SAN JOAQUIN RIVER
RESTORATION PROGRAM

Draft

Program Environmental Impact Statement/ Environmental Impact Report

SCH # 2007081125

April 2011

The San Joaquin River Restoration Program is a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of Merced River and restore a self-sustaining Chinook salmon fishery in the river while reducing or avoiding adverse water supply impacts from Interim and Restoration flows.

Mission Statements

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

The mission of the California Department of Water Resources is to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

Executive Summary

Introduction and Background

Headwaters of the San Joaquin River

Originating high in the Sierra Nevada Mountains, the San Joaquin River carries snowmelt from mountain meadows to the valley floor before turning north and becoming the backbone of tributaries draining into the San Joaquin Valley. The San Joaquin River is California's second longest river and discharges to the Sacramento-San Joaquin Delta (Delta) and, ultimately, to the Pacific Ocean through San Francisco Bay. In 1944, the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) completed construction of Friant Dam on the San Joaquin River. With the completion of the Friant-Kern Canal in 1951 and Madera Canal in 1945, Friant Dam diverted San Joaquin River water supplies to over 1 million acres of highly productive farmland along the eastern portion of the San Joaquin Valley. Operation of the dam ceased flow in some portions of the river, and substantially impacted salmon runs in the San Joaquin River upstream from its confluence with the Merced River.

This Executive Summary provides an overview of the San Joaquin River Restoration Program (SJRRP) Draft Program Environmental Impact Statement/Environmental Impact Report (PEIS/R), prepared pursuant to the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). This Draft PEIS/R evaluates alternative ways to implement the proposed action. The proposed action is to implement the Stipulation of Settlement in *NRDC, et al., v. Kirk Rodgers, et al.* (Settlement), consistent with the San Joaquin River Restoration Settlement Act (Act) in Public Law 111-11. This Draft PEIS/R and its appendices, including the Settlement and the Act, are available on the attached compact disk.

This Draft PEIS/R is being circulated for public review. Comments received during the public review period will be considered by the lead agencies, and responses to comments will be included in the Final PEIS/R. Continued public outreach, including public hearings, will be conducted before completion of the Final PEIS/R. Please see *www.restoresjr.net* for information on these meetings.

San Joaquin River

San Joaquin River Settlement

In 1988, a coalition of environmental groups, led by the Natural Resources Defense Council (NRDC), filed a lawsuit, known as *NRDC, et al., v. Kirk Rodgers, et al.*, challenging the renewal of long-term water service contracts between the United States and Central Valley Project (CVP) Friant Division contractors. On September 13, 2006, after more than 18 years of litigation, the Settling Parties, including NRDC, Friant Water Authority (FWA), and the U.S. Departments of the Interior and Commerce, agreed on the terms and conditions of a Settlement subsequently approved by the U.S. Eastern District Court of California on October 23, 2006. The Act, included in Public Law 111-11 and signed into law on March 30, 2009, authorizes and directs the Secretary of the Interior (Secretary) to implement the Settlement. The Settlement establishes two primary goals:

- **Restoration Goal** – To restore and maintain fish populations in "good condition" in the main stem San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish.
- **Water Management Goal** – To reduce or avoid adverse water supply impacts on all of the Friant Division long-term contractors that may result from the Interim and Restoration flows provided for in the Settlement.

Chinook salmon

To achieve the Restoration Goal, the Settlement calls for releases of water from Friant Dam to the confluence of the Merced River (referred to as Interim and Restoration flows), a combination of channel and structural modifications along the San Joaquin River below Friant Dam, and reintroduction of Chinook salmon. Restoration Flows are specific volumes of water to be released from Friant Dam

Orange groves within the Friant Division of the Central Valley Project

during different year types, according to Exhibit B of the Settlement; Interim Flows are experimental flows that began in 2009 and will continue until full Restoration Flows are initiated, with the purpose of collecting relevant data concerning flows, temperatures, fish needs, seepage losses, recirculation, recapture, and reuse. To achieve the Water Management Goal, the Settlement calls for recirculation, recapture, reuse, exchange, or transfer of the Interim and Restoration flows to reduce or avoid impacts to water deliveries to all of the Friant Division long-term contractors caused by the Interim and Restoration flows. In addition, the Settlement establishes a Recovered Water Account (RWA) and recovered water program to make water available to all of the Friant Division long-term contractors who provide water to meet Interim or Restoration flows, to reduce or avoid the impact of the Interim and Restoration flows on such contractors. Reclamation is currently working with the Friant Division long-term contractors and appropriate agencies to develop procedures for identifying delivery reductions to Friant Division long-term contractors associated with the release of Interim and Restoration flows, as part of the RWA stipulated for implementation under Paragraph 16(b) of the Settlement.

The Settlement and the Act authorize and direct specific physical and operational actions that could potentially directly or indirectly affect environmental conditions in the Central Valley. Areas potentially affected by Settlement actions include the San Joaquin River and associated flood bypass system, tributaries to the San Joaquin River, the Delta, and water service areas of the CVP and State Water Project (SWP), including the Friant Division. Settlement Paragraphs 11 through 16 describe the physical and operational actions. Table ES-1 summarizes the level of analysis provided in this Draft PEIS/R for actions identified in key Settlement paragraphs.

Table ES-1. Restoration and Water Management Actions in Key Settlement Paragraphs

SETTLEMENT PARAGRAPH	DESCRIPTION	LEVEL OF NEPA/CEQA COMPLIANCE SUPPORTED BY DRAFT PEIS/R
11	Identifies specific channel and structural improvements considered necessary to achieve the Restoration Goal. Includes a list of improvements.	Program Level
12	Acknowledges that additional channel or structural improvements not identified in Paragraph 11 may be needed to achieve the Restoration Goal.	Program Level
13	Identifies specific volumes of water to be released from Friant Dam during different year types (Restoration Flows), and provisional water supplies to meet the Restoration Flow targets, as provided in Exhibit B of the Settlement. Stipulates the release of full Restoration Flows no later than January 1, 2014, subject to then-existing channel capacities.	Project Level
14	Stipulates that spring-run and fall-run Chinook salmon be reintroduced to the San Joaquin River between Friant Dam and the confluence of the San Joaquin River with the Merced River no later than December 31, 2012. Assigns priority to self-sustaining spring-run Chinook salmon over fall-run Chinook salmon.	Program Level
15	Specifies that a program of Interim Flows begins no later than October 1, 2009, and continues until full Restoration Flows can begin, to collect relevant data concerning flows, temperatures, fish needs, seepage losses, recirculation, recapture, and reuse.	Project Level for release of Interim Flows and related actions Program Level for some data collection activities
16	Requires that the Secretary develop and implement a plan for recirculation, recapture, reuse, exchange, or transfer of the Interim and Restoration flows to reduce or avoid impacts to water deliveries for all Friant Division long-term contractors. This paragraph also calls for establishment of an RWA and program to make water available to the Friant Division long-term contractors who provide water to meet Interim or Restoration flows.	Project Level for recapture in the Restoration Area and in the Delta Program Level for all other Water Management actions

Key:
CEQA = California Environmental Quality Act
Delta = Sacramento-San Joaquin Delta
NEPA = National Environmental Policy Act
PEIS/R = Program Environmental Impact Statement/Report
RWA = Recovered Water Account
Secretary = Secretary of the Interior

San Joaquin River Restoration Program

The SJRRP comprises several Federal and State of California (State) agencies responsible for implementing the Settlement through the SJRRP. Implementing Agencies include Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Water Resources, and California Department of Fish and Game. Table ES-2 shows milestone dates anticipated in the Settlement. The Implementing Agencies are committed to attaining these milestones, as demonstrated by the release of Interim Flows beginning in October 2009; however, these dates may change, pending completion of compliance, coordination, consultation, data collection, and related efforts. Reclamation and DWR initiated the NEPA and CEQA processes in August 2007 to analyze implementation of the Settlement. Reclamation is the lead NEPA agency and DWR is the lead CEQA agency in preparing this Draft PEIS/R.

Table ES-2. Key Settlement Milestones

DATE	MILESTONE[1]
October 2009	• Initiate Interim Flows and monitoring program
September 2010	• USFWS submits a completed permit application to NMFS for reintroduction of spring-run Chinook salmon
April 2012	• NMFS issues a decision on the permit application for reintroduction of spring-run Chinook salmon
December 2012	• Reintroduce spring-run and fall-run Chinook salmon, if permitted by NMFS
December 2013	• Complete Phase 1 improvements identified in the Settlement • Secretary of the Interior, in consultation with NRDC and FWA, develops operational guidelines
January 2014	• Initiate full Restoration Flows
December 2016	• Complete Phase 2 improvements identified in the Settlement
December 2024	• Secretary of Commerce reports to Congress on the progress made in reintroducing spring-run and fall-run Chinook salmon and discusses plans for future implementation of the Settlement
December 2025	• Review and revise Restoration Flows, if necessary
January – July 2026	• Any party to the Settlement may file a motion to request an increase, decrease, or material change in the quantity and/or timing of Restoration Flows

Note:
[1] The milestones are set forth in the Settlement.

Key:
FWA = Friant Water Authority
NMFS = National Marine Fisheries Service
NRDC = Natural Resources Defense Council
Settlement = Stipulation of Settlement
USFWS = U.S. Fish and Wildlife Service

In addition to the Implementing Agencies, the Settlement stipulates that a Technical Advisory Committee be established, comprising six members appointed by NRDC and FWA. The Settlement also calls for a Restoration Administrator (RA) to be appointed by NRDC and FWA, to facilitate the Technical Advisory Committee and provide specific recommendations to the Secretary in coordination with the Technical Advisory Committee. The RA's duties are defined in the Settlement, and include making recommendations to the Secretary on the release of Interim and Restoration flows. The RA is also responsible for consulting with the Secretary on implementing actions under Paragraph 11 of the Settlement, and for identifying and recommending additional actions under Paragraph 12 of the Settlement. In addition, the RA is responsible for consulting with the Secretary on the reintroduction of Chinook salmon under Paragraph 14 of the Settlement. The RA's recommendations would be taken into consideration by the Secretary in making decisions or taking specific actions to be implemented under the Settlement, consistent with the RA's roles as outlined in the Settlement.

Purposes and Uses of PEIS/R

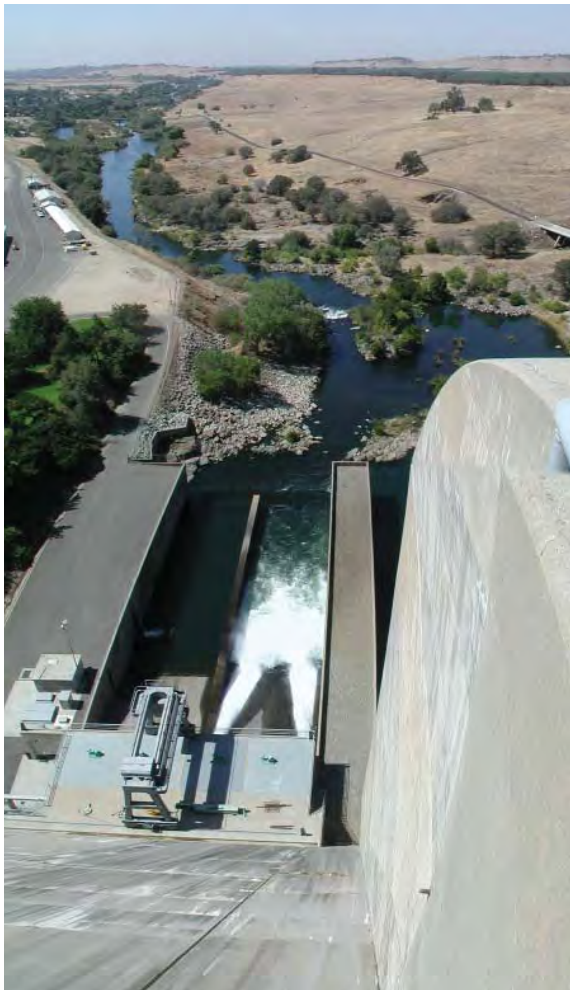
The purpose of this Draft PEIS/R is to analyze and disclose the direct, indirect, and cumulative impacts of implementing the Settlement as directed by the Act, consistent with NEPA/CEQA requirements. This Draft PEIS/R serves as an informational document for decision makers, public agencies, nongovernmental organizations, and the general public regarding the potential direct, indirect, and cumulative environmental consequences of implementing any of the alternatives. It is anticipated that future site-specific environmental analysis would be developed based on information from this PEIS/R.

NEPA/CEQA Compliance Supported by the PEIS/R

This Draft PEIS/R includes both a "program-level" analysis and a "project-level" analysis. All actions evaluated at a program level in this Draft PEIS/R would require completion of additional analysis pursuant to NEPA and/or CEQA at a project level of detail before implementation. In addition, the program-level analysis addresses the entire suite of effects of implementing the Settlement, including the project-level actions evaluated in detail in this Draft PEIS/R, as well as cumulative impacts. This approach provides broad direction for a wide range of possible future actions while allowing the opportunity for flexibility to respond to changing needs and conditions.

The actions analyzed at a project level in this Draft PEIS/R would not require additional NEPA/CEQA compliance for implementation. Project-level actions addressed in this Draft PEIS/R include the following:

- Reoperate Friant Dam and downstream flow-control structures to release Interim and Restoration flows to the San Joaquin River, as constrained by then-existing channel capacities, and make water supplies available to Friant Division long-term contractors at a preestablished rate (Reclamation action).
- Provide additional funding to support additional maintenance activities, including patrolling to assess levee conditions when increased potential for seepage is identified through monitoring, as described in the Physical Monitoring and Management Plan; performing additional operations and maintenance needed in the Eastside and Mariposa bypasses, at the Chowchilla Bypass Bifurcation Structure, at the Eastside Bypass Bifurcation Structure, or at the Mariposa Bypass Bifurcation Structure to facilitate routing Interim and Restoration flows; and removing vegetation and sediment by mechanical or chemical means that would cause Interim or Restoration flows to exceed channel capacity (Reclamation action).



San Joaquin River at Friant Dam

- Recapture Interim and Restoration flows at existing facilities within the Restoration Area and the Delta (Reclamation action).
- Reduce, redirect, or redivert Interim or Restoration flows to reduce flow in downstream reaches to address any issues identified through implementation of the Physical Monitoring and Management Plan (Reclamation action).
- Modify releases from Friant Dam to adjust flows to flush or mobilize spawning gravel based on monitoring reports and recommendations on spawning gravel conditions (Reclamation action).
- Grant an order by the State Water Resources Control Board (SWRCB) for the downstream protection and rediversion of Interim and Restoration flows (SWRCB action, serving as CEQA Responsible Agency).

All anticipated actions necessary to implement the Settlement are described in this Draft PEIS/R. The impact conclusions and associated mitigation measures for the 22 resource topics evaluated in this Draft PEIS/R are summarized in a table at the end of this Executive Summary. Implementation of several SJRRP actions began in 2009, including the release and recapture of Interim Flows and establishment of the RWA in October 2009. Site-specific NEPA and CEQA environmental compliance documentation was prepared, as necessary, for actions needed to enable implementation of the Settlement before release of this document, as shown in Table ES-3.

San Joaquin River at Lost Lake County Park

Table ES-3. Site-Specific NEPA/CEQA Environmental Compliance Documentation for SJRRP Actions Completed or In Progress

ACTION	DESCRIPTION	NEPA/CEQA ENVIRONMENTAL COMPLIANCE DOCUMENT(S)	LEAD AGENCY OR AGENCIES
Install water level recorders	Install up to seven water level recorders in the San Joaquin River in Fresno and Madera counties to provide data related to hydrograph translation characteristics.	San Joaquin River Restoration Program Water Level Recorder Installation and Data Collection NOE. February 2009.	DWR (CEQA)
Install scour chains	Install scour chains in the San Joaquin River at locations in Fresno and Madera counties to provide data on sediment transport.	San Joaquin River Restoration Program Scour Chain Installation and Data Collection NOE. February 2009.	DWR (CEQA)
Install and rehabilitate stream gages	Rehabilitate and retrofit the existing stream gage stations at the Chowchilla Bypass Bifurcation Structure and below Sack Dam on the San Joaquin River, and install two new monitoring stations at the top of Reach 4B and one at the confluence of the Merced and San Joaquin rivers.	Installation and Rehabilitation of Stream Gages on the San Joaquin River, Fresno, Madera, and Merced Counties, California EA/FONSI. December 2008. Stream Gage Installation and Operation and Maintenance Project IS/MND. March 2009.	Reclamation (NEPA) and DWR (CEQA)
Sample stream bed sediment	Sample bed material at 20 locations to establish baseline data before release of Water Year 2010 Interim Flows.	San Joaquin River Restoration Program Stream Bed and Sand Sampling NOE. April 2009.	DWR (CEQA)
Seal the gates of the Chowchilla Bypass Bifurcation Structure	Install seals on the gates of the Chowchilla Bypass Bifurcation Structure to reduce or prevent flow from entering the sediment catchment basin downstream from the gates.	Chowchilla Bifurcation Structure Gate Seal Installation NOE. August 2009.	DWR (CEQA)
Release of Water Year 2010 Interim Flows	Implement provisions of the Settlement related to Water Year 2010 Interim Flows and to collect relevant data to guide future releases of Interim and Restoration flows.	Water Year 2010 Interim Flows Project EA/FONSI and IS/MND. September 2009.	Reclamation (NEPA) and DWR (CEQA)
Gather geotechnical data and install monitoring wells	Install groundwater monitoring wells adjacent to the San Joaquin River and collect geotechnical data through exploration holes at existing and potential new levees, control structures, river crossing structures, and test pits to identify possible borrow material.	Draft San Joaquin River Restoration Program Geotechnical Investigation and Seepage Well Installation Project IS/MND. October 2009.	DWR (CEQA)
Release Water Year 2011 Interim Flows	Implement provisions of the Settlement related to Water Year 2011 Interim Flows and collect relevant data to guide future releases of Interim and Restoration flows.	Water Year 2011 Interim Flows Project Supplemental EA/FONSI. September 2010.	Reclamation (NEPA)

Key:
CEQA = California Environmental Quality Act
DWR = California Department of Water Resources
EA/FONSI = Environmental Assessment/Finding of No Significant Impact
IS/MND = Initial Study/Mitigated Negative Declaration
NEPA = National Environmental Policy Act
NOE = Notice of Exemption
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
SJRRP = San Joaquin River Restoration Program

As previously described, Reclamation is the lead NEPA agency and DWR is the lead CEQA agency in preparing this Draft PEIS/R. The project-level actions addressed in this Draft PEIS/R include actions to be undertaken by Reclamation, and the effects of these actions are the sole responsibility of Reclamation. DWR serves as the CEQA lead agency for the entire SJRRP, although DWR is not taking any discretionary action for the project-level actions analyzed in this Draft PEIS/R. SWRCB is the only State agency expected to take a discretionary action, in the form of a water rights approval related to the release and conveyance of Interim and Restoration flows. It is anticipated that SWRCB would use this PEIS/R in support of that decision as a CEQA Responsible Agency. In the future, it is expected that DWR, and other State agencies, will complete project-level CEQA review in support of discretionary actions to implement some of the actions addressed at a program-level in the Final PEIS/R.

To implement the project-level actions, Reclamation would require a modified water rights permit from SWRCB. Under CEQA, SWRCB is a Responsible Agency insofar as it has a limited role related to the project-level actions analyzed in this Draft PEIS/R. To allow SWRCB to take its action as a Responsible Agency, which involves making findings that the agency has "considered" the EIR (see State CEQA Guidelines Section 15096(f)), DWR as the CEQA Lead Agency will be required to certify the PEIS/R as meeting CEQA requirements; adopt Findings of Fact, a Statement of Overriding Considerations if needed, and a Mitigation Monitoring and Reporting Program; approve the program; and file a Notice of Determination. As the CEQA Lead Agency for the PEIS/R, DWR has prepared an EIR that provides sufficient project-level information to allow SWRCB, as a Responsible Agency, to (1) consider the environmental effects of the project-level actions, (2) mitigate or avoid environmental effects of those parts of the project over which those agencies have discretionary authority, and (3) make findings, required by CEQA Guidelines Section 15091, that its decision-making body reviewed and considered the project-level environmental effects presented in the PEIS/R. As a Responsible Agency, if SWRCB decides to take action to approve its portion of the project, SWRCB must approve feasible mitigation measures that would reduce the magnitude of or avoid any significant impacts.

Additional Compliance, Coordination, and Consultation Supported by PEIS/R

In addition to the NEPA/CEQA compliance described above, this Draft PEIS/R supports additional permits, petitions, and similar compliance, coordination, and consultation for the project- and program-level actions, as shown in Table ES-4. Program-level actions would require further site-specific analysis to support compliance and consistency with applicable regulatory requirements, including additional permits, petitions, and similar requirements.

Table ES-4. Compliance, Consultation, and Coordination Supported by PEIS/R

RESOURCE	APPLICABLE LAWS/REGULATIONS/PERMITS	REGULATING AGENCY	LEVEL OF COMPLIANCE OF APPLICABLE ACTIONS
All	San Joaquin River Restoration Settlement Act	Secretary of the Interior	Project and Program
Wetlands, Waters of the United States, and Federal Levees	Section 404 of the Clean Water Act – Individual or General Permit	U.S. Army Corps of Engineers	Program
	Section 10 of the Clean Water Act – Individual or General Permit	U.S. Army Corps of Engineers	Program
	Section 14 of the Clean Water Act ("Section 408") – Permission	U.S. Army Corps of Engineers	Program
	Section 401 of the Clean Water Act – Water Quality Certification or Waiver	Regional Water Quality Control Board	Program
	Section 402 of the Clean Water Act – National Pollutant Discharge Elimination System permit(s)	State Water Resources Control Board and Regional Water Quality Control Board	Program
	Sections 1600 through 1607 of the California Fish and Game Code – Streambed Alteration Agreement	California Department of Fish and Game	Program
Federally Listed Species	Section 7 of the Federal Endangered Species Act – Section 7 Consultation	U.S. Fish and Wildlife Service and National Marine Fisheries Service	Project and Program
	Section 10(j) of the Federal Endangered Species Act	National Marine Fisheries Service	Program
Essential Fish Habitat	Magnuson-Stevens Act	National Marine Fisheries Service	Project and Program
Fish and Wildlife Resources	Fish and Wildlife Coordination Act report	U.S. Fish and Wildlife Service	Project and Program
Cultural Resources	National Historic Preservation Act – Section 106 Consultation	State Historic Preservation Officer	Project and Program
State-Listed Species/ State Special-Status Species	Section 2081 of the California Endangered Species Act – Incidental Take Permit/Consistency Determination	California Department of Fish and Game	Project and Program
	California Native Plant Protection Act	California Department of Fish and Game	Project and Program
Levees and Floodways	Central Valley Flood Protection Board Encroachment Permit and Title 33, CFR Section 208.10 (USACE review)	Central Valley Flood Protection Board and U.S. Army Corps of Engineers	Program
Water Rights	California Water Code – Water Right Petitions (including petitions for changes to water right permits 11885, 11886, and 11887)	State Water Resources Control Board	Project and Program
State Lands	Land Use Lease	State Lands Commission	Program
Air Quality	Authority to Construct, Permit to Operate	San Joaquin Valley Air Pollution Control District	Program
State-Owned Roadways	Encroachment Permit	California Department of Transportation	Program
Surface Mining	California Surface Mining and Reclamation Act permit	California Surface Mining and Reclamation Act Lead Agencies and California Department of Conservation	Program

Key:
CFR = Code of Federal Regulations PEIS/R = Program Environmental Impact Statement/Report USACE = U.S. Army Corps of Engineers

Planning Horizon for PEIS/R

The planning horizon for assessment of impacts in this Draft PEIS/R is through 2030, which is consistent with the duration of court jurisdiction for the Settlement; available planning tools; consistency with long-term operations modeling data, tools, and assumptions; acceptable levels of uncertainty and speculation; climate change considerations; and the range of available hydrologic data.

The Settlement remains under court jurisdiction until July 1, 2026. Between December 31, 2025, and July 1, 2026, any Party to the Settlement may file a motion to modify the quantity or timing of Restoration Flows. If modifications are made as described in Paragraph 20 of the Settlement, additional NEPA/CEQA analysis may be required. In addition, Reclamation and DWR have developed and refined a series of analytical tools to support physical, institutional, operational, and economic planning for water resources management activities in the Central Valley. Many of these tools are based on a common set of assumptions, including water demands for projected 2030 population levels, as developed by the California Department of Finance. The 2030 level of demand is being used for several other proposed projects and actions in the Central Valley to ensure a relatively consistent method of analysis between projects. For example, USFWS's 2008 Biological Opinion on the Coordinated Operations of the CVP and SWP (2008 USFWS CVP/SWP Operations BO) and NMFS's 2009 Final Biological and Conference Opinion on the Long-Term Operations of the CVP and SWP (2009 NMFS CVP/SWP Operations BO) identify anticipated effects on listed species from CVP/SWP operations, based on a 2030 level of development. Consistency among data supporting decisions on CVP/SWP operations and implementation of the Settlement is desirable, considering the extensive overlap in potentially affected resources.

In water resources planning, it is common to apply historical data to projected future conditions as a means to identify the anticipated effects of proposed actions. Uncertainties associated with forecasts become greater the farther into the future the forecasts are made. Under an extended planning horizon, uncertainties related to population, climate change, ecological conditions, and implementation of other actions can become major drivers. Friant Dam became operational in 1942, providing 66 years of data on flow releases, and monitoring stations on the San Joaquin River were installed over the following decades. In addition, records from water management districts receiving water from Friant Dam are available for various periods, although at varying degrees of completeness and precision. In consideration of the uncertainty on projecting future conditions, and the limited available data set regarding water management, evaluations presented in this Draft PEIS/R would have a restricted confidence level if future conditions were projected forward beyond 2030. To accommodate this uncertainty, the SJRRP management process would incorporate a continuously growing set of historical data.

San Joaquin River at dusk

Scoping and Public Involvement Process

The Implementing Agencies conducted extensive public and stakeholder outreach activities to engage and inform all interested parties of SJRRP activities, including development of this Draft PEIS/R. Public outreach activities conducted as part of the scoping process to prepare this Draft PEIS/R included the following:

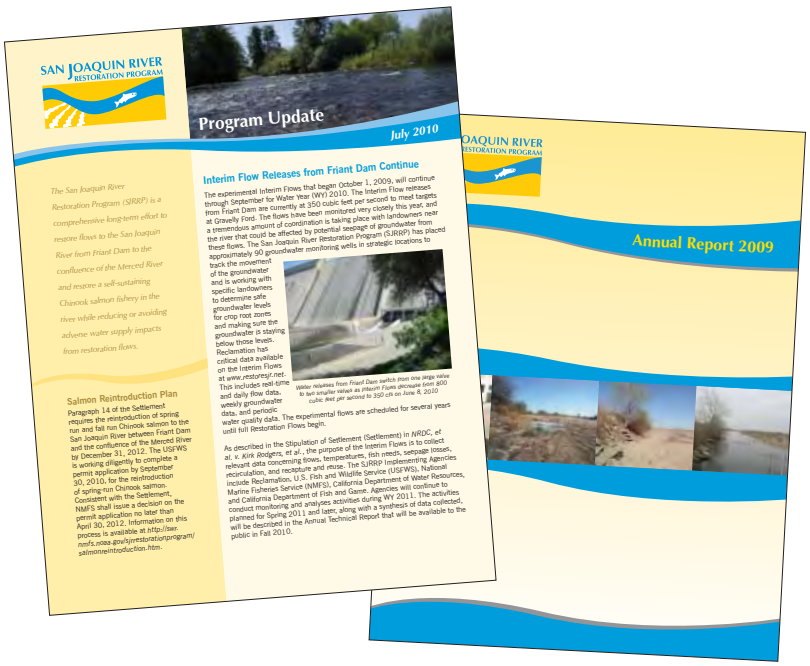
- Reclamation initiated the NEPA process by issuing a Notice of Intent (NOI) on August 2, 2007, and DWR initiated the CEQA process by issuing a Notice of Preparation (NOP) on August 22, 2007, to prepare this Draft PEIS/R and hold public scoping meetings.
- The PEIS/R scoping comment period began August 2, 2007 (the date the NOI was issued), and ended on September 26, 2007.
- Reclamation and DWR convened four public meetings during the scoping process to inform the public and interested stakeholders about the SJRRP, and to solicit comments and input on the scope of the PEIS/R, including one meeting each in the following locations:
  - Tulare – August 28, 2007
  - Fresno – August 29, 2007
  - Los Banos – August 30, 2007
  - Sacramento – September 10, 2007

SJRRP landowner coordination meeting

Reclamation and DWR received comments from 85 entities during the scoping process, including Federal and State agencies, local interest groups, local residents, farmers, landowners, environmental groups, public advocacy groups, Native American community groups, and individuals. The comments received were summarized in a *Public Scoping Report* released by SJRRP on December 14, 2007.

Public involvement and outreach activities have enabled the Implementing Agencies to successfully involve stakeholders, and incorporate public and stakeholder input into the development of major SJRRP documents, including this Draft PEIS/R. These activities seek to create an open and transparent process through which the general public, stakeholders, affected Third Parties, and other interested parties can track and participate in SJRRP activities, including the formulation and evaluation of alternatives for this Draft PEIS/R. Ongoing public outreach activities conducted in support of the SJRRP include the following:

- Maintaining a publicly accessible, frequently updated web site (*www.restoresjr.net*) that is the primary vehicle for disseminating information to the wide range of people, organizations, and agencies interested in the SJRRP. The site contains background and history of the SJRRP; general information on SJRRP staff, stakeholders, schedule and management; opportunities for public involvement and outreach; workgroup activities and progress; timely information and updates; and a document repository that includes technical memoranda and other milestone SJRRP documents.
- Maintaining and updating a "Grapevine" hotline (800-742-9474) with information regarding SJRRP-related field activities, safety information, and events.
- Developing and distributing a wide variety of SJRRP information, including quarterly SJRRP updates, news releases, fact sheets, and brochures to the SJRRP mailing list, which includes over 3,200 members.



A wide variety of SJRRP information is distributed to the SJRRP's 3,200 member mailing list

- Organizing and hosting Technical Feedback Meetings with subject-matter experts, Settling Parties, affected stakeholders, and the general public in order to obtain information and viewpoints from individual attendees; provide updates on the status of SJRRP work products; gather feedback on SJRRP documents; and to discuss potential opportunities and constraints that may arise.
- Maintaining close coordination with organizations that have specialized expertise in existing programs related to the San Joaquin River specifically, as well as restoration efforts, and water issues in general, such as the San Joaquin River Partnership, San Joaquin River Parkway and Conservation Trust, San Joaquin River Resource Management Coalition, and the Water Education Foundation.
- Holding informational meetings for tribal representatives and Native American organizations active in the Fresno area.
- Maintaining close coordination with individuals or organizations, recognized as Third Parties to the Settlement, through establishment of a SJRRP Landowner Coordinator. The Landowner Coordinator serves as the primary point-of-contact for private property landowners in the Restoration Area, and their representatives, on behalf of the Implementing Agencies. Activities include, in part, organization and facilitation of monthly or bimonthly landowner meetings; serve as technical liaison for the SJRRP and landowners for field surveys and investigations directly and indirectly associated with the SJRRP; and administration of the distribution and tracking of Temporary Entry Permits for preconstruction surveys and investigations on private and public lands by the Implementing Agencies.
- Organizing or facilitating tours of the river for Federal and State legislators and staff, and for the public in conjunction with the Water Education Foundation to assist stakeholders in gaining firsthand understanding of the San Joaquin River and the SJRRP.

Purpose and Need for Action and Project Objectives

The purpose of the proposed action is to implement the Settlement consistent with the Act. The Act authorizes and directs the Secretary to implement the Settlement. The Settlement specifies the project need, which requires changes to the operation of Friant Dam in support of achieving the Restoration Goal while reducing or avoiding adverse impacts to Friant Division long-term contractors' water deliveries caused by releasing Interim or Restoration flows in support of achieving the Water Management Goal. The Implementing Agencies identified several objectives of the proposed action:

San Joaquin River near Chowchilla Bypass Bifurcation Structure

- Release Interim Flows from Friant Dam in accordance with Settlement Paragraph 15.
- Release Restoration Flows from Friant Dam in accordance with Settlement Paragraph 13.
- Implement channel and structure modifications in accordance with Settlement Paragraph 11.
- Implement additional modifications to meet the Restoration Goal, as described in Paragraph 12.
- Reintroduce spring-run and fall-run Chinook salmon to the San Joaquin River below Friant Dam, in accordance with Settlement Paragraph 14.
- Develop and implement a plan to recirculate, recapture, reuse, exchange, or transfer water released for Restoration Flows in accordance with criteria identified in Settlement Paragraph 16(a).
- Establish an RWA that would account for reductions in water supply deliveries to Friant Division long-term contractors resulting from the release of Interim and Restoration flows, and make water available, at $10 an acre-foot, to Friant Division long-term contractors who have experienced water supply reductions resulting from the release of Interim or Restoration flows, in accordance with Settlement Paragraph 16(b).
- Develop and implement monitoring and management plans to guide implementation of the Settlement, including the actions listed in the preceding bullets, in accordance with the Settlement and the Act

The purpose and objectives respond to a need to increase water releases from Friant Dam to support achieving the Restoration Goal while implementing a plan for recirculation, recapture, reuse, exchange, or transfer of the Interim and Restoration flows for the purpose of reducing or avoiding impacts to water deliveries to all of the Friant Division long-term contractors caused by releasing Interim and Restoration flows.

Study Area

The study area for this Draft PEIS/R, shown in Figure ES-1, has been broadly defined to evaluate potential direct, indirect, and cumulative effects within five geographic areas:

- **San Joaquin River upstream from Friant Dam.** This area includes Millerton Lake and its watershed.
- **San Joaquin River from Friant Dam to the Merced River confluence (Restoration Area).** This section of the river is referred to as the Restoration Area, and includes Reaches 1 through 5 and portions of the flood management system, as shown in Figure ES-2. All construction actions to support the Restoration Goal would be implemented in this geographic area. Some actions to support the Water Management Goal would be implemented in the Restoration Area.
- **San Joaquin River from the Merced River to the Delta.** Release of Interim and Restoration flows would increase flows in this reach. This reach also would support migration of salmon between the Delta and the Restoration Area. Some actions to support the Water Management Goal would be implemented in this reach.
- **Delta.** Release of Interim and Restoration flows would increase flows into the Delta and generate changes in facilities operations within CVP/SWP operational parameters, consistent with regulatory and legal operating requirements in place at the time flows enter the Delta. Some actions to support the Water Management Goal would be implemented in the Delta.
- **CVP/SWP water service areas.** This area encompasses all CVP/SWP facility and water service areas, including the Friant Division of the CVP. Changes in the delivery of water to the Friant Division and the recapture and recirculation of Interim and Restoration flows may affect water project operations in this geographic area.

Friant-Kern Canal

Figure ES-1. Study Area for Program Environmental Impact Statement/Report

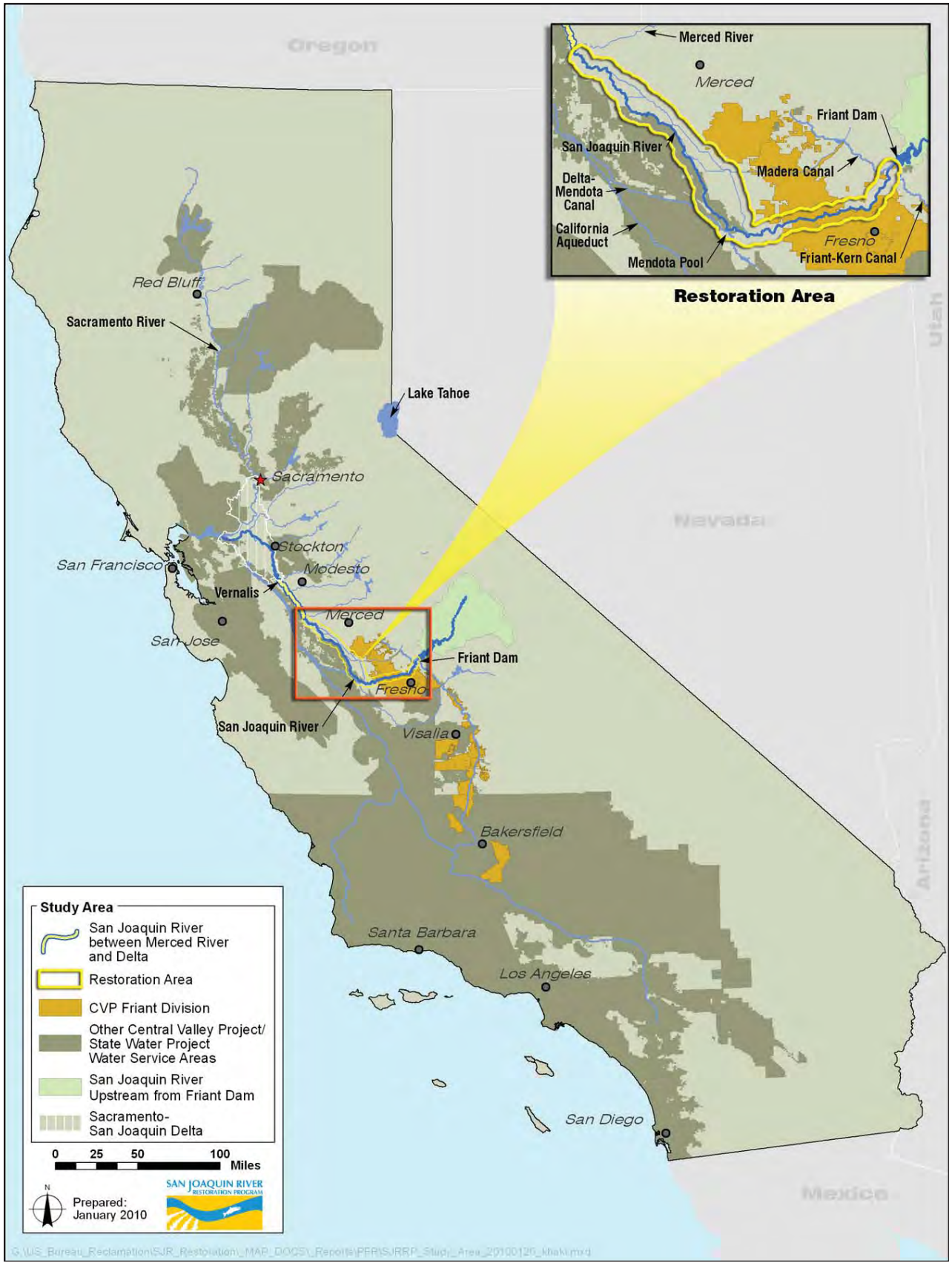
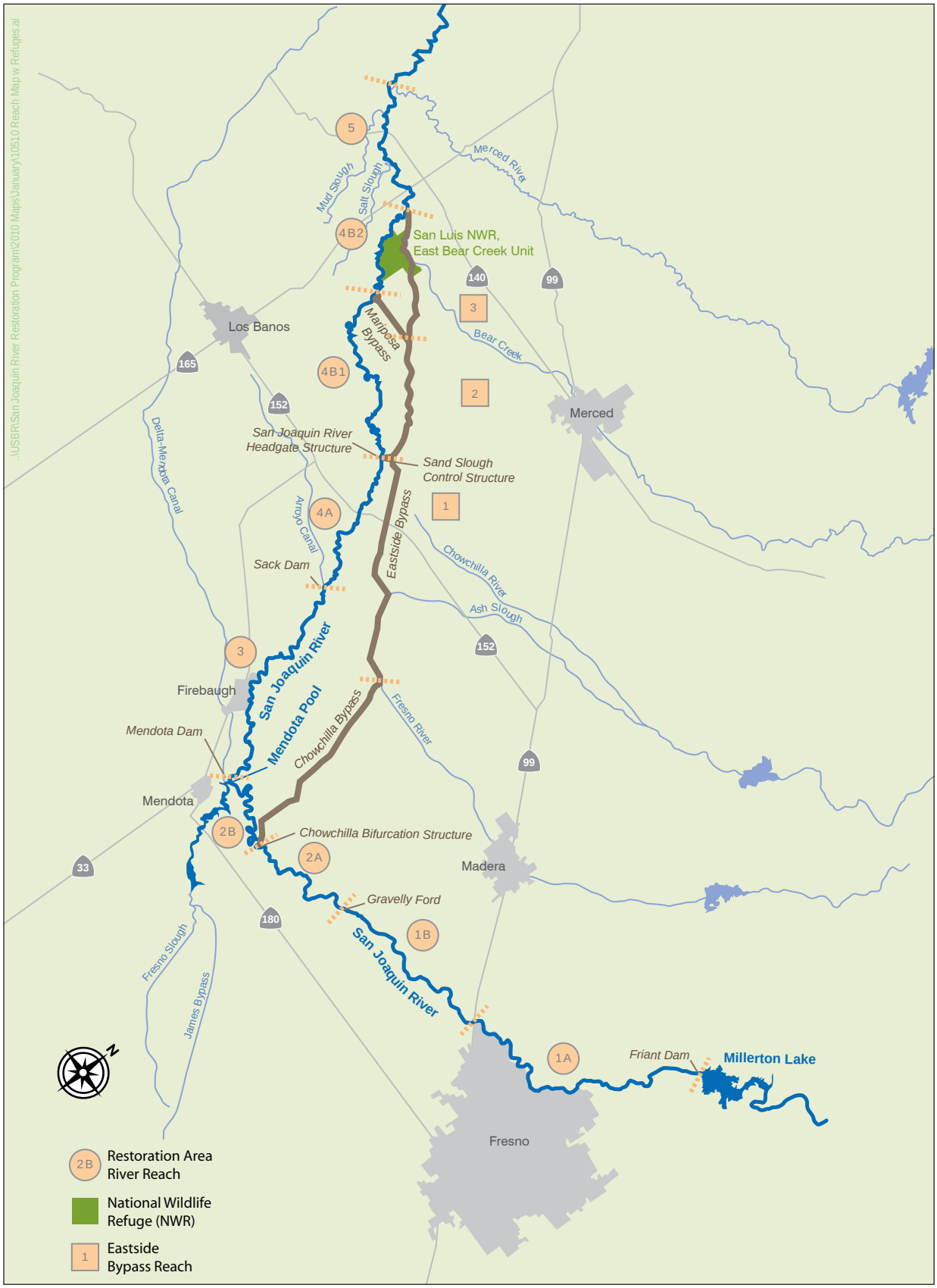


Figure ES-2. San Joaquin River Reaches and Flood Bypass System in Restoration Area



Restoration Area

The Restoration Area includes five distinct reaches of the San Joaquin River between Friant Dam and the Merced River, and portions of the flood management system:

- **Reach 1 – Friant Dam to Gravelly Ford.** Reach 1 begins at Friant Dam and extends downstream approximately 39 miles to Gravelly Ford, the most downstream diversion point for releases from Friant Dam. Reach 1 is the only reach in the Restoration Area with exposed gravel and a river gradient suitable for Chinook salmon spawning. Reach 1 is divided into two subreaches, Reach 1A and Reach 1B. Extensive gravel mining in Reach 1A and the upper portion of Reach 1B has left many pits, some connected to the river, within the historical floodplain. An average of 117,000 acre-feet of water per year is released from Friant Dam into Reach 1 for riparian water users. A nonflood flow rate of about 5 cubic feet per second (cfs) typically reaches Gravelly Ford at the downstream end of Reach 1.

Reach 1

- **Reach 2 – Gravelly Ford to Mendota Dam.** Reach 2 meanders approximately 24 miles across the sandy alluvial fan of the San Joaquin River between Gravelly Ford and Mendota Dam. Reach 2 is divided into two subreaches, Reach 2A and Reach 2B. Reach 2A begins at Gravelly Ford and extends downstream to the Chowchilla Bypass Bifurcation Structure, and is confined by San Joaquin River Flood Control Project levees. Reach 2B extends from the bifurcation structure downstream to Mendota Dam, and is confined by nonproject levees. Except during times of flood, water passing Gravelly Ford typically infiltrates before reaching the Chowchilla Bypass Bifurcation Structure; therefore, the majority of Reach 2A and all of Reach 2B normally carry no water.

Reach 2

- **Reach 3 – Mendota Dam to Sack Dam.** Reach 3 begins at Mendota Dam and extends approximately 23 miles downstream to Sack Dam. Reach 3 conveys flows of up to 800 cfs from the Mendota Pool for diversion to the Arroyo Canal at Sack Dam, maintaining flow year-round in a meandering channel with a sandy bed. The Fresno Slough and Mendota Pool convey flood flows from the Kings River to this reach. Irrigation canals bound this reach for most of its length. In some portions, lands within the floodway are actively used for agricultural production, and are protected by local or interior levees.

Reach 3

- **Reach 4 – Sack Dam to Eastside Bypass Confluence.** Reach 4 is approximately 46 miles long, and is divided into two subreaches: Reach 4A, which extends from Sack Dam downstream to the Sand Slough Control Structure and San Joaquin River Headgate Structure, and Reach 4B, which begins at the San Joaquin River Headgate Structure and extends downstream to the confluence with Bear Creek and the Eastside Bypass. Except in times of high flows, Reach 4A normally carries only water that passes Sack Dam, and runoff from adjacent agricultural areas. At the downstream end of Reach 4A, any water in the channel flows into the Eastside Bypass through Sand Slough. Reach 4B1 carries agricultural returns and local water deliveries - channel capacity has been reduced by vegetation and the installation of road crossings and other obstructions. Although Reach 4B1 was estimated to carry 1,500 cfs when the flood management system was constructed, the current conveyance capacity of Reach 4B1 is unknown and could be zero in some locations. Downstream from the Mariposa Bypass, Reach 4B2 is confined by San Joaquin River Flood Control Project levees, and regularly conveys agricultural return flows, runoff, and flood flows conveyed through the Mariposa Bypass.

Reach 4

- **Reach 5 – Eastside Bypass Confluence to Merced River.** Reach 5 of the San Joaquin River extends approximately 18 miles from the confluence of the Eastside Bypass downstream to the Merced River confluence. This reach receives flows from Mud and Salt sloughs, channels that run through both agricultural and wildlife managements areas. San Joaquin River Flood Control Project levees confine Reach 5. West bank levees end at Salt Slough while the east bank levees continue to the Merced River confluence.

Reach 5

- **Flood Bypasses – Chowchilla, Eastside, and Mariposa.** The Chowchilla, Eastside, and Mariposa bypasses convey flood flows from the San Joaquin and Kings rivers. Tributaries to the Chowchilla Bypass include the Fresno River and Berenda Slough. The Chowchilla Bypass extends to the confluence of Ash Slough, which marks the beginning of the Eastside Bypass. Eastside Bypass Reach 1 extends from Ash Slough to the Sand Slough Bypass confluence and receives flows from the Chowchilla River. Eastside Bypass Reach 2 extends from the Sand Slough Bypass confluence to the head of the Mariposa Bypass. Eastside Bypass Reach 3 extends from the head of the Mariposa Bypass to the head of Reach 5 and receives flows from Deadman, Owens, and Bear creeks. The Mariposa Bypass extends from the Mariposa Bypass Bifurcation Structure to the head of Reach 4B2. A drop structure is located near the downstream end of the Mariposa Bypass that dissipates energy from flows before flows enter the mainstem San Joaquin River.

Eastside Bypass

Alternatives Evaluated in PEIS/R

This Draft PEIS/R evaluates a No-Action Alternative and six action alternatives to implement the Settlement. Each action alternative includes the actions called for in the Settlement. The action alternatives differ in two ways. The first is the amount of flow that is routed through Reach 4B1 (at least 475 cfs or at least 4,500 cfs). The second is the way water is recaptured (Delta only or Delta plus existing San Joaquin River diversions without or with new pumping infrastructure below the Merced River). Project-level and program-level actions included in each action alternative are summarized in Table ES-5. Common Restoration actions are shown in Figure ES-3. Alternatives include the following:

- No-Action Alternative
- Alternative A1: Reach 4B1 at 475 cfs, Delta Recapture
- Alternative A2: Reach 4B1 at 4,500 cfs, Delta Recapture
- Alternative B1: Reach 4B1 at 475 cfs, San Joaquin River Recapture
- Alternative B2: Reach 4B1 at 4,500 cfs, San Joaquin River Recapture
- Alternative C1: Reach 4B1 at 475 cfs, New Pumping Plant Recapture
- Alternative C2: Reach 4B1 at 4,500 cfs, New Pumping Plant Recapture

Mendota Dam and Pool

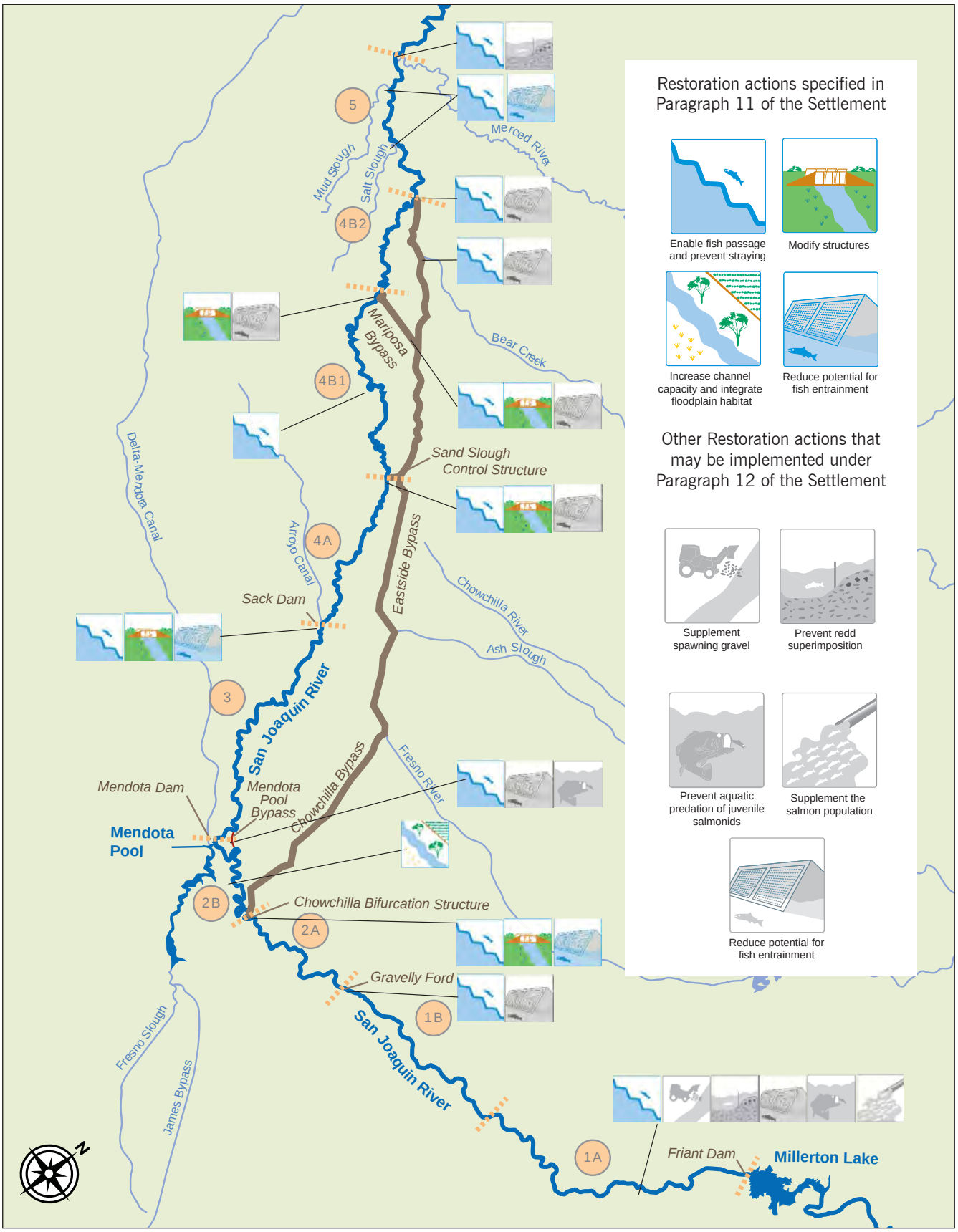
Table ES-5. NEPA/CEQA Level of Compliance for Actions Included Under Action Alternatives

CATEGORY	ACTION	LEVEL OF NEPA/CEQA COMPLIANCE
Reoperate Friant Dam and Downstream Flow Control Structures	Release Interim and Restoration flows from Friant Dam up to full Restoration Flows stipulated by Settlement, as constrained by then-existing channel capacities	Project
	Minimize increases in flood risk in the Restoration Area as a result of Interim and Restoration flows	
	Reoperate downstream flow control structures	
	Establish an RWA and manage Friant Dam to make water supplies available to Friant Division long-term contractors at a preestablished rate	
Recapture Interim and Restoration Flows	Recapture Interim and Restoration flows in Restoration Area at Mendota Pool and wildlife refuge	
	Recapture Interim and Restoration flows in Delta at existing CVP/SWP facilities	
	Recapture Interim and Restoration flows at existing facilities on San Joaquin River with potential in-district modifications to existing facilities	Program
	Construct and operate new pumping infrastructure on San Joaquin River	
Recirculate Recaptured Interim and Restoration Flows	Recirculate recaptured Interim and Restoration flows	
Common Restoration Actions	Construct Mendota Pool Bypass and modify Reach 2B to convey at least 4,500 cfs	
	Modify Reach 4B1 to convey at least 475 cfs	
	Modify San Joaquin River Headgate Structure to enable fish passage and flow routing	
	Modify Sand Slough Control Structure to enable fish passage	
	Screen Arroyo Canal and provide fish passage at Sack Dam	
	Modify Eastside and Mariposa Bypasses for fish passage	
	Enable deployment of seasonal barriers at Mud and Salt sloughs	
	Modify Chowchilla Bypass Bifurcation Structure	
	Fill or isolate gravel pits	
	Reintroduce salmon	
	Enhance spawning gravel	
	Reduce potential for redd superimposition and/or hybridization	
	Supplement the salmon population	
	Modify floodplain and side-channel habitat	
	Enhance in-channel habitat	
	Reduce potential for aquatic predation of juvenile salmonids	
	Reduce potential for fish entrainment	
	Enable fish passage	
	Modify flood flow control structures	
Actions in Reach 4B1 to Provide at Least 4,500 cfs Capacity	Modify Reach 4B1 to convey at least 4,500 cfs	Program
Physical Monitoring and Management Plan	Monitoring actions[1]	
	Immediate management actions	Project
	Long-term management actions	Program
Conservation Strategy	Various conservation measures, applied to actions above	Project and Program

Note:
[1] Site-specific documentation has been prepared for monitoring actions completed or currently underway, and would be prepared, as necessary, for actions described at a program-level of detail in this Draft PEIS/R.

Key:
CEQA = California Environmental Quality Act
cfs = cubic foot per second
CVP = Central Valley Project
Delta = Sacramento-San Joaquin Delta
NEPA = National Environmental Policy Act
PEIS/R = Program Environmental Impact Statement/Report
RWA = Recovered Water Account
SWP = State Water Project

Figure ES-3. Location of Common Restoration Actions Included in All Action Alternatives



Project-Level Actions Common to All Action Alternatives

Actions related to the release, routing, and recapture of Interim and Restoration flows at existing CVP/SWP facilities are analyzed in this Draft PEIS/R at a project-specific level, and these actions are common to all action alternatives. The Physical Monitoring and Management Plan and the Conservation Strategy, which include both project- and program-level actions, are described in separate subsections.

Releases from Friant Dam

- **Reoperate Friant Dam and downstream flow control structures** – Operations at Friant Dam would change to release Interim and Restoration flows to the San Joaquin River, according to the six flow schedules specified in Exhibit B of the Settlement and shown in Figure ES-4. Actions to reoperate Friant Dam and route Interim and Restoration flows include the following:
  - **Release Interim and Restoration flows** – The release of Interim and Restoration flows from Friant Dam includes an annual allocation of Interim and Restoration flows using either the Restoration Flow schedules, as included in Exhibit B of the Settlement, or a more continuous hydrograph, as shown in Figure ES-5, and includes applying the following provisions to modify Restoration Flows, in consideration of recommendations to be made by the RA: application of flexible flow periods, as described in Exhibit B of the Settlement; the use of a 10 percent buffer flow to help meet the Restoration Goal; and the release of acquired water for unanticipated river seepage losses for Restoration Flows. According to Paragraph 13(i), the RA is responsible for recommending to the Secretary the date for commencing full Restoration Flows in consideration of the completion of Phase 1 improvements. If, for any reason, full Restoration Flows are not released in any year beginning January 1, 2014, the Secretary, in consultation with the RA, would bank, store, exchange, transfer, or sell the water through mutually acceptable agreements with Friant Division long-term contractors or third parties (with proceeds deposited into the Restoration Fund established under the Settlement), or release the water from Friant Dam during times of the year other than those specified in the applicable hydrograph.

Figure ES-4. Restoration Flow Schedules Specific in Exhibit B of the Settlement

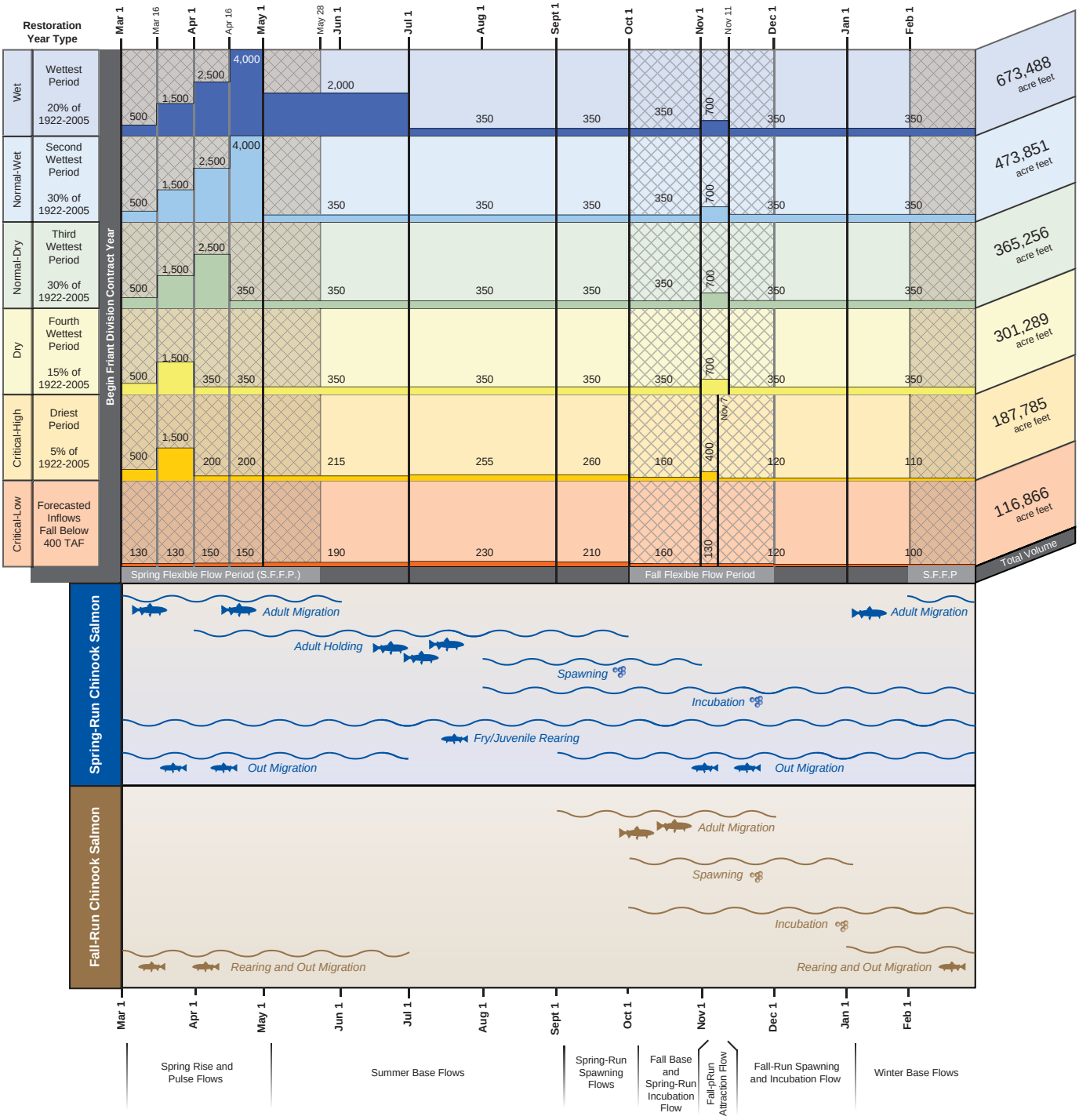
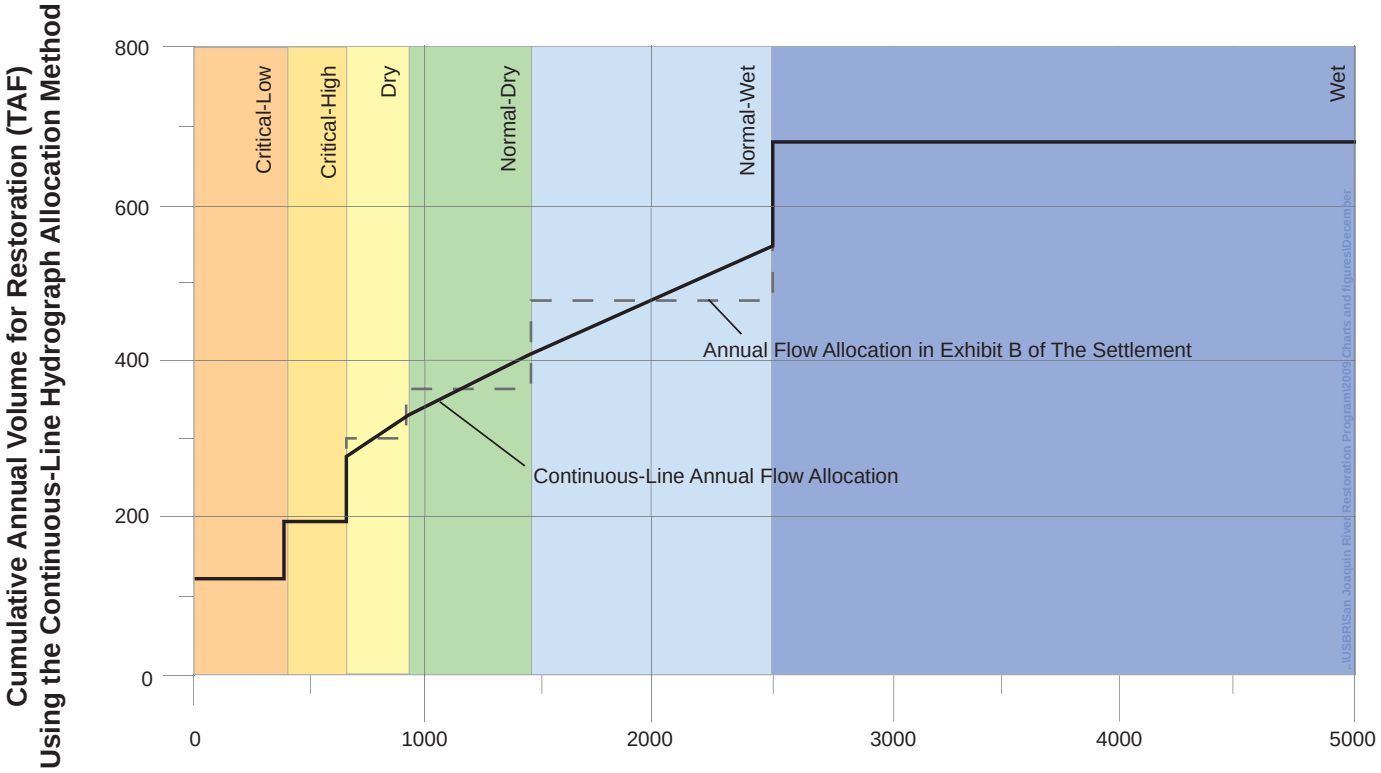


Figure ES-5. Continuous Annual Restoration Flow Allocation in Alternatives



FORECASTED WATER YEAR INFLOW (OCTOBER – SEPTEMBER) BELOW FRIANT DAM (TAF)	ANNUAL FLOW ALLOCATION IN EXHIBIT B OF THE SETTLEMENT[1] (TAF)	CONTINUOUS-LINE ANNUAL FLOW ALLOCATION (TAF)	RESTORATION YEAR TYPE
Less than 400	116.7	116.9	Critical-Low
Greater than 400 to 670	187.5	187.8	Critical-High
Greater than 670 to 930	300.8	272.3 to 330.3	Dry
Greater than 930 to 1,450	364.6	Greater than 330.3 to 400.3	Normal-Dry
Greater than 1,450 to 2,500	473.0	Greater than 400.3 to 574.4	Normal-Wet
Greater than 2,500	672.3	673.5	Wet

Key:
Key: TAF = thousand acre-feet
Notes:
[1] Friant Dam releases include deliveries to riparian water right holders in Reach 1 under "holding contracts," and releases for the Restoration Goal.

» **Minimize Increases in Flood Risk in the Restoration Area Due to Release of Interim and Restoration Flows** – Throughout Settlement implementation, the maximum downstream rate of Interim and Restoration flows would be limited to then-existing channel capacities throughout the Restoration Area. Reclamation would implement three integrated measures that would collectively minimize or avoid increasing flood risk in the Restoration Area as a result of releasing Interim and Restoration flows. These three measures include (1) establishing a Channel Capacity Advisory Group and applying performance standards to determine and update estimated then-existing channel capacities, (2) maintaining Interim and Restoration flows at or below estimated then-existing channel capacities, and (3) closely monitoring erosion and performing maintenance and/or reducing Interim and Restoration flows, as necessary, to avoid erosion-related impacts. Only limited data are currently available on San Joaquin River channel capacities and levee conditions. Until adequate data are available to determine the then-existing capacities using the performance standards, Reclamation would limit the release of Interim and Restoration flows to those that would remain in-channel. In-channel flows are flows that maintain a water surface elevation at or below the elevation of the landside levee toe (i.e., the base of the levee). When sufficient data are available to apply the performance standards, Reclamation would limit Interim and Restoration flows to levels that would satisfy the performance standards at all times.

» **Routing of Interim and Restoration Flows** – All action alternatives would modify operation of the Lower San Joaquin River Flood Control Project (flood management system) to convey Interim and Restoration flows. Modifications would include reoperation of the Chowchilla Bypass Bifurcation Structure, the San Joaquin River Headgate Structure, and the Eastside and Mariposa bypass bifurcation structures. These structures are, and would continue to be, operated as part of the flood management system, and flood operation criteria would supersede operations to convey Interim and Restoration flows. Currently, these structures are operated as part of the flood management system to direct flood flows and irrigation deliveries based on several factors, including flows and capacities of the river and bypass reaches; flows from tributaries such as the Kings River system via Fresno Slough and the Merced Stream Group; and water demands in the Mendota Pool. Modifications to the operating criteria would incorporate the routing of Interim and Restoration flows during nonflood operations to meet flow targets in each reach. If flood releases are made from Friant Dam in excess of then-current Interim or Restoration flow targets, Interim and Restoration flows would not be released and standard operation of the flood management system would apply. In addition, Reclamation delivers water to the San Joaquin River Exchange Contractors at the Mendota Pool via the Delta-Mendota Canal (DMC) under the San Joaquin River Exchange Contract. Under this contract, Reclamation can deliver water to Mendota Pool to fulfill contract obligations from the DMC or through the San Joaquin River at its discretion, subject to the terms of the contract[1]. If Reclamation must make deliveries to

[1] Typically, all deliveries to the San Joaquin River Exchange Contractors in excess of flood flows are made via the DMC, subject to the terms of Article 3(n) of the Friant Division long-term water service contracts. Under this contract article, "[t]he United States agrees that it will not deliver to the Exchange Contractors thereunder waters of the San Joaquin River unless and until required by the terms of said contract, and the United States further agrees that it will not voluntarily and knowingly determine itself unable to deliver to the Exchange Contractors entitled thereto from water that is available or that may become available to it from the Sacramento River and its tributaries or the Sacramento-San Joaquin Delta those quantities required to satisfy the obligations of the United States under said Exchange Contract and under Schedule 2 of the Contract for Purchase of Miller and Lux Water Rights" (Contract I1r-1145, dated July 27, 1939).

the San Joaquin River Exchange Contractors via the San Joaquin River, these water deliveries would have a higher priority over Interim and Restoration flows. After completion of modifications to provide for increased capacity in Reach 4B1 and modifications to the San Joaquin River Headgate Structure, Interim and Restoration flows would be released into Reach 4B1. Modifications to the operating criteria of the Eastside and Mariposa bypass bifurcation structures would incorporate the routing of Interim and Restoration flows to meet flow targets in downstream reaches.

- **Establish Recovered Water Account and Program** – Reclamation would identify delivery reductions to Friant Division long-term contractors associated with the release of Interim and Restoration flows, as part of the RWA stipulated for implementation under Paragraph 16(b). Paragraph 16(b) also provides for delivery of water during wet hydrologic conditions to Friant Division long-term contractors at a cost of $10 per acre-foot.

- **Recapture of Interim and Restoration Flows** – Locations available for recapture of Interim and Restoration flows within the Restoration Area include the following:
  - **Recapture in the Restoration Area** – If necessary to avoid interfering with in-channel construction activities associated with the Restoration Goal, or to avoid potential material adverse impacts from groundwater seepage, or for other emergency actions to avoid immediate adverse impacts, Interim and Restoration flows would be recaptured at existing diversion points in the Restoration Area, including the Mendota Pool and Arroyo Canal, and the East Bear Creek Unit of the San Luis National Wildlife Refuge (East Bear Creek Unit) located in Eastside Bypass Reach 3. Interim and Restoration flows recaptured in the Restoration Area could provide deliveries in lieu of DMC supplies. Delta water, up to the amount diverted at these locations, would be available for recirculation to the Friant Division using existing south-of-Delta facilities, subject to available capacity and then-existing operational constraints within CVP/SWP storage and conveyance facilities.
  - **Recapture of Interim and Restoration Flows in the Delta** – Interim and Restoration flows reaching the Delta would result in changes in allowable Delta exports under then-existing criteria at CVP and SWP facilities. Recapture of Interim and Restoration flows in the Delta would occur at the Jones and Banks pumping plants operated under existing operating criteria consistent with and limited by prevailing and relevant laws, regulations, BOs, and court orders in place at the time the water is recaptured. No additional agreements or regulatory compliance documentation would be required to recapture Interim and Restoration flows in the Delta under operational requirements in place at the time water is recaptured. Any increase in allowable Delta exports that result from Interim and Restoration flows entering the Delta would be available for recirculation to the Friant Division. Recirculation of recaptured Interim and Restoration flows would be subject to available capacity and then-existing operational constraints within CVP/SWP storage and conveyance facilities.

C.W. "Bill" Jones Pumping Plant (formerly Tracy Pumping Plant)

Program-Level Actions Common to All Action Alternatives

Most actions to achieve the Restoration Goal are included in all action alternatives (common Restoration actions). Common Restoration actions would require future, project-specific planning studies and preparation of NEPA and/or CEQA documentation analyzing the effects of implementation. General locations of common Restoration actions included in all action alternatives are shown in Figure ES-3. Additional Restoration actions to increase Reach 4B1 channel capacity to at least 4,500 cfs with integrated floodplain habitat are common to Alternatives A2, B2, and C2, but are not included in Alternatives A1, B1, or C1.

- **Paragraph 11(a) (Phase 1) Common Restoration Actions** – Phase 1 actions stipulated in Paragraph 11(a) are the highest priority channel improvements needed to provide channel capacity for the release of full Restoration Flows and are identified for completion by December 31, 2013, in the Settlement. The Phase 1 actions are as follows:
  - » Construct a Mendota Pool Bypass to convey at least 4,500 cfs
  - » Modify Reach 2B to convey at least 4,500 cfs
  - » Modify Reach 4B1 to convey at least 475 cfs
  - » Modify the San Joaquin River Headgate Structure to convey at least 475 cfs
  - » Modify Sand Slough Control Structure to enable fish passage
  - » Screen Arroyo Canal and provide fish passage at Sack Dam
  - » Modify structures in Eastside and Mariposa bypasses for fish passage
  - » Modify Eastside and Mariposa bypasses for low-flow fish passage
  - » Enable deployment of seasonal barriers at Mud and Salt sloughs

Sand Slough Control Structure

Sack Dam

- **Paragraph 11(b) (Phase 2) Common Restoration Actions** – Phase 2 actions stipulated in Paragraph 11(b) are high priority channel improvements that may further contribute to achieving the Restoration Goal, and are identified in the Settlement for completion by December 31, 2016. If this date cannot be met without delaying completion of the Phase 1 actions, Paragraph 24 of the Settlement stipulates procedures to modify the schedule. Phase 2 actions are as follows:
  - » Modify Chowchilla Bypass Bifurcation Structure
  - » Fill or isolate gravel pits in Reach 1

- **Paragraph 12 Common Restoration Actions** – Paragraph 12 states that additional structural or channel improvements that may further enhance the success of achieving the Restoration Goal may be recommended by the RA to the Secretary for implementation. The range of potential Restoration actions pursuant to Paragraph 12 spans from no modifications to the following modifications:
  - » Enhance spawning gravel
  - » Reduce potential for redd superimposition and/or hybridization
  - » Supplement the salmon population
  - » Modify floodplain and side-channel habitat
  - » Enhance in-channel habitat
  - » Reduce potential for predation of juvenile salmonids
  - » Reduce potential for fish entrainment
  - » Enable fish passage
  - » Modify flood flow control structures

- **Paragraph 14 Common Restoration Actions** – Paragraph 14 stipulates reintroduction of spring-run and fall-run Chinook salmon to the San Joaquin River between Friant Dam and the confluence with the Merced River by December 31, 2012. The range of potential actions for reintroduction spans from the reintroduction of only spring-run Chinook salmon to reintroduction of both fall-run and spring-run Chinook salmon, and could include one or more life stages. The range of potential actions for reintroduction could also include the use of the existing San Joaquin Hatchery, another existing hatchery, or constructing and using a new hatchery. Hatchery use would be phased out over time as the fish population is reestablished.

- **Paragraph 16 (a) Recirculation of Recaptured Interim and Restoration Flows** – Reclamation will monitor and report the quantity and timing of Interim and Restoration flows that are available for recirculation to the Friant Division long-term contractors. Reporting available recapture supplies will be coordinated with the Settling Parties and performed in a manner that facilitates recapture opportunities. Supplies could be recaptured at existing facilities (under all action alternatives) or new or modified facilities (Alternatives C1 and C2). Water recaptured and recirculated to the

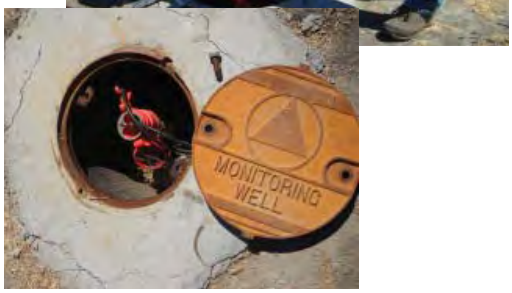
Delta-Mendota Canal and the California Aqueduct

Friant Division in this manner could require exchange agreements between Reclamation, DWR, Friant Division long-term contractors, and other south-of-Delta CVP/SWP contractors. Details of the plan for recirculation would be determined through future negotiations among affected parties.

Physical Monitoring and Management Plan

The Physical Monitoring and Management Plan provides guidelines for observing and adjusting to changes in physical conditions in the Restoration Area. The Physical Monitoring and Management Plan consists of five component plans that address interrelated physical conditions, including flow, seepage, channel capacity, propagation of native vegetation, and suitability of spawning gravel. Each component plan identifies objectives for physical conditions within the Restoration Area, and provides guidelines for monitoring and managing those conditions. The plans identify potential actions that could be taken to further enhance the achievement of the objectives. The component plans include immediate actions that could be taken, which are analyzed at a project level in this Draft PEIS/R. The component plans also include long-term actions that are analyzed at a program level of detail in this Draft PEIS/R. Finally, the Physical Monitoring and Management Plan describes monitoring activities that apply to one or more of the component plans. The objectives of the component plans include the following:

- **Flow Monitoring and Management Component Plan** – To ensure compliance with the hydrograph releases in Exhibit B of the Settlement and any other applicable flow releases (e.g., Buffer Flows)
- **Seepage Monitoring and Management Component Plan** – Reduce or avoid adverse or undesirable groundwater seepage impacts
- **Channel Capacity Monitoring and Management Component Plan** – Maintain flood conveyance capacity
- **Native Vegetation Monitoring and Management Component Plan** – Establish and maintain native riparian habitat
- **Spawning Gravel Monitoring and Management Component Plan** – Maintain gravels for spawning



Measurements being taken at a monitoring well

Conservation Strategy

As part of Settlement implementation, a comprehensive strategy for the conservation of listed and sensitive species and habitats has been prepared, and would be implemented in coordination with USFWS and DFG. The strategy's purpose is to serve as a tool built into the project description to minimize and avoid potential impacts to sensitive species and habitats. This Conservation Strategy guides development and implementation of specific conservation measures for project- and program-level actions. The Conservation Strategy includes conservation goals and measures for species and communities (such as avoidance, minimization, monitoring, and management measures) consistent with adopted recovery plans. For individual project- and program-level actions under each of the action alternatives, the applicable, feasible measures would guide development of action-specific conservation strategies. Table ES-6 presents the conservation measures.

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
VP	**Vernal pool habitats, fleshy (succulent) owl's clover, Hoover's spurge, Bogg's Lake hedge-hyssop, Colusa grass, San Joaquin Valley Orcutt grass, hairy Orcutt grass, Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot toad**		
VP-1. Avoid effects to species	a) If vernal pools or vernal pool species are anticipated within a project area, a qualified biologist will identify and map vernal pool and seasonal wetland habitat potentially suitable for listed vernal pool plants, invertebrates, and western spadefoot toad within the project footprint. b) Facility construction and other ground-disturbing activities will be sited to avoid core areas identified in the *Vernal Pool Recovery Plan* (USFWS 2005) because conservation of these areas is a high priority for recovering listed vernal pool species.	Project & Program	USFWS DFG
VP-2. Minimize effects to species	a) If vernal pools are present, a buffer around the microwatershed or a 250-foot-wide buffer, whichever is greater, will be established before ground-disturbing activities around the perimeter of vernal pools and seasonal wetlands that provide suitable habitat for vernal pool crustaceans or vernal pool plants. This buffer will remain until ground-disturbing activities in that area are completed. Suitable habitat and buffer areas will be clearly identified in the field by staking, flagging, or fencing. b) Appropriate fencing will be placed and maintained around all preserved vernal pool habitat buffers during ground-disturbing activities to prevent impacts from vehicles and other construction equipment. c) Worker awareness training and on-site biological monitoring will occur during ground-disturbing activities to ensure buffer areas are being maintained.	Program	Lead Agency
VP-3. Compensate for temporary or permanent loss of habitat	a) If activities occur within the microwatershed or 250-foot-wide buffer for vernal pool habitat will be affected by the SJRRP, the project proponent will develop and implement a compensatory mitigation plan, consistent with the USACE and EPA April 10, 2008, Final Rule for Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Parts 325 and 332 and 40 CFR Part 230) and other applicable regulations and rules at the time of implementation, that will result in no net loss of acreage, function, and value of affected vernal pool habitat. Unavoidable effects will be compensated through a combination of creation, preservation, and restoration of vernal pool habitat or purchase of credits at a mitigation bank approved by the applicable regulatory agency/agencies. b) Project effects and compensation will be determined in consideration of the Vernal Pool Recovery Plan goals for core areas, which call for 95 percent preservation for habitat in the Grasslands Ecological Area and Madera core areas, and 85 percent habitat preservation in the Fresno core area (USFWS 2005). c) Appropriate compensatory ratios for loss of habitat both in and out of core areas will be determined during coordination and consultation with USFWS and/or DFG, as appropriate. d) If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be and developed as part of the USFWS and/or DFG coordination and consultation process. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations. Any impacts that result in a compensation purchase will require an endowment for land management in perpetuity before any project groundbreaking activities.	Project & Program	USFWS DFG

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
CH	**Critical habitat**		
CH-1. Avoid and minimize effects to critical habitat	a) Designated critical habitats shall be identified and mapped. b) All SJRRP actions will be designed to avoid direct and indirect adverse modifications to these areas. c) Minimization measures, such as establishing and maintaining buffers around areas of designated critical habitat, shall be implemented if avoidance is not feasible.	Project & Program	USFWS
CH-2. Compensate for unavoidable adverse effects on Federally designated critical habitat	a) If critical habitat may be adversely modified by the implementation of SJRRP actions, the area to be modified will be evaluated by a qualified biologist to determine the potential magnitude of the project effects (i.e., description of primary constituent elements present and quantification of those affected) at a level of detail necessary to satisfy applicable environmental compliance and permitting requirements. b) Compensatory conservation measures developed through Section 7 consultation with USFWS will be implemented. If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in and developed as part of the USFWS consultation process. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations. Any impacts that result in a compensation purchase require an endowment for land management in perpetuity before any project groundbreaking activities.	Project & Program	USFWS
CTS	**California tiger salamander**		
CTS-1. Avoid and minimize effects to species	a) If potential California tiger salamander habitat or species are anticipated within the project area, within 1 year before project construction activities, a qualified biologist shall identify and map potential California tiger salamander habitat (areas within 1.3 miles of known or potential California tiger salamander breeding habitat) within the project footprint. One week before ground-disturbing activities, a qualified biologist will survey for and flag the presence of ground squirrel and gopher burrow complexes. Where burrow complexes are present, a 250-foot-wide buffer shall be placed to avoid and minimize disturbance to the species. b) Facility construction and other ground-disturbing activities shall be sited to avoid areas of known California tiger salamander habitat and avoidance buffers. c) To eliminate an attraction to predators of the California tiger salamander, all food-related trash items such as wrappers, cans, bottles, and food scraps, must be disposed of in closed containers and removed at least once every day from the entire project site.	Program	USFWS DFG

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CTS-2. Minimize effects to species	a) Before and during construction activities, construction exclusion fencing will be installed just outside the work limit or around vernal pools where California tiger salamander may occur. This fencing shall be maintained throughout construction and will be removed at the conclusion of ground-disturbing activities. No vehicles will be allowed beyond the exclusion fencing. A USFWS-approved biological monitor shall be present on site, during intervals recommended by USFWS, to inspect the fencing. b) The biological monitor will be on site each day during any wetland restoration or construction, and during initial site grading or development of sites where California tiger salamanders have been found. c) Before the start of work each day, the biological monitor will check for animals under any equipment to be used that day, such as vehicles or stockpiles of items such as pipes. If California tiger salamanders are present, they will be allowed to leave on their own, before the initiation of construction activities for the day. To prevent inadvertent entrapment of California tiger salamanders during construction, all excavated, steep-walled holes or trenches more than 1 foot deep shall be covered, by plywood or similar materials, at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. d) Plastic monofilament netting (erosion control matting) or similar material shall not be used at the project site because California tiger salamanders may become entangled or trapped. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds. e) All ground-disturbing work shall occur during daylight hours. Clearing and grading will be conducted between April 15 and October 15, in coordination with USFWS and DFG, and depending on the level of rainfall and site conditions. f) Revegetation of project areas temporarily disturbed by construction activities will be conducted with locally occurring native plants.	Program	USFWS
CTS-3. Compensate for temporary or permanent loss of habitat	a) If California tiger salamander, or areas within 1.3 miles of known or potential California tiger salamander breeding habitat, would be affected by the SJRRP, the project proponent will develop and implement a compensatory mitigation plan in coordination with USFWS and DFG, as appropriate. Unavoidable effects will be compensated through a combination of creation, preservation, and restoration of habitat or purchase of credits at a mitigation bank approved by the regulatory agencies. b) If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in and developed as part of the USFWS and/or DFG coordination and consultation process. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations. Any impacts that result in a compensation purchase will require an endowment for land management in perpetuity before any project groundbreaking activities.	Program	USFWS DFG

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DBC	**Delta button-celery**		
DBC-1. Avoid and minimize loss of habitat and individuals	a) Historically, Delta button celery was known to exist in the Eastside and Mariposa bypasses (CNDDB). In most areas of the bypasses, local flows up to 1,500 cfs remain in the main channel, and do not inundate the floodplain. Maintaining flows at or below 1,500 will not impact Delta button celery populations. In general, historical Delta button celery populations have been located below the 2,500 cfs inundation area (CNDDB). If these historical populations are still thriving in these areas, flows between 1,500 cfs and 2,500 cfs will most likely impact these populations. Potential areas of impact within the Eastside Bypass from the Sand Slough Bypass to the Mariposa Bypass are approximately 400 acres, and for the Mariposa Bypass, approximately 100 acres. Before increasing flows above 1,500 cfs in these specific areas, comprehensive surveys will be conducted (DWR, December 2010).Surveys will include remapping and recensus of the documented occurrences during at least 2 consecutive or nonconsecutive years when habitat conditions are favorable to detect the species to determine the population trend. Status updates for these occurrences will be provided to DFG. b) A Delta button-celery conservation plan will be developed and implemented that includes a preservation and adaptive management strategy for existing occurrences within the Restoration Area. The conservation plan will be developed in collaboration with DFG and other species experts, and be supported by review of the existing literature, including information on species' life history characteristics, historic and current distribution, and microhabitat requirements.	Project & Program	DFG
DBC-2. Avoid and minimize loss of habitat and risk of take for implementation of construction activities	a) If direct impacts to Delta button celery could occur, DFG and the appropriate State lead agency will coordinate to determine specific minimization and mitigation measures	Program	Lead Agency
DBC-3. Compensate for temporary or permanent loss of habitat	a) Compensatory mitigation for Delta button-celery will be developed in consultation with DFG. Mitigation may include the development and implementation of habitat creation and enhancement designs to incorporate habitat features for Delta button-celery (e.g., depressions within seasonally inundated areas) into floodplains with potentially suitable habitat conditions. Compensatory mitigation may also include efforts to establish additional populations in the Restoration Area or to enhance existing populations on or off site. Mitigation sites will avoid areas where future SJRRP activities are likely. The project proponent will obtain site access through a conservation easement or in-lieu fee title and will provide adequate funding to implement the required compensation measures, and to monitor compliance with and success of the conservation measures. b) Establishment of new occurrences will be attempted by transplanting seed and plants from affected locations to created habitat or suitable, but unoccupied, existing habitat. c) Monitoring, performance criteria, and protective measures will be applied to compensatory mitigation sites. The replacement requirements, and any additional conservation and mitigation measures will be determined in coordination with DFG.	Project & Program	DFG
PALM	**Palmate-bracted bird's beak**		
PALM-1. Avoid and minimize effects to species	a) If palmate-bracted bird's beak is anticipated within the project area, a qualified botanist will identify and map the location of palmate-bracted bird's beak plants within the project footprint, within 1 year before the start of activities that may cause disturbance from either release of flows over 1,660 cfs or from ground-disturbing actions. b) A minimum 500-foot-wide buffer shall be placed around occurrences of palmate-bracted bird's beak during construction activities, consistent with recommendations in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998). The 500-foot-wide buffer will be clearly identified in the field by staking, flagging, or fencing. Project activity will avoid buffer areas, and work awareness training and biological monitoring will be conducted to ensure that the buffer area is not encroached on and that effects are being avoided.	Project & Program	USFWS DFG

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PALM-2. Compensate for temporary or permanent loss of occupied habitat	a) A compensatory conservation plan shall be developed in coordination with USFWS and DFG, as appropriate. The conservation plan will require the project proponent to maintain viable plant populations in the Restoration Area and will identify compensatory measures for any populations affected. The conservation plan shall include monitoring and reporting requirements for populations to be preserved in or adjacent to construction areas, or populations to be protected or enhanced off site. b) If relocation efforts are part of the conservation plan, the plan will include details on the methods to be used: collection, relocation/transplant potential, storage, propagation, preparation of receptor site, installation, long-term protection and management, monitoring and reporting requirements, and remedial action responsibilities should the initial effort fail to meet compensation requirements. c) If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in the conservation plan and must occur with full endowment for management in perpetuity before groundbreaking. The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.	Project & Program	USFWS DFG
VELB	**Valley elderberry longhorn beetle**		
VELB-1. Avoid and minimize effects to species	a) If elderberry shrubs and valley elderberry longhorn beetle are anticipated within the project area, within 1 year before the commencement of ground-disturbing activities, a qualified biologist shall identify any elderberry shrubs in the project footprint. Qualified biologist(s) will survey potentially affected shrubs for valley elderberry longhorn beetle exit holes in stems greater than 1 inch in diameter. b) If elderberry shrubs are found on or adjacent to the construction project site, a 100-foot-wide avoidance buffer – measured from the dripline of the plant – will be established around all elderberry shrubs with stems greater than 1 inch in diameter at ground level and will be clearly identified in the field by staking, flagging, or fencing. No activities will occur within the buffer areas and worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented.	Project & Program	USFWS
VELB -2. Compensate for temporary or permanent loss of habitat	a) The project proponent will consult with USFWS to determine appropriate compensation ratios. Compensatory mitigation measures will be consistent with the *Conservation Guidelines for Valley Elderberry Longhorn Beetle* (USFWS 1999a), or current guidance. b) Compensatory mitigation for adverse effects may include transplanting elderberry shrubs during the dormant season (November 1 to February 15), if feasible, to an area protected in perpetuity, as well as required additional elderberry and associated native plantings and approved by USFWS. c) If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.	Project & Program	USFWS

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CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
BNLL	**Blunt-nosed leopard lizard**		
BNLL-1. Avoid and minimize effects to species	a) Three areas have been identified as having potential blunt-nosed leopard lizard habitat based on aerial maps. These areas include approximately 2,460 acres along the southwest side of the San Joaquin River in Reach 2, approximately 490 acres in a portion of the Eastside Bypass and adjacent lands near Reach 4A of the San Joaquin River, and approximately 2,938 acres encompassing the northern side of the Mariposa Bypass and parcels north of the Mariposa Bypass and west of the Eastside Bypass. Within 1 year before the commencement of the proposed project, focused site visits and habitat assessment will be conducted on these lands. Based on focused assessment, and discussions with the USFWS and DFG, protocol-level surveys may be conducted. If blunt-nosed leopard lizard are detected within or adjacent to the project site, measures that will avoid direct take of this species will be developed in cooperation with USFWS and DFG and implemented before ground disturbing activities. (DWR 2010).	Project & Program	USFWS DFG
BNLL-2. Compensate for temporary or permanent loss of habitat or species	a) Compensation for impacts to the species, if needed, will be determined in coordination with USFWS and DFG as appropriate.	Program	USFWS DFG
PLANTS	**Other special-status plants**		
PLANTS-1. Avoid and minimize effects to special-status plants	a) Within 1 year before the commencement of ground-disturbing activities, habitat assessment surveys for the special-status plants listed in Table 1 of Appendix L of this Draft PEIS/R, "Biological Resources – Vegetation and Wildlife," will be conducted by a qualified botanist, in accordance with the most recent USFWS and DFG guidelines and at the appropriate time of year when the target species would be in flower or otherwise clearly identifiable. b) Locations of special-status plant populations will be clearly identified in the field by staking, flagging, or fencing a minimum 100-foot-wide buffer around them before the commencement of activities that may cause disturbance. No activity shall occur within the buffer area, and worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented. c) Some special-status plant species are annual plants, meaning that a plant completes its entire life cycle in one growing season. Other special-status plant species are perennial plants that return year after year until they reach full maturity. Because of the differences in plant life histories, all general conservation measures will be developed on a case-by-case basis and will include strategies that are species- and site-specific to avoid impacts to special-status plants.	Program	USFWS DFG
PLANTS-2. Compensate for temporary or permanent loss of special-status plants	a) USFWS and/or DFG will be consulted to determine appropriate compensation measures for the loss of special-status plants, as appropriate. b) Appropriate mitigation measures may include the creation of off-site populations through seed collection or transplanting, preservation and enhancement of existing populations, restoration or creation of suitable habitat, or the purchase of credits at a regulatory-agency-approved mitigation bank. If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.	Program	USFWS DFG

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CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
GGS	**Giant garter snake**		
GGS-1. Avoid and minimize loss of habitat for giant garter snake	a) If giant garter snake habitat is anticipated to be present within the project area, preconstruction surveys will be completed by a qualified biologist approved by USFWS and DFG within a 24-hour period before any ground disturbance of potential giant garter snake habitat. If construction activities stop on the project site for a period of 2 weeks or more, a new giant garter snake survey will be completed no more than 24 hours before the restart of construction activities. Avoidance of suitable giant garter snake habitat, as defined by USFWS (USFWS 1993) and DFG, will occur by demarcating and maintaining a 300-foot-wide buffer around these areas. b) For projects within potential giant garter snake habitat, all activity involving disturbance of potential giant garter snake habitat will be restricted to the period between May 1 and October 1, the active season for giant garter snakes. The construction site shall be reinspected if a lapse in construction activity of 2 weeks or greater has occurred. c) Clearing will be confined to the minimal area necessary to facilitate construction activities. Giant garter snake habitat within or adjacent to the project will be flagged, staked, or fenced and designated as an Environmentally Sensitive Area. No activity shall occur within this area, and USFWS-approved worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented. Construction activities shall be minimized within 200 feet of the banks of giant garter snake habitat. Movement of heavy equipment will be confined to existing roadways to minimize habitat disturbance. d) Vegetation shall be hand-cleared in areas where giant garter snakes are suspected to occur. Exclusionary fencing with one-way exit funnels shall be installed at least 1 month before activities to allow the species to passively leave the area and to prevent reentry into work zones, per USFWS and/or DFG guidance. e) If a giant garter snake is found during construction activities, USFWS, DFG, and the project's biological monitor will immediately be notified. The biological monitor, or his/her assignee, will stop construction in the vicinity of the find and allow the snake to leave on its own. The monitor will remain in the area for the remainder of the work day to ensure the snake is not harmed. Escape routes for giant garter snake should be determined in advance of construction and snakes will be allowed to leave on their own. If a giant garter snake does not leave on its own within 1 working day, USFWS and DFG will be consulted. f) All construction-related holes shall be covered to prevent entrapment of individuals. Where applicable, construction areas shall be dewatered 2 weeks before the start of activities to allow giant garter snakes and their prey to move out of the area before any disturbance.	Program	Lead Agency USFWS DFG
GGS-2. Compensate for temporary or permanent loss of habitat	a) Temporarily affected giant garter snake aquatic habitat will be restored in accordance with criteria listed in the USFWS *Mitigation Criteria for Restoration and/or Replacement of Giant Garter Snake Habitat* (Appendix A to Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake Within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California (USFWS 1997)), or the most current criteria from USFWS or DFG. b) Permanent loss of giant garter snake habitat will be compensated at a ratio and in a manner consulted on with USFWS and DFG. Compensation may include preservation and enhancement of existing populations, restoration or creation of suitable habitat, or purchase of credits at a regulatory-agency-approved mitigation bank in sufficient quantity to compensate for the effect. Credit purchases, land preservation, or land enhancement to minimize effects to giant garter snakes should occur geographically close to the impact area. If off-site compensation is chosen, it shall include dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, and the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.	Program	USFWS DFG

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WPT	**Western pond turtle**		
WPT-1. Avoid and minimize loss of individuals	a) A qualified biologist will conduct surveys in aquatic habitats to be dewatered and/or filled during project construction. Surveys will be conducted immediately after dewatering and before fill of aquatic habitat suitable for western pond turtles. If western pond turtles are found, the biologist will capture them and move them to nearby USFWS- and/or DFG-approved areas of suitable habitat that will not be disturbed by project construction.	Program	DFG
EAGLE	**Bald eagle and golden eagle**		
EAGLE-1. Avoid and minimize effects to bald and golden eagles (as defined in the Bald and Golden Eagle Protection Act)	a) Surveys for bald and golden eagle nests will be conducted within 2 miles of any proposed project within areas supporting suitable nesting habitat and important eagle roost sites and foraging areas. These surveys will be conducted in accordance with the USFWS *Protocol for Evaluating Bald Eagle Habitat and Populations in California and DFG Bald Eagle Breeding Survey Instructions* or current guidance (*USFWS Draft Project Design Criteria and Guidance for Bald and Golden Eagles*). b) If an active eagle's nest is found, project disturbance will not occur within ½ mile of the active nest site during the breeding season (typically December 30 to July 1) or any project disturbance if it is shown to disturb the nesting birds. A no-disturbance buffer will be established around the nest site for construction activities in consultation with USFWS and DFG, and will depend on ecological factors, including topography, surrounding vegetation, nest height, and distance to foraging habitat, as well as the type and magnitude of disturbance. c) Project activity will not occur within the ½-mile-buffer areas, and worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented.	Program	USFWS DFG
SWH	**Swainson's hawk**		
SWH-1. Avoid and minimize impacts to Swainson's Hawk	a) Preconstruction surveys for active Swainson's hawk nests will be conducted in and around all potential nest trees within 0.5 miles of project-related disturbance (including construction-related traffic).. b) If known or active nests are identified through preconstruction surveys or other means, a ½ mile no-disturbance buffer shall be established around all active nest sites if construction cannot be limited to occur outside the nesting season (February 15 through September 15). c) Worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented.	Program	DFG
SWH-2. Compensate for loss of nest trees and foraging habitat	a) If foraging habitat for Swainson's hawk is removed in association with project implementation, foraging habitat compensation will occur in coordination with DFG. Foraging habitat mitigation may consist of planting and establishing alfalfa, row crops, pasture, or fallow fields. b) If potential nesting trees are to be removed during construction activities, removal will take place outside of Swainson's hawk nesting season, and the project proponent will develop a plan to replace known Swainson's hawk nest trees with a number of equivalent native trees that were previously determined to be impacts through consultation with DFG. Compensation shall include dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, and the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.	Program	DFG

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RAPTOR	**Other nesting raptors**		
RAPTOR-1. Avoid and minimize loss of individual raptors	a) Construction activity, including vegetation removal, will only occur outside the typical breeding season for raptors (September 1 to February 14), if raptors are determined to be present. b) Preconstruction surveys will be conducted by a qualified biologist in areas of suitable habitat to identify active nests in the project footprint. c) If active nests are located in the project footprint, a no-disturbance buffer will be established until a qualified biologist determines that the nest is no longer active. The size of the buffer shall be established by a qualified biologist in coordination with DFG based on the sensitivity of the resource, the type of disturbance activity, and nesting stage. No activity shall occur within the buffer area, and worker awareness training and biological monitoring will be conducted to ensure that avoidance measures are being implemented.	Program	DFG
RAPTOR-2. Compensate for loss of nest trees	a) Native trees removed during project activities will be replaced with an appropriate number of native trees, in coordination with DFG.	Program	DFG
MBTA	**Other birds protected by the Migratory Bird Treaty Act**		
MBTA-1. Avoid and minimize effects to species	a) Native nesting birds will be avoided by not conducting project activity, including vegetation removal, during the typical breeding season (February 1 to September 1), if species covered under the Migratory Bird Treaty Act and Fish and Game Code Sections 3503, 3503.5, and 3513 are determined to be present. b) An Avian Protection Plan shall be established in coordination with USFWS and DFG. Any overhead utility companies within the project area, whose lines, poles, or towers may be moved in association with the project, will also be consulted as part of the Avian Protection Plan.	Program	USFWS DFG
BRO	**Burrowing owl**		
BRO-1. Avoid loss of species	a) Preconstruction surveys for burrowing owls will be conducted in areas supporting potentially suitable habitat and within 30 days before the start of construction activities. If ground-disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site should be resurveyed. b) Occupied burrows shall not be disturbed during the breeding season (February 1 through August 31). A minimum 160-foot-wide buffer shall be placed around occupied burrows during the nonbreeding season (September 1 through January 31), and a 250-foot-wide buffer shall be placed around occupied burrows during the breeding season. Ground-disturbing activities shall not occur within the designated buffers.	Program	DFG
BRO-2. Minimize impacts to species	a) If a DFG-approved biologist can verify through noninvasive methods that owls have not begun egg-laying and incubation, or that juveniles from occupied burrows are foraging independently and are capable of independent survival, a plan shall be coordinated with DFG to offset burrow habitat and foraging areas on the project site if burrows and foraging areas are taken by SJRRP actions. b) If destruction of occupied burrows occurs, existing unsuitable burrows should be enhanced (enlarged or cleared of debris) or new burrows created. This should be done in consultation with DFG. c) Passive owl relocation techniques must be implemented. Owls should be excluded from burrows in the immediate impact zone within a 160-foot-wide buffer zone by installing one-way doors in burrow entrances. These doors shall be in place at least 48 hours before excavation to insure the owls have departed. d) The project area shall be monitored daily for 1 week to confirm owl departure from burrows before any ground-disturbing activities. e) Where possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe should be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.	Program	DFG

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BAT	**Special-status bats**		
BAT-1. Avoid and minimize loss of species	a) If suitable roosting habitat for special-status bats will be affected by project construction (e.g., removal of buildings, modification of bridges), surveys for roosting bats on the project site will be conducted by a qualified biologist. The type of survey will depend on the condition of the potential roosting habitat and may include visual surveys or use of acoustic detectors. Visual surveys may consist of a daytime pedestrian survey for evidence of bat use (e.g., guano) and/or an evening emergence survey for the presence or absence of bats. The type of survey will depend on the condition of the potential roosting habitat. If no bat roosts are found, then no further study is required. b) If evidence of bat use is observed, the number and species of bats using the roost will be determined. Bat detectors may be used to supplement survey efforts. c) If roosts are determined to be present and must be removed, the bats will be excluded from the roosting site before the facility is removed. A mitigation program addressing compensation, exclusion methods, and roost removal procedures will be developed in consultation with DFG before implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave, but not reenter), or sealing roost entrances when a site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young).	Program	DFG
BAT-2. Compensate for loss of habitat	a) The loss of each roost will be replaced, in consultation with DFG, and may include construction and installation of bat boxes suitable to the bat species and colony size excluded from the original roosting site. Roost replacement will be implemented before bats are excluded from the original roost sites. Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost sites, the structure may be removed.	Program	DFG
SJAS	**San Joaquin antelope squirrel**		
SJAS-1. Avoid and minimize loss of individuals	a) A 50-foot-wide minimum buffer shall be maintained from all small mammal burrows of suitable size for San Joaquin antelope squirrel. b) If work is to occur within the 50-foot-wide buffer, a qualified, permitted biologist shall conduct focused visual surveys for San Joaquin antelope squirrel within a 500-foot-wide buffer of the work area. These surveys shall coincide with the squirrels' most active season, April 1 to September 30, and shall be conducted only when air temperatures are between 20º to 30º C (68º to 86º F). Surveys should be conducted using daytime line transects with 10- to 30-meter spacing. Focused live trapping may also be required, in coordination with DFG. If San Joaquin antelope squirrels are observed during surveys, no vegetation or soil disturbance will be allowed within 50 feet of occupied burrows or burrow systems until the individuals are determined to no longer be occupying the area, as determined by a qualified biologist. c) Focused surveys, which may involve live trapping, may be required, in coordination with DFG, as appropriate. Additional conservation measures may developed pending the results of surveys, and in consultation with DFG. d) Construction activities shall be conducted when they are least likely to affect the species (i.e., after the normal breeding season). This timing shall be coordinated with USFWS and DFG.	Program	DFG
SJAS-2: Compensate for temporary or permanent loss of habitat or species	a) Compensation for impacts to the species, if needed, will be determined in coordination with DFG, as appropriate.	Program	DFG

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
FKR	**Fresno kangaroo rat**		
FKR-1. Avoid and minimize effects to species	a) Preconstruction surveys will be conducted by a qualified biologist per USFWS and DFG survey methodology to determine if potential burrows for Fresno kangaroo rat are present in the project footprint. Surveys will be conducted within 30 days before ground-disturbing activities. The biologist will conduct burrow searches by systematically walking transects, which shall be adjusted based on vegetation height and topography, and in coordination with USFWS and DFG. Transects shall be used to identify the presence of kangaroo rat burrows. When burrows are found within 100 feet of the proposed project footprint, focused live trapping surveys shall be conducted by a qualified and permitted biologist, following a methodology approved in advance by USFWS and DFG. Additional conservation measures may be developed pending the results of surveys, and in consultation with USFWS and DFG. b) Construction activities shall be conducted when they are least likely to affect the species (i.e., after the normal breeding season). This timing shall be coordinated with USFWS and DFG.	Program	USFWS DFG
FKR-2. Avoid disturbance of designated critical habitat	a) Facility construction and modification and other restoration projects shall be sited to avoid primary constituent elements of designated critical habitat for Fresno kangaroo rat.	Program	USFWS DFG
FKR-3: Compensate for temporary or permanent loss of habitat or species	a) Compensation for impacts to the species, if needed, will be determined in coordination with DFG and USFWS, as appropriate.	Program	USFWS DFG
SJKF	**San Joaquin kit fox**		
SJKF-1. Avoid and minimize effects to species	a) A qualified biologist will conduct preconstruction surveys no less than 14 days and no more than 30 days before the commencement of activities to identify potential dens more than 5 inches in diameter. The project proponent shall implement USFWS' (1999b) *Standardized Recommendations for Protection of San Joaquin Kit Fox Prior to or During Ground Disturbance*. The project proponent will notify USFWS and DFG in writing of the results of the preconstruction survey within 30 days after these activities are completed. b) If dens are located within the proposed work area, and cannot be avoided during construction activities, a USFWS-approved biologist will determine if the dens are occupied. c) If occupied dens are present within the proposed work, their disturbance and destruction shall be avoided. Exclusion zones will be implemented following the latest USFWS procedures (currently USFWS 1999b). d) The project proponent will notify USFWS and DFG immediately if a natal or pupping den is found in the survey area. The project proponent will present the results of preactivity den searches within 5 days after these activities are completed and before the start of construction activities in the area. e) Construction activities shall be conducted when they are least likely to affect the species (i.e., after the normal breeding season). This timing shall be coordinated with USFWS and DFG.	Program	USFWS DFG
SJKF-2. Compensate for loss of habitat	a) The project proponent, in coordination with USFWS and DFG, will determine if kit fox den removal is appropriate. If unoccupied dens need to be removed, the USFWS-approved biologist shall remove these dens by hand-excavating them in accordance with USFWS procedures (USFWS 1999b). b) Additional conservation measures will be coordinated with USFWS and DFG, and may include replacing dens, installing off-site artificial dens, acquiring compensation habitat, or other options to be determined. Compensation may include dedicating conservation easements, purchasing mitigation credits, or other off-site conservation measures, and the details of these measures will be included in the mitigation plan and must occur with full endowments for management in perpetuity. The plan will include information on responsible parties for long-term management, holders of conservations easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations. c) The project proponent will present the results of den excavations to USFWS and DFG within 5 days after these activities are completed.	Program	USFWS DFG

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
PL	**Pacific lamprey**		
PL-1. Avoid and minimize effects to species	a) A qualified biologist will conduct preconstruction surveys as outlined in Attachment A of USFWS' *Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (Entosphenus tridentatus)* (2010). b) Work in documented areas of Pacific lamprey presence will be timed to avoid in-channel work during typical lamprey spawning (March 1 to July 1). c) If temporary dewatering in documented areas of lamprey presence is required for instream channel work, salvage methods shall be implemented to capture and move ammocoetes to a safe area, in consultation with USFWS.	Program	USFWS
DS	**Delta smelt**		
DS-1. Avoid and minimize effects to species	a) All in-water work within delta smelt habitat, as defined by most recent USFWS guidance, shall be confined to a seasonal work window of August 1 - November 30, when delta smelt are least likely to be present. Because this species does not regulate its movements strictly within this time frame, modifications to the work windows may be approved by USFWS before project implementation, based on information from the various in-Delta monitoring programs. b) If activities occur within Delta smelt habitat, measure will be taken to maintain or increase shading of suitable shallow water habitat. Prevention of shading of suitable shallow water habitat by the project will be taken, if activities occur within Delta smelt habitat. The project will also avoid areas deemed suitable for delta smelt habitat that have established aquatic vegetation or have not been previously disturbed.	Program	USFWS DFG
RHSNC	**Riparian Habitat and other sensitive natural communities**		
RHSNC-1. Avoid and minimize loss of riparian habitat and other sensitive natural communities	a) Biological surveys will be conducted to identify, map, and quantify riparian and other sensitive habitats in potential construction areas. b) Construction activities will be avoided in areas containing sensitive natural communities, as appropriate. c) If effects occur to riparian habitat, emergent wetland, or other sensitive natural communities associated with streams, the State lead agency will comply with Section 1602 of the California Fish and Game Code; compliance may include measures to protect fish and wildlife resources during the project.	Project and Program	DFG
RHSNC-2. Compensate for loss of riparian habitat and other sensitive natural communities	a) The Riparian Habitat Mitigation and Monitoring Plan for the SJRRP will be developed and implemented in coordination with DFG. Credits for increased acreage or improved ecological function or riparian and wetland habitats resulting from the implementation of SJRRP actions will be applied as compensatory mitigation before additional compensatory measures are required. b) If losses of other sensitive natural communities (e.g., recognized as sensitive by CNDDB, but not protected under other regulations or policies) would not be offset by the benefits of the SJRRP, then additional compensation will be provided through creating, restoring, or preserving in perpetuity in-kind communities at a sufficient ratio for no net loss of habitat function or acreage. The appropriate ratio will be determined in consultation with USFWS or DFG, depending on agency jurisdiction.	Project and Program	DFG

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
WUS	**Waters of the United States/waters of the State**		
WUS-1. Identify and quantify wetlands and other waters of the United States	a) Before SJRRP actions that may affect waters of the United States or waters of the State, Reclamation will map the distribution of wetlands (including vernal pools and other seasonal wetlands) in the Eastside and Mariposa bypasses. b) The project proponent will determine, based on the mapped distribution of these wetlands and hydraulic modeling and field observation, the acreage of effects, if any, on waters of the United States. c) If it is determined that vernal pools or other seasonal wetlands will be affected by the SJRRP, the project proponent will conduct a delineation of waters of the United States, and submit the delineation to USACE for verification. The delineation will be conducted according to methods established in the USACE Wetlands Delineation Manual (Environmental Laboratory 1987) and Arid West Supplement (Environmental Laboratory 2008). d) Construction and modification of road crossings, control structures, fish barriers, fish passages, and other structures will be designed to minimize effects on waters of the United States and waters of the State, and will employ BMPs to avoid indirect effects on water quality.	Project and Program	USACE
WUS-2. Obtain permits and compensate for any loss of wetlands and other waters of the United States/waters of the State	a) The project proponent, in coordination with USACE, will determine the acreage of effects on waters of the United States and waters of the State that will result from implementation of the SJRRP. b) The project proponent will adhere to a "no net loss" basis for the acreage of wetlands and other waters of the United States and waters of the State that will be removed and/or degraded. Wetland habitat will be restored, enhanced, and/or replaced at acreages and locations and by methods agreed on by USACE and the Central Valley RWQCB, as appropriate, depending on agency jurisdiction. c) The project proponent will obtain Section 404 and Section 401 permits and comply with all permit terms. The acreage, location, and methods for compensation will be determined during the Section 401 and Section 404 permitting processes. d) The compensation will be consistent with recommendations in the Fish and Wildlife Coordination Act Report (Appendix F of this Draft PEIS/R).	Project and Program	USACE
INV	**Invasive plants**		
INV-1. Implement the Invasive Vegetation Monitoring and Management Plan	a) Reclamation and the project lead agencies will implement the Invasive Vegetation Monitoring and Management Plan for the SJRRP (Appendix L of this Draft PEIS/R), which includes measures to monitor, control, and where possible eradicate, invasive plant infestations during flow releases and construction activities. b) The implementation of the Invasive Vegetation Monitoring and Management Plan (Appendix L of this Draft PEIS/R) will include monitoring procedures, thresholds for management responses, success criteria, and adaptive management measures for controlling invasive plant species. c) The control of invasive weeds and other recommended actions in the Invasive Vegetation Monitoring and Management Plan (Appendix L of this Draft PEIS/R) will be consistent with recommendations in the Fish and Wildlife Coordination Act Report (Appendix F of this Draft PEIS/R).	Project and Program	Lead Agency
CP	**Conservation plans**		
CP-1. Remain consistent with approved conservation plans	a) Facility siting and construction activities will be conducted in a manner consistent with the goals and strategies of adopted habitat conservation plans, natural community conservation plans, or other approved local, regional, or State habitat conservation plans to the extent feasible. Coordination shall occur with USFWS and/or DFG, as appropriate.	Program	USFWS DFG
CP-2. Compensate effects consistent with approved conservation plans	a) The project proponent shall compensate effects consistent with applicable conservation plans and implement all applicable measures required by the plans.	Program	USFWS DFG

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
GS	**Southern distinct population segment of North American green sturgeon**		
GS-1. Avoid and minimize loss of habitat and individuals	a) The SJRRP will be operated in such a way that actions within green sturgeon habitat shall be done in accordance with existing operating criteria of the CVP and SWP, and prevailing and relevant laws, regulations, BOs, and court orders in place when the action(s) are performed.	Project and Program	NMFS
CVS	**Central Valley steelhead**		
CVS-1. Avoid loss of habitat and risk of take of species	a) Impacts to habitat conditions (i.e., changes in flows potentially resulting in decreased flows in the tributaries, increases in temperature, increases in pollutant concentration, change in recirculation/recapture rates and methods, decrease in floodplain connectivity, removal of riparian vegetation, decreased in quality rearing habitat, etc.) must be analyzed in consultation with NMFS. b) The Hills Ferry Barrier will be operated and maintained to exclude Central Valley steelhead from the Restoration Area during construction activities and until suitable habitat conditions are restored. c) Maintenance of conservation measures will be conducted to the extent necessary to ensure that the overall long-term habitat effects of the project are positive. d) Before implementation of site-specific actions, the action agency shall conduct an education program for all agency and contracted employees relative to the Federally listed species that may be encountered within the study area of the action, and required practices for their avoidance and protection. A NMFS-appointed representative shall be identified to employees and contractors to ensure that questions regarding avoidance and protection measures are addressed in a timely manner. e) Disturbance of riparian vegetation will be avoided to the greatest extent practicable. f) A spill prevention plan will be prepared describing measures to be taken to minimize the risk of fluids or other materials used during construction (e.g., oils, transmission and hydraulic fluids, cement, fuel) from entering the San Joaquin River or contaminating riparian areas adjacent to the river itself. In addition to a spill prevention plan, a cleanup protocol will be developed before construction begins and shall be implemented in case of a spill. g) Stockpiling of materials, including portable equipment, vehicles and supplies, such as chemicals, shall be restricted to the designated construction staging areas, exclusive of any riparian and wetland areas. h) A qualified biological monitor will be present during all construction activities, including clearing, grubbing, pruning, and trimming of vegetation at each job site during construction initiation, midway through construction, and at the close of construction, to monitor implementation of conservation measures and water quality. i) The San Joaquin River channel shall be designed to decrease or eliminate predator holding habitat, in coordination with NMFS.	Project and Program	NMFS

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
CVS-2. Minimize loss of habitat and risk of take of species	a) In-channel construction activities that could affect designated critical habitat for Central Valley steelhead will be limited to the low-flow period between June 1 and October 1 to minimize potential for adversely affecting Federally listed anadromous salmonids during their emigration period. b) In-channel construction activities that could affect designated critical habitat for Central Valley steelhead will be limited to daylight hours during weekdays, leaving a nighttime and weekend period of passage for Federally listed fish species. c) Construction BMPs for off-channel staging, and storage of equipment and vehicles, will be implemented to minimize the risk of contaminating the waters of the San Joaquin River by spilled materials. BMPs will also include minimization of erosion and stormwater runoff, as appropriate. d) Riparian vegetation removed or damaged will be replaced at a ratio, coordinated with NMFS, within the immediate area of the disturbance to maintain habitat quality. e) If individuals of listed species are observed present within a project area, NMFS must be notified. NMFS personnel shall have access to construction sites during construction, and following completion, to evaluate species presence and condition and/or habitat conditions. f) If bank stabilization activities should be necessary, then such stabilization shall be constructed to minimize predator habitat, minimize erosion potential, and contain material suitable for supporting riparian vegetation.	Program	NMFS
WRCS	**Sacramento Valley winter-run Chinook salmon**		
WRCS-1. Avoid and minimize loss of habitat and individuals	a) The SJRRP will be operated in such a way that actions related to the SJRRP in the vicinity of winter-run Chinook salmon habitat shall be performed in accordance with existing operating criteria of the CVP and SWP, and prevailing and relevant laws, regulations, BOs, and court orders in place at the time the actions are performed.	Project and Program	NMFS DFG
SRCS	**Central Valley spring-run Chinook salmon**		
SRCS-1. Avoid and minimize loss of habitat and individuals	a) The SJRRP will be operated in such a way that actions in the vicinity of spring-run Chinook salmon habitat shall be done in accordance with existing operating criteria of the CVP and SWP, and prevailing and relevant laws, regulations, BOs, and court orders in place at the time the actions are performed. b) SJRRP actions shall be performed in accordance with the Experimental Population 4(d) rule, as it is developed, and where applicable.	Project and Program	NMFS DFG

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
EFH	**Essential fish habitat (Pacific salmonids & starry flounder)**		
EFH-1. Avoid loss of habitat and risk of take of species	a) Impacts to habitat conditions (e.g., changes in flows potentially resulting in decreased flows in the tributaries, increases in temperature, increases in pollutant concentration, change in recirculation/recapture rates and methods, decrease in floodplain connectivity, removal of riparian vegetation, decreased in quality rearing habitat) must be analyzed in consultation with NMFS. b) The Hills Ferry Barrier will be operated and maintained to exclude Pacific salmonids from the Restoration Area during construction activities, and until suitable habitat conditions are restored. c) Maintenance of conservation measures will be conducted to the extent necessary to ensure that the overall long-term habitat effects of the project are positive. d) Before implementation of site-specific actions, the action agency shall conduct an education program for all agency and contracted employees relative to the Federally listed species that may be encountered within the study area of the action, and required practices for their avoidance and protection. A NMFS-appointed representative shall be identified to employees and contractors to ensure that questions regarding avoidance and protection measures are addressed in a timely manner. e) Disturbance of riparian vegetation will be avoided to the greatest extent practicable. f) A spill prevention plan will be prepared describing measures to be taken to minimize the risk of fluids or other materials used during construction (e.g., oils, transmission and hydraulic fluids, cement, fuel) from entering the San Joaquin River or contaminating riparian areas adjacent to the river itself. In addition to a spill prevention plan, a cleanup protocol will be developed before construction begins and shall be implemented in case of a spill. g) Stockpiling of materials, including portable equipment, vehicles and supplies, such as chemicals, shall be restricted to the designated construction staging areas, exclusive of any riparian and wetland areas. h) A qualified biological monitor will be present during all construction activities, including clearing, grubbing, pruning, and trimming of vegetation at each job site during construction initiation, midway through construction, and at the close of construction to monitor implementation of conservation measures and water quality. i) The bottom topography of the San Joaquin River channel will be designed to decrease or eliminate predator holding habitat.	Project and Program	NMFS

Table ES-6. Conservation Measures for Biological Resources That May Be Affected by Settlement Actions

CONSERVATION MEASURE AND IDENTIFIER	APPLICABLE HABITAT AND/OR SPECIES, AND CONSERVATION MEASURE DESCRIPTION	LEVEL OF COMPLIANCE	REGULATORY AGENCY
EFH-2. Minimize loss of habitat and risk of take from implementation of construction activities	a) In-channel construction activities that could affect habitat for will be limited to the low-flow period between June 1 and October 1 to minimize potential for adversely affecting Federally listed anadromous salmonids during their emigration period. b) In-channel construction activities that could affect habitat for starry flounder and Pacific salmonids will be limited to daylight hours during weekdays, leaving a nighttime and weekend period of passage for Federally listed fish species. c) Construction BMPs for off-channel staging and storage of equipment and vehicles will be implemented to minimize the risk of contaminating the waters of the San Joaquin River by spilled materials. BMPs will also include minimization of erosion and stormwater runoff, as appropriate. d) Riparian vegetation removed or damaged will be replaced at a ratio, coordinated with NMFS, within the immediate area of the disturbance to maintain habitat quality. e) If individuals of listed species are observed present within a project area, NMFS must be notified. NMFS personnel shall have access to construction sites during construction and following completion to evaluate species presence and condition and/or habitat conditions. f) If bank stabilization activities should be necessary, then such stabilization shall be constructed to minimize predator habitat, minimize erosion potential, and contain material suitable for supporting riparian vegetation.	Program	NMFS

Key:
ºC = degrees Celsius
ºF = degrees Farenheit
BMP = best management practice
BO = Biological Opinion
CFR = Code of Federal Regulations
cfs = cubic feet per second
CNDDB = California Natural Diversity Database
CVP = Central Valley Project
DFG = California Department of Fish and Game
DWR = California Department of Water Resources
EPA = Federal Environmental Protection Agency
NMFS = National Marine Fisheries Service
PEIS/R = Program Environmental Impacts Statement/Report
Reclamation = U.S. Department of the Interior, Bureau of Reclamation
RWQCB = Regional Water Quality Control Board
Settlement = Stipulation of Settlement in NRDC, et al,. v. Kirk Rodgers, et al.
SJRRP = San Joaquin River Restoration Program
State = State of California

No-Action and No-Project Alternative

This Draft PEIS/R evaluates a No-Action Alternative in compliance with NEPA No-Action and CEQA No-Project requirements. The No-Action Alternative reflects conditions projected to exist in 2030 if the Settlement is not implemented. The No-Action Alternative includes existing facilities, conditions, land uses, and reasonably foreseeable actions expected to occur in the study area by 2030. Reasonably foreseeable actions include actions that have current authorization, complete funding for design and construction, and complete environmental permitting and compliance.

The No-Action Alternative would not include implementing the Settlement. Although the specific actions regarding *NRDC, et al., v. Kirk Rodgers, et al.,* that would be taken under the No-Action Alternative are too speculative for meaningful consideration, and cannot be defined at this time, it is reasonable to assume that the Settlement would be voided and litigation would resume.

Additional simulations are being prepared to determine the projected conditions under the No-Action Alternative with implementation of the 2008 USFWS CVP/SWP Operations BO and the 2009 NMFS CVP/SWP Operations BO. The results of this assessment will change the anticipated effects of the No-Action Alternative; however, the relative impacts and overall impact mechanisms are not anticipated to change with the results of this assessment. The results of this assessment will be provided in the Final PEIS/R.

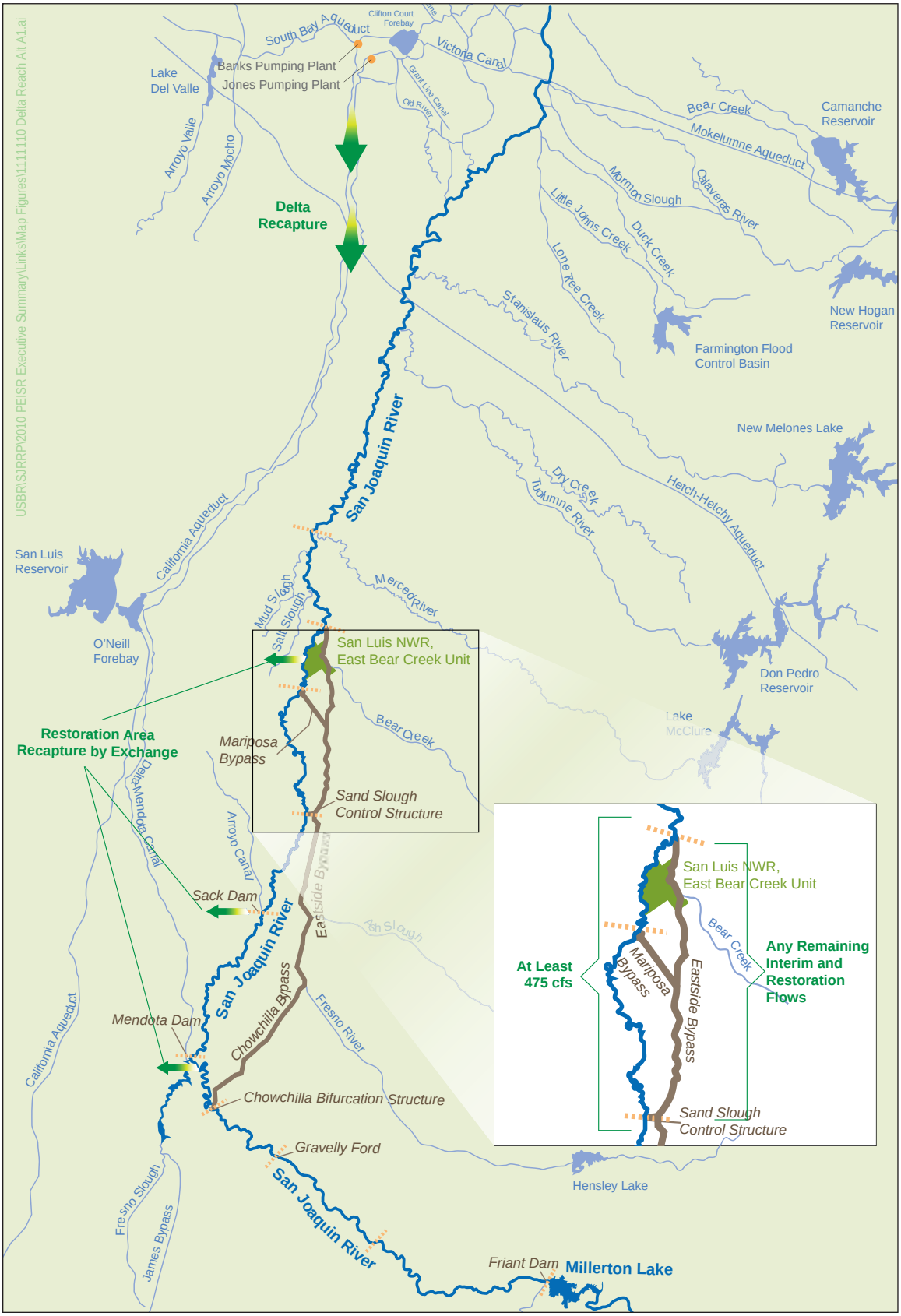
San Joaquin River near San Mateo Road

Alternative A1
Reach 4B1 at 475 cfs, Delta Recapture

Alternative A1 includes reoperating Friant Dam, and a range of actions to achieve the Restoration and Water Management goals, as shown in Figure ES-3. Under Alternative A1, Reach 4B1 would convey at least 475 cfs, and the Eastside and Mariposa bypasses would convey any remaining Interim and Restoration flows, as shown in Figure ES-6. Alternative A1 includes the potential for recapture of Interim and Restoration flows in the Restoration Area and in the Delta using existing facilities, and the potential for recirculation of all recaptured Interim and Restoration flows, as shown in Figure ES-6. The Physical Monitoring and Management Plan is included in Alternative A1 to provide guidelines for observing and adjusting to changes in conditions regarding flow, seepage, channel capacity, propagation of native vegetation, and suitability of spawning gravel. Alternative A1 also includes the Conservation Strategy, which consists of conservation measures necessary to provide a net increase in the extent and quality of riparian and wetland habitats in the Restoration Area, to avoid reducing the long-term viability of sensitive species, and to be consistent with adopted conservation plans.

Clifton Court Forebay

Figure ES-6. Flow Routing and Water Recapture Under Alternative A1

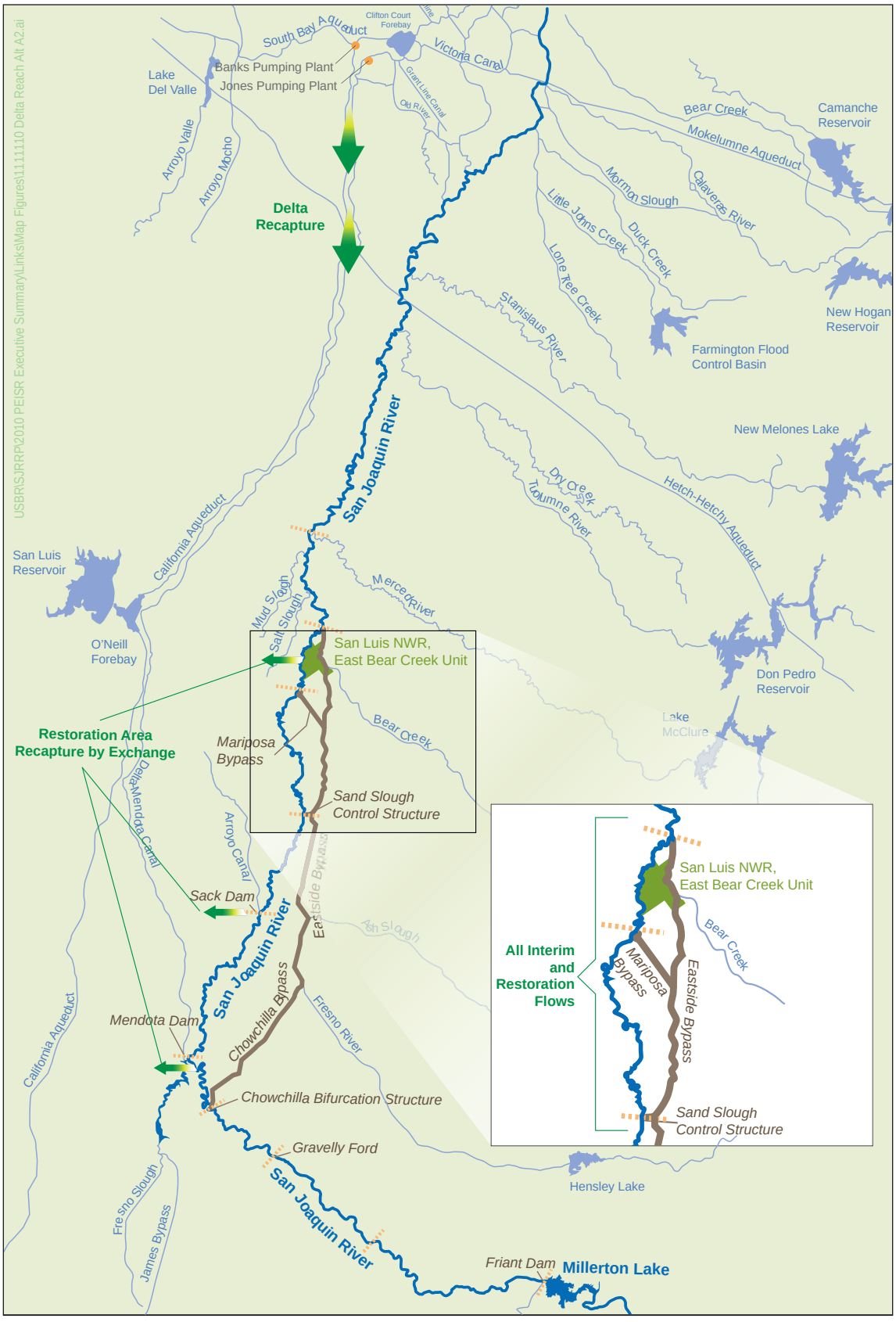


Alternative A2
Reach 4B1 at 4,500 cfs, Delta Recapture

Alternative A2 includes the same Restoration and Water Management actions as Alternative A1. Alternative A2 also includes additional program-level Restoration actions to increase Reach 4B1 channel capacity to at least 4,500 cfs with integrated floodplain habitat, as specified in Paragraph 11(b)(1) of the Settlement. Alternative A2 is shown in Figure ES-7.

Restricted channel capacity in Reach 4B

Figure ES-7. Flow Routing and Water Recapture Under Alternative A2

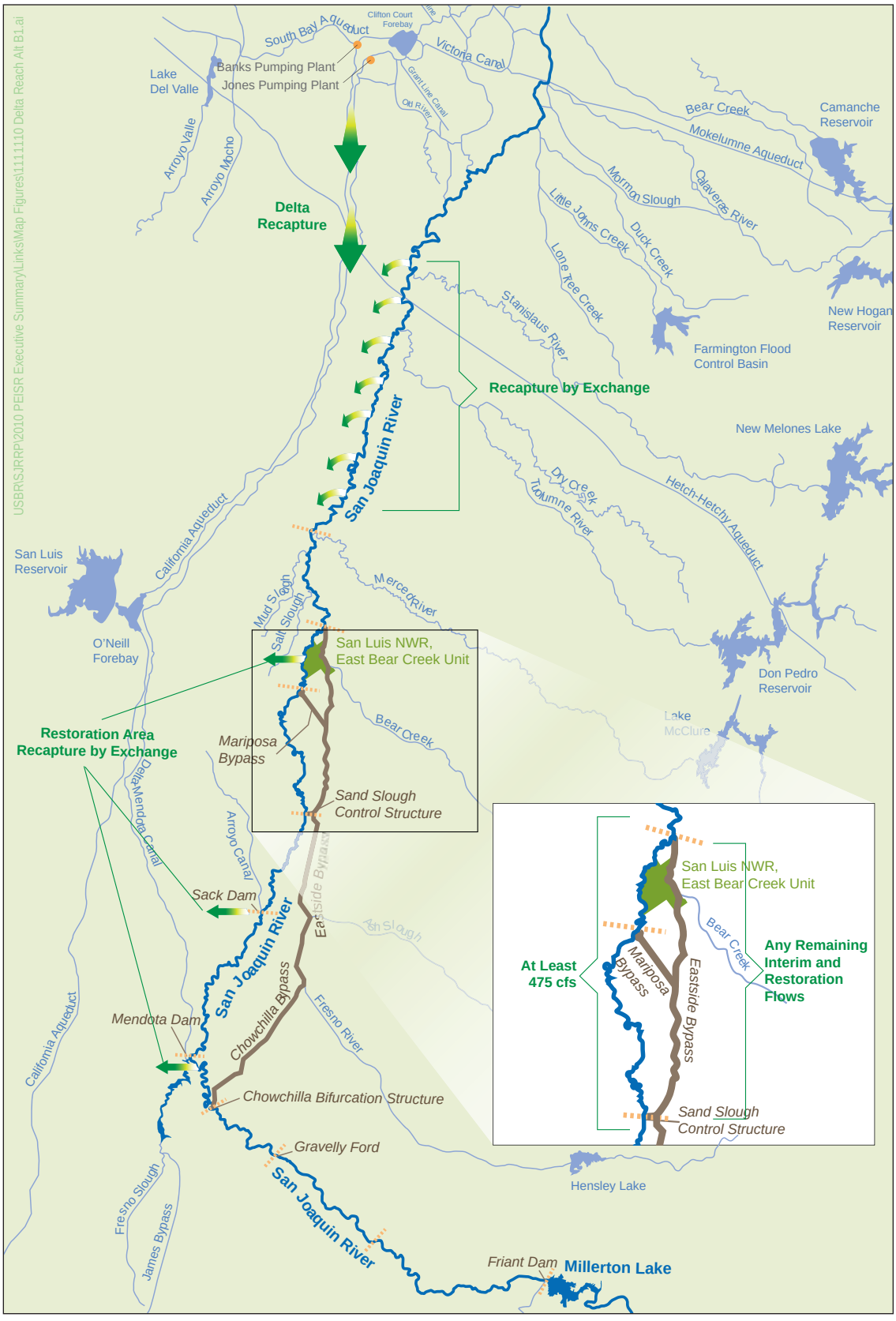


Alternative B1
Reach 4B1 at 475 cfs, San Joaquin River Recapture

Alternative B1 includes all of the program-level and project-level actions in Alternative A1, plus additional program-level Water Management actions to recapture Interim and Restoration flows using existing facilities along the San Joaquin River between the Merced River and the Delta. These actions could include potential in-district modifications to existing off-river facilities to facilitate routing or storage of water, such as expansion of existing canals or construction of lift stations on existing canals. Alternative B1 is shown in Figure ES-8.

San Joaquin River and Chowchilla Bypass

Figure ES-8. Flow Routing and Water Recapture Under Alternative B1

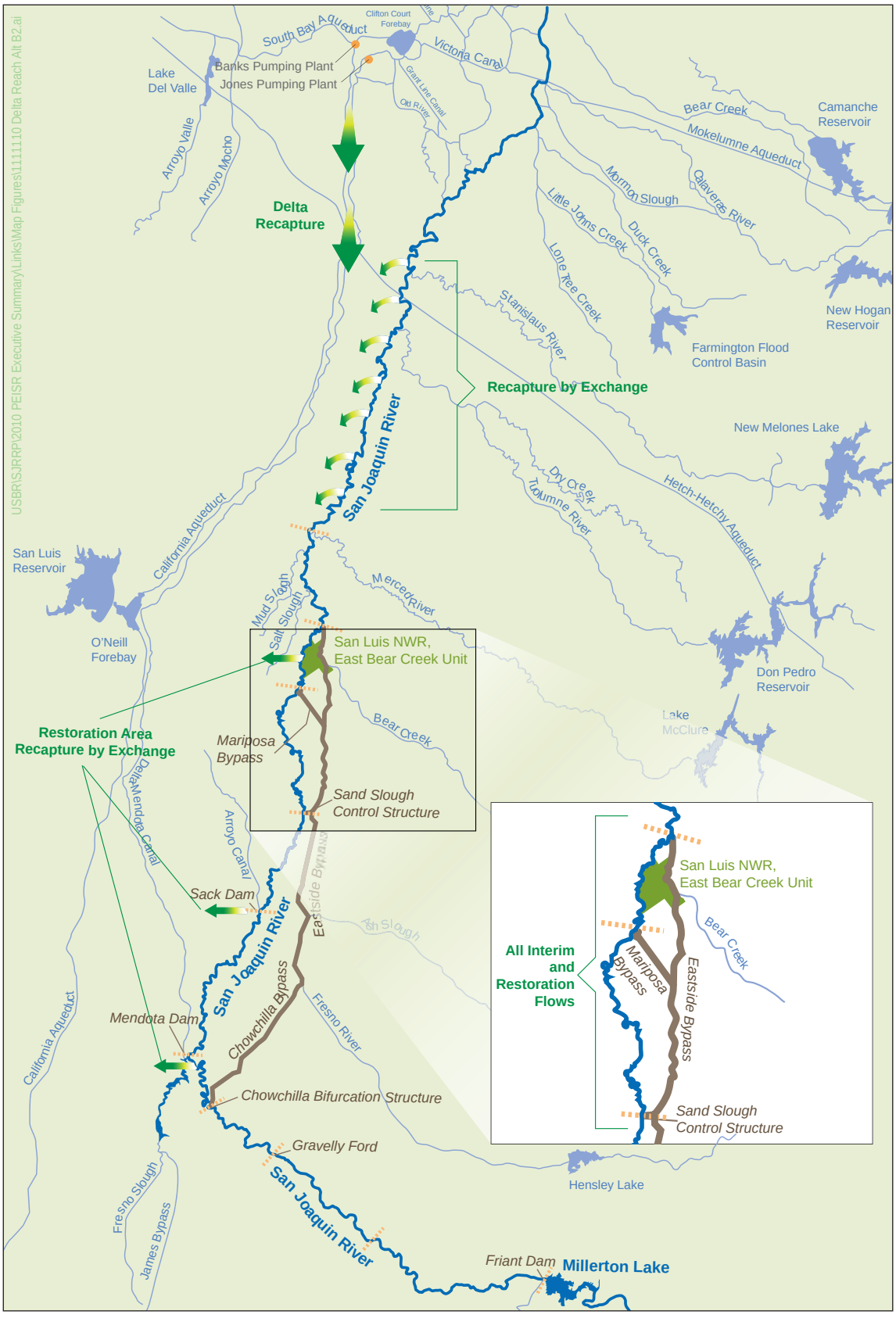


Alternative B2
Reach 4B1 at 4,500 cfs, San Joaquin River Recapture

Alternative B2 includes all of the program-level and project-level actions in Alternative B1. Alternative B2 also includes additional program-level Restoration actions in Reach 4B1 and the bypass system to increase Reach 4B1 channel capacity to at least 4,500 cfs with integrated floodplain habitat, as included in Alternative A2. Under this alternative, the Eastside Bypass would not convey Interim or Restoration flows after completion of Reach 4B1 channel modifications. Alternative B2 is shown in Figure ES-9.

Head of Reach 4B

Figure ES-9. Flow Routing and Water Recapture Under Alternative B2



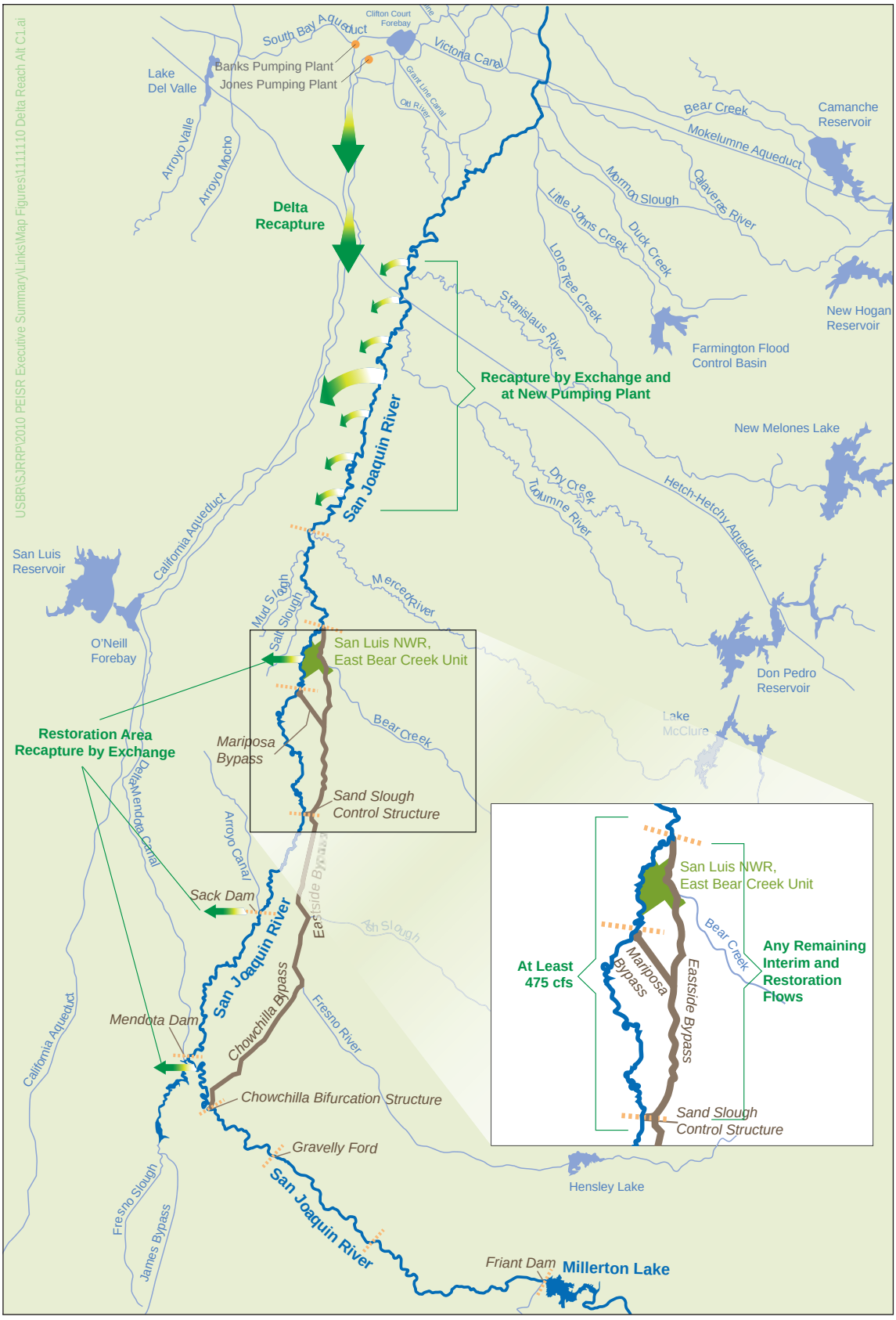
ALTERNATIVE B2
REACH 4B1 AT 4,500 CFS, SAN JOAQUIN RIVER RECAPTURE

Alternative C1
Reach 4B1 at 475 cfs, New Pumping Plant Recapture

Alternative C1 includes all of the program-level and project-level actions in Alternative B1, plus additional program-level Water Management actions for constructing and operating new pumping infrastructure on the San Joaquin River, below the confluence of the Merced River, to recapture Interim and Restoration flows. New pumping infrastructure could include expansion of existing pumping plants, or the construction of a new pumping plant on the San Joaquin River below the confluence of the Merced River. Alternative C1 is shown in Figure ES-10.

San Joaquin River at the confluence with the Merced River

Figure ES-10. Flow Routing and Water Recapture Under Alternative C1

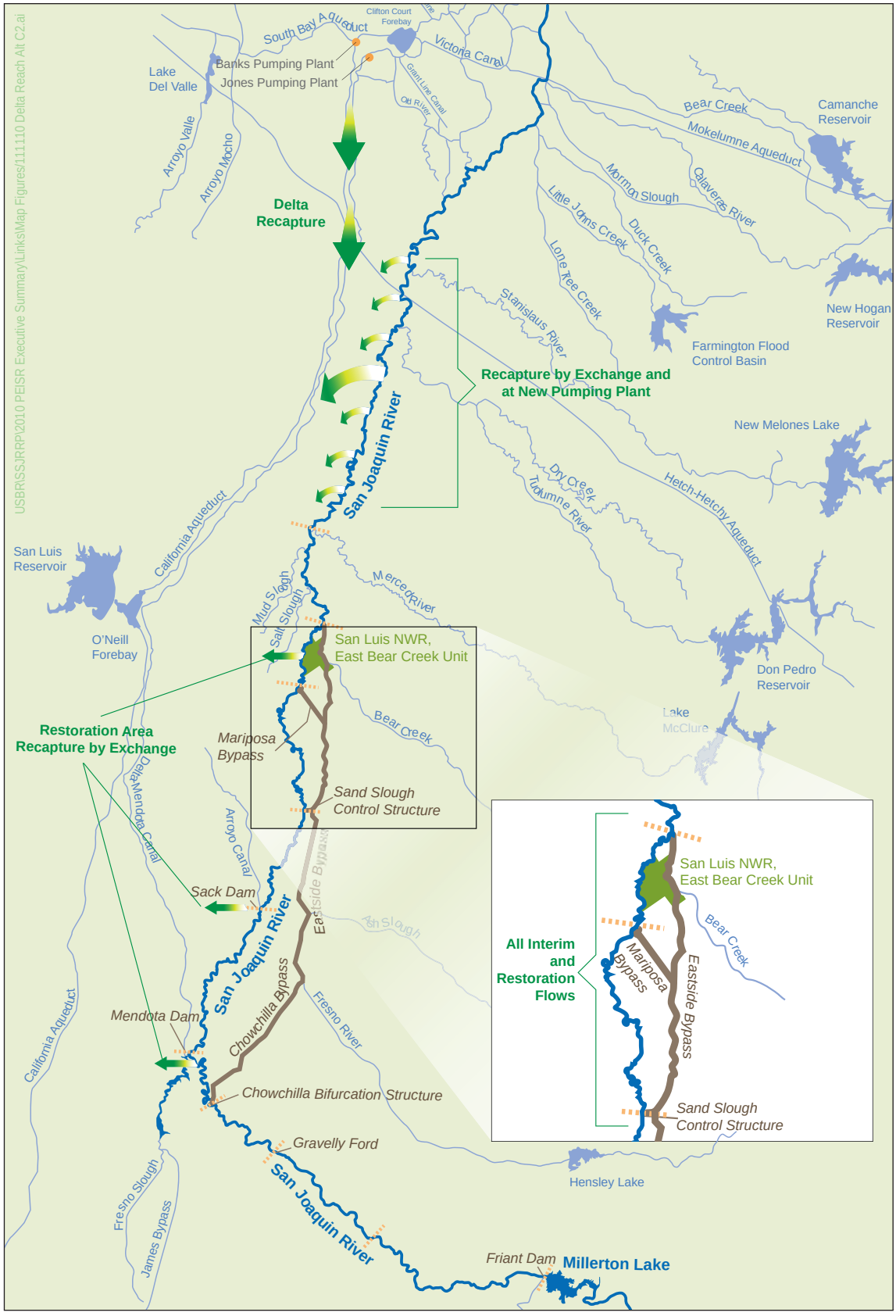


Alternative C2
Reach 4B1 at 4,500 cfs, New Pumping Plant Recapture

Alternative C2 includes all program-level and project-level actions in Alternative C1. Alternative C2 also includes additional program-level Restoration actions in Reach 4B1 and the bypass system to increase Reach 4B1 channel capacity to at least 4,500 cfs with integrated floodplain habitat, as included in Alternative A2. Alternative C2 is shown in Figure ES-11.

Orchard in bloom in the San Joaquin Valley

Figure ES-11. Flow Routing and Water Recapture Under Alternative C2



Alternatives Considered and Eliminated

Formulation of a range of program alternatives for evaluation in this Draft PEIS/R began with a review of Settlement provisions for achieving the Restoration and Water Management goals. This was followed by preparing the purpose, need, and objectives; developing criteria for including actions in the program alternatives; defining planning and implementation constraints; and identifying related projects and opportunities associated with achieving the purpose and need. These steps were applied to actions identified in Settlement provisions and to comments received during the public scoping process to identify a range of alternatives to be addressed. As a result of this process, several potential actions were eliminated from consideration and the reasonable range of initial program alternatives was identified. This process and the alternatives eliminated from consideration are described in the SJRRP 2008 *Initial Program Alternatives Report*.

Some actions suggested during the scoping process and considered by the Implementing Agencies were not retained for inclusion in the program alternatives because they would be beyond the scope of the Settlement. These actions included restoring salmon in other river systems instead of the San Joaquin River; limiting human population growth; setting salinity standards for the San Joaquin River; removing debris and trash from the river; designating a conservation zone for the San Joaquin River; raising Friant Dam or developing other major new surface water storage facilities; routing Interim and Restoration flows through the Chowchilla Bypass on a permanent basis; and requiring that the Central Valley Flood Protection Board (formerly The Reclamation Board of the State of California) ensure the integrity of the flood management system.

Friant Dam and Millerton Lake

Areas of Known Controversy

CEQA Guidelines Section 15123(b) require that an Executive Summary identify "areas of controversy known to the lead agency including issues raised by agencies and the public." During development and evaluation of the program alternatives, preliminary information was discussed with the Settling Parties, Third Parties, and other stakeholders. Remaining areas of known controversy are largely associated with the lack of available data regarding the existing condition of the Restoration Area, and uncertainty regarding the future performance of the system. Specifically, areas of known controversy include the potential for groundwater seepage to occur within the Restoration Area as a result of Interim and Restoration flows, uncertainty regarding the physical condition of levees in the Restoration Area, the likelihood of successful restoration of Chinook salmon to the Restoration Area, and the ability to release full Restoration Flows under the schedule anticipated in the Settlement.

Chinook salmon

Concerns were raised by some members of the public about the ability to avoid seepage damage to properties along the river. Measures described in the Physical Monitoring and Management Plan would provide additional information during the release and conveyance of Interim and Restoration flows about the response of the system to flows in the river channel. This information would be used in estimating then-existing channel capacities and during the planning stages of site-specific projects which may alter the channel or otherwise influence seepage.

There is uncertainty about the ability to reintroduce Chinook salmon and establish self-sustaining populations within the Restoration Area. The Fisheries Management Plan describes the framework for addressing specific actions related to fisheries and evaluates their merits (including uncertainty) in an action routing process.

The Settlement specifies that full Restoration Flows are to begin no later than January 1, 2014, but shall be limited to flow levels that can be accommodated by then-existing channel capacities. Substantial information has been collected since the signing of the Settlement as part of development of this Draft PEIS/R, implementing the Interim Flows, and as part of California FloodSAFE initiative and other programs. This new information indicates that current channel capacities in the Restoration Area may not be sufficient to convey full Restoration Flows. Additional information is needed to better understand the integrity of banks and levees throughout the Restoration Area. Collecting and analyzing this information may take

years to complete. The action alternatives include measures that would achieve the following objectives: (1) commit Reclamation to implementing actions that will meet performance standards that minimize increases in flood risk as a result of Interim or Restoration flows, (2) limit the release and conveyance of Interim and Restoration flows to those flows that will remain in-channel until adequate data are available to apply the performance standards and until the performance standards are satisfied, and (3) enable the Settlement to be implemented in coordination with other ongoing and future actions outside of the Settlement that could address channel capacity issues identified in the Settlement or through the SJRRP or other programs. Therefore, it may take longer to achieve full Restoration Flows than was anticipated in the Settlement. It is possible that the Settlement could be fully implemented in a manner consistent with the Act, and the purpose of the project thereby achieved, without release of the maximum Restoration Flows.

Eastside Bypass

Issues to Be Resolved

Consistent with CEQ Guidelines for NEPA and State CEQA Guidelines, the Final PEIS/R will identify a preferred alternative for implementation. The preferred alternative is not identified in this Draft PEIS/R. The preferred alternative will be identified in the Final PEIS/R based on the information presented in this Draft PEIS/R, in light of any potential revisions made in response to comments received on the Draft PEIS/R. Because a preferred alternative has not been determined at this time, the potential effects of all alternatives are described at an equal level of detail.

Additional simulations are being prepared to determine the impacts of the program alternatives under the 2008 USFWS CVP/SWP Operations BO and the 2009 NMFS CVP/SWP Operations BO. The results of this assessment may change the anticipated effects of the alternatives; however, the relative impacts and overall impact mechanisms are not anticipated to change with the results of this assessment. The results of this assessment will be provided in the Final PEIS/R.

Particular uncertainty exists as to the amount of water supply reduction the Friant Division long-term contractors would experience as a result of implementing the Settlement. The range of potential water supply reduction to the Friant Division long-term contractors as a result of implementing the Settlement is shown in Table ES-7 and analysis of the potential impacts of this water supply are presented in this Draft PEIS/R Additional specificity is necessary to achieve elements of the Water Management Goal to reduce or avoid adverse water supply impacts to Friant Division long-term contractors, including recirculation of Interim and Restoration flows, and the ability to convey and store supplies under Paragraph 16(b) of the Settlement.

Row crops in the San Joaquin Valley

Table ES-7. Range of Simulated Long-Term Average Annual Water Supply Reduction to Friant-Division Long-Term Contractors

Water Supply Component		EXISTING CONDITION (2005)			FUTURE CONDITION (2030)			
		ALT A1 AND A2 (TAF)	ALT B1 AND B2 (TAF)	ALT C1 AND C2 (TAF)	NO-ACTION ALT (TAF)	ALT A1 AND A2 (TAF)	ALT B1 AND B2 (TAF)	ALT C1 AND C2 (TAF)
Releases for Interim and Restoration Flows		250	250	250	0	250	250	250
Recirculation Under Paragraph 16(a)	Project-Level[1]	59	59	59	0	59	59	59
	Program-Level[2]	0	6	72	0	0	56	76
Friant-Kern and Madera Canal Diversions at Friant Dam	Non- Paragraph 16(b) Diversions	1,166	1,166	1,166	1,313	1,166	1,166	1,166
	Diversions Under Paragraph 16(b)	46	46	46	0	46	46	46
Maximum Deliveries to Friant Division		1,271	1,271	1,283	1,313	1,271	1,268	1,288
Range of Potential Reduction[3,4]		41 - 100	41 -100	29 -100	0	42 -101	44 - 101	24 -101

Notes:
Simulation period: October 1921 – September 2003.
[1] Project-level recirculation under Paragraph 16(a) is shown as total deliveries to south-of-Delta Central Valley Project/State Water Project contractors, and is the maximum long-term average annual water supply that would be available for recirculation to Friant Division long-term contractors as a result of Delta diversions.
[2] Program-level recapture under Paragraph 16(a) is shown as total diversion along the San Joaquin River between the Merced River confluence and the Delta (under Alternatives B1, B2, C1, and C2), and is the maximum long-term average annual water supply that would be available for recirculation to Friant Division long-term contractors as a result of these diversions.
[3] The range of potential reduction in long-term annual average water supply reduction is calculated as the difference of the minimum and maximum long-term average annual water supply deliveries and the long-term average annual water supply delivery under the No-Action Alternative. The minimum long-term average annual water supply delivery is calculated as the deliveries under the No-Action Alternative minus the maximum deliveries to the Friant Division (including diversions at Friant-Kern and Madera canals and supplies recirculated under Paragraph 16(a)).
[4] The maximum long-term average annual water supply delivery is calculated as the deliveries No-Action Alternative minus the supplies recirculated under Paragraph 16(a).

Key:
Alt = Alternative
jTAF = thousand acre-feet

Summary of Impacts and Mitigation Measures

The impact conclusions and associated mitigation measures for the 22 resource topics evaluated in this Draft PEIS/R are summarized Table ES-8. Impacts with the potential to result in a cumulatively considerable contribution to a significant cumulative impact are shown in Table ES-9.

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Air Quality: Program-Level				
AIR-1: Construction-Related Emissions of Criteria Air Pollutants and Precursors	No-Action	PSU	--	PSU[1]
	A1	PS	AIR-1: Prepare Project-Level Quantitative Analysis of Construction-Related Emissions and Implement Measures to Minimize Emissions	PSU[1]
	A2	PS		PSU[1]
	B1	PS		PSU[1]
	B2	PS		PSU[1]
	C1	PS		PSU[1]
	C2	PS		PSU[1]
AIR-2: Operations-Related Emissions of Criteria Air Pollutants and Precursors	No-Action	PSU	--	PSU[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
AIR-3: Exposure of Sensitive Receptors to Substantial Concentrations of Toxic Air Contaminants	No-Action	PSU	--	PSU[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
AIR-4: Exposure of Sensitive Receptors to Odor Emissions	No-Action	PSU	--	PSU[2]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Air Quality: Project-Level				
AIR-5: Construction-Related Emissions of Criteria Air Pollutants and Precursors	No-Action	PSU	--	PSU[1]
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
AIR-6: Operations-Related Emissions of Criteria Air Pollutants and Precursors	No-Action	PSU	--	PSU[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
AIR-7: Exposure of Sensitive Receptors to Substantial Concentrations of Toxic Air Contaminants	No-Action	PSU	--	PSU[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
AIR-8: Exposure of Sensitive Receptors to Odor Emissions	No-Action	PSU	--	PSU[2]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Biological Resources - Fisheries: Program-Level				
FSH-1: Changes in Water Temperatures in the San Joaquin River Between Friant Dam and the Merced River	No-Action	PS	--	PS[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Fisheries: Program-Level (contd.)				
FSH-2: Changes in Pollutant Discharge in the San Joaquin River Between Friant Dam and the Merced River	No-Action	PS	--	PS[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-3: Changes in Sediment Discharge and Turbidity in the San Joaquin River Between Friant Dam and the Merced River	No-Action	PS	--	PS[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-4: Construction-Related Changes in Habitat Conditions in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-5: Displacement from Preferred or Required Habitat, Injury, or Mortality in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-6: Changes in Habitat Conditions in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-7: Changes in Diversions and Entrainment in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Fisheries: Program-Level (contd.)				
FSH-8: Changes in Predation Levels in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-9: Changes in Food Web Support in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-10: Effects to Fall-Run Chinook Salmon from Hybridization Resulting from Reintroduction of Spring-Run Chinook Salmon to the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-11: Effects of Disease on Fisheries in the San Joaquin River Between the Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-12: Changes in Diversions and Entrainment in the San Joaquin River Between the Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Fisheries: Program-Level (contd.)				
FSH-13: Displacement from Preferred or Required Habitat, Injury, or Mortality in the San Joaquin River Between Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-14: Changes in Water Temperatures in the San Joaquin River Between the Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Biological Resources - Fisheries: Project-Level				
FSH-15: Changes in Water Temperatures and Dissolved Oxygen Concentrations in the San Joaquin River Upstream from Friant Dam	No-Action	PS	--	PS[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-16: Changes in Pollutant Discharge and Mobilization in the San Joaquin River Upstream from Friant Dam	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
FSH-17: Changes in Sediment Discharge and Turbidity in the San Joaquin River Upstream from Friant Dam	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Fisheries: Project-Level (contd.)				
FSH-18: Changes in Fish Habitat Conditions in the San Joaquin River Upstream from Friant Dam	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-19: Changes in Diversions and Entrainment in the San Joaquin River Upstream from Friant Dam	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-20: Changes in Predation Levels in the San Joaquin River Upstream from Friant Dam	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-21: Changes in Food Web Support in the San Joaquin River Upstream from Friant Dam	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-22: Changes in Water Temperatures and Dissolved Oxygen Concentrations in the San Joaquin River Between Friant Dam and the Merced River	No-Action	PS	--	PS[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Fisheries: Project-Level (contd.)				
FSH-23: Changes in Pollutant Discharge and Mobilization in the San Joaquin River Between Friant Dam and the Merced River	No-Action	PS	--	PS[1]
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-24: Changes in Sediment Discharge and Turbidity in the San Joaquin River Between Friant Dam and the Merced River	No-Action	PS	--	PS[1]
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-25: Changes in Fish Habitat Conditions in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-26: Changes in Diversions and Entrainment in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-27: Changes in Predation Levels in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Fisheries: Project-Level (contd.)				
FSH-28: Changes in Food Web Support in the San Joaquin River Between Friant Dam and the Merced River	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-29: Effects of Disease on Fisheries in the San Joaquin River Between the Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-30: Changes in Chinook Salmon and Steelhead Habitat in the Merced, Tuolumne, and Stanislaus Rivers	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-31: Changes in Water Temperatures and Dissolved Oxygen Concentrations in the Delta	No-Action	PS	--	PS[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-32: Changes in Pollutant Discharge and Mobilization in the Delta	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Fisheries: Project-Level (contd.)				
FSH-33: Changes in Sediment Discharge and Turbidity in the Delta	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-34: Changes in Fish Habitat Conditions in the Delta	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-35: Changes in Diversions and Entrainment in the Delta	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-36: Changes in Predation Levels in the Delta	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
FSH-37: Changes in Food Web Support in the Delta	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Fisheries: Project-Level (contd.)				
FSH-38: Salinity Changes in the Delta	No-Action	PS	--	PS[2]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FSH-39: Changes to Delta Inflow and Flow Patterns in the Delta	No-Action	PS	--	PS[1]
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
Biological Resources - Vegetation and Wildlife: Program-Level				
VEG-1: Substantially Alter Riparian Habitat and Other Sensitive Communities in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
VEG-2: Fill, Fragment, Isolate, Divert, or Substantially Alter Jurisdictional Waters of the United States in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-3: Facilitate Increase in Distribution and Abundance of Invasive Plants in the Restoration Area	No-Action	SU	--	SU
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Vegetation and Wildlife: Program-Level (contd.)				
VEG-4: Substantially Affect Special-Status Plant Species in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-5: Substantially Reduce Habitat or Populations of Special-Status Animals in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-6: Substantially Alter Designated Critical Habitat in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-7: Conflict with Adopted Conservation Plans in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
VEG-8: Substantially Alter Riparian Habitat and Other Sensitive Communities Between the Merced River and the Delta	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Vegetation and Wildlife: Program-Level (contd.)				
VEG-9: Fill, Fragment, Isolate, Divert, or Substantially Alter Jurisdictional Waters of the United States Between the Merced River and the Delta	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-10: Facilitate Increase in Distribution and Abundance of Invasive Plants Between the Merced River and the Delta	No-Action	SU	--	SU
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-11: Substantially Alter Special-Status Plant Species Between the Merced River and the Delta	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-12: Substantially Reduce Habitat or Populations of Special-Status Animals Between the Merced River and the Delta	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-13: Substantially Alter Designated Critical Habitat Between the Merced River and the Delta	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-14: Conflict with Adopted Conservation Plans Between the Merced River and the Delta	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Vegetation and Wildlife: Project-Level				
VEG-15: Effects of Surface Water Fluctuation on Biological Resources Upstream from Friant Dam	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-16: Substantially Alter Riparian Habitat and Other Sensitive Communities in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
VEG-17: Fill, Fragment, Isolate, Divert, or Substantially Alter Jurisdictional Waters of the United States in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-18: Facilitate Increase in Distribution and Abundance of Invasive Plants in Sensitive Natural Communities in the Restoration Area	No-Action	SU	--	SU[2]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-19: Substantially Affect Delta Button-Celery and Other Special-Status Plant Species in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Vegetation and Wildlife: Project-Level (contd.)				
VEG-20: Substantially Reduce Habitat or Populations of Special-Status Animal Species in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-21: Substantially Alter Designated Critical Habitat in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-22: Conflict with Provisions of Adopted Habitat Conservation Plans, Natural Community Conservation Plans, and Other Approved Local, Regional, or State Conservation Plans in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
VEG-23: Substantially Affect Special-Status Species, Sensitive Communities, Jurisdictional Waters of the United States, and Adopted Conservation Plans Between the Merced River and the Delta	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VEG-24: Substantially Affect Special-Status Species, Sensitive Communities, Jurisdictional Waters of the United States, and Adopted Conservation Plans in the Delta	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Biological Resources - Vegetation and Wildlife: Project-Level (contd.)				
VEG-25: Substantially Affect Special-Status Species, Sensitive Communities, Jurisdictional Waters of the United States, and Adopted Conservation Plans in the CVP/ SWP Water Service Areas	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Climate Change: Program-Level[3]				
CLM-1: Construction-Related Emissions of GHGs	A1	PS	CLM-1: Implement All Feasible Measures to Reduce Emissions	PSU[2]
	A2	PS		PSU[2]
	B1	PS		PSU[2]
	B2	PS		PSU[2]
	C1	PS		PSU[2]
	C2	PS		PSU[2]
CLM-2: Operational Emissions of GHGs	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Climate Change: Project-Level[3]				
CLM-3: Construction-Related Emissions of GHGs	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
CLM-4: Operational Emissions of GHGs	A1	PS	CLM-1: Implement All Feasible Measures to Reduce Emissions	PSU[2]
	A2	PS		PSU[2]
	B1	PS		PSU[2]
	B2	PS		PSU[2]
	C1	PS		PSU[2]
	C2	PS		PSU[2]

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Cultural Resources: Program-Level				
CUL-1: Disturbance or Destruction of Cultural Resources Within the Restoration Area	No-Action	No Impact	--	No Impact
	A1	PS	CUL-1: Comply with Section 106 of the NHPA Process or Equivalent	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
Cultural Resources: Project-Level				
CUL-2: Disturbance or Destruction of Cultural Resources Around Millerton Lake	No-Action	LTS	--	LTS
	A1	PS	CUL-2: Comply with Section 106 of the NHPA and Develop and Implement a Programmatic Agreement	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
CUL-3: Disturbance or Destruction of Cultural Resources in the Restoration Area	No-Action	LTS	--	LTS
	A1	PS	CUL-2: Comply with Section 106 of the NHPA and Develop and Implement a Programmatic Agreement	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
CUL-4: Disturbance or Destruction of Cultural Resources Along the San Joaquin River Downstream from the Merced River	No-Action	LTS	--	LTS
	A1	PS	CUL-2: Comply with Section 106 of the NHPA and Develop and Implement a Programmatic Agreement	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
Geology and Soils: Program-Level				
GEO-1: Potential Localized Soil Erosion, Sedimentation, and Inadvertent Permanent Soil Loss	No-Action	LTS	--	LTS
	A1	PS	GEO-1: Prepare and Implement a Stormwater Pollution Prevention Plan that Minimizes the Potential Contamination of Surface Waters, and Complies with Applicable Federal Regulations Concerning Construction Activities	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Geology and Soils: Program-Level (contd.)				
GEO-2: Potential Loss of Availability of a Known Mineral Resource of Value	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Geology and Soils: Project-Level				
GEO-3: Potential Localized Soil Erosion, Sedimentation, and Inadvertent Permanent Soil Loss	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
GEO-4: Potential Increase in Channel Erosion, Sediment Transport, and Meander Migration from San Joaquin River Flows	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
GEO-5: Potential Loss of Availability of a Known Mineral Resource of Value	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Hydrology - Flood Management: Program-Level				
FLD-1: Expose People or Structures to a Significant Risk of Loss, Injury, or Death Involving Flooding, Including Flooding as a Result of the Failure of a Levee or Dam	No-Action	No Impact	--	No Impact
	A1	PS	FLD-1: Implement Design Standards to Minimize Risk of Loss, Injury, or Death Involving Flooding	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Hydrology - Flood Management: Program-Level (contd.)				
FLD-2: Substantially Reduce Opportunities for Levee and Flood System Facilities Inspection and Maintenance	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FLD-3: Substantially Alter the existing Drainage Pattern of the Site or Area, Including Through the Alteration of the Course of a Stream or River, or Substantially Increase the Rate or Amount of Surface Run-off in a Manner Which Would Result in Flooding On- or Off-Site	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FLD-4: Placement of Structures Within a 100-Year Flood Hazard Area Structures That Would Impede or Redirect Flood Flows	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FLD-5: Placement of Housing Within a 100-Year Flood Hazard Area, as Mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or Other Flood Hazard Delineation Map	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Hydrology - Flood Management: Project-Level				
FLD-6: Expose People or Structures to a Significant Risk of Loss, Injury, or Death Involving Flooding, Including Flooding as a Result of the Failure of a Levee or Dam	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Hydrology - Flood Management: Project-Level (contd.)				
FLD-7: Substantially Reduce Opportunities for Levee and Flood System Facilities Inspection and Maintenance	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
FLD-8: Substantially Alter the Existing Drainage Pattern of the Site or Area, Including Through the Alteration of the Course of a Stream or River, or Substantially Increase the Rate or Amount of Surface Runoff in a Manner Which Would Result in Flooding On- or Off-Site	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
FLD-9: Placement of Structures Within a 100-Year Flood Hazard Area Structures That Would Impede or Redirect Flood Flows	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
FLD-10: Placement of Housing Within a 100-Year Flood Hazard Area, as Mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or Other Flood Hazard Delineation Map	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Hydrology - Groundwater: Program-Level				
GRW-1: Temporary Construction-Related Effects on Groundwater Quality	No-Action	LTS and Beneficial	--	LTS and Beneficial
	A1	PS	GRW-1a: Prepare and Implement a Stormwater Pollution Prevention Plan That Minimizes the Potential Contamination of Surface Waters, and Complies with Applicable Federal Regulations Concerning Construction Activities GRW-1b: Conduct Phase I Environmental Site Assessments	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Hydrology - Groundwater: Project-Level				
GRW-2: Changes in Groundwater Levels Along the San Joaquin River from Friant Dam to the Delta	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
GRW-3: Changes in Groundwater Quality Along the San Joaquin River from Friant Dam to the Delta	No-Action	LTS and Beneficial	--	LTS and Beneficial
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
GRW-4: Changes in Groundwater Levels in CVP/SWP Water Service Areas	No-Action	PSU	--	PSU[1]
	A1	PSU	--	PSU[1]
	A2	PSU	--	PSU[1]
	B1	PSU	--	PSU[1]
	B2	PSU	--	PSU[1]
	C1	PSU	--	PSU[1]
	C2	PSU	--	PSU[1]
GRW-5: Changes in Groundwater Quality in CVP/SWP Water Service Areas	No-Action	PSU	--	PSU[1]
	A1	PSU	--	PSU[1]
	A2	PSU	--	PSU[1]
	B1	PSU	--	PSU[1]
	B2	PSU	--	PSU[1]
	C1	PSU	--	PSU[1]
	C2	PSU	--	PSU[1]
Hydrology - Surface Water Supplies and Facilities Operations: Program-Level				
SWS-1: Changes in Diversion Capacities	No-Action	No Impact	--	No Impact
	A1	PS	SWS-1: Provide Alternate Temporary or Permanent River Access to Avoid Diversion Losses	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Hydrology - Surface Water Supplies and Facilities Operations: Project-Level				
SWS-2: Change in Water Levels in the Old River near the Tracy Road Bridge	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SWS-3: Change in Water Levels in the Grant Line Canal near the Grant Line Canal Barrier	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SWS-4: Change in Water Levels in the Middle River near the Howard Road Bridge	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SWS-5: Change in Recurrence of Delta Excess Conditions	No-Action	PS	--	PS[2]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Hydrology - Surface Water Quality: Program-Level				
SWQ-1: Temporary Construction-Related Effects on Surface Water Quality in the San Joaquin River from Friant Dam to the Merced River, San Joaquin River from the Merced River to the Delta, the Delta, and CVP/SWP Water Service Areas	No-Action	LTS and Beneficial	--	LTS and Beneficial
	A1	PS	SWQ-1A: Prepare and Implement a Stormwater Pollution Prevention Plan that Minimizes the Potential Contamination of Surface Waters, and Complies with Applicable Federal Regulations Concerning Construction Activities SWQ-1B: Conduct and Comply with Phase I Environmental Site Assessments in the Restoration Area	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Hydrology - Surface Water Quality: Program-Level (contd.)				
SWQ-2: Long-Term Effects on Water Quality that Cause Violations of Existing Water Quality Standards or Adversely Affect Beneficial Uses in the CVP/SWP Water Service Areas	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Hydrology - Surface Water Quality: Project-Level				
SWQ-3: Long-Term Effects on Water Quality that Cause Violations of Existing Water Quality Standards or Adversely Affect Beneficial Uses in Millerton Lake	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SWQ-4: Long-Term Effects on Water Quality that Cause Violations of Existing Water Quality Standards or Adversely Affect Beneficial Uses in the San Joaquin River from Friant Dam to the Merced River	No-Action	LTS and Beneficial	--	LTS and Beneficial
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SWQ-5: Long-Term Effects on Water Quality that Cause Violations of Existing Water Quality Standards or Adversely Affect Beneficial Uses in the San Joaquin River from the Merced River to the Delta	No-Action	LTS and Beneficial	--	LTS and Beneficial
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SWQ-6: Effects on X2 Position	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Hydrology - Surface Water Quality: Project-Level (contd.)				
SWQ-7: Delta Salinity in San Joaquin River at Vernalis, San Joaquin River at Brandt Bridge, Old River near Middle River, and Old River at Tracy Road Bridge	No-Action	LTS	--	LTS
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
SWQ-8: Delta Salinity in San Joaquin River at Jersey Point, Sacramento River at Emmaton, and Sacramento River at Collinsville	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SWQ-9: Delta Water Quality at Contra Costa Water District's Contra Costa Canal Pumping Plant No. 1, Old River at Los Vaqueros Intake, and Proposed Victoria Canal Intake, and City of Stockton's Proposed Delta Intake	No-Action	LTS	--	LTS
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
SWQ-10: Water Quality in the Delta-Mendota Canal at Jones Pumping Plant and in the West Canal at the Clifton Court Forebay	No-Action	LTS	--	LTS
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
Indian Trust Assets: Program-Level				
ITA-1: Affect Land, Minerals, Federally Reserved Hunting and Fishing Rights, Federally Reserved Water Rights, and In-Stream Flows Associated With Trust Land	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Indian Trust Assets: Project-Level				
ITA-2: Affect Land, Minerals, Federally Reserved Hunting and Fishing Rights, Federally Reserved Water Rights, and In-Stream Flows Associated With Trust Land	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
Land Use: Program-Level				
LUP-1: Conversion of Important Farmland to Nonagricultural Uses and Cancellation of Williamson Act Contracts	No-Action	SU	--	SU[1]
	A1	Significant	LUP-1a: Design and Implement Levee Setbacks to Preserve Agricultural Productivity of Important Farmland to the Extent Possible and Comply with the Surface Mining and Reclamation Act LUP-1b: Minimize Impacts on Williamson Act–Contracted Lands, Comply with Government Code Sections 51290–51293, and Coordinate with Landowners and Agricultural Operators	SU[1]
	A2	Significant		SU[1]
	B1	Significant		SU[1]
	B2	Significant		SU[1]
	C1	Significant		SU[1]
	C2	Significant		SU[1]
LUP-2: Conversion of Riparian Forest to Non-Forest Uses	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
LUP-3: Conflict with Adopted Land Use Plans, Goals, Policies, and Ordinances of Affected Jurisdictions	No-Action	No Impact	--	No Impact
	A1	SU	--	SU[1]
	A2	SU	--	SU[1]
	B1	SU	--	SU[1]
	B2	SU	--	SU[1]
	C1	SU	--	SU[1]
	C2	SU	--	SU[1]

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Land Use: Project-Level				
LUP-4: Physically Divide or Disrupt an Established Community	No-Action	No Impact	--	No Impact
	A1	PS	LUP-4: Implement Vehicular Traffic Detour Planning	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
LUP-5: Substantial Diminishment of Agricultural Land Resource Quality and Importance Because of Altered Inundation and/or Soil Saturation	No-Action	No Impact	--	No Impact
	A1	PS	LUP-5: Preserve Agricultural Productivity of Important Farmland to Minimize Effects of Inundation and Saturation Effects	PSU[1]
	A2	PS		PSU[1]
	B1	PS		PSU[1]
	B2	PS		PSU[1]
	C1	PS		PSU[1]
	C2	PS		PSU[1]
LUP-6: Diminishment of Agricultural Production by Increased Orchard and Vineyard Diseases	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
LUP-7: Potential Conversion of Riparian Forest Because of Altered Inundation	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
LUP-8: Substantial Diminishment of Agricultural Land Resource Quality and Importance Because of Altered Water Deliveries	No-Action	No Impact	--	No Impact
	A1	SU	--	SU[1]
	A2	SU	--	SU[1]
	B1	SU	--	SU[1]
	B2	SU	--	SU[1]
	C1	SU	--	SU[1]
	C2	SU	--	SU[1]

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Noise: Program-Level				
NOI-1: Exposure of Sensitive Receptors to Generation of Temporary and Short-Term Construction Noise	No-Action	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A1	PS	NOI-1: Implement Measures to Reduce Temporary and Short-Term Noise Levels from Construction-Related Equipment Near Sensitive Receptors	PSU[1]
	A2	PS		PSU[1]
	B1	PS		PSU[1]
	B2	PS		PSU[1]
	C1	PS		PSU[1]
	C2	PS		PSU[1]
NOI-2: Exposure of Sensitive Receptors to Increased Off-Site Traffic Noise Levels	No-Action	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A1	PS	NOI-2: Implement Measures to Reduce Temporary Noise Levels from Construction-Related Traffic Increases Near Sensitive Receptors	PSU[1]
	A2	PS		PSU[1]
	B1	PS		PSU[1]
	B2	PS		PSU[1]
	C1	PS		PSU[1]
	C2	PS		PSU[1]
NOI-3: Exposure of Sensitive Receptors to Long-Term Operation-Related Noise Levels from Stationary Sources	No-Action	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	PS	NOI-3: Implement Measures to Reduce Long-Term Operation-Related Noise Levels from Stationary Sources on Sensitive Receptors	LTS
	C2	PS		LTS
NOI-4: Exposure of Sensitive Receptors to Increased Noise from Borrow Site-Related Activities	No-Action	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A1	PS	NOI-4: Implement Measures to Reduce Borrow Site Noise Levels Near Sensitive Receptors	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
NOI-5: Exposure of Sensitive Receptors to or Generation of Excessive Groundborne Vibration	No-Action	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A1	PS	NOI-5: Implement Measures to Reduce Temporary and Short-term Groundborne Noise and Vibration Levels Near Sensitive Receptors	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Noise: Project-Level				
NOI-6: Effects of the Reoperation of Friant Dam on the Noise Environment	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Paleontological Resources: Program-Level				
PAL-1: Possible Damage to or Destruction of Unique Paleontological Resources	No-Action	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A1	PS	PAL-1: Stop Work if Paleontological Resources Are Encountered During Earthmoving Activities and Implement Recovery Plan	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
Paleontological Resources: Project-Level				
PAL-2: Possible Damage to or Destruction of Unique Paleontological Resources	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
Power and Energy: Program-Level				
PWR-1: Decrease in CVP and SWP Energy Generation	No-Action	LTS and Beneficial	--	LTS and Beneficial
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
PWR-2: Increase in CVP and SWP Energy Consumption	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Power and Energy: Program-Level (contd.)				
PWR-3: Increased Energy Consumption as a Result of Construction Activities	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
PWR-4: Increased Energy Consumption Within Friant Division	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
Power and Energy: Project-Level				
PWR-5: Decrease in CVP and SWP Energy Generation	No-Action	LTS and Beneficial	--	LTS and Beneficial
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
PWR-6: Increase in CVP and SWP Energy Consumption	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
PWR-7: Change in Energy Generation at Friant Dam	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Power and Energy: Project-Level (contd.)				
PWR-8: Increased Energy Consumption Within Friant Division	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Public Health and Hazardous Materials: Program-Level				
PHH-1: Exposure of Construction Workers and Others to Hazardous Materials	No-Action	No Impact	--	No Impact
	A1	PS	PHH-1: Conduct Phase I Environmental Site Assessments	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
PHH-2: Creation of a Substantial Hazard to the Public or the Environment Through the Use of Hazardous Materials	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
PHH-3: Exposure to Naturally Occurring Asbestos	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
PHH-4: Exposure to Diseases	No-Action	No Impact	--	No Impact
	A1	PS	PHH-4: Implement Workplace Precautions against West Nile Virus and Valley Fever	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Public Health and Hazardous Materials: Program-Level (contd.)				
PHH-5: Creation of a Substantial Hazard to School Safety	No-Action	No Impact	--	No Impact
	A1	PS	PHH-5: Minimize Hazards to School Safety	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
PHH-6: Substantial Hazard from Idle and Abandoned Wells	No-Action	No Impact	--	No Impact
	A1	PS	PHH-6: Minimize Hazards from Idle and Abandoned Wells	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
PHH-7: Creation of a Substantial Hazard from Wildland Fires	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
PHH-8: Creation of a Substantial Hazard to Aircraft Safety	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Public Health and Hazardous Materials: Project-Level				
PHH-9: Exposure to Diseases in the San Joaquin River Upstream from Friant Dam, in the Restoration Area, and in the San Joaquin River from Merced River to the Delta	No-Action	No Impact	--	No Impact
	A1	PS	PHH-9: Coordinate with and Support Vector Control District(s)	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Public Health and Hazardous Materials: Project-Level (contd.)				
PHH-10: Exposure to Diseases in the Delta	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Recreation: Program-Level				
REC-1: Increased Use of Facilities at Millerton Lake State Recreation Area and Demand for Recreation Opportunities at Millerton Lake and Vicinity	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
REC-2: Increased Use of Recreation Facilities and Demand for Recreation Opportunities in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
REC-3: Effects of Construction, Operation, and Maintenance of New Projects or Facilities on Recreation Opportunities in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	PS	REC-3: Restore Recreation Access and Facilities Affected by Construction, Operation, and Maintenance from Settlement Actions in the San Luis Unit of the San Luis National Wildlife Refuge	LTS
	B1	LTS	--	LTS
	B2	PS	REC-3: Restore Recreation Access and Facilities Affected by Construction, Operation, and Maintenance from Settlement Actions in the San Luis Unit of the San Luis National Wildlife Refuge	LTS
	C1	LTS	--	LTS
	C2	PS	REC-3: Restore Recreation Access and Facilities Affected by Construction, Operation, and Maintenance from Settlement Actions in the San Luis Unit of the San Luis National Wildlife Refuge	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Recreation: Program-Level (contd.)				
REC-4: Effects of Reintroducing Salmon to the Restoration Area on Reach 1 Angling Opportunities	No-Action	No Impact	--	No Impact
	A1	PS	REC-4: Enhance Fishing Access and Fish Populations on the Kings River Below Pine Flat Dam	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
REC-5: Effects on Reach 1 Warm-Water Angling Opportunities from Program Actions within the Restoration Area	No-Action	No Impact	--	No Impact
	A1	PS	REC-5: Enhance Warm-Water Fishing Access and Fish Populations in the Vicinity of the San Joaquin River Below Friant Dam	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
REC-6: Effects on Wildlife-Based Recreation Opportunities from Enhanced Wildlife Habitat Conditions Caused by Program Actions Within the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
REC-7: Effects of Construction, Operation, and Maintenance of New Projects or Facilities on Recreation Opportunities on the San Joaquin River Between Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
REC-8: Effects of Reintroducing Salmon to the San Joaquin River Between Friant Dam and the Merced River on Angling Opportunities Downstream	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Recreation: Project-Level				
REC-9: Effects on Recreation Opportunities from Earlier Seasonal Drawdown of Millerton Lake Related to Timing of Release of Interim and Restoration Flows	No-Action	No Impact	--	No Impact
	A1	PS	REC-9: Extend Millerton Lake Boat Ramps or Construct a New Low-water Ramp to Allow Boat Launching at the Lower Pool Elevations that May Result from Interim and Restoration Flows during Dry and Critical-High Years	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
REC-10: Effects on Recreation Facilities from Increased Flow in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
REC-11: Effects on Swimming or Wading and Fishing Opportunities from Increased Flow in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
REC-12: Effects on Boating Opportunities from Increased Flow in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	Significant	REC-12: Develop and Implement Recreation Outreach Program	LTS
	A2	Significant		LTS
	B1	Significant		LTS
	B2	Significant		LTS
	C1	Significant		LTS
	C2	Significant		LTS
REC-13: Effects on Wildlife-Based Recreation Opportunities from Enhanced Wildlife Habitat Conditions Related to Increased Flow in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Recreation: Project-Level (contd.)				
REC-14: Effects on Warm-Water Fishing Opportunities from Enhanced Fish Populations Related to Increased Flow in the Restoration Area	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
REC-15: Effects on Warm-Water Fishing Opportunities from Increased Flow in the San Joaquin River from the Merced River to the Delta	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
REC-16:Effects on Warm-Water and Cold-Water Fishing Opportunities from Increased Flow into the Sacramento-San Joaquin Delta	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
Socioeconomics: Program-Level				
SOC-1: Change in Regional Employment Levels	No-Action	No Impact	--	No Impact
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial
SOC-2: Change in Regional Population Levels	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Socioeconomics: Program-Level (contd.)				
SOC-3: Change in Regional Housing Demand	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Socioeconomics: Project-Level				
SOC-4: Change in Regional Employment Levels	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SOC-5: Change in Regional Population Levels	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SOC-6: Change in Regional Housing Demand	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
SOC-7: Physical Decay in Communities	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Transportation and Infrastructure: Program-Level				
TRN-1: Reduced Traffic Circulation and Roadway Capacity	No-Action	LTS	--	LTS
	A1	PS	TRN-1: Minimize Short-term Impacts on Traffic Circulation and Roadway Capacity	PSU[1]
	A2	PS		PSU[1]
	B1	PS		PSU[1]
	B2	PS		PSU[1]
	C1	PS		PSU[1]
	C2	PS		PSU[1]
TRN-2: Creation of a Hazard as a Result of a Design Feature	No-Action	No Impact	--	No Impact
	A1	PS	TRN-2: Avoid Disruption of Subsurface Utility Facilities	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
TRN-3: Reduced Emergency Access	No-Action	No Impact	--	No Impact
	A1	PS	TRN-1: Minimize Short-term Impacts on Traffic Circulation and Roadway Capacity	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
TRN-4: Reduced Bicycle and Pedestrian Circulation	No-Action	No Impact	--	No Impact
	A1	PS	TRN-4: Minimize Impacts on Public Bicycle and Pedestrian Circulation Facilities	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
Transportation and Infrastructure: Project-Level				
TRN-5: Reduced Traffic Circulation and Roadway Capacity	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Transportation and Infrastructure: Project Level (contd.)				
TRN-6: Creation of a Hazard as a Result of a Design Feature	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
TRN-7: Inadequate Emergency Access	No-Action	No Impact	--	No Impact
	A1	PS	TRN-7: Implement Vehicular Traffic Detour Planning	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
TRN-8: Reduced Bicycle and Pedestrian Circulation	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Utilities and Service Systems: Program-Level				
UTL-1: Potential Environmental Effects Associated with Needed Construction or Expansion of Water and Wastewater Treatment Facilities in the Restoration Area	No-Action	PS	--	PS[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
UTL-2: Potential Reduction in Ability of Facilities in the Restoration Area to Meet Wastewater Treatment Requirements	No-Action	LTS	--	LTS
	A1	PS	UTL-2: Obtain Required Permits for Hatchery Wastewater Discharges and Implement Best Management Practices to Reduce Pollutant Discharges	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Utilities and Service Systems: Program-Level (contd.)				
UTL-3: Potential for Insufficient Water Supply and Resources in the Restoration Area	No-Action	PS	--	PS[1]
	A1	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A2	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	B1	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	B2	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	C1	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	C2	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
UTL-4: Potential for Generation of Solid Waste in the Restoration Area in Excess of Permitted Landfill Capacity	No-Action	LTS	--	LTS
	A1	PS	UTL-4: Identify Landfills with Adequate Permitted Capacity to Accept Solid Waste Generated by Settlement Activities and Dispose of Waste in Accordance with Applicable Regulations	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
UTL-5: Potential Need for New or Altered Facilities to Accommodate Increased Demand for Emergency Services in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
UTL-6: Potential for Insufficient Existing Water Supply and Resources Between the Merced River and the Delta	No-Action	PS	--	PS[1]
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
UTL-7: Potential for Generation of Solid Waste Between the Merced River and the Delta in Excess of Permitted Landfill Capacity	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Utilities and Service Systems: Program-Level (contd.)				
UTL-8: Potential Need for New or Altered Facilities to Accommodate Increased Demand for Emergency Services Between the Merced River and the Delta	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Utilities and Service Systems: Project-Level				
UTL-9: Potential Environmental Effects Associated with Needed Construction or Expansion of Water and Wastewater Treatment Facilities in the Restoration Area	No-Action	PS	--	PS[1]
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
UTL-10: Potential Reduction in Ability of Facilities in the Restoration Area to Meet Wastewater Treatment Requirements	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
UTL-11: Potential for Insufficient Existing Water Supply and Resources in the Restoration Area	No-Action	PS	--	PS[1]
	A1	PSU	--	PSU[1]
	A2	PSU	--	PSU[1]
	B1	PSU	--	PSU[1]
	B2	PSU	--	PSU[1]
	C1	PSU	--	PSU[1]
	C2	PSU	--	PSU[1]
UTL-12: Potential for Generation of Solid Waste in the Restoration Area in Excess of Permitted Landfill Capacity	No-Action	LTS	--	LTS
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Utilities and Service Systems: Project-Level (contd.)				
UTL-13: Potential Need for New or Altered Facilities to Accommodate Increased Demand for Emergency Services in the Restoration Area	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
UTL-14: Potential Environmental Effects Associated with Needed Construction or Expansion of Water and Wastewater Treatment Facilities Between the Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
UTL-15: Potential Reduction in Ability of Facilities Between the Merced River and the Delta to Meet Wastewater Treatment Requirements	No-Action	No Impact	--	No Impact
	A1	No Impact	--	No Impact
	A2	No Impact	--	No Impact
	B1	No Impact	--	No Impact
	B2	No Impact	--	No Impact
	C1	No Impact	--	No Impact
	C2	No Impact	--	No Impact
UTL-16: Potential for Insufficient Existing Water Supply and Resources from Recapture of Interim and Restoration Flows Between the Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	PSU	--	PSU[2]
	A2	PSU	--	PSU[2]
	B1	PSU	--	PSU[2]
	B2	PSU	--	PSU[2]
	C1	PSU	--	PSU[2]
	C2	PSU	--	PSU[2]
UTL-17: Potential Need for New or Altered Facilities to Accommodate Increased Demand for Emergency Services Between the Merced River and the Delta	No-Action	No Impact	--	No Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
Visual Resources: Program-Level				
VIS-1: Temporary and Short-Term Construction-Related Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character	No-Action	No-Impact	--	No-Impact
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS

Table ES-8. Summary of Impacts and Mitigation Measures

IMPACTS	ALTERNATIVE	LEVEL OF SIGNIFICANCE BEFORE MITIGATION	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Visual Resources: Program-Level (contd.)				
VIS-2: Long-Term Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character	No-Action	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A1	PS	VIS-2: Screen New Facilities and Minimize Adverse Visual Impacts	PSU[1]
	A2	PS		PSU[1]
	B1	PS		PSU[1]
	B2	PS		PSU[1]
	C1	PS		PSU[1]
	C2	PS		PSU[1]
VIS-3: Substantial Changes in Light or Glare	No-Action	No-Impact	--	No-Impact
	A1	PS	VIS-3: Establish and Require Conformance to Lighting Standards, and Prepare and Implement a Lighting Plan	LTS
	A2	PS		LTS
	B1	PS		LTS
	B2	PS		LTS
	C1	PS		LTS
	C2	PS		LTS
Visual Resources: Project-Level				
VIS-4: Effects of Friant Dam Reoperation on Scenic Vistas, Scenic Resources, and Existing Visual Character Upstream from Friant Dam	No-Action	LTS	--	LTS
	A1	LTS	--	LTS
	A2	LTS	--	LTS
	B1	LTS	--	LTS
	B2	LTS	--	LTS
	C1	LTS	--	LTS
	C2	LTS	--	LTS
VIS-5: Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character Downstream from Friant Dam	No-Action	Too Speculative for Meaningful Consideration	--	Too Speculative for Meaningful Consideration
	A1	LTS and Beneficial	--	LTS and Beneficial
	A2	LTS and Beneficial	--	LTS and Beneficial
	B1	LTS and Beneficial	--	LTS and Beneficial
	B2	LTS and Beneficial	--	LTS and Beneficial
	C1	LTS and Beneficial	--	LTS and Beneficial
	C2	LTS and Beneficial	--	LTS and Beneficial

Notes:
[1] An analysis was performed in compliance with Executive Order 12898, Environmental Justice, which found that this impact **would** have the potential to result in disproportionately high and adverse effect on minority and/or low-income populations.
[2] An analysis was performed in compliance with Executive Order 12898, Environmental Justice, which found that this impact **would not** have the potential to result in disproportionately high and adverse effect on minority and/or low-income populations.
[3] Because analysis of the environmental effects of GHG emissions from the program alternatives is addressed as a cumulative impact analysis, and the No-Action Alternative by definition cannot contribute to a cumulative impact, no significance determination is made for the No-Action Alternative.

Key:
LTS = less than significant
PS = potentially significant
PSU = potentially significant and unavoidable
SU = significant and unavoidable
X2 = geographic location of 2 parts per thousand salinity isohaline in Delta, measured from Golden Gate bridge in Suisun Bay
CVP = Central Valley Project
GHG = greenhouse gas
SWP = State Water Project
NHPA = National Historic Preservation Act

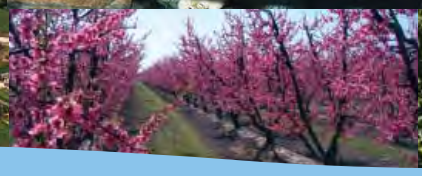
Table ES-9. Impacts of Alternatives A1 through C2 with Potential to Result in an Incremental Contribution to a Significant Cumulative Impact

RESOURCE AREA	IMPACT
Air Quality	Construction-Related Emissions of Criteria Air Pollutants and Precursors
Biological Resources - Fisheries	Potential Direct Mortality or Reduced Fecundity of Wild Fall-Run Chinook Salmon in San Joaquin River Tributaries Resulting from Disease Outbreak
Climate Change	Cumulative impacts resulting from greenhouse emissions, and associated mitigation measures, are shown in Table ES-8
Cultural Resources	Disturbance or Destruction of Cultural Resources
Hydrology - Groundwater	Changes in Groundwater Levels and Groundwater Quality in CVP/SWP Water Service Areas
Hydrology - Surface Water Supplies and Facilities Operations	Change in Contra Costa Water District Water Supplies
Land Use Planning and Agriculture	Conversion of Important Farmland to Nonagricultural Uses and Cancellation of Williamson Act Contracts
	Substantial Diminishment of Agricultural Land Resource Quality and Importance Because of Altered Inundation and/or Soil Saturation
	Substantial Diminishment of Agricultural Land Resource Quality and Importance Because of Altered Water Deliveries
Noise	Exposure of Sensitive Receptors to Generation of Temporary and Short-Term Construction Noise
	Exposure of Sensitive Receptors to Increased Off-Site Traffic Noise Levels
Utilities and Service Systems	Reduced Water Supplies for Friant Division Water Contractors
Visual Resources	Long-Term Changes in Scenic Vistas, Scenic Resources, and Existing Visual Character

Key:
CVP = Central Valley Project
SWP = State Water Project

SAN JOAQUIN RIVER
RESTORATION PROGRAM





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