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## 2 Introduction

3 This Biological Assessment (BA) evaluates the effects of implementing the 2-Gates Fish Protection  
 4 Demonstration Project (2-Gates Project and/or the Project) in compliance with the federal Endangered  
 5 Species Act (ESA). The Project would be located in the Sacramento-San Joaquin River Delta (Delta), which  
 6 is a vital diversion point to provide drinking water for over 23 million Californians and supports more than  
 7 1.3 million acres of irrigated agricultural lands. The 2-Gates Project will install and operate removable gates  
 8 in two key channels in the central Delta (Old River and Connection Slough). The Project goal is to control  
 9 flows in a manner that provides equal or improved protection (reduced entrainment) to delta smelt  
 10 (*Hypomesus transpacificus*) at the State Water Project (SWP) and Central Valley Project (CVP) export  
 11 facilities while allowing higher than the minimum water exports described in the Operations Criteria and  
 12 Plan (OCAP) Biological Opinions (BOs) Reasonable and Prudent Alternatives (RPAs) of the U.S. Fish and  
 13 Wildlife Service (USFWS 2008) and National Marine Fisheries Service (NMFS 2009). The Project will  
 14 operate within other water management requirements (e.g. D-1641). This BA addresses baseline  
 15 hydrodynamic conditions inherent in CVP and SWP operations, as well as baseline ecological interactions.

16 Another goal of the 2-Gates Project is also to minimize adverse affects to other federal or State listed species  
 17 in the Delta, including Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central  
 18 Valley spring-run Chinook salmon (*O. tshawytscha*), Central Valley Steelhead (*O. mykiss*), North American  
 19 green sturgeon (*Acipenser medirostris*), and longfin smelt (*Spirinchus thaleichthys*). In addition to federally  
 20 or State listed threatened or endangered aquatic species, this BA addresses the anticipated effects of the  
 21 Project on the following terrestrial species: giant garter snake (*Thamnophis gigas*), vernal pool fairy shrimp  
 22 (*Branchinecta lynchi*), conservancy fairy shrimp (*B. conservatio*), vernal pool tadpole shrimp (*Lepidurus*  
 23 *packardii*), Swainson's hawk (*Buteo swainsoni*), and California black rail (*Laterallus jamaicensis*  
 24 *coturniculus*). This BA also includes several State listed species of concern (see Section 3.3).

25 The purpose of this BA is to review the 2-Gates Project in sufficient detail to determine to what extent it may  
 26 affect any of the threatened, endangered, proposed, or sensitive species and designated or proposed critical  
 27 habitats found in the Action Area<sup>1</sup>. In addition, the information in this BA is provided to comply with  
 28 statutory requirements to use the best scientific and commercial information available when assessing the  
 29 risks posed to listed and/or proposed species and designated and/or proposed critical habitat by federal  
 30 actions. This BA is prepared in accordance with legal requirements set forth under regulations implementing  
 31 ESA Section 7 (50 CFR 402; 16 United States Code 1536 (c)).

## 32 1.1 ESA REQUIREMENTS

33 Federal Agencies have an obligation to ensure that any discretionary action they authorize, fund, or carry out  
 34 is not likely to jeopardize the continued existence of any endangered or threatened species or destroy or  
 35 adversely modify its critical habitat unless that activity is exempt pursuant to the Federal ESA 16 United  
 36 States Code §(a)(2); 50 Code of Federal Regulations (CFR) § 402.03. Under Section 7(a)(2), a discretionary  
 37 agency action jeopardizes the continued existence of a species if it “reasonably would be expected, directly or

Comment [PB1]: Statements that 2-Gates can provide equal or better protection of delta smelt compared to the OCAP BO RPAs seems to presume that there are no other effects of water operations on delta smelt than entrainment. The OCAP BO discussed on page 202 and 203 the influence of CVP and SWP operations on hydrodynamic conditions in the delta and in turn the dynamics of delta smelt interaction with other stressors.

Responded briefly here. This comment was made on a later section so it appears again later.

Comment [PB2]: The introduction in this version of the BA now states up-front that this is primarily a water supply project. This fact is also reflected in the purpose and need. This is an improved description of the project's purpose compared to the April 2009 draft.

Addressed

Comment [PB3]: See footnote. Find definition directly from guidance, with citation.

<sup>1</sup> The action area includes all areas to be affected directly or indirectly by the action, not merely the immediate area involved in the action.

indirectly, to reduce appreciably the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of the species” 50 CFR 402.02.

The U.S. Bureau of Reclamation (Reclamation) will comply with its obligations under ESA, namely, to: (1) avoid any discretionary action that is likely to jeopardize continued existence of listed species or adversely affect designated critical habitat; (2) take listed species only as permitted by the relevant Service; (3) and use Reclamation’s authorities to conserve listed species. Through this BA, Reclamation will evaluate anticipated effects of the proposed 2-Gates Project and is proposing actions to minimize adverse effects to listed species, and designated critical habitat, under its existing authorities and consistent with its 7(a)(1) obligation to conserve and protect listed species. Section 7(a)(1) alone does not give Reclamation additional authority to undertake any particular action, regardless of its potential benefit for endangered species. The Project operations will be coordinated with SWP and CVP operations and as such, are consulted on as part of the proposed action described in this BA.

## 1.2 BACKGROUND

Through the CVP and SWP, Reclamation and DWR have collectively built water storage and conveyance facilities in the Central Valley in order to deliver water supplies to water rights holders as well as CVP and SWP water contractors throughout California. A substantial amount of the water exported from the Delta is conveyed by SWP and CVP facilities.

Both Reclamation’s and DWR’s water rights are conditioned by the California State Water Resources Control Board (SWRCB) to protect the beneficial uses<sup>2</sup> of water within each respective project and jointly for the protection of beneficial uses in the Sacramento Valley and the Sacramento-San Joaquin Delta. The Coordinated Operations Agreement (COA) was signed in 1986 and defines the project 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 Rights Decision 1485 (D-1485), and 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. Additional water management restrictions are included in the SWRCB Water Rights Decision 1641 (D-1641) and in other permits, decisions, and biological opinions (i.e. FWS 2008 and NMFS 2009).

The SWP is operated to provide flood control and water supply for agricultural, municipal, industrial, recreational, and environmental purposes. The DWR has SWRCB permits and licenses to appropriate and divert (or redivert) water for the SWP. Water is stored in Oroville Reservoir, on the Feather River, and released to three Upper Feather River area contractors, two contractors served by the North Bay Aqueduct, and the State’s Harvey O. Banks Pumping Plant in the south Delta, near Tracy, California, after which it is delivered to the remaining 24 contractors in the SWP service areas south of the Delta. In addition, the Banks Pumping Plant pumps water from other sources entering the Delta (i.e., the Sacramento River, San Joaquin River, and Mokelumne River). The current operations of SWP reservoirs, pumping plants, and aqueducts vary throughout the year based on changing hydrologic and environmental factors, as well as regulations and agreements governing the operation of the Project.

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<sup>2</sup> A water quality control plan must establish beneficial uses. (Wat. Code § 13050(j)) Beneficial uses serve as a basis for establishing water quality objectives. The beneficial uses to be protected were established in the 1978 Delta Plan and the 1991 Bay-Delta Plan and no subsequent requests were made to change the beneficial uses so these uses are carried over into the current plan. The beneficial uses protected by this plan are: Municipal and Domestic Supply; Industrial Service Supply; Industrial Process Supply; Agricultural Supply; Ground Water Recharge; Navigation; Water Contact and Non-Contact Water Recreation; Shellfish Harvesting; Commercial and Sportfishing; Warm Freshwater Habitat; Cold Freshwater Habitat; Migration of Aquatic Organisms; Spawning, Reproduction, and/or Early Development; Estuarine Habitat; Wildlife Habitat; and Rare, Threatened, or Endangered Species.

The CVP is operated by Reclamation and includes several large storage reservoirs, associated hydroelectric plants, and pumping plants, including the C. W. "Bill" Jones Pumping Plant in the south Delta near Tracy. The CVP's major storage facilities are Shasta, Trinity, Whiskeytown, Folsom, New Melones, and Millerton. The upstream reservoirs release water to provide water for the Delta, of which a portion is exported through the Jones Pumping Plant for storage in San Luis Reservoir and its associated O'Neal Forebay, in the western San Joaquin Valley, or delivered down the Delta Mendota Canal to water contractors south of the Delta. 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 to store and convey water to contractors south of the Delta.

Delta smelt is currently a federally listed threatened species, although, the USFWS is considering a petition to change its status to endangered. The California Department of Fish and Game changed the status of delta smelt to 'endangered' on March 4, 2009. Many factors individually or in combination influence the movement of delta smelt into the south Delta toward the State and federal water export pumps. This movement can be influenced by Delta inflow, tidal flows, pumping at the CVP and SWP south Delta facilities, channel geometry and connections of Franks Tract, Old River and Middle River, along with salinity, temperature, and turbidity gradients. The southward movement of water, influenced significantly by pumping at the CVP and SWP water export facilities, makes these sensitive fish more vulnerable to entrainment and increases the risk to the long term survival of the species. Accordingly, this BA presents mitigation measures .....

Comment [PB4]: This begins to get at the numerous factors – "stressors."

Comment [PB5]: Delta smelt only?

Comment [PB6]: Complete

### 1.3 CONTENTS AND ORGANIZATION OF THE BIOLOGICAL ASSESSMENT

Reclamation has the responsibility for the scope, content, and adequacy of this BA. The species addressed in the following sections were evaluated in accordance with the federal ESA guidelines. This BA follows a structure similar to a BO and includes appendices which provide more details on the models used to evaluate effects. It also includes an operations plan that incorporates actions required through RPAs from the USFWS and NMFS OCAP BO's (USFWS 2008, NMFS 2009) and Conditions of Approval described in the CDFG Longfin smelt 2081 Incidental Take Permit (DFG 2009). The appendices also include the monitoring plan developed as part of the project to evaluate the effects of the 2-Gates Project on delta smelt and the other listed species.

Comment [PB7]: Why say?

Comment [PB8]: Meaning it's part of the PD?

This Biological Assessment is organized as follows:

- **Section 1.** Introduction: Presents the 2-Gates Project and the purpose of the BA.
- **Section 2.** Project Purpose and Description: Describes the purpose and need for the Project, its objectives, project description including the location and Action Area, construction details and schedule, operations and monitoring, protective measures for listed species, and mitigation measures incorporated as part of the Project.
- **Section 3.** Status of the Species: Describes the covered species status in the region, and in the Action Area.
- **Section 4.** Environmental Baseline: Provides an environmental baseline identifying the regulatory (including constraints established by the recent USFWS and NMFS BOs) and environmental setting.
- **Section 5.** Effects of the Action: Describes the approach to the effects analysis, the models used, and how the models were used to evaluate the operation of the Project.
- **Section 6.** Cumulative Effects: Lists other non-federal projects that may affect listed species in the Action Area.

Comment [PB9]: Concept?

Comment [PB10]: ?

- 1 • **Section 7.** Summary and Conclusion: Discusses the overall effects of cumulative effects and project  
2 actions.
- 3 • **Section 8.** Essential Fish Habitat: Provides an analysis of Essential Fish Habitat affected by the Project.
- 4 • **Section 9.** References: Provides a detailed listing of the references cited in the BA.
- 5 • **Appendices.** Provides supporting materials for the BA including the operations plan, science and  
6 monitoring plan, models used in the analysis, modeling results, and design plans for the sites. The BA  
7 appendices are listed below.
- 8 – Appendix A. Particle Tracking and Analysis of Adult and Larval/Juvenile Delta Smelt
- 9 – Appendix B. Operations Plan
- 10 – Appendix C. Science & Monitoring Plan
- 11 – Appendix D. 90% Design Plans for Old River Site & Connection Slough Sites
- 12 – Appendix E. Sacramento-San Joaquin Delta Turbidity Modeling
- 13 – Appendix F. Monitoring and Analysis to Determine if Elevated Turbities from the Sacramento River  
14 Trigger Movement of Adult Delta Smelt
- 15 – Appendix G. Hydrodynamic Analysis of 2-Gates Flood Stage Issues
- 16 – Appendix H. Hydrodynamic Analysis of 2-Gates Near Field Effects
- 17 – Appendix I. Consultation Letters
- 18 – Appendix J. Dry-and Wet-Season Sampling for Federally Listed Large Branchiopods
- 19 – Appendix K. Habitat Assessment for the Giant Garter Snake
- 20 – Appendix L. Essential Fish Habitat