RECLAMATION

Managing Water in the West

2-Gates Fish Protection Demonstration Project

Central Valley Project, California

Draft Environmental Assessment

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

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.

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Abbreviations & Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
AADT	annual average daily traffic
AB	Assembly Bill
Æ	Applied Earthworks
APE	Area of Potential Effects
BA	Biological Assessment
BAAQMD	Bay Area Air Quality Management District
Banks	Harvey O. Banks Pumping Plant
Bay-Delta Plan	Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary
BDCP	Bay-Delta Conservation Plan
BHP-hr	brake horsepower-hour
BMP	Best Management Practice
BO	Biological Opinion
B.P.	before present
BSFC	brake specific fuel consumption
BTU	British thermal units
CAA	Clean Air Act of 1970
CAAQS	California ambient air quality standards
Cal Boating	California Department of Boating and Waterways
CalTrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CBOC	California Burrowing Owl Consortium
CCFB	Clifton Court Forebay
CCR	California Code of Regulations
CCWD	Contra Costa Water District
CDEC	California Data Exchange Center
CDOC	California Department of Conservation
CEQ	Council on Environmental Quality
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CNDDB	California Natural Diversity Database

CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
Corps	U.S. Army Corps of Engineers
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
D-1485	SWRCB Water Right Decision 1485
D-1641	SWRCB Water Right Decision 1641
dB	decibel(s)
dBA	A-weighted decibel(s)
DDT	dichlorodiphenyltrichloroethane
Delta	Sacramento-San Joaquin River Delta
DFG	(California) Department of Fish and Game
DIDSON	dual-frequency identification sonar
DO	dissolved oxygen
DOSS	Delta Operations for Salmon and Sturgeon Technical Working Group
DPM	Delta Passage Model
DPM	diesel particulate matter
DPS	distinct population segment
DSM2	Delta Simulation Model II
DTSC	Department of Toxic Substances Control
DWR	(California) Department of Water Resources
EA	Environmental Assessment
EBMUD	East Bay Municipal Utility District
EC	electrical conductivity
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
EWA	Environmental Water Account
FE	federally listed as endangered
FEMA	Federal Emergency Management Agency
FMWT	Fall Midwater Trawl
FT	federally listed as threatened

gal	gallon
GGS	giant garter snake
GHG	greenhouse gas
HOR	Head of Old River
H_2S	hydrogen sulfide
IEP	Interagency Ecological Program
IS	Initial Study
Jones	C.W. "Bill" Jones Pumping Plant
L_{dn}	day/night average sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
lb/mgal	pounds per thousand gallons
MAF	million acre-feet
MBTA	Migratory Bird Treaty Act
MeHg	methyl mercury
MEI	Maximally Exposed Individual
mgd	million gallon(s) of water per day
mph	miles per hour
m/s	meters per second
$\mu g/m^3$	microgram(s) per cubic meter
µmhos/cm	micromhos per centimeter
N_2O	nitrous oxide
N/A	not applicable
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NMFS CVP/SWP Operations BO	Biological Opinion and Conference Opinion for the Long-term Operations of the Central Valley Project and the State Water Project
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Unit
OCAP	Operations Criteria and Plan
OMR	Old River and Middle River
O_3	ozone

PCB(s)	Polychlorinated biphenyls
PCE	Primary constituent elements
PG&E	Pacific Gas and Electric
PL	Public Law
PM_{10}	Respirable particulate matter
$PM_{2.5}$	Fine particulate matter
POD	Pelagic Organism Decline
ppm	parts per million
ppmv	parts per million by volume
ppt	parts per thousand
PRBO	Point Reyes Bird Observatory
Proposed Action	2-Gates Fish Protection Demonstration Project
RCRA	Resource Conservation and Recovery Act
Reclamation	U.S. Bureau of Reclamation
RHA	Rivers and Harbors Act of 1899
RMA	Resource Management Associates
RMS	root mean squared
ROC	reactive organic compound
RPA	Reasonable and Prudent Alternative
RWQCB	Reasonable Water Quality Control Board
SB	Senate Bill
SC	federal species of concern
SCWA	Sacramento County Water Agency
SE	state endangered
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SJMSCP	San Joaquin County Multi-Species Habitat Conservation and Open Space Plan
SJR	San Joaquin River
SJRRP	San Joaquin River Restoration Program
SJVAPCD	San Joaquin Valley Air Pollution Control District
SKT	Spring Kodiak Trawl
SO_2	sulfur dioxide
SO_4	sulfate
SR	State Route
SRDWSC	Sacramento River Deep Water Ship Channel
SSC	state species of concern
ST	state threatened
SWG	Smelt Working Group
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan

SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
URV	Unit Reference Value
U.S.	United States
U.S.C.	United States Code
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
USFWS CVP/SWP Operations BO	The Biological Opinion for the Proposed Coordinated Operations of the Central Valley Project and State Water Project
USGS	U.S. Geological Survey
VAMP	Vernalis Adaptive Management Plan
VdB	velocity in decibels
VOC	volatile organic compound
WOMT	Water Operations Management Team
WPT	western pond turtle
X2	Location of 2 ppt Salinity Isohaline
YCWA	Yuba County Water Authority
Yuba Accord	Lower Yuba River Accord

Chapter 1 Introduction

This Environmental Assessment (EA) evaluates the impacts of implementing the 2-Gates Fish Protection Demonstration Project (Proposed Action) in compliance with the National Environmental Policy Act (NEPA).

1.1 NEPA Requirements, Lead Agency, and Federal Actions

This EA has been prepared in accordance with NEPA (42 United States Code [U.S.C.] 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508, and the Department of Interior's regulations for implementing NEPA (43 CFR Part 46). An EA is a concise public document that has three defined functions: (1) it briefly provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS); (2) it aids an agency's planning when no EIS is necessary; and (3) it facilitates preparation of an EIS when one is determined to be necessary (40 CFR 1508.9(a)). Since the EA is a concise document, it should not contain long descriptions or detailed data which the agency may have gathered. Rather, it should contain a brief discussion of the need for the proposal, alternatives to the proposal, the environmental impacts of the proposed action and alternatives, and a list of agencies and persons consulted (40 CFR 1508.9(b)). The Bureau of Reclamation (Reclamation) is the lead agency for compliance with NEPA because it would be the owner and responsible for operation of the Proposed Action.

1.2 Background

The Delta is at the confluence of the Sacramento and San Joaquin Rivers and is composed of an extensive tidally influenced network of interconnecting channels surrounding Delta islands or bordering adjacent uplands. The Delta also includes the lower channels of the Mokelumne River and the confluences of the Consumnes and Calaveras Rivers, and the area collectively receives runoff from 40 percent of the land area of the state. The specifically defined "Legal Delta" (Figure 1-1) covers 738,000 acres, of which about 8.3 percent is water. Much of the land is located in islands or tracts that are below sea level and are collectively protected by over a thousand miles of levees. Channel flow in the Delta is influenced by inflow from upstream rivers, tidal flows, diversion for in-Delta agriculture and exports at the state and federal facilities. Water quality is influenced by upstream water development, including reservoir storage, flood control, diversion and water transfers, return flows from upstream and in-Delta agriculture, and municipal and industrial wastewater releases. The Delta is often referred to as the upper estuary associated with San Francisco Bay and is connected through the San Pablo Bay, Carquinez Straits, and Suisun and Honker bays. The western edge of the Delta is about 53 miles from the Golden Gate Bridge. The Delta also serves as a key resource for water management activities in the state.

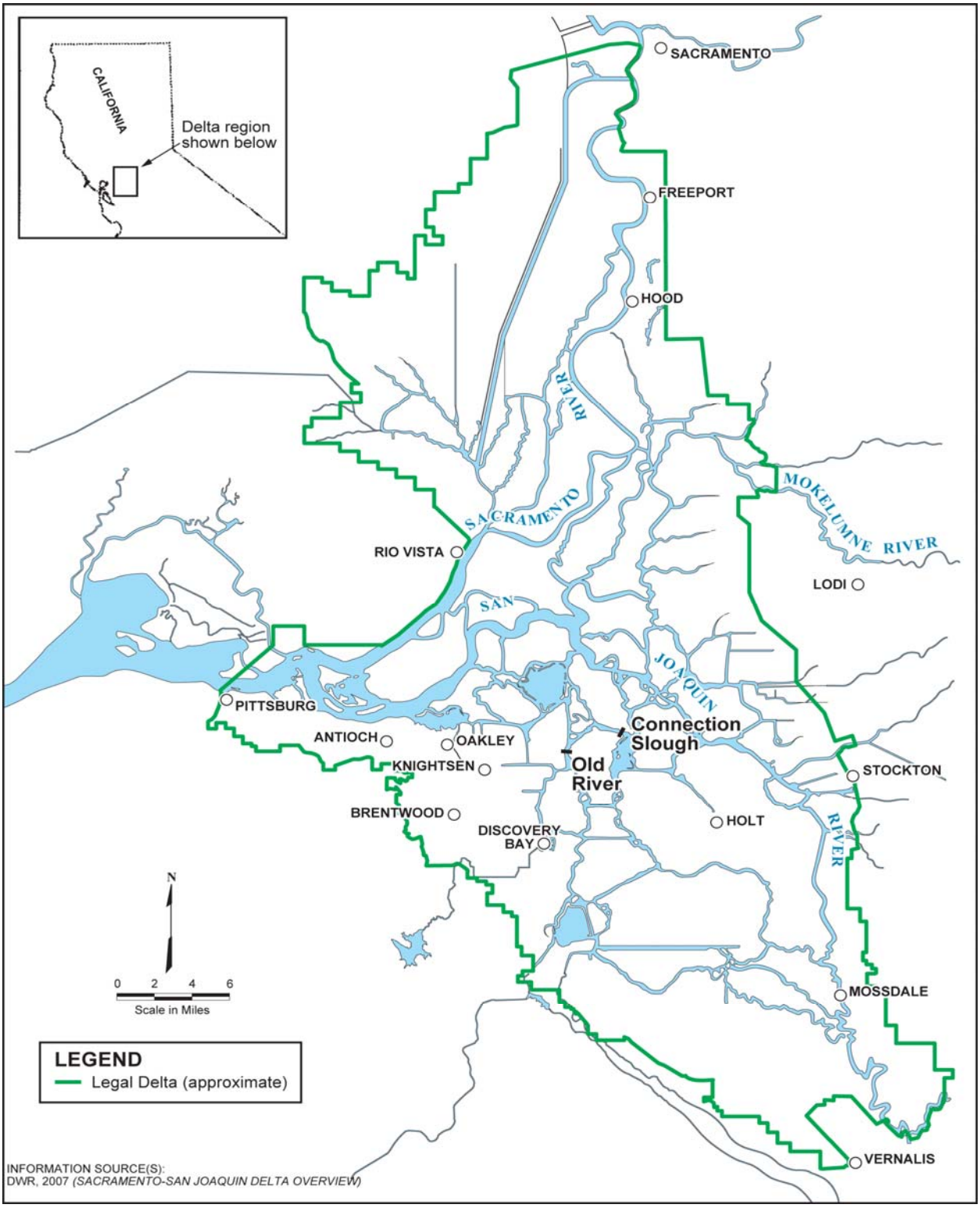

Figure 1-1 Legal Delta

The Central Valley Project (CVP) is operated by Reclamation, and includes several reservoirs, hydroelectric plants, and pumping plants, including the Jones Pumping Plant in the south Delta near Tracy. The CVP's major storage facilities are Shasta, Folsom, Friant, and New Melones. The upstream reservoirs release water that flows into the Delta, of which a portion is exported through Jones Pumping Plant for storage in San Luis Reservoir, jointly operated by the CVP and the State Water Project (SWP), or delivered down the Delta Mendota Canal. Reclamation has State Water Resources Control Board (SWRCB) permits to appropriate and divert (or redivert) water for the CVP. The California Department of Water Resources (DWR) also has SWRCB permits and licenses to appropriate and divert (or redivert) water for the SWP. The SWP stores water in Oroville Reservoir and releases it to three Upper Feather River area contractors, two contractors by means of the North Bay Aqueduct, and the Harvey O. Banks Pumping Plant (Banks) in the Delta, after which it is delivered to the remaining 24 contractors in the SWP service areas south of the Delta. In addition, Banks pumps water from other sources entering the Delta (i.e., the Sacramento River, San Joaquin River, and Mokelumne River). Reclamation and DWR have both built water storage and delivery facilities in the state in order to deliver water supplies. Some CVP facilities were developed in coordination with the SWP, such as San Luis Reservoir. Both the CVP and the SWP use the San Luis Reservoir, O'Neill Forebay, and more than 100 miles of the California Aqueduct and its related pumping and generating facilities

Both DWR and Reclamation's water rights are conditioned by the SWRCB to protect the beneficial uses of water within each respective project and jointly for the protection of beneficial uses in the Sacramento Valley and the Sacramento-San Joaquin Delta Estuary. Water management conditions are included in the SWRCB Water Right Decision 1641 (D-1641), as well as in other orders and decisions.

The Coordinated Operations Agreement was signed by Reclamation and DWR in 1986, which: defines both CVP and SWP facilities and their water supplies; sets forth procedures for coordination of operations; identifies formulas for sharing joint responsibilities for meeting Delta standards, as the standards existed in the SWRCB Water Right Decision 1485 (D-1485); identifies other legal uses of water; identifies how unstored flow will be shared; sets up a framework for exchange of water and services between the two projects; and, provides for periodic review of the agreement.

The USFWS Biological Opinion (BO) for the Long-Term Coordinated Operations of the CVP and SWP (USFWS CVP/SWP Operations BO) (USFWS 2008b) requires the CVP and SWP facilities to be operated in a manner that doesn't jeopardize delta smelt. The National Oceanographic and Atmospheric Administration's National Marine Fisheries Service (NMFS) also issued a Biological Opinion and Conference Opinion for the Long-Term Operations of the CVP and SWP (NMFS CVP/SWP Operations BO), which requires the CVP and SWP facilities to be operated in a manner that doesn't jeopardize salmonids, green sturgeon, and killer whales (NMFS 2009a). These BOs thoroughly describe the components of the CVP and SWP, and evaluate the effects of operations of these components on species listed under the federal Endangered Species Act (ESA). Each BO includes a Reasonable and Prudent Alternative (RPA) to the water operations proposed in Reclamation's Biological Assessment. Implementation of the RPAs form the basis for the incidental take statements under Section 7 of the ESA, and generally form the basis for CVP and SWP operations in compliance with the ESA. Table 1-1 summarizes the RPA actions relevant to the Proposed Action.

Table 1-1 Summary of CVP/SWP Operations BOs RPA Actions[1]					
Month	USFWS Action 1	USFWS Action 2	USFWS Action 3	NMFS Action IV. 2.1	NMFS Action IV. 2.3
	Adult delta smelt migration and entrainment (first flush)	Adult delta smelt migration and entrainment (extended protection)	Entrainment protection of larval delta smelt	Maintain San Joaquin River inflow/export ratio	Reduced exports to limit negative OMR flows depending on presence of salmonids
Dec	December – March Limit exports to limit negative OMR flows (-2,000 to -2,500 cubic feet per second [cfs]), until water temperature ≥12 degrees Celsius (ºC) or spawning detected.	December – March Limit exports to limit negative OMR flows (-1,250 to -5,000 cfs), until water temperature ≥12ºC or spawning detected.			
Jan					January 1 – June 15 OMR flow (-5,000 to -2,500 cfs) until after June 1 water temperature at Mossdale ≥ 22ºC for 7 days.
Feb					
Mar					
			arly/ mid-March – June 30 Once temperature ≥12ºC or spawning detected, limit exports to limit negative OMR flows (-1,250 to -5,000) until June 30.		
April				April 1 – May 31 Maintain Vernalis inflow/export ratio depending on water supply parameters (interim 2009-2011) or depending on water year (long term 2012+)	
May					
June					
Note: 1 USFWS 2008b CVP/SWP Operations BO RPA Component 1 and NMFS 2009a CVP/SWP Operations BO RPA Action IV.2 2 OMR flows are defined as the combined net flow of Old and Middle Rivers.					

The description of existing conditions in this EA includes various components of D-1641 and the Coordinated Operations Agreement (e.g., water quality standards, discharge requirements, and allowed diversions), as well as other operational requirements, particularly those contained in the CVP/SWP Operations BOs. During certain time periods and environmental conditions, the components of D-1641 define CVP/SWP operations, during other time periods and environmental conditions, the CVP/SWP Operations BOs RPAs define operations.

1.3 Contents and Organization of the Environmental Assessment

This EA is organized as follows:

- **Section 1.** Introduces the Proposed Action and its background.
- **Section 2.** Describes the Proposed Action and alternatives that were considered.

- **Section 3.** Describes the affected environment and environmental consequences of implementing the Proposed Action and No Action alternative.
- **Section 4.** Evaluates the cumulative impacts of the Proposed Action in combination with other past, present, and reasonably foreseeable projects.
- **Section 5.** Describes the agencies and parties that were consulted during the environmental review process, compliance with applicable regulations, and the public involvement process.
- **Section 6.** Identifies references used in this document.
- **Section 7.** Lists the EA preparers and reviewers.
- **Appendices. –** Provides supporting materials for the EA.
    - Appendix A Particle Tracking and Analysis
    - Appendix B. Science Investigation Program & Monitoring Plan
        - Attachment A. Sacramento-San Joaquin Delta Turbidity Modeling
        - Attachment B. Fixed-Site Monitoring as a Tool for Understanding
        - Attachment C. Monitoring and Analysis of Turbidities
        - Attachment D. Mokelumne Salmonid Monitoring Plan for 2-Gates Proposal
    - Appendix C. 100% Design Plans for Old River Site & Connection Slough Sites
    - Appendix D. Operations Plan
    - Appendix E. Air Quality Calculations
    - Appendix F. Wetland Delineation Study
    - Appendix G. Summer and Spring Rare Plant Surveys
    - Appendix H Habitat Assessment for the Giant Garter Snake
    - Appendix I. Dry- and Wet-Season Sampling for Federally Listed Large Branchiopods
    - Appendix J. – Hydrodynamic Analysis of 2-Gates Near Field Effects
    - Appendix K. – Hydrodynamic Analyses of 2-Gates Flood Stage Issues
    - Appendix L. – Consultation Letters Chapter 2 Description of the Proposed Action and Alternatives