoidable adverse impact
LS: Less-than-significant adverse impact
N: No adverse impact
B: Beneficial impact
na: Not applicable