

1 Introduction

The California Department of Water Resources (DWR) proposes to construct and operate new water conveyance facilities in the Sacramento–San Joaquin River Delta, including three intakes, two tunnels, associated facilities, and a permanent head of Old River (HOR) gate; operate existing State Water Project (SWP) Delta facilities in coordination with the new facilities; maintain the newly- constructed and existing facilities; implement and uphold new and existing conservation measures; and implement and assist in an ongoing monitoring and adaptive management program. Proposed operations, as described in Chapter 3, Section 3.3, *Operations and Maintenance of New and Existing Facilities*, will begin only after construction of the proposed new facilities is complete.

The U.S. Department of Interior, Bureau of Reclamation (Reclamation), as the lead agency for the Endangered Species Act section 7 consultation, proposes to coordinate Central Valley Project (CVP) operations with DWR, the applicant, using the new and existing facilities. The U.S. Army Corps of Engineers (USACE) proposes to issue permits to DWR pursuant to Rivers and Harbors Act Section 10, Clean Water Act Section 404, and 33 United States Code (U.S.C.) 408.

DWR’s operation of the proposed facilities, referred to as “California WaterFix,” would modify operation of SWP, which is operated in coordination with the CVP. Reclamation is responsible for operation and maintenance of the CVP, and DWR is responsible for the operation and maintenance of the SWP. The proposed new facilities would operate in coordination with the existing Delta facilities, including the Clifton Court Forebay (CCF), located in San Joaquin County, California. The three proposed intakes, comprising the new proposed north Delta diversions, would be located on the east bank of the Sacramento River near Clarksburg, in Sacramento County, California, and connected to the CCF by two underground tunnels and a new pumping plant, which would be sited at the CCF. The proposed new facilities would provide water for intake at the Banks Pumping Station and the South Bay Pumping Plant, which are existing SWP facilities that draw water from the CCF for distribution through existing SWP facilities.

DWR is the entity undertaking all construction-related activities including those related to the intakes, the associated tunnels, and their associated structures. The in-water construction activities associated with the intakes, tunnels, and associated structures, as well as the change in SWP Delta operations, requires a combination of Rivers and Harbors Act Section 10, Clean Water Act Section 404, and 33 U.S.C. 408 approvals from USACE. DWR and/or its designees will operate and maintain the facilities, and Reclamation will adjust operation of the CVP to utilize the dual conveyance.

As required by the by Section 7 of the Endangered Species Act and its implementing regulations (50 CFR 402.02), this Biological Assessment (BA) is being prepared to provide the basis for consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to determine whether the proposed action (PA) is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify designated critical habitat.

Through informal consultation (see 50 CFR 402.02, 402.13), this document has been developed by DWR and Reclamation in close collaboration with NMFS and USFWS, as detailed in Chapter 2 *Consultation History*. This collaboration has determined the scope of the PA, the species addressed, the analyses used to assess effects on those species, and changes to the PA to ensure that effects are minimized and, to the extent possible, beneficial. This collaboration has helped to produce a PA that minimizes potential effects on listed species and that supports the analyses needed to enable NMFS and USFWS to develop their biological opinion. Names and contact information for responsible parties are presented in Table 1-1.

Table 1-1. Responsible Parties, Respective Role, and Contact Information

Agency	Role	Contact Information
Bureau of Reclamation	Lead Federal Agency and Action Agency for Coordinated Operation of the CVP/ and SWP (“Operation”)	Brooke Miller-Levy, California WaterFix Program Manager, Bureau of Reclamation, 801 I Street, Suite 140, Sacramento, CA 95814-2536 (916) 414-2402
California Department of Water Resources	Applicant	Cindy Messer, Assistant Chief Deputy Director, Department of Water Resources, 1416 Ninth Street, Sacramento, CA 95814 916-651-6736
U.S. Army Corps of Engineers	Action Agency for Construction	Zachary Simmons or Meegan Nagy, Operations & Readiness Branch, 1325 J Street (CESPK-CO-OR), Sacramento, CA 95814-2922 916-557-7257

1.1 Relationship to Existing Biological Opinions

This BA is being submitted with a request for initiation of formal consultation that is expected to result in a biological opinion that will apply to, among other things, construction of new facilities described in Chapter 3, *Description of the Proposed Action*, of this BA. The CVP/SWP will continue to operate pursuant to the 2008 USFWS and 2009 NMFS Biological Opinions (National Marine Fisheries Service 2009, 2011; U.S. Fish and Wildlife Service 2008) until the new facilities are constructed. Once the new facilities are operational, the new biological opinion will replace and supersede the 2008 USFWS and 2009 NMFS Biological Opinions for operations of the CVP and SWP described in Chapter 3 of this BA, which includes both new operational provisions and operational provisions that will remain in effect unmodified. As such, once the new facilities are operational, CVP and SWP operations not described in Chapter 3 of this Biological Assessment will continue to operate pursuant to the 2008 USFWS and 2009 NMFS Biological Opinions.

As discussed in Chapter 2, *Consultation History*, and in Section 3.1.4, *Delta Operations Regulatory Setting*, there are currently numerous regulatory constraints in place that apply to the PA. Many of the existing regulatory constraints are in place as a result of the 2008 and 2009 Biological Opinions (BiOps; National Marine Fisheries Service 2009, 2011; U.S. Fish and Wildlife Service 2008) and a California Incidental Take Permit (California Department of Fish and Game [CDFG] 2009); these have been incorporated into the PA unless otherwise noted, although several components will continue to be evaluated through the current and future Collaborative Science and Adaptive Management Program (Section 3.4.7). Table 3.1-1 identifies the proposed new facilities, identifies the existing regulatory constraints that apply to CVP/SWP

facilities and operations in the Delta region, and notes which requirements are (or are not) incorporated in the PA.

1.2 Inclusion of Upstream Operations

The PA is described in Chapter 3, and does not include any upstream operational changes. A number of physical and biological models were used to assess the general long-term operational effects of the PA, with the primary model being CALSIM II, a monthly model, on which other monthly and daily flow and temperature models rely for input. These models represent the best scientific and commercial data available to estimate and analyze the potential system-wide environmental effects of the PA related to water operations. However, the modeled results cannot represent exactly how the project would necessarily operate, because they cannot take into account the various annual, seasonal, and real-time conditions that occur as part of the operational management of the CVP and SWP. These operations occur in response to uncontrollable and unpredictable conditions that can vary significantly, and often at a time step much shorter than the basis for the operations model.

The increased flexibility provided by the dual conveyance system and changes in operational criteria for facilities within the Delta may allow for changes in upstream operations to occur, but such changes would remain consistent with the existing operating criteria governing operations on the tributary systems. For example, upstream operations may change in response to climate change and sea level rise as shown in the modeling of the No Action Alternative (NAA) for the BDCP Draft EIR/EIS (California Department of Water Resources, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, and National Marine Fisheries Service 2013), even though the operating criteria for those conditions remain unchanged. Appendix 5A presents a detailed description of the CALSIM II modeling assumptions and results.

The PA does not propose any changes to upstream operational criteria, and the CALSIM model assumes that the currently applicable criteria, including those set forth in the NMFS BiOp (National Marine Fisheries Service 2009, 2011), remain intact. As is the case today, the PA and the rest of the CVP and SWP will be operated to meet authorized purposes, including flood control, navigation, water supply, and fish and wildlife purposes, in a manner that comports with applicable legal and contractual obligations. The modeled results show that the CVP could be operated slightly differently under the PA, but these differences in results do not thoroughly reflect the ability to manage the upstream operations in a way that addresses environmental variables and meets the applicable flow and temperature criteria. Rather, results are intended to be a reasonable representation of long-term operational trends of the CVP and SWP, providing the ability to compare and contrast the effect of current and assumed future operational conditions. The effects of these differences in results are thoroughly evaluated in this BA (Chapter 5, Section 5.4.2). The existing processes used to manage upstream operations and meet the current applicable criteria (which are not proposed to change) will continue. As such, there are no proposed new actions related to upstream operations.

Potential interrelated or interdependent actions were evaluated by considering actions that are ongoing or reasonably foreseeable, that occur wholly or in part within the action area, and that are functionally related to the PA. To determine if an action is interrelated to or interdependent with a proposed action, the Fish & Wildlife Service Endangered Species Consultation Handbook

(FWS Handbook) directs that the agency “should ask whether another activity in question would occur ‘but for’ the proposed action under consultation” (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998, 4-27). In doing so, the agency must be “careful not to reverse the analysis by analyzing the relationship of the proposed action against the other activity.” *Id.* For instance, “if the proposed action is the addition of a second turbine to an existing dam, the question is whether the dam (the other activity) is interrelated to or interdependent with the proposed action (the addition of the turbine), not the reverse.” *Id.* In this case, the PA is the proposed action under consultation, so the agency should determine whether any other action in question would occur “but for” the PA.

Upstream operations of the CVP and SWP (the other activity) will continue—consistent with existing biological opinions—whether or not the PA (the action under consultation) is authorized, constructed, and operated. Thus, consistent with the directive from FWS Handbook, upstream actions are not interrelated to or interdependent with the PA.

1.3 Species Considered

Pursuant to the interagency consultation requirements of Section 7 of the Endangered Species Act (ESA) of 1972, as amended (the “Act”), this BA has been prepared to assess the effects of the PA on species listed or designated critical habitat under the ESA. Determination of which listed species should be included in this BA was based on review of Geographical Information System (GIS) distributional maps and water operations modeling, field visits, literature reviews, and discussions with federal and State agencies. Species lists were generated on May 20, 2015, by the USFWS’ Bay-Delta Fish and Wildlife Office and on May 22, 2015, by the USFWS’ Sacramento Fish and Wildlife Office. On July 24, 2015, NMFS confirmed the list of species under NMFS jurisdiction in an email. These lists are attached as Appendix 1.A and Appendix 1.B. The species addressed in this document have been derived from the species lists provided by USFWS and NMFS. Species considered for inclusion in this BA include all species on the USFWS and NMFS species lists and additional species with potential to occur in the action area (Table 1-2 and Table 1-3).

1.3.1 Species Addressed in This Biological Assessment

Table 1-3 identifies the listed species that may be affected by the PA, status of designated critical habitat in the action area, listing status (threatened or endangered), and which Federal agency (USFWS or NMFS) retains jurisdiction and responsibility under Section 7 of the Act. Throughout this document, the term “listed species” is used to refer to the species listed in Table 1-2 or to its critical habitat, and is not intended to include any other species listed under the ESA.

1.3.2 Species Considered but Not Addressed Further

In addition to the species listed in Table 1-2, a number of species and their critical habitat were considered for inclusion because initial review indicated they could occur in the action area; however, based on analysis of the PA, Reclamation and DWR have determined that the PA will not affect (*no effect*) these listed species or designated critical habitat (Table 1-3). A rationale for that determination is provided in Table 1-3.

Table 1-2. Listed Species Addressed in This BA

Common Name	Scientific Name	Jurisdiction	Status	Status of Critical Habitat
Chinook salmon, Sacramento River winter-run ESU	<i>Oncorhynchus tshawytscha</i>	NMFS	Endangered	Designated critical habitat in action area
Chinook salmon, Central Valley spring-run ESU	<i>Oncorhynchus tshawytscha</i>	NMFS	Threatened	Designated critical habitat in action area
Steelhead, California Central Valley DPS	<i>Oncorhynchus mykiss</i>	NMFS	Threatened	Designated critical habitat in action area
Green sturgeon, southern DPS	<i>Acipenser medirostris</i>	NMFS	Threatened	Designated critical habitat in action area
Killer whale, Southern Resident DPS	<i>Orcinus orca</i>	NMFS	Endangered	Designated critical habitat in action area
Delta Smelt	<i>Hypomesus transpacificus</i>	USFWS	Threatened	Designated critical habitat in action area
Salt marsh harvest mouse ^a	<i>Reithrodontomys raviventris</i>	USFWS	Endangered	Critical habitat not designated.
Riparian brush rabbit	<i>Sylvilagus bachmani riparius</i>	USFWS	Endangered	Not designated
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	USFWS	Endangered	Not designated
California clapper rail ^a	<i>Rallus longirostris obsoletus</i>	USFWS	Endangered	Not designated
California least tern	<i>Sternula antillarum browni</i>	USFWS	Endangered	Not designated
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	USFWS	Threatened	Designated critical habitat not in action area
Giant garter snake	<i>Thamnophis gigas</i>	USFWS	Threatened	Not designated
California red-legged frog	<i>Rana draytonii</i>	USFWS	Threatened	Designated critical habitat in action area
California tiger salamander	<i>Ambystoma californiense</i>	USFWS	Threatened	Designated critical habitat not in action area
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	USFWS	Threatened	Designated critical habitat in action area
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	USFWS	Endangered	Designated critical habitat not in action area
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	USFWS	Threatened	Designated critical habitat not in action area
Least Bell's vireo	<i>Vireo bellii pusillus</i>	USFWS	Endangered	Designated critical habitat not in action area
Soft bird's beak ^a	<i>Cordylanthus mollis ssp. mollis</i>	USFWS	Endangered	Designated critical habitat in action area
Suisun thistle ^a	<i>Cirsium hydrophilium</i>	USFWS	Endangered	Designated critical habitat in action area
DPS = distinct population segment ESU = evolutionarily significant unit ^a Species occurs in Suisun Marsh, and is addressed in Appendix 6.C, <i>Suisun Marsh Species</i> , rather than the main body of this Biological Assessment.				

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Table 1-3. Species Considered but Not Addressed Further because of “No Effect” Determinations

Common Name	Scientific Name	Jurisdiction	ESA Status	Potential for Effect	Potential to Affect Critical Habitat
Steelhead, Central California Coast DPS	<i>Oncorhynchus mykiss</i>	NMFS	Threatened	The species' range does not overlap the action area.	Designated critical habitat not in action area
Coho salmon, Southern Oregon/Northern California Coast ESU	<i>Orncorhynchus kisutch</i>	NMFS	Threatened	The species' range does not overlap the action area.	Designated critical habitat not in action area
Lange's metalmark butterfly	<i>Apodemia mormo langei</i>	USFWS	Endangered	The species' range does not overlap the action area.	Designated critical habitat not in action area
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	USFWS	Endangered	Occurrences have not been detected in the area to be affected by the conveyance facility, transmission lines, or geotechnical activity. The vernal pools to be affected by these activities were surveyed consistent with USFWS protocol, and Conservancy fairy shrimp was not detected. Moreover, the vernal pools to be affected are not large turbid pools that are characteristic of Conservancy fairy shrimp habitat. Restoration projects will avoid any areas that potentially support Conservancy fairy shrimp.	Designated critical habitat not in action area
Longhorn fairy shrimp	<i>Branchinecta longiantenna</i>	USFWS	Endangered	Occurrences have not been detected in the area to be affected by the conveyance facility, transmission lines, or geotechnical activity. The vernal pools to be affected by these activities were surveyed consistent with USFWS protocol, and longhorn fairy shrimp was not detected. Restoration projects will avoid any areas that potentially support longhorn fairy shrimp.	Designated critical habitat not in action area.
Delta green ground beetle	<i>Elaphrus viridis</i>	USFWS	Threatened	There are no proposed activities in the area where this species is known to occur. Tidal restoration could occur along Lindsay Slough within the range of the species but would be required to avoid Delta green ground beetle habitat.	Designated critical habitat not in action area
San Bruno elfin butterfly	<i>Callophrys mossii bayensis</i>	USFWS	Endangered	The species' range does not overlap the action area.	Proposed critical habitat not in action area
Callippe silverspot butterfly	<i>Speyeria callippe</i>	USFWS	Endangered	Documented occurrences are outside the legal Delta in the hills west of Interstate 680 (LSA and ESP 2009); therefore, there is no potential for take or effects on this species.	Critical habitat not designated
Alameda whipsnake	<i>Masticophis lateralis euryxanthus</i>	USFWS	Threatened	The occurrences, critical habitat, and recovery unit for Mt. Diablo – Black Hills population are approximately 8 miles west of the boundary of the PA, primarily west and north of Los Vaqueros Reservoir. No suitable habitat would be affected by the PA. Although some grassland protection could occur west of the Delta to mitigate effects on other species, the grasslands would not provide suitable habitat for Alameda whipsnake. Accordingly, the PA would not affect this species.	Designated critical habitat not in action area
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	USFWS	Threatened	The species' range does not overlap the action area; there are only three nesting records for the species in Yolo County since 1945—the Yolo Bypass, Davis Sewage Ponds, and Woodland Sugar Ponds; no other recent records exist for the Delta or Sacramento Valley.	Critical habitat not designated
Riparian woodrat	<i>Neotoma fuscipes riparia</i>	USFWS	Endangered	There is one reported occurrence near Vernalis from 1935 (California Department of Fish and Wildlife 2013). Two extant populations occur, one documented at Caswell Memorial State Park and the other unconfirmed near Vernalis. There is no modeled habitat in the area to be affected by the PA.	Critical habitat not designated
Large-flowered fiddleneck	<i>Amsinckia grandiflora</i>	USFWS	Endangered	Species does not occur in the action area.	Critical habitat not designated
Succulent (fleshy) owl's clover	<i>Castilleja campestris</i> ssp. <i>Succulenta</i>	USFWS	Threatened	Species does not occur in the action area.	Designated critical habitat not in action area

Common Name	Scientific Name	Jurisdiction	ESA Status	Potential for Effect	Potential to Affect Critical Habitat
Tiburon paintbrush	<i>Castilleja affinis</i> subsp. <i>neglecta</i>	USFWS	Endangered	Species does not occur in the action area.	Critical habitat not designated
Palmate-bracted bird's-beak	<i>Chloropyron palmatum</i>	USFWS	Endangered	There are no recorded occurrences in the action area.	Critical habitat not designated
Contra Costa wallflower	<i>Erysimum capitatum</i> var. <i>angustatum</i>	USFWS	Endangered	There are no recorded occurrences in the action area.	Designated critical habitat not in action area
Santa Cruz tarplant	<i>Holocarpha macradenia</i>	USFWS	Threatened	Species does not occur in the action area	Critical habitat not designated
Contra Costa goldfields	<i>Lasthenia conjugens</i>	USFWS	Endangered	There are no recorded occurrences in the action area.	Designated critical habitat not in action area
Colusa grass	<i>Neostapfia colusana</i>	USFWS	Threatened	There are no recorded occurrences in the action area.	Designated critical habitat not in action area
Antioch Dunes evening-primrose	<i>Oenothera deltoides</i> subsp. <i>howellii</i>	USFWS	Endangered	There are no recorded occurrences in the action area.	Designated critical habitat not in action area
Slender Orcutt grass	<i>Orcuttia tenuis</i>	USFWS	Threatened	Occurrences and critical habitat are located east of the action area.	Designated critical habitat in action area
Sacramento Orcutt grass	<i>Orcuttia viscida</i>	USFWS	Endangered	Occurrences and critical habitat are located east of the action area.	Designated critical habitat not in action area
Keck's checkerbloom	<i>Sidalcea keckii</i>	USFWS	Endangered	Species does not occur in the action area.	Critical habitat not designated
Showy rancheria clover	<i>Trifolium amoenum</i>	USFWS	Endangered	There are no recorded occurrences in the action area.	Critical habitat not designated
Solano grass	<i>Tuctoria mucronata</i>	USFWS	Endangered	There are no recorded occurrences in the action area.	Designated critical habitat not in action area

1.4 References

- Bureau of Reclamation. 2008. *Biological Assessment on the Continued Long-term Operations of the Central Valley Project and the State Water Project*. Available: http://www.usbr.gov/mp/cvo/ocap_page.html.
- California Department of Fish and Game. 2009. California Endangered Species Act Incidental Take Permit No. 2081-2009-001-03.
- California Department of Fish and Wildlife. 2013. *California Natural Diversity Database*, RareFind 3, Version 3.1.0. June.
- California Department of Water Resources, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, and National Marine Fisheries Service. 2013. *Draft Environmental Impact Report/Environmental Impact Statement for the Bay Delta Conservation Plan*. November. (ICF 00674.12.) Prepared by ICF International, Sacramento, CA.
- California Department of Water Resources. 2009. California Incidental Take Permit Application for the California State Water Project Delta Facilities and Operations. February.
- LSA Associates, Inc. and Environmental Stewardship & Planning, Inc. [LSA and ESP]. 2009. *Mitigation and Monitoring Plan – Potrero Hills Landfill Phase II Expansion, Solano County, Corps File No. 26024N*. Prepared for Potrero Hills Landfill. Prepared by LSA Associates, Inc. and Environmental Stewardship & Planning, Inc., Pt. Richmond and Sacramento, California.
- National Marine Fisheries Service. 2009. *Biological Opinion and Conference Opinion on the Long-term Operations of the Central Valley Project and State Water Project*. June. Southwest Region, Long Beach, CA. Available: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/nmfs_biological_and_conference_opinion_on_the_long-term_operations_of_the_cvp_and_swp.pdf, accessed 2015.09.17.
- National Marine Fisheries Service. 2011. *2009 Reasonable and Prudent Alternative with 2011 Amendments*. April 7. Available: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf, accessed 2015.09.17.
- U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. *Endangered Species Consultation Handbook*. Available: https://www.fws.gov/ENDANGERED/esalibrary/pdf/esa_section7_handbook.pdf, accessed 2016.01.08.
- U.S. Fish and Wildlife Service. 2008. *Formal Endangered Species Act Consultation on the Proposed Coordinated Operations of the Central Valley Project (CVP) and State Water Project (SWP)*. Biological opinion. December. Sacramento, CA. Available: http://www.fws.gov/sacramento/delta_update.htm.