Chapter 7
Environmental Analysis

7.1 Introduction, Project Description, and Approach to Environmental Analysis

This section includes the project description for the proposed Plan amendments, including reasonably foreseeable methods of compliance and response actions to inform the environmental analyses. It describes the project purposes and goals, the plan area and study area, the approach to the environmental analyses, and where more detailed information is located in the Staff Report.

7.1.1 Introduction

The State Water Board is considering amendments to the Bay-Delta Plan focused on the Sacramento River and its tributaries, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne Rivers), Delta outflows, and interior Delta flows. Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*, describes possible updates to the Bay-Delta Plan, or proposed Plan amendments, that were largely identified in a 2018 State Water Board staff Framework for a possible Sacramento/Delta Update to the Bay-Delta Plan (Framework) (^SWRCB 2018) that was released in advance of consideration of the 2018 updates to the Bay-Delta Plan and following completion of the 2017 *Scientific Basis Report in Support of possible New and Modified Requirements for Inflows from the Sacramento River and Its Tributaries and Eastside Tributaries to the Delta, Delta Outflows, Cold Water Habitat, and Interior Delta Flows* (Scientific Basis Report) (^SWRCB 2017b).

The proposed Plan amendments include the following objectives and implementation measures for the protection of fish and wildlife, which are discussed in more detail below.

1. Inflows from the Sacramento River, its tributaries, and Delta eastside tributaries (the Calaveras, Cosumnes, and Mokelumne Rivers) that would require 55 percent unimpaired flow, with an adaptive range from 45 percent to 65 percent unimpaired flow.
2. Inflow-based Delta outflows that would require inflows required as part of the Bay-Delta Plan, including from the Sacramento/Delta tributaries and San Joaquin River and tributaries, to be provided as outflows.
3. Cold water habitat provisions that would require reservoirs to be operated in a manner that provides needed cold water habitat for salmonids or other measures to provide cold water habitat.
4. Interior Delta flows to reasonably protect native fish populations migrating through and rearing in the Delta, including expanding the existing Bay-Delta Plan exports constraints based on San Joaquin River inflows to include all of April and May and variable exports based on hydrologic conditions; incorporation of Old and Middle River (OMR) flow constraints; and addition of October to the possible period when the Delta Cross Channel (DCC) gate is required to be closed.
5. Monitoring, reporting, and evaluation measures and other provisions.

In 2022, when this draft Staff Report was nearing completion, the State Water Board received a memorandum of understanding (MOU) for proposed Voluntary Agreements (VAs) for updating the Bay-Delta Plan from various water users in the watershed, including the California Department of Water Resources (DWR) and U.S. Bureau of Reclamation (Reclamation), as well as the California Department of Fish and Wildlife (CDFW), California Natural Resources Agency, and California Environmental Protection Agency.

Consistent with State Water Board Resolution 2018-0059 adopting the 2018 amendments to the Bay-Delta Plan, the State Water Board is considering the proposed VAs as an alternative that could provide a possible path forward for updating the Bay-Delta Plan. The VAs propose flow assets and habitat restoration measures in the Sacramento/Delta for an 8-year term. The proposed VAs identify that there will be a regulatory implementation pathway that would exist in parallel with the VA implementation pathway. The staff-proposed regulatory pathway under the VA alternative would apply to non-VA parties and could apply to VA parties in the event the VAs are discontinued. The proposed regulatory pathway is largely consistent with the proposed Plan amendments, except that instead of being amended into the water quality objectives, the inflow, inflow-based Delta outflow, and cold water habitat provisions of the proposed Plan amendments would be included in the program of implementation and could become applicable in the future if the VAs are not continued. Upon completion of the VA components, anticipated in late 2023, the State Water Board plans to hold additional public meetings and provide additional opportunities for public comments to receive input on possible incorporation of the VAs into the Bay-Delta Plan update and other input on the Plan update.

When proposing to undertake or approve a discretionary project, state agencies must comply with the California Environmental Quality Act (CEQA). (Pub. Resources Code, § 21000 et seq.) This draft Staff Report was prepared in compliance with CEQA and other laws to analyze the potential environmental impacts of adopting and implementing amendments to the Bay-Delta Plan. This chapter (Chapter 7) contains the analyses of potential environmental effects that may occur due to implementation of the proposed Plan amendments and several other project alternatives. Because the VAs were received after much of this draft Staff Report was prepared, the VA alternative is analyzed separately in Chapter 9, *Proposed Voluntary Agreements*, of this report. This section discusses CEQA, identifies the project purpose and goals, presents the project description for the proposed Plan amendments, and explains the approach and organization of the environmental analyses.

7.1.2 California Environmental Quality Act

The State Water Board adopts water quality control plans as part of a certified regulatory program under CEQA. (Pub. Resources Code, § 21080.5, subd. (b)(2); Cal. Code Regs., tit. 23, § 3775 et seq.) Certified regulatory programs are exempt from CEQA's requirements for preparing an environmental impact report (EIR), negative declaration, and/or initial study (Pub. Resources Code § 21080.5; Cal. Code Regs., tit. 14, § 15251, subd, (g).) Accordingly, the State Water Board may prepare a substitute environmental document (SED) that meets the requirements of CEQA. (Cal. Code Regs., tit. 14, § 15252, subd, (a).)

The State Water Board has adopted CEQA regulations applicable to certified regulatory programs and preparation of an SED. (Cal. Code Regs., tit. 23, §§ 3720–3781.) These regulations provide the State Water Board's exclusive procedural requirements for the Board's certified regulatory programs, including the contents of the SED and the procedures for receiving and responding to

comments. (Id., §§ 3777, 3779, 3779.5.) The Board's certified regulatory program is "subject to the broad policy goals and substantive standards of CEQA." (City of Arcadia v. State Water Resources Control Bd. (2006) 135 Cal.App.4th 1392, 1422; Cal. Code Regs., tit. 23, § 3720, subd. (c)(2).) The Staff Report also cites the State CEQA Guidelines where appropriate and relevant to help guide or inform the CEQA analysis consistent with CEQA's goals and standards.

The SED may be comprised of a single document or a compilation of documents. Pursuant to California Code of Regulations, title 23, section 3777, subdivision (b), the SED must include:

(1) A brief description of the proposed project;

(2) An identification of any significant or potentially significant adverse environmental impacts of the proposed project;

(3) An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and

(4) An environmental analysis of the reasonably foreseeable methods of compliance. The environmental analysis shall include, at a minimum, all of the following:

  (A) An identification of the reasonably foreseeable methods of compliance with the project;

  (B) An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;

  (C) An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and

  (D) An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance.

CEQA's basic purposes are to: (1) inform governmental decision makers and the public about the potential significant environmental effects of proposed activities; (2) identify ways that environmental damage can be avoided or significantly reduced; (3) prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and (4) disclose to the public why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved. (Cal. Code Regs., tit. 14, § 15002, subd. (a).) To fulfill these functions, an evaluation of the environmental effects need not be exhaustive, but the sufficiency of an environmental analysis is to be reviewed in light of what is reasonably feasible and CEQA documents need not be perfect. CEQA documents should be adequate, complete, and represent a good faith effort at full disclosure. (Id., § 15151.)

This entire Staff Report can be considered the SED that fulfills the requirements of CEQA and the State Water Board's CEQA regulations (Cal. Code Regs., tit. 23, § 3775 et seq.) to analyze the environmental effects of the proposed regulatory activity, as well as requirements of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) and other applicable requirements. The majority of the environmental analyses and conclusions are presented in Chapters 7, *Environmental Analysis*, and 9, *Proposed Voluntary Agreements*. This Staff Report will inform the State Water Board's consideration of the potential amendments to the Bay-Delta Plan.

Chapters included in this Staff Report are summarized below.

- Chapter 1, *Executive Summary*, explains the Staff Report purpose and organization, and provides a summary of its major findings. Other chapters of the Staff Report inform the environmental analysis and contain additional details on specific topics.
- Chapter 2, *Hydrology and Water Supply*, describes the flow regime within the Sacramento/Delta watershed, including how the magnitude, frequency, duration, timing, and rate of change of flows have been altered, and presents an overview of California's water rights system and water supply portfolios.
- Chapter 3, *Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations*, provides a review and summary of the best available science on flow needs for the protection of fish and wildlife beneficial uses.
- Chapter 4, *Other Aquatic Ecosystem Stressors*, summarizes other aquatic ecosystem stressors (e.g., loss of habitat, invasive species, water quality pollutants) in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) watershed, and how those stressors interact in the ecosystem.
- Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta,* includes a description and discussion of the proposed Plan amendments, including water quality objectives and a description of the program of implementation provisions designed to meet the objectives. This chapter is informed by Chapters 2 through 4, the model outputs in Chapter 6, environmental analyses in Chapter 7, and economic evaluation in Chapter 8.
- Chapter 6, *Changes in Hydrology and Water Supply*, presents the Sacramento Water Allocation Model (SacWAM) output in a range of potential instream flow changes in increments of ten, from 35 percent up to 75 percent unimpaired flow (referred to as *scenarios*), and describes other water management actions, including groundwater storage and recovery, water transfers, water recycling, and conservation measures.
- Chapter 7, *Environmental Analysis*, presents the approach to the environmental analysis; a description of alternatives and alternatives analysis; the environmental analyses for all resource topics; an evaluation of habitat restoration and other ecosystem projects, as well as new or modified facilities; and an analysis of cumulative impacts, growth-inducing impacts, and significant irreversible environmental changes.
- Chapter 8, *Economic Analysis and Other Considerations*, evaluates economic effects associated with the proposed Plan amendments.
- Chapter 9, *Proposed Voluntary Agreements*, includes analyses of the proposed VAs. These analyses are included together in Chapter 9 because the VAs were received after much of this draft Staff Report was prepared. Chapter 9 provides model results and an evaluation of potential environmental impacts of the Proposed Voluntary Agreements Alternative. This chapter relies on the environmental analyses presented in Chapter 7 where possible for efficiency and to avoid redundancy. The economic effects of the proposed VAs also are evaluated in this chapter.
- Chapter 10, *Economically Disadvantaged Communities*, provides an overview of economically disadvantaged communities (DAC) and their water supplies, discusses potential effects of the project on DACs and small public water systems, and incorporates information from several other sections and chapters to identify potential effects on DACs. This chapter also discusses

relevant State Water Board financial and technical assistance programs to provide safe, clean, and reliable water supplies to DACs.

- Chapter 11, *Tribal Engagement*, summarizes tribal engagement activities and input received related to the Sacramento/Delta update to the Bay-Delta Plan, including tribal input requesting the incorporation of traditional ecological knowledge (TEK) and addition of Tribal Beneficial Uses to the Bay-Delta Plan. Chapter 11 also provides a summary of TEK from California Native American tribes in the Bay-Delta watershed. The State Water Board plans to continue to work with the tribes to incorporate their further input on this draft Staff Report.
- Chapter 12, *Public Participation*, summarizes public participation activities that were held throughout the pre-scoping and scoping phase of the environmental review process for the Sacramento/Delta update to the Bay-Delta Plan.

7.1.3 Purpose and Goals of the Sacramento/Delta Update to the Bay-Delta Plan

The underlying fundamental purpose of the project is to establish water quality objectives, a program of implementation, and monitoring and special study measures for the reasonable protection of fish and wildlife beneficial uses in the Sacramento/Delta.[1]

The goals of the Sacramento/Delta update to the Bay-Delta Plan are to:

1. Provide an interconnected flow regime that provides for comprehensive protection for fish and wildlife from upstream natal Sacramento/Delta tributaries, through the Delta, and out to the ocean.
2. Provide flows, water quality, and other habitat conditions in the Sacramento/Delta that are sufficient to recover and maintain the natural production of viable native fish populations residing in and migrating through the Delta.
3. Provide flows of sufficient frequency, timing, magnitude, and duration necessary to achieve functions and processes essential to native fishes, such as improved tributary and in-Delta habitat conditions, improved temperature conditions, improved migratory conditions, and increased floodplain inundation, and promote habitat conditions that favor native fishes over nonnative fishes.
4. Provide for voluntary and default pathways with flexibility for establishing beneficial habitat conditions for native fishes, addressing scientific uncertainty and changing conditions, developing scientific information that will inform future management of flows, and meeting biological goals.
5. Promote transparency in decision-making to the regulated community, tribal nations, environmental justice communities, and other stakeholders.
6. Establish flow objectives to reasonably protect fish and wildlife that take into consideration all of the demands being made and to be made on waters in the Sacramento/Delta and the factors.

[1] State CEQA Guidelines section 15124, subdivision (b), requires the lead agency to include a statement of the objectives sought by the proposed project. To avoid confusion with the term "objective" as it is used in reference to flow and other water quality objectives, this document will refer to the "objectives" mentioned in section 15124 instead as "goals."

to be considered for establishing water quality objectives in Water Code section 13241. These factors include, but are not limited to, past, present, and probable future beneficial uses and economic considerations.

7. Provide for the development and implementation of a monitoring and evaluation program to inform adaptive management of flows and future changes to the Plan.
8. Provide for and encourage collaboration, coordination, and integration of regulatory, scientific, and management processes related to flows in the Sacramento/Delta.

The proposed Plan amendments discussed below were developed in consideration of these purposes and goals. The proposed Plan amendments would establish new inflow, cold water habitat, interior Delta flow, and Delta outflow objectives and a program of implementation for the reasonable protection of fish and wildlife beneficial uses in the Sacramento/Delta. The proposed objectives would be intended to provide an interconnected flow regime from upstream natal Sacramento/Delta tributaries, through the Delta, and out to the ocean along with recommendations to other entities for habitat restoration and other actions to improve ecosystem functions. As explained in more detail below, the proposed Plan amendments would be expected to provide for the recovery and maintenance of viable native fish populations residing in and migrating through the Delta.

Information presented in previous chapters, including but not limited to Chapter 3*, Scientific Knowledge to Inform Fish and Wildlife Flow Recommendations*, discuss the science on flow conditions that support protection of fish and wildlife beneficial uses. Specifically, flow-abundance relationships indicate that the population abundance of key indicator species of the health of the ecosystem would be expected to be greater under the proposed Plan amendments (55 percent unimpaired flow requirement) while also providing the ability to maintain cold water supplies. While higher flow levels show greater species responses using flow abundance relationships, at those flow levels (i.e., 75 percent of unimpaired flow), maintaining cold water supplies would be difficult and water supply impacts would be extensive and may be unreasonable.

Overall, the proposed Plan amendments would be expected to provide for the frequency, timing, magnitude, and duration of flows that supports functions and processes for the protection of native fishes. The proposed Plan amendments would also provide for voluntary implementation pathways that can provide for better outcomes with lower water supply costs. The proposed Plan amendments also provide for monitoring and special studies measures to inform decision-making. The proposed Plan amendments were designed to provide transparency in decision-making to the regulated community, tribal nations, environmental justice communities, and other stakeholders. While not the only possible approach that would do so, the proposed Plan amendments provide an approach that considers the demands being made and to be made on waters in the Sacramento/Delta and the factors to be considered for establishing water quality objectives in Water Code section 13241.

Section 7.2, *Description of Alternatives*, Section 7.24, *Alternatives Analysis*, and Chapter 9, *Proposed Voluntary Agreements,* discuss each alternative relative to the project purposes and goals.

7.1.4 Proposed Plan Amendments

The possible changes to the Bay-Delta Plan referred to as the *proposed Plan amendments* include new or modified narrative and numeric objectives, including new inflow and cold water habitat objectives for the Sacramento/Delta tributaries, new Delta outflow objectives, and new interior

Delta flow objectives. Tributaries where the new inflow and cold water habitat objectives would apply include tributaries in the Sacramento River watershed, including the Sacramento River, Clear Creek, Cow Creek, Bear Creek, Cottonwood Creek, Battle Creek, Paynes Creek, Antelope Creek, Mill Creek, Elder Creek, Deer Creek, Thomes Creek, Big Chico Creek, Stony Creek, Feather River, Butte Creek, Yuba River, Bear River, Cache Creek, Putah Creek, and the American River; as well as Delta eastside tributaries, including the Cosumnes River, Mokelumne River, and Calaveras River. The interior Delta and Delta outflow objectives would apply in the Delta. Figure 7.1-1a identifies the extent of the possible updates to the Bay-Delta Plan.

The proposed Plan amendments are summarized briefly below and discussed in more detail in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*.

7.1.4.1 Proposed Plan Amendments

Inflows

In order to improve ecosystem functions on the tributaries, including by providing appropriate habitat conditions for adult salmonid immigration and holding and juvenile rearing and outmigration, and to connect flows from throughout the watershed with the Delta to support native estuarine species, a new inflow objective is proposed for the Sacramento/Delta tributaries as part of the proposed Plan amendments. The new inflow objective would be integrated with the cold water habitat protection and Delta outflow objectives for the proposed Plan amendments to provide comprehensive protection of the Bay-Delta watershed ecosystem. The proposed inflow objective is also intended to provide for increasing the frequency and duration of floodplain inundation for the benefit of native species.

To help guide implementation actions, the proposed new inflow objective includes both a narrative and a numeric component. The narrative portion of the inflow objective: (1) describes the needs for inflows to provide appropriate conditions in tributaries and to contribute flows to the Delta; and (2) describes the conditions the numeric inflows and other provisions in the Bay-Delta Plan are intended to produce.

To provide flexibility to address the unique circumstances of different tributaries and actions that may be taken to implement the inflow objective on those tributaries both initially and over time, the objective is proposed to include a range of possible flows. The proposed flow range is between 45 percent and 65 percent unimpaired flow. Because 55 percent unimpaired flow is the flow level at which more significant improvements to fish and wildlife beneficial uses are expected and cold water supplies can still be maintained, the proposed starting point for the flow level is 55 percent. As discussed in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*, the proposed program of implementation provides for adaptive management within the proposed flow range. Flows may be lower in the range in cases where: (1) there are successful voluntary implementation plans that demonstrate that they can achieve the narrative objective using a combination of flow and other measures; or (2) if the State Water Board determines that lower flows are needed to meet the narrative objective, including to preserve reservoir storage supplies to maintain water quality and temperature conditions later in the same year or in the following year for the protection of native fish species. Under the proposed inflow objective, inflows would be required to be at least 45 percent of unimpaired flow. Under the proposed inflow objective, flows may be higher in the range on tributaries where flows under current conditions are already higher than 55 percent and where those higher flows are needed to protect fish and wildlife and meet the

narrative objective. Flows would not be required to be higher than 65 percent unimpaired flow (unless flows are already above that level and those flows are needed to protect fish and wildlife) because those higher flows may not provide for reasonable protection of fish and wildlife, including the ability to maintain carryover storage for cold water habitat while meeting water supplies.

The proposed program of implementation provides for both default and voluntary implementation provisions (voluntary implementation plans) to comply with the proposed inflow objective (see Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*).

Cold Water Habitat

As a complementary measure to the inflow objective to protect salmonids and other native species in the tributaries, the proposed Plan amendments include a new narrative cold water objective for the Sacramento/Delta tributaries. The proposed objective is intended to ensure that there are not redirected impacts on cold water habitat from the new inflow and Delta outflow objectives and to address other existing and potential future temperature management concerns on the tributaries for salmonids and other native species. Because temperature requirements depend on the species of salmonid, the life stage, and other factors and because temperature management actions depend on the specific circumstances of each tributary, a narrative objective is proposed. The proposed objective would require that measures be implemented to provide cold water habitat for salmonids and other native cold water fish species on the Sacramento/Delta tributaries, including management of cold water storage and releases or alternate protective measures (including measures to install and operate temperature control devices, measures to provide for passage above dams, and other measures) to meet the narrative objective.

The narrative objective would apply on all of the Sacramento/Delta tributaries that support or contribute to protection of salmonids and other native cold water fish species. As described further in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta,* the owners and operators of rim reservoirs would be specifically responsible for undertaking actions to comply with the narrative objective through either voluntary or default implementation processes. As needed, other water users would be required to contribute to these actions or undertake additional actions.

Delta Outflows

In addition to inflow and cold water habitat objectives, new and modified Delta outflow objectives are included in the proposed Plan amendments. The proposed Delta outflow objectives, working with the inflow objectives, are intended to provide for a comprehensive integrated flow regime that protects fish and wildlife, from natal streams out to the ocean. The changes are proposed both to enhance Delta outflow protections and to ensure that existing protections are not diminished.

Specific proposed changes to Delta outflow objectives include a new narrative Delta outflow objective, a new inflow-based Delta outflow objective, and a new fall Delta outflow objective. The existing outflow objectives are proposed to be retained, with some minor modifications.

To help inform implementation of the numeric Delta outflow objective, a new narrative Delta outflow objective is proposed. The objective describes the outflow conditions that protect native fish and aquatic species populations and provides the description of the conditions the numeric outflows are intended to produce along with other measures in the watershed. The narrative outflow objective would apply throughout the watershed and would specifically be implemented through

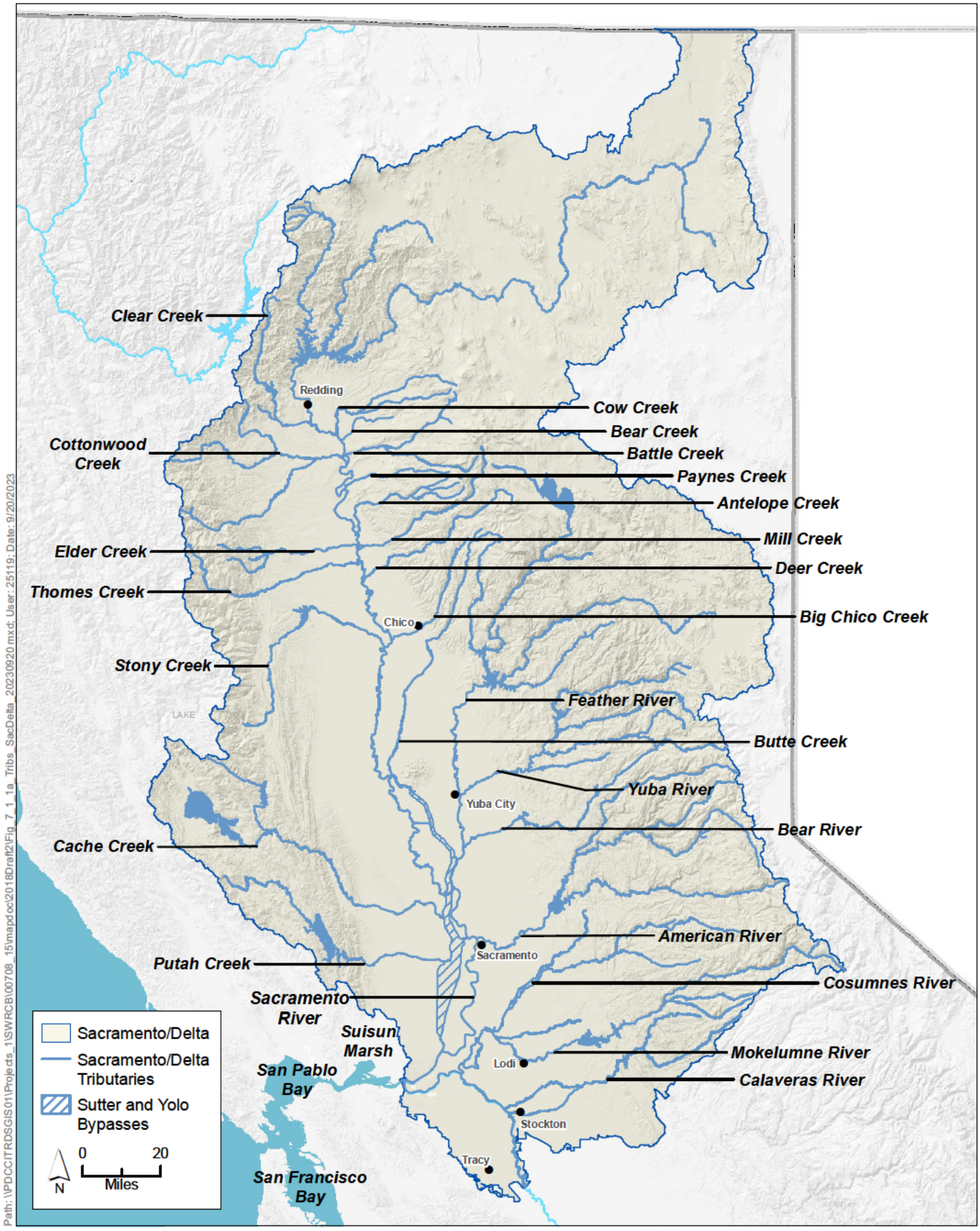

Figure 7.1-1a
Sacramento/Delta Tributaries

implementation of the numeric objectives, as well as other actions described in the program of implementation through either the voluntary or default implementation processes.

In order to ensure that adequate quantities and qualities of outflow are provided to the Delta for the protection of estuarine and other native aquatic species in the watershed, a new inflow-based Delta outflow objective is proposed. The proposed objective would require that the inflows required in the Bay-Delta Plan, including the proposed Sacramento/Delta and San Joaquin River flows specified in the Bay-Delta Plan, are provided as outflows. As described further in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*, under the proposed inflow-based outflow objective, the required outflow would be calculated by adding up the applicable required inflows in the Bay-Delta Plan and making appropriate adjustments for natural losses and gains.

In order to ensure that there are adequate outflows during the fall to protect Delta smelt and other native aquatic species, a new fall Delta outflow objective is proposed to be added to the Bay-Delta Plan. As discussed in Chapter 5, the new fall Delta outflow objective is included in the proposed Plan amendments that would apply from September to December in wet and above normal years consistent with the 2019 U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BiOp). Section 7.24, *Alternatives Analysis*, also evaluates an alternative (Exclusion of Interior Delta Flow and Fall Delta Outflow Related Amendments [Alternative 4a]) in which this and other possible BiOp and Incidental Take Permit (ITP) related provisions are not added to the Bay-Delta Plan to avoid unnecessary duplication and regulatory complexity.

In addition, the current Delta outflow objectives included in the Bay-Delta Plan are proposed to be retained in order to ensure that minimum quantities of Delta outflow are provided to the estuary in all months and all years. Current Delta outflow objectives would be referred to as *base Delta outflows*. These existing Delta outflow objectives are described in more detail in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*.

Interior Delta Flows

New and modified interior Delta flow measures are proposed for the reasonable protection of fish and wildlife, including modified DCC gate closure measures, new OMR reverse flow restrictions, and modified export constraints based on San Joaquin River inflows. Section 7.24, *Alternatives Analysis*, also evaluates an alternative (Exclusion of Interior Delta Flow and Fall Delta Outflow Related Amendments [Alternative 4a]) in which this and other possible BiOp and ITP related provisions are not added to the Bay-Delta Plan to avoid unnecessary duplication and regulatory complexity.

To help inform implementation of the numeric interior Delta flow objectives, a new narrative interior Delta flow objective is proposed. The objective describes the interior Delta flow conditions that protect native fish and aquatic species populations and provides the description of the conditions the numeric interior Delta flow objectives are intended to produce along with other measures in the watershed.

In addition, specific proposed changes to the interior Delta flow objectives include new and modified numeric objectives. For the most part, the proposed changes to the interior Delta flow objectives and implementation measures involve the addition of existing BiOp and ITP requirements into the Bay-Delta Plan, including requirements contained within the USFWS and National Marine Fisheries Service BiOps and California Fish and Wildlife ITP. While these requirements already exist, it is possible that they will change. To avoid undue complexity in an already complex regulatory regime, these measures are proposed to be built on existing requirements and implemented in an integrated

fashion with the BiOps and ITP. In so doing, implementation of the objectives is proposed to rely on the existing BiOp and ITP processes, including monitoring, evaluation, coordination, and review processes, with the incorporation of the State Water Board into these processes. In the event of changes to the BiOps and ITP, as discussed further in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*, the proposed implementation measures would provide flexibility to adjust the requirements as appropriate.

The proposed new and modified numeric interior Delta flow objectives are discussed in more detail in Chapter 5 and include proposed modifications to the existing DCC gate objective, export limits objective, and OMR reverse flow objectives.

Suisun Marsh

The Bay-Delta Plan includes a narrative objective for the brackish tidal marshes of Suisun Bay and numeric salinity (measured as electrical conductivity [EC]) objectives at eight locations in the marsh. The State Water Board is not proposing any changes to the Suisun Marsh narrative objective. Modifications are proposed to the existing Suisun Marsh salinity objectives to update those requirements to be consistent with existing conditions. Specifically, Stations S-35 and S-97 provide western Suisun Marsh salinity information and have been in continual use as monitoring stations. Accordingly, these locations are proposed to be deleted from Table 3 of the Bay-Delta Plan and are proposed to be maintained as monitoring stations. Van Sickle and Chipps Islands are proposed to be deleted as both compliance and monitoring stations since monitoring at nearby locations is adequate for meeting monitoring needs at these locations.

7.1.4.2 Habitat Restoration and Other Complementary Ecosystem Projects

The State Water Board's Bay-Delta planning and implementation efforts are part of a multi-faceted approach to address protection of fish and wildlife in the Bay-Delta and reconcile an altered ecosystem. The State Water Board has responsibility and authority for addressing flow and other water quality impairments, but ecosystem recovery in the Delta depends on more than adequate flows. It also requires implementation of complementary measures, including habitat restoration, fisheries management, control of waste discharges and invasive species, and other efforts by other agencies and entities in the watershed that are responsible for these actions. These actions are discussed in more detail in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*.

7.1.4.3 General Changes to the Program of Implementation

Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*, provides a description of other general proposed changes to the program of implementation, including provisions for accounting, monitoring, reporting, assessment, and adaptive management, and other actions to assist with implementation of the Bay-Delta Plan. A discussion of proposed changes to the Bay-Delta Plan monitoring, assessment, special studies, and reporting is provided in Chapter 5. A general description of additional actions to further the goals of the Bay-Delta Plan, achieve reasonable protection of beneficial uses of water in the Bay-Delta watershed, and minimize or avoid redirected impacts on other beneficial uses to the extent possible that could occur as a result of the proposed Plan amendments is provided in Chapter 5.

The proposed Plan amendments also include other actions to reasonably protect fish and wildlife beneficial uses of water in the Bay-Delta watershed and minimize and avoid redirected impacts on other beneficial uses to the extent possible that could occur as a result of the proposed Plan amendments. Those actions are discussed in Chapter 5 and include State Water Board discretionary approvals; State Water Board financial assistance programs; actions to address climate change, drought, and public safety; groundwater management actions; modifications to fully appropriated streams determinations; and actions to protect wildlife refuge water supplies and other wildlife protection measures. These measures are also mitigation measures for potential impacts from the project. To the extent these actions have environmental impacts, they are analyzed in the Staff Report.

7.1.5 Environmental Analysis

Due to the size and complexity of Sacramento/Delta water supply and use, the environmental analyses are necessarily broad to cover the wide range of foreseeable compliance measures and responses that may result from the proposed Plan amendments. A wide range of responses and associated environmental effects could occur as a result of the project due to the degree of flexibility included in the proposed Plan amendments and the scope and complexity of Sacramento/Delta water use. The impact analyses are necessarily broad to cover the wide range of foreseeable compliance measures, responses, and associated efforts that may result from the proposed Plan amendments. The environmental analyses use the thresholds of significance that the State Water Board adopted in 2011 as Appendix A to the CEQA regulations. (Cal. Code. Regs., tit. 23, sections 3720 et seq.)

This section describes the plan area and study area considered in the environmental analysis, the project baseline and other points of comparison, and the approach to the evaluation of potential environmental impacts. This section also provides a description of the changes in hydrology and changes in water supply that are evaluated in further detail in Sections 7.3 through 7.20, including groundwater use and other water management actions such as groundwater storage and recovery, water transfers, water recycling, and water conservation that may be utilized to offset reductions in surface water. Habitat restoration and other ecosystem projects are evaluated in Section 7.21, *Habitat Restoration and Other Ecosystem Projects*, and new or modified facilities that involve construction are addressed in Section 7.22, *New or Modified Facilities*. The environmental setting presented in Sections 7.3 through 7.20 supports the analyses presented in Sections 7.21 and 7.22.

7.1.5.1 Sacramento/Delta, Plan Area, and Study Area

As discussed above, the State Water Board is considering amendments to the Bay-Delta Plan focused on the Sacramento River and its tributaries, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne Rivers), Delta outflows, and interior Delta flows in order to reasonably protect fish and wildlife beneficial uses. This area is collectively referred to as the *Sacramento/Delta watershed* or *Sacramento/Delta*. Tributaries in the Sacramento/Delta watershed are shown on Figure 7.1-1a and described in detail in Chapter 2, *Hydrology and Water Supply*.

The *plan area* includes the Sacramento/Delta and continues west as water flows through the Delta and downstream through Suisun Marsh and adjoining bays, marking the brackish transition from freshwater to saltwater and the Pacific Ocean. The plan area encompasses the areas where the Bay-Delta Plan's flow and water quality objectives and implementation measures apply, and the

ecosystem that the Bay-Delta Plan is intended to protect. Figure 7.1-1b shows the plan area boundary.

Surface water from the Sacramento/Delta is used within the Sacramento/Delta watershed and is delivered to and used in other areas of the state. Therefore, a larger *study area* is defined to provide context for total water supplies and to ensure that environmental and economic impacts are addressed comprehensively. Figure 7.1-1c shows the study area, which is divided into seven regions based on geography and water supply. The geographic regions in the study area include the Sacramento River watershed, Delta eastside tributaries, Delta, San Francisco Bay Area (Bay Area), San Joaquin Valley, Central Coast, and Southern California. Only a portion of the water supplied to each of the study area geographic regions is derived from surface water in the Sacramento/Delta watershed. Section 2.8, *Existing Water Supply*, provides more information about the geographic regions and the water supplies used in each region. The environmental analyses presented in Chapter 7, *Environmental Analysis*, and Chapter 9, *Proposed Voluntary Agreements*, describe and analyze potential environmental impacts in these geographic regions.

7.1.5.2 Baseline, Evaluation Approach, and Modeling Tools

CEQA requires a description of the physical environmental conditions in the vicinity of the project as they exist at the time the Notice of Preparation (NOP) is published (January 24, 2012 [supplemental NOP for the Sacramento/Delta update to the Bay-Delta Plan]), or if no NOP is published, at the time environmental analysis is commenced. (Pub. Resources Code, § 15125.) This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. Where environmental conditions fluctuate over time, CEQA provides for comparing a project's impacts against a baseline derived from historical conditions.

The process for updating the Sacramento/Delta portions of the Bay-Delta Plan has been ongoing since 2012, when a supplemental NOP was issued for the Sacramento/Delta updates to the Bay-Delta Plan. Since that time, there have been changes to regulations that affect reservoir operations, streamflows, and Delta operations. Updates to the BiOps for the long-term operation of the CVP and SWP and ITP for the SWP have changed requirements for the operation of the SWP and CVP, though under most circumstances actual operations have not significantly changed. The project baseline includes requirements as they have been implemented in recent years in order to represent existing conditions. The project baseline, including these requirements, is described in more detail in Chapter 6, *Changes in Hydrology and Water Supply*.

The environmental analyses utilize a quantitative and qualitative approach to compare the potential impacts to baseline conditions. For the quantitative evaluation, the Sacramento Water Allocation Model (SacWAM) is used to simulate changes in hydrology and water supply that could result from the project. The SacWAM documentation (^SacWAM 2023) describes the methods and assumptions used to develop SacWAM. Chapter 6, *Changes in Hydrology and Water Supply,* summarizes the results modeled for the proposed Plan amendments, and the Low and High Flow Alternatives described in Section 7.2, *Description of Alternatives*. Appendix A1, *Sacramento Water Allocation Model Methods and Results*, presents additional information and provides detailed tables and figures of model results that are summarized in Chapter 6. Model results for the proposed VAs are summarized in Chapter 9, *Proposed Voluntary Agreements*, and detailed methods and results are presented in Appendix G4a, *Sacramento Water Allocation Model Methods and Results for the Proposed Voluntary Agreements*.

Figure 7.1-1b
Plan Area

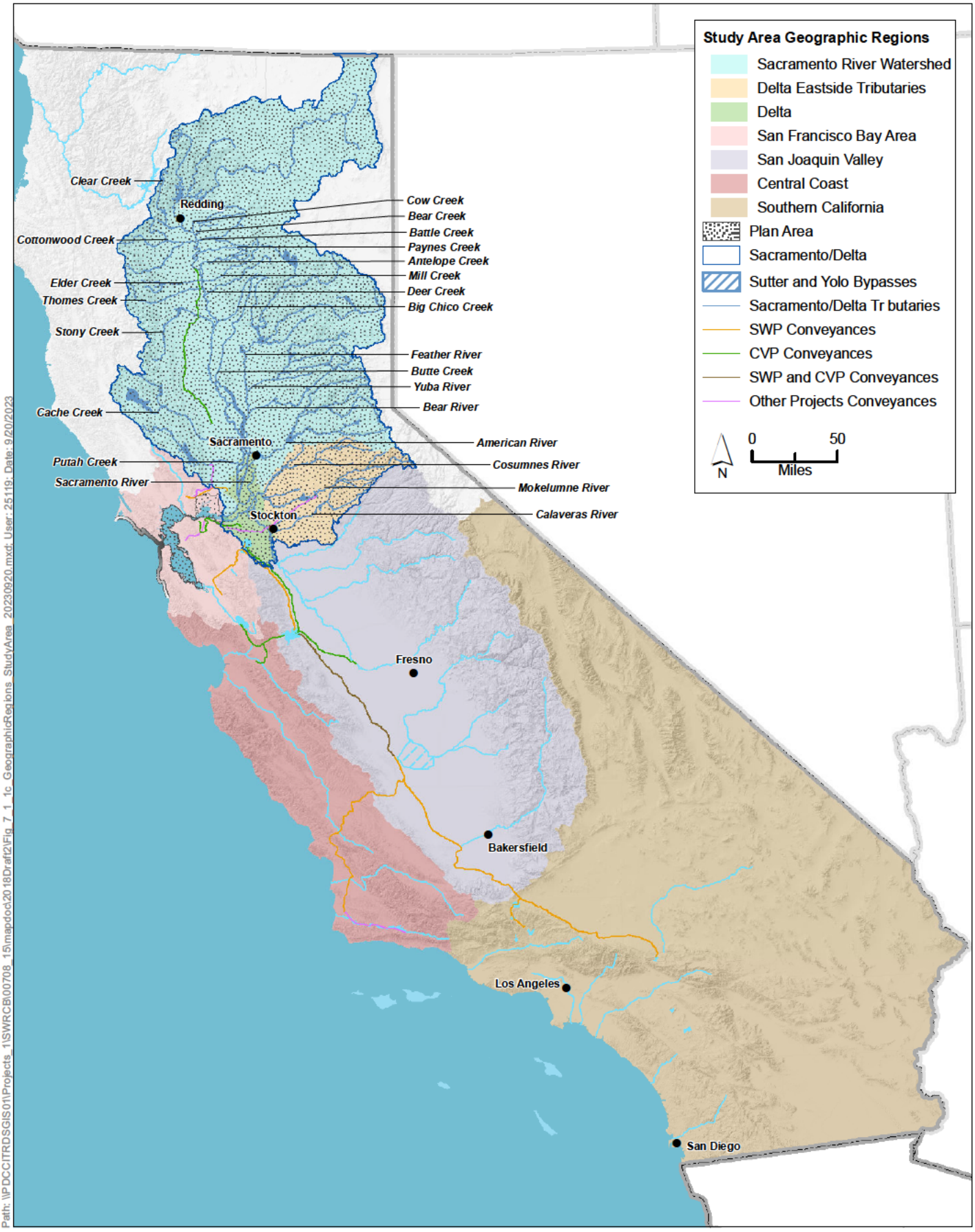

Figure 7.1-1c
Study Area Geographic Regions

For some environmental resource topics, SacWAM results are used directly to quantitatively evaluate potential environmental impacts. In addition to SacWAM, other modeling and technical analyses are utilized to evaluate the environmental impacts and economic effects of the project, including the models and analyses listed in Table 7.1-1. Each of these models has its own set of modeling assumptions and inputs. Additional discussion of modeling and technical analyses used to evaluate the environmental impacts of the project is presented in relevant chapters and sections of this draft Staff Report. Detailed model results are presented in Appendix A1, *Sacramento Water Allocation Model Methods and Results*, for the proposed Plan amendments and in Appendix G4, *Modeling Results for the Proposed Voluntary Agreements,* for the proposed VAs.

Table 7.1-1. Overview of Modeling Tools Used in the Staff Report

Analytical Tool	Description of Modeling/Analysis Tool and Results	Staff Report Appendices That Contain Tool Description, Methodology, and Results	Staff Report Chapters and Sections Informed by Results
Sacramento Water Allocation Model (SacWAM)	Hydrology and water supply in the Sacramento/Delta, and Sacramento/Delta supply exported from the Delta	Appendix A1 Appendix G4	2, *Hydrology and Water Supply* 6, *Changes in Hydrology and Water Supply* Sections 7.3 through 7.20 8, *Economic Analysis and Other Considerations* 9, *Proposed Voluntary Agreements*
Delta Simulation Model II (DSM2)	Delta hydrodynamics and water quality	Appendix A2 Appendix G4	7.12.1, *Surface Water* 9.7.12.1, *Proposed Voluntary Agreements*
Statewide Agricultural Production Model (SWAP)	Agricultural production in the Sacramento and San Joaquin Valleys	Appendix A3 Appendix G4	7.4, *Agriculture and Forest Resources* 7.6.1, *Terrestrial Biological Resources* 8, *Economic Analysis and Other Considerations* 9, *Proposed Voluntary Agreements*
California Sub-Regional Agricultural Analysis (CASRAA)	Municipal and agricultural water supply. Agricultural production in areas outside of the SWAP domain.	Appendix A1a	2, *Hydrology and Water Supply* 6, *Changes in Hydrology and Water Supply* 7.4, *Agriculture and Forest Resources* 7.20, *Utilities and Service Systems* 8, *Economic Analysis and Other Considerations*
IMPLAN	Regional economic effects associated with changes in agricultural production	Appendix A4 Appendix G4	8, *Economic Analysis and Other Considerations* 9, *Proposed Voluntary Agreements*

Analytical Tool	Description of Modeling/Analysis Tool and Results	Staff Report Appendices That Contain Tool Description, Methodology, and Results	Staff Report Chapters and Sections Informed by Results
Hydropower calculations	Hydropower capacity and generation. Provides input to power flow model.	Appendix A5 Appendix G4	7.8, *Energy* 7.10, *Greenhouse Gas Emissions* 9, *Proposed Voluntary Agreements*
Power Flow Model – Power Gem's Transmission Adequacy and Reliability Assessment software (TARA)	Electric grid reliability	Appendix A5	7.8, *Energy*
Water Temperature Models (HEC-5Q)	Water temperature in Lake Shasta, the Sacramento River, Lake Oroville, the Feather River, Folsom Lake, and the American River	Appendix A6 Appendix G4	7.6.2, *Aquatic Biological Resources* 7.12.1, *Surface Water* 9, *Proposed Voluntary Agreements*
Salmonid Tributary Habitat Analysis	FlowWest tool for estimating floodplain habitat for fish	Appendix A8 Appendix G2	7.6.1, *Terrestrial Biological Resources* 7.6.2, *Aquatic Biological Resources* 9, *Proposed Voluntary Agreements*

For qualitative analyses, baseline conditions are generally defined by the conditions present at the time the NOP was issued, or current conditions. Establishment and analysis of baseline conditions may be constrained in some instances by data availability; in these instances, the most current readily available information is used. Other analyses consider the relevance of changes in information that may have occurred since the issuance of the 2012 NOP, where appropriate.

Qualitative analyses follow an approach parallel to the quantitative analyses: they compare potential impacts to narrative descriptions of resource conditions that may vary over time. For many resources, project-related changes in resource-specific parameters could not be modeled directly, but the magnitude of effect could be inferred from changes in hydrologic conditions.

In addition to the project baseline, other points of comparison are used in the draft Staff Report that are particularly relevant in describing and analyzing the effects of the proposed VAs. In addition to comparing the VAs to baseline, the VA benefits are also assessed in this draft Staff Report relative to the 2008/2009 BiOps condition, which is the point of reference used for both the 2017 Scientific Basis Report and the *Final Draft Scientific Basis Report Supplement in Support of Proposed Voluntary Agreements for the Sacramento River, Delta, and Tributaries Update to the San Francisco Bay/Sacramento-San Joaquin Delta Water Quality Control Plan*. The difference between the baseline and the 2008/2009 BiOps conditions are described in detail in Chapter 6, *Changes in Hydrology and Water Supply*. The major differences are changes in fall Delta outflow requirements between the

BiOps, with somewhat minor differences in export constraints in wetter years and other minor differences that have little to no effect on the modeling. In addition, the proposed VAs rely on the 2019 BiOps condition as the theoretical assumed starting point for VA accounting purposes.

7.1.5.3 Reasonably Foreseeable Methods of Compliance and Response Actions

To organize the environmental analysis, the evaluation of reasonably foreseeable methods of compliance and response actions that may be taken in response to the project are organized into the following categories: (1) changes in hydrology, (2) changes in water supply, (3) habitat restoration and other ecosystem projects, and (4) new or modified facilities. The evaluation of actions that may be taken in response to changes in water supply includes other water management actions, which include groundwater use and groundwater storage and recovery/conjunctive management efforts, water transfers, water recycling, and conservation measures that are already being implemented throughout the state. While the project cannot be considered the driving impetus for sustainable management and water supply diversification efforts, the project may accelerate and increase the need for such efforts to manage water sustainably and plan more carefully. The project may also increase efforts to obtain other water supplies and diversify the water supply portfolios of various water users. Further, entities may take actions to modify or build new facilities and infrastructure to supplement or conserve surface water supplies. As noted, the impact analyses are necessarily broad to cover the wide range of foreseeable methods of compliance and response actions that may result from the project.

The analyses in the environmental resource sections of this chapter (Sections 7.3 through 7.20) largely focus on environmental impacts that may result from changes in hydrology and changes in water supply, including other water management actions that do not involve construction. As described in more detail in the following subsections, changes in hydrology include changes in streamflows and reservoir storage levels. Changes in water supply include reduced Sacramento/Delta supplies for agriculture, municipal, and wildlife refuge uses, as well as potential changes in groundwater levels and use, including increased pumping from existing and new wells. Changes in water supply also includes other water management actions that do not involve construction. These other water management actions that water users may take to offset reductions in Sacramento/Delta surface water supply include groundwater storage and recovery, water transfers, water recycling, and water conservation utilizing existing infrastructure.

The environmental impacts of physical habitat restoration and other complementary ecosystem projects and new and modified facilities are evaluated in Sections 7.21, *Habitat Restoration and Other Ecosystem Projects*, and 7.22, *New or Modified Facilities*, respectively. Section 7.21 evaluates the environmental impacts of non-flow ecosystem projects, including physical habitat restoration, fish passage projects, predation, and aquatic invasive species control. Section 7.22 evaluates the environmental impacts of actions that entities may take that would involve construction to modify or build new facilities and infrastructure to supplement or conserve surface water supplies and other construction projects that may result from implementation of the proposed Plan amendments, proposed VAs, or other project alternatives.

Many of the actions evaluated in Sections 7.21 and 7.22 would involve construction, and in some cases, large construction projects that would require site-specific environmental impact analyses. Because the potential combination of future actions such as restoration actions or development of

new or modified water facilities is unknown, these actions are discussed generally and qualitative comparisons to baseline conditions are made.

Changes in Hydrology

Flows and Reservoir Operations

Reasonably foreseeable methods of compliance with possible changes to the Bay-Delta Plan could result in changes in streamflows and reservoir storage levels. Details regarding the modeled changes in hydrology that would occur under the proposed Plan amendments are presented in Chapter 6, *Changes in Hydrology and Water Supply*, and Appendix A1, *Sacramento Water Allocation Model Methods and Results*. Chapter 6 summarizes SacWAM modeling results for changes in hydrology, including changes in streamflows and reservoir levels under various percent of unimpaired flow scenarios. Modeling results are presented in ranges of potential instream flows in increments of ten, from 35 percent up to 75 percent unimpaired flow (referred to as *scenarios*). These modeling results are compared to the baseline condition modeling results to help inform the determination of potential environmental and economic impacts of the proposed Plan amendments.

Under the proposed Plan amendments, flows in some streams would increase at times compared to baseline conditions. For example, streamflows on some Sacramento/Delta tributaries would be expected to increase in the late winter and spring months compared to baseline conditions. However, flows in some streams could be reduced at times compared to baseline conditions. Streamflows on some Sacramento/Delta tributaries could be lower, particularly in summer and early fall compared to baseline conditions. Additional discussion is provided in Chapter 6, *Changes in Hydrology and Water Supply*.

The proposed Plan amendments also would result in changes in Delta inflows and Delta outflows. Delta inflows would generally increase during December through June and decrease in July through September. Delta outflow generally would be expected to increase during all months, with the exception of reductions during August and for the highest flows in some months.

The proposed Plan amendments could result in changes in reservoir levels, including lower reservoir levels in some locations. As discussed in Chapter 6, operations of the rim reservoirs are increasingly constrained under the percent of unimpaired flow scenarios, and particularly the higher percents of unimpaired flow, because new instream flow requirements would limit the ability to store water in the winter and spring, and cold water pool requirements would limit how far rim reservoirs can be drawn down in the drier years. In general, this results in lower storage at the end of April entering the irrigation season, and less total water being released in the summer months. The actual level of a given reservoir could differ from that modeled as operations are refined with increased understanding of actions needed to protect cold water habitat. Under the proposed Plan amendments, most of the upper watershed reservoirs in the Sacramento River watershed and Delta eastside tributaries regions show no significant change in reservoir storage. However, several of the upper watershed reservoirs represented in SacWAM show the potential for large changes in operation, particularly facilities that include interbasin diversions that move water from one watershed to another. However, the modeling scenarios represent only one possible operation of these systems. The proposed Plan amendments provide for one or more tributaries to meet flow requirements so long as narrative objectives are met. Parties may develop operational scenarios that reduce the reservoir drawdown effects currently reflected in the modeling scenarios.

As discussed in Chapter 6, *Changes in Hydrology and Water Supply*, the SacWAM results show that Sacramento/Delta supplies to other regions would be reduced under the proposed Plan amendments compared to baseline conditions. These changes could affect the levels in export reservoirs in the Bay Area, San Joaquin Valley, Central Coast, and Southern California regions that receive Sacramento/Delta supplies. In response to reduced Sacramento/Delta supplies, reservoir operators could reduce the demand on the reservoir or reduce storage in the reservoir. Either of these two responses could result in lower streamflows below the reservoirs. Streamflow requirements of many of the streams below export reservoirs do not allow for reductions below historical minimum flows. However, some of these streamflow requirements are based on hydrologic conditions or reservoir storage; if reservoir storage is reduced, the streamflow requirements are also reduced. Further, it is possible that existing flow requirements may change in the future. Therefore, there is uncertainty in how reservoir operators may respond to changes in Sacramento/Delta supplies, and it is possible that streamflows below export reservoirs receiving Sacramento/Delta supplies could be reduced.

Changes in Water Supply

Details regarding the modeled changes in water supply that could occur under the proposed Plan amendments are presented in Chapter 6, *Changes in Hydrology and Water Supply*, and Appendix A1, *Sacramento Water Allocation Model Methods and Results*. Chapter 6 summarizes SacWAM modeling results for changes in Sacramento/Delta water supply by sector (agricultural uses, municipal uses, and wildlife refuge uses) under the modeled scenarios. Chapter 6 also provides information on changes in the Sacramento/Delta water supply for the seven regions in the study area (Sacramento River watershed, Delta eastside tributaries, Delta, San Francisco Bay Area, San Joaquin Valley, Central Coast, and Southern California).

Reduced Sacramento/Delta Surface Water Supply

Implementation of the proposed Plan amendments would result in changes in Sacramento/Delta water supply, including reductions to agricultural and municipal uses, and wildlife refuge uses. As discussed in Chapter 6, *Changes in Hydrology and Water Supply*, reductions in Sacramento/Delta water supply would occur in all of the geographic regions in the study area. Reductions in Sacramento/Delta supplies are not expected to be uniform across the various source tributaries, and some water users would be affected more by reduced Sacramento/Delta supplies. Table 6.4-1 in Chapter 6 presents the annual average total water supplied to each region in the study area and the estimated Sacramento/Delta supply by use as modeled in the SacWAM scenarios. SacWAM includes assumptions to represent how those water supply reductions may occur. However, there is uncertainty in how water users may respond to changes in Sacramento/Delta supplies, and the water supply reductions could be distributed somewhat differently than modeled.

Changes in Groundwater Supply

In response to reductions in Sacramento/Delta water supplies, individual water users could choose to increase groundwater pumping as a substitute supply, where available and not locally restricted. In addition, reductions in applied irrigation water, including from increased water use efficiencies, would reduce incidental groundwater recharge. These potential groundwater-related response actions could result in potential impacts on groundwater that are evaluated in Section 7.12.2, *Groundwater*.

There is uncertainty regarding groundwater pumping, groundwater recharge rates, and stream-groundwater interactions in many parts of the study area. In addition, precisely how these physical processes may change and how users may respond to reduced Sacramento/Delta surface water supplies is unknown. In some areas, groundwater pumping may be limited by regulatory requirements (e.g., groundwater adjudications, implementation of the Sustainable Groundwater Management Act). In other areas, groundwater pumping may be locally unrestricted.

Section 7.12.2, *Groundwater*, discusses that there are several state programs aimed at regulating groundwater quality and waste discharges. For example, the State Water Board's Division of Drinking Water regulates public water systems, which are defined under Health and Safety Code (§ 116275). Public water systems are required to provide drinking water that meets all drinking water standards, as well as to conduct routine sampling and analysis of their drinking water supplies to certify compliance. Drinking water standards (maximum contaminant levels) are found in title 22 of the California Code of Regulations. In accordance with the California and federal Safe Drinking Water Acts, drinking water standards are set at levels necessary to protect the public from acute and chronic health risks associated with consuming contaminants in drinking water supplies, including groundwater.

Other Water Management Actions

Implementation of the percent of unimpaired flow scenarios would reduce Sacramento/Delta water supplies at certain times and locations. In response to reduced Sacramento/Delta surface water supplies, water users may choose to modify their water supply portfolios by increasing the use of other sources of water and maximizing the use of existing water supplies. These other water management actions include groundwater storage and recovery, water transfers, water recycling, and water conservation. A description of these other water management actions, including state-wide trends and regional observations, is provided in Section 6.6, *Other Water Management Actions*.

Other water management actions affect the overall analysis in two ways. First, environmental impacts and economic effects from reduced Sacramento/Delta surface water supplies likely would be less given these efforts. Second, other water management actions may result in their own environmental impacts that must be disclosed and analyzed. The approach to the environmental analyses of other water management actions assumes the use of existing infrastructure (i.e., existing groundwater wells, existing water delivery systems, existing storage systems), as well as existing conservation measures. The impacts of changes in hydrology and changes in water supply resulting from other water management actions are described in Sections 7.3 to 7.20 for each environmental resource area.

In some instances, other water management actions utilized to prioritize limited available water supplies or develop other water supply sources would involve construction to modify or build new facilities and infrastructure to supplement or conserve water supplies. (See discussion under *New or Modified Facilities*.)

The following subsections provide additional information on other water management actions, including groundwater storage and recovery, water transfers, water recycling, and water conservation.

Groundwater Storage and Recovery

Groundwater storage and recovery actions are already underway and utilized extensively. The environmental analysis evaluates the effects of additional groundwater storage and recovery/conjunctive use actions that could be taken in response to changes in water supply. Groundwater storage and recovery (also known as managed groundwater recharge or groundwater banking) involves storage of water for later recovery by intentionally recharging groundwater basins when excess surface water or other water sources are available, for example, during years of above-average surface water supply or through storing recycled water or stormwater in groundwater basins for future use. Groundwater storage and recovery is also part of conjunctive management or use that involves the coordinated management of surface water and groundwater resources to maximize the availability and reliability of water supplies in a region. Water sources for groundwater storage and recovery include primarily surface water supply during above-average years or treated wastewater. Decentralized groundwater recharge actions may also occur with low impact development (LID) projects designed to allow storm water runoff to infiltrate into the ground.

Capturing surface water to recharge groundwater aquifers artificially is a method of diversion to storage and generally requires an appropriative water right that identifies how the stored water will be beneficially used. The State Water Board has developed a streamlined permitting process for diversions of water from winter high-flow events to underground storage. (Executive Order B-39-17.) The streamlined application process is available to groundwater sustainability agencies and local agencies as defined by the Sustainable Groundwater Management Act. A water right permit is not required for groundwater storage and recovery projects that propose to replenish groundwater with recycled water, where the recycled water comes directly from a WWTP and is not conveyed using a surface water stream system or a subterranean stream. In this situation, a wastewater change petition approval from the State Water Board pursuant to Water Code section 1211 may be necessary if the wastewater was previously discharged to a stream. In addition to active groundwater recharge projects, decentralized groundwater recharge actions are also occurring with LID projects designed to allow storm water runoff to infiltrate into the ground. Storm water discharges regulated through National Permit Discharge Elimination System permits may also act as a resource and recharge to groundwater when properly managed.

Water Transfers

A number of water transfers occur in California in most years. The environmental analysis considers water transfer actions that could be taken in response to reduced Sacramento/Delta supply. The extensive network of water conveyance infrastructure developed through state, federal, and locally funded projects, most notably the CVP and SWP, is used to facilitate water transfers. Water can be transferred from a seller to a buyer through networks of rivers, canals, aqueducts, and pipelines.

Reduced surface water supplies from the Sacramento/Delta could affect the water transfer market in several ways, although exact outcomes are uncertain. Overall, implementation of the project would reduce Sacramento/Delta water supplies at certain times and locations, which could limit the amount of surface water available for transfer. At the same time, changes in water supply could increase the value of transfer water, thereby incentivizing transfers and leading to transfers from lower net revenue crops to higher net revenue crops or for municipal uses. Common types of water transfers include cropland fallowing, reservoir storage releases, groundwater substitution, and, to a lesser extent, direct groundwater transfers. Water transfers include short- and long-term transfers

or exchanges of water. A temporary, or short-term, transfer is a transfer of less than 1 year. Some short-term transfers may require temporary changes of water right points of diversion, places of use, or purposes of use, and may require approval from the State Water Board pursuant to Water Code section 1725 et seq. These changes approved under Water Code section 1725 are exempt from CEQA. In order to approve a temporary transfer, the State Water Board must find that the transfer only involves the amount of water that would have been consumptively used or stored in the absence of the transfer; that no injury to any legal user of water during hydrologic conditions is likely to occur during the proposed change; and the change does not unreasonably affect fish, wildlife, or other instream beneficial uses.

Some long-term transfers or permanent water transfers/sales may require site-specific environmental impact analyses and approvals from the State Water Board or other agencies. In order to approve a long-term or permanent transfer, the State Water Board must find that the change does not initiate a new water right; the change can be made without substantial injury to other legal users of water; the change can be made without unreasonable effects on fish, wildlife, or other instream beneficial uses; and the change is in the public interest, a concept that is an overriding concern in all State Water Board decisions.

Some water transfers may not require site-specific environmental impact analyses or approvals from the State Water Board. For example, transfers of surface water among contractors within the CVP and SWP generally do not require additional State Water Board approval because they do not involve a change in the purpose, place of use, or point of diversion assigned to the overall water right, but the Projects themselves must authorize these transfers.

Water Recycling

The environmental analysis considers that increased use of recycled water from existing facilities could be a response to changes in water supply. Recycled water is primarily treated municipal wastewater that has been treated in a wastewater facility and complies with recycled water regulations for a specific beneficial use. It is generated by treating domestic wastewater to make the water suitable for a direct beneficial use that would not otherwise occur. There are different required levels of treatment corresponding to the proposed use of the recycled water.

The State Water Board's Water Quality Control Policy for Recycled Water (Recycled Water Policy) was adopted in 2009 and was amended most recently on December 11, 2018 (effective on April 8, 2019) to encourage the safe use of recycled water from wastewater sources that meets the definition in Water Code section 13050(n), in a manner that implements state and federal water quality laws and protects public health and the environment. There are various regulatory requirements governing recycled water. The State Water Board's General Order for Water Reclamation Requirements for Recycled Use (WQ 2016-0068-DDW) serves as a statewide Order for non-potable use of recycled water. Enrollees under the Order may use recycled water for non-potable uses allowed under California Code of Regulations, title 22, such as agricultural and landscape irrigation, dust control, firefighting, and hydrostatic testing. When used in compliance with the Recycled Water Policy, Uniform Statewide Recycling Criteria in title 22 of the California Code of Regulations, and all applicable state and federal water quality laws, recycled water is safe for approved uses; and the State Water Board strongly supports recycled water as a safe alternative to potable water for such approved uses. Water Code section 1211 requires that (1) the owner of any WWTP obtain the approval of the State Water Board before making any change in the point of discharge, place of use, or purpose of use of treated wastewater where changes to the discharge or

use of treated wastewater have the potential to decrease the flow in any portion of a watercourse; and (2) the State Water Board review the proposed changes pursuant to the provisions of Water Code section 1700 et seq. In order to approve the proposed change, the State Water Board must determine that the proposed change will not operate to the injury of any legal user of the water involved (Wat. Code, § 1702).

Water Conservation

While many conservation efforts are currently underway and being implemented in response to legislative action and state agency initiatives, the project could accelerate or expand these efforts. The environmental analysis considers additional and accelerated implementation of conservation measure actions that could be taken in response to changes in water supply. Water conservation is often the fastest, easiest to implement, most efficient, and most cost-effective way to quickly reduce water demand and extend supplies, providing flexibility for all California communities. The Water Conservation Bill of 2009 (SB X7-7) requires the state to reduce urban water consumption by 20 percent by the year 2020 and encourages both urban and agricultural water providers to implement conservation strategies, monitor water usage, and report data to DWR.

In 2018, two policy bills were enacted by the California Legislature, Assembly Bill 1668 (AB 1668, Friedman) and Senate Bill 606 (SB 606, Hertzberg), collectively referred to as the *2018 Water Conservation Legislation* or *Making Conservation a California Way of Life*. The 2018 Water Conservation Legislation establishes guidelines for efficient water use and a framework for the drought planning for urban water suppliers, agricultural water suppliers, and small water suppliers and rural communities. Among other things, the State Water Board must adopt standards for using water more efficiently, as well as performance measures for commercial, industrial, and institutional water use.

Broadly, the environmental analysis presented in Sections 7.3 through 7.20 considers the effects of agricultural and municipal water conservation measures. Municipal water conservation measures include metering, audits, and water demand management measures, such as more efficient appliances and water efficient landscaping. Agricultural water conservation measures include actions such as installation of integrated supervisory control and data acquisition (SCADA) systems and canal automation; increased use of pressurized, drip, or micro-spray irrigation methods; and lining of canals or encasement/installation of underground pipes. Some conservation measures (e.g., weather forecasting, audits) do not contemplate on-the-ground actions likely to result in environmental impacts and are not analyzed in this chapter. Other measures, such as crop cover and crop-shifting to reduce water use or loss, that take place within the normal footprint of agricultural activities also are not analyzed in this chapter.

Habitat Restoration and Other Ecosystem Projects

As discussed in Section 7.1.4, the proposed Plan amendments (and Low and High Flow Alternatives [described in Section 7.2, *Description of Alternatives*]) provide a framework that would allow stakeholders to implement complementary ecosystem projects in addition to flow requirements, and actions that other entities could take that would contribute toward achieving the overall goal of improving conditions for fish and wildlife in the Sacramento/Delta watershed. These actions include physical habitat restoration projects as well as predation and invasive species control measures. In addition, the narrative cold water habitat objective would address tributary-specific temperature needs by requiring that cold water flows from reservoirs be maintained and timed to provide for

downstream temperatures to protect salmon at critical times of year, or that alternate protective measures are implemented to protect native fish. The cold water habitat objective could be implemented in part through certain construction projects such as reservoir temperature management facilities or fish passage facilities. These types of habitat restoration and other ecosystem projects are described in detail and analyzed in Section 7.21, *Habitat Restoration and Other Ecosystem Projects*.

Physical habitat restoration projects can range in size and scope and generally include the physical restoration of tidal, floodplain, and riparian habitats to increase hydrologic connectivity and habitat complexity. These projects generally involve reconnecting historical stream and river channels and freshwater deltas with floodplains and reconnecting historical estuaries to tidal influence through levee removal, setback, and breaching. Enhancement of in-channel complexity is a subset of habitat restoration that focuses on the placement of large wood or boulder structures and gravel augmentation to assist in the restoration of degraded river ecosystems. Fish passage improvements include fish screens and fishways, temperature control devices, and dam removal to facilitate fish passage at dams and other potential passage impediments and improve the survival rate of migrating adult and juvenile Chinook salmon and steelhead as they return to and from their natal spawning ground. Fish passage improvement projects may also serve as an implementation mechanism for the proposed cold water habitat objective.

New or Modified Facilities

As discussed above, the Sacramento/Delta update to the Bay-Delta Plan would result in reduced Sacramento/Delta water supplies for agriculture, municipal, and refuge uses at certain times and locations. In response, water users could increase efforts to prioritize limited available water supplies and/or develop other water supply sources. Other water sources are already being developed and utilized in response to water shortages that occur as a result of many factors. While the Sacramento/Delta update to the Bay-Delta Plan is not the driving impetus for sustainable management and water supply diversification efforts, the project may accelerate and increase the need for such efforts.

Section 7.22, *New and Modified Facilities*, addresses actions that entities may take that would involve construction to modify or build new facilities and infrastructure to supplement or conserve surface water supplies and other construction projects that may result from the Sacramento/Delta update to the Bay-Delta Plan. Projects include new or modified dams/reservoirs and points of diversion; groundwater wells and groundwater storage and recovery projects; and new or modified drinking water treatment plants, including desalination plants and wastewater treatment plants. Section 7.22 also evaluates other construction projects that entities may take in response to changes in hydrology and water supply, including new or modified boat ramps, streamflow or temperature monitoring devices, and water conservation projects such as canal lining.

7.1.6 Project Alternatives

Section 7.2, *Alternatives Description,* describes the project alternatives (stand-alone and modular alternatives) evaluated in the Staff Report, the No Project Alternative, and the alternatives considered but eliminated from consideration during the scoping process. The proposed VAs alternative is also briefly described in Section 7.2 and further described and analyzed in Chapter 9. With the exception of the No Project Alternative, all alternatives would add objectives and/or implementation measures to the Bay-Delta Plan and would not eliminate or modify any of the

existing objectives or implementation measures. In addition to the potential changes to the objectives and implementation measures discussed below and elsewhere in the Staff Report, the State Water Board is considering the addition of Tribal Beneficial Uses (TBU) to the Bay-Delta Plan in the context of its Plan update for the reasonable protection of fish and wildlife. The State Water Board adopted definitions for TBUs in 2017, which are Tribal Subsistence Fishing (T-SUB), Tribal Tradition and Culture (CUL), and Subsistence Fishing (SUB).

Section 7.24, *Alternatives Analysis*, provides additional information and an evaluation of all of the alternatives except the proposed Plan amendments and proposed VAs, including the environmental impacts and economic effects of each of these alternatives. Because the proposed VAs were received after much of this Staff Report had been prepared, the proposed VAs are analyzed separately in Chapter 9, *Proposed Voluntary Agreements*. Chapter 9 provides a full environmental analysis of the proposed VAs, including evaluation of the potentially significant, less-than-significant, and beneficial environmental effects of the proposed VAs, as well as a Protection of Voluntary Agreement Flows modular alternative that could be implemented in combination with the proposed VAs. Chapter 9 also identifies mitigation measures that could avoid or reduce potentially significant impacts of the proposed VAs.

As discussed above, California water resource management is complex, and the project covers a broad range of compliance methods across a large area of the state. As a result, the impact analyses are necessarily broad and cover a wide range of foreseeable compliance measures and responses that could also be considered alternative means of compliance. Many of the environmental effects of the alternatives presented in Section 7.24 and Chapter 9 are already assessed in detail in the primary analyses in Sections 7.3 through 7.20, and in Sections 7.21 and 7.22 for compliance methods and response actions that involve construction. The alternatives analyses rely on the existing environmental analysis for efficiency and focus on identifying any new or changed environmental impacts of each alternative as applicable.

7.1.7 Summary of Potential Environmental Impacts and Mitigation Measures

The CEQA analyses cover a broad range of impact mechanisms and actions including changes in hydrology (flows and reservoir levels), changes in water supply (including for agricultural, municipal, and refuge uses), and actions that may be taken in response to the project.

The impacts of changes in hydrology and changes in water supply that could result from implementation of the proposed Plan amendments are described in Sections 7.3 through 7.20. Sections 7.3 through 7.20 are organized by environmental resource category following the State Water Board's environmental checklist (Cal. Code Regs, tit. 23, div. 3, ch. 27 §§ 3720-3781, Appendix A). For a summary of environmental impacts and mitigation measures identified for the proposed Plan amendments, see Table 7.1-2. CEQA environmental checklist questions are listed in the same order as they are addressed in Sections 7.3 through 7.20. Some impact questions are sufficiently related and are addressed together.

Impact and mitigation measure summary tables have also been prepared for other project alternatives. For a summary of significant impacts and mitigation measures identified for Habitat Restoration and Other Ecosystem Projects, see Table 7.21-1 in Section 7.21. For a summary of significant impacts and mitigation measures identified for New and Modified Facilities, see Table 7.22-1 in Section 7.22. For a summary of significant impacts and mitigation measures identified for

the No Project Alternative (Alternative 1), Low Flow Alternative (Alternative 2), and High Flow Alternative (Alternative 3), see Appendix F, *Impact Summary Tables for Alternatives 1, 2, and 3.* For a summary of significant impacts and mitigation measures identified for the proposed VAs, see Chapter 9.

7.1.8 Other State Water Board CEQA Requirements

Other State Water Board CEQA requirements addressed in this chapter include analyzing cumulative impacts (Cal. Code Regs., tit. 14, § 15355), growth-inducing impacts (Cal. Code Regs., tit. 14, §15126.2, subd. (d).), and significant irreversible environmental changes (Cal. Code Regs., tit. 14, § 15126.2, subd. (c). Section 7.23, *Cumulative Impact Analysis, Growth-Inducing Impacts, and Significant Irreversible Environmental Changes*, describes the cumulative impacts associated with the proposed Plan amendments and Low Flow and High Flow alternatives together with other projects (and programs) that could cause related impacts. Section 7.23 also discusses the ways in which the proposed Plan amendments, Low Flow Alternative, High Flow Alternative, and No Project Alternative could directly or indirectly foster economic or population growth or the construction of additional projects. In addition, Section 7.23 discloses any significant irreversible environmental changes that could result from implementation of the proposed Plan amendments, Low Flow Alternative, High Flow Alternative, and No Project Alternative. Chapter 9 evaluates cumulative, growth, and irreversible impacts for the proposed VAs.

7.1.9 Impact Summary

This section provides a summary of the potentially significant impacts, less than significant impacts, and beneficial environmental effects of the proposed Plan amendments. Table 7.1-2 summarizes impacts from changes in hydrology and supply under the proposed Plan amendments. Some potentially significant impacts can be mitigated to less-than-significant levels. Because the State Water Board has authority to ensure that mitigation is implemented for certain actions, these impacts could be reduced to less-than-significant levels with mitigation incorporated. These impacts are listed as potentially significant followed by an asterisk (*).

Many other identified potentially significant environmental impacts could be reduced to less-than-significant levels with mitigation incorporated; however, due to the large scope of the project and wide range of possible response actions, sufficient information is not available to conclude with certainty that the mitigation measures will reduce all impacts to less-than-significant levels in all circumstances. Some mitigation activities are within the State Water Board's jurisdiction. However, other mitigation measures are largely within the jurisdiction and control of other agencies or depend on how water users respond to the project. Accordingly, the State Water Board cannot guarantee that measures will always be adopted or applied fully to mitigate potentially significant impacts. Therefore, unless and until the mitigation is fully implemented, the impacts remain potentially significant.

In addition, the environmental analysis often considers a range of potential outcomes, including the most conservative for evaluating potentially significant effects on the physical environment. In many cases, there may be no impact. For each resource area, the analysis assumes a worst-case scenario. Some impacts are inversely proportional, and it is not possible for a worst-case scenario to occur for every environmental resource area.

It is important that the CEQA impact conclusions be understood in the context of the nature of the proposed project, which is intended to be a restoration action. The Porter-Cologne Act (Wat. Code, § 13000 et seq.) is California's comprehensive water quality control statue, which implements portions of the federal Clean Water Act. The primary purpose of the federal Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (Clean Water Act § 101(a).) Water quality objectives are established to ensure the reasonable protection of beneficial uses and the prevention of nuisance, in consideration of various factors including past, present, and probable future beneficial uses of water (Wat. Code, § 13241.) The Bay-Delta Plan identifies various beneficial uses of water in the Bay-Delta watershed and establishes water quality objectives designed to reasonably protect those uses. The impacts that could potentially result from implementation occur in a system that has been highly altered, and the project would be expected to improve conditions for native fish and wildlife in the Sacramento/Delta watershed over time. However, changes in hydrology and changes in water supply could result in some environmental impacts at certain times and locations that must be analyzed under CEQA. These potential environmental impacts should be viewed in light of the overall purpose and goals of the Sacramento/Delta update to the Bay-Delta Plan.

Table 7.1-2. Impact and Mitigation Measure Summary—Proposed Plan Amendments [1]

Impact	Impact Conclusions	Proposed Mitigation
AESTHETICS		
Impact AES-a: Have a substantial adverse effect on a scenic vista **Impact AES-b:** Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway **Impact AES-c:** Substantially degrade the existing visual character or quality of the site and its surroundings	**Potentially Significant**	
	Reservoir level changes may result in exposure of more unvegetated ground or "bathtub rings" Agriculture land conversion could affect aesthetic resources if properties are developed or neglected	**MM-AES-a–c: Mitigate impacts of the project that could have a substantial adverse effect on a scenic vista or could substantially damage a scenic resource or degrade the existing visual character or quality of the site and its surroundings** 1. Reservoir Management (MM-AQUA-a,d: 1) 2. Measures to Mitigate Conversion of Agricultural Land (MM-AG-a,e)
	Less than Significant	
	Altered streamflows could affect water levels and appearance Reduced Sacramento/Delta supply to municipalities could affect the visual quality of the urban environment Reduced Sacramento/Delta supplies to wildlife refuges could result in slight changes to the visual character of these areas Municipal water conservation measures could cause a change in the visual character of localized settings	—
Impact AES-d: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
AGRICULTURE AND FOREST RESOURCES		
Impact AG-a: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use **Impact AG-e:** Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Important Farmland to nonagricultural use	**Potentially Significant**	
	Reduced Sacramento/Delta supply to agriculture could lead to changes in distribution of crop types and acreage and conversion of farmland to nonagricultural use Increased use of water transfers could further incentivize farmland conversion, particularly in rapidly urbanizing areas Lower groundwater levels could reduce groundwater available for agricultural use Reduced streamflow and water levels at some locations could affect the ability of existing diversion intakes to divert water for agricultural use Increased inundation in the Sutter and Yolo Bypasses during the planting season could affect crop acreage	**MM-AG-a,e: Mitigate impacts related to the conversion of Prime and Unique Farmland and Farmland of Statewide Importance (important farmland) to nonagricultural use** 1. Voluntary Implementation Plans 2. Diversify Water Portfolios 3. Increase Efficiency of Agricultural Water Use 4. Impose Conditions on Land Use Changes or Other Discretionary Approvals 5. Reduce Impacts on Groundwater (MM-GW-b) 6. Oversight and Approval of Water Transfers 7. Ensure Effectiveness of Diversion Intakes 8. Minimize Disruptions to Agriculture in the Sutter and Yolo Bypasses from Increased Floodplain Inundation
Impact AG-b: Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract	**No Impact**	
	—	—
Impact AG-c: Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))	**No Impact**	
	—	—
Impact AG-d: Result in the loss of forest land or conversion of forest land to non-forest use	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
AIR QUALITY		
Impact AQ-a: Conflict with or obstruct implementation of the applicable air quality plan **Impact AQ-b:** Violate any air quality standard or contribute substantially to an existing or projected air quality violation **Impact AQ-c:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)	**Potentially Significant**	
	Increased groundwater pumping using diesel pumps and generators could result in emissions	**MM-AQ-a–c: Mitigate impacts from criteria air pollutant emissions from groundwater pumping**
	Less than Significant	
	Lower streamflows and reservoir levels could result in exposure to increased windblown dust emissions Agricultural land fallowing could result in exposure to increased fugitive dust Post-harvest rice burning could result in exposure to air pollutant emissions	—
	Beneficial	
	Water conservation could result in a reduction in emissions	—
Impact AQ-d: Expose sensitive receptors to substantial pollutant concentrations	**Less than Significant**	
	Lower reservoir levels could result in exposure to increased windblown dust emissions Agricultural land fallowing could result in exposure to increased fugitive dust on lands where soil is exposed Post-harvest rice burning, groundwater pumping, and the use of other water management actions could result in exposure to pollutant emissions	—
Impact AQ-e: Create objectionable odors affecting a substantial number of people	**Less than Significant**	
	Formation of harmful algal blooms from reduced flows and reservoir levels could produce odor compounds Reductions in overall wastewater flow and increased use of recycled water could result in increases in odors Increases in odors from increased groundwater	—

Impact	Impact Conclusions	Proposed Mitigation
	pumping and other water management actions	
BIOLOGICAL RESOURCES—TERRESTRIAL		
Impact TER-a: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service	**Potentially Significant**	
	Increased inundation in flood bypasses during the planting season could affect crop acreage, which could affect special-status wildlife species that use croplands as habitat Reduced Sacramento/Delta supply to wildlife refuges and agricultural lands could affect habitat for special-status species, including giant gartersnake, Swainson's hawk, greater sandhill crane, tricolored blackbird, and California black rail Reduced Sacramento/Delta supply to municipal and agricultural use could affect special-status plant and wildlife species Capturing flood flows for groundwater storage and recovery could diminish instream ecological benefits of high-flow events* Water transfers based on cropland idling could affect special-status species that use agricultural fields Increased use of recycled water that would otherwise discharge to streams could diminish ecological benefits of instream flows, especially in dry seasons and in low-flow conditions where streamflow is dependent on wastewater discharges*	**MM-TER-a: Mitigate impacts on special-status species** 1. Minimize Impacts on Sutter and Yolo Bypass Agricultural Lands (MM-AG-a,e: 4, MM-AG-a,e: 8) 2. Habitat Protection and Restoration Actions 3. Voluntary Implementation Plans 4. Special-Status Species Management Measures 5. Diversify Water Portfolios 6. Regulation of Waste Discharges to Streams (MM-SW-a,f: 1) 7. Support and Approval of Water Recycling 8. Support and Approval of Groundwater Storage and Recovery 9. Oversight and Approval of Water Transfers
	Less than Significant	
	Increased winter flows on the Sacramento and Feather Rivers could affect bank swallow habitat Changes in reservoir water levels could affect habitat for bald eagle, American white pelican, western pond turtle, and amphibians Changes in streamflow below export reservoirs could affect habitat for special-status terrestrial species Lower groundwater levels could affect natural	—

Impact	Impact Conclusions	Proposed Mitigation
	communities that are dependent on groundwater and sensitive species that are reliant on groundwater-dependent ecosystems	
	Beneficial	
	Restoration and maintenance of natural flow would improve conditions for special-status plants and wildlife A more natural flow regime could contribute to the control of invasive species in combination with invasive species control efforts Increased frequency and duration of floodplain inundation would improve habitat for wintering waterfowl and other wildlife species Changes in Delta inflows and Delta outflows would improve habitat conditions for freshwater and tidal marsh species in the Delta and Suisun Marsh	—
Impact TER-b: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service **Impact TER-c:** Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means	**Potentially Significant**	
	Changes in reservoir levels and streamflow below reservoirs could affect associated riparian and wetland habitat Reduced Sacramento/Delta supply to wildlife refuges could decrease wetland area over time Reduced Sacramento/Delta supply could affect water quality in managed wetlands Reduced Sacramento/Delta supply to municipal and agricultural use could affect sensitive riparian and wetland habitat, and other natural communities Lower groundwater levels could affect riparian and wetland habitat, and sensitive groundwater-dependent natural communities and wetlands Capturing flood flows for groundwater storage and recovery could diminish the instream ecological benefits of high-flow events* Increased use of water transfers could affect groundwater-dependent natural communities and	**MM-TER-b,c: Mitigate impacts on riparian habitats or other sensitive natural communities, including wetlands** 1. Reservoir Management (MM-AQUA-a,d: 1) 2. Reduce Impacts on Groundwater-Dependent Ecosystems (MM-GW-b: 1–7) 3. Agricultural Drainage Control (MM-SW-a,f: 7) 4. Implement Mitigation Measure MM-TER-a elements to reduce impacts on riparian habitats and other sensitive natural communities, including wetlands: • Habitat Protection and Restoration Actions (MM-TER-a: 2) • Regulation of Waste Discharges to Streams (MM-TER-a: 6) • Support and Approval of Water Recycling

Impact	Impact Conclusions	Proposed Mitigation
	some perennial wetlands in some areas, and could exacerbate effects from lower groundwater levels on riparian and wetland habitat and sensitive natural communities Increased use of water recycling could diminish riparian and wetland habitat, especially in dry seasons and in low-flow conditions where streamflow depends on wastewater discharges*	(MM-TER-a: 7) • Support and Approval of Groundwater Storage and Recovery (MM-TER-a: 8) • Oversight and Approval of Water Transfers (MM-TER-a: 9)
	Less than Significant	
	Reduced streamflows below export reservoirs could affect riparian and wetland habitat Reduced agricultural and municipal discharges could affect some wetland communities and native vegetation	—
	Beneficial	
	A more natural flow regime would restore and maintain natural processes, such as sediment deposition, marsh accretion, nutrient transport, seed dispersal, and flow-related disturbance, which would benefit riverine and associated wetland and riparian habitat Increased frequency and duration of floodplain inundation would benefit riparian and wetland habitat and associated natural communities Changes in Delta inflows and Delta outflows would benefit freshwater marshes and tidal marshes Increased use of water recycling and municipal water conservation measures could reduce municipal discharges and support conditions favorable to wetlands and sensitive natural communities adapted to the natural flow regime	—

Impact	Impact Conclusions	Proposed Mitigation
Impact TER-d: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	**Potentially Significant**	
	Reduced Sacramento/Delta supply for wildlife refuges and agriculture could decrease the amount of habitat available for resident and migratory waterfowl and shorebirds Increased use of water transfers could result in conversion of crop types that provide foraging habitat for migratory waterfowl and shorebirds	1. MM-TER-d: Mitigate impacts on wildlife movement wildlife nurseries 2. Implement Mitigation Measure MM-TER-a and Mitigation Measure MM-TER-b,c elements to mitigate impacts on the movement of native resident or migratory fish or wildlife species, migratory wildlife corridors, and native wildlife nursery sites. • Habitat Protection and Restoration Actions (MM-TER-a: 2) • Voluntary Implementation Plans (MM-TER-a: 3) • Oversight and Approval of Water Transfers (MM-TER-a: 9) • Reduce Impacts on Groundwater-Dependent Ecosystems (MM-TER-b,c: 2)
	Less than Significant	
	Changes in reservoir levels could affect the amount of breeding habitat for resident or migratory waterfowl populations	—
	Beneficial	
	A more natural flow regime would benefit native resident and migratory wildlife that use riverine and associated wetland and riparian habitat and natural communities as migratory corridors or nursery sites	—
Impact TER-e: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	**No Impact**	
	—	—
Impact TER-f: Conflict with the provisions of an adopted habitat conservation plan, natural community	**Less than Significant**	
	Reduced Sacramento/Delta supply could affect habitat goals of some habitat conservation plans	—

Impact	Impact Conclusions	Proposed Mitigation
conservation plan, or other approved local, regional, or state habitat conservation plan	**Beneficial**	
	Changes in Sacramento/Delta tributary flows, Delta inflows, and Delta outflows would complement actions identified in some habitat conservation plans	—
BIOLOGICAL RESOURCES—AQUATIC		
Impact AQUA-a: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service **Impact AQUA-d:** Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	**Potentially Significant**	
	Changes in reservoir levels could affect downstream flows and water temperatures below some reservoirs Reduced Sacramento/Delta supply to agriculture could affect habitat for special status species that depend in part on Sacramento/Delta water supply for habitat (i.e., irrigation runoff in agricultural drain for desert pupfish) Lower groundwater levels could affect stream-aquifer interactions and streamflows in some locations Diversion of surface water for groundwater storage and recovery could reduce peak flows that provide ecological and habitat functions (e.g., floodplain inundation)* Water transfers could alter hydrologic patterns and affect aquatic biological resources in some locations Increased water recycling could decrease the volume of treated wastewater effluent discharge into water bodies that are migratory corridors for fish*	MM-AQUA-a,d: Mitigate impacts on aquatic special-status species and wildlife movement or wildlife nurseries 1. Temperature Control and Reservoir Management 2. Voluntary Implementation Plans 3. Habitat Protection and Restoration Actions 4. Special-Status Species Management Measures 5. Regulation of Waste Discharges to Streams (MM-SW-a,f: 1) 6. Support and Approval of Recycled Water 7. Reduce Impacts on Groundwater (MM-GW-b: 1–7) 8. Diversify Water Portfolios 9. Support and Approval of Groundwater Storage and Recovery 10. Oversight and Approval of Water Transfers
	Less than Significant	
	Changes in interior Delta flows Changes in wet season flows (geomorphic flows) on regulated tributaries in the Sacramento/Delta regions could cause some erosion, but would also result in ecological benefits of floodplain inundation Changes in reservoir levels could affect native reservoir fish species, such as minnows and suckers	—

Impact	Impact Conclusions	Proposed Mitigation
	Beneficial	
	A more natural flow regime would support a connected and functioning ecosystem and benefit native fish in the Sacramento/Delta Changes in Delta inflows and outflows would benefit native anadromous, estuarine, and resident fish species Increased frequency and duration of floodplain inundation in Feather River and Yolo Bypass would benefit aquatic species	—
Impact AQUA-f: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan	**Less than Significant**	
	Reduced Sacramento/Delta supply could frustrate certain conservation plan management actions	—
CULTURAL RESOURCES		
Impact CUL-a: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 **Impact CUL-b:** Cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5	**Potentially Significant**	
	Changes in reservoir levels could expose previously inundated cultural resources and/or significant historic or archaeological resources to increased wave action, erosion, and human activity	**MM-CUL-a,b: Mitigate impacts of project that could cause a substantial adverse change in the significance of a historical or archaeological resource** 1. Reservoir Management (MM-AQUA-a,d: 1) 2. Implement or Adhere to Cultural Resource Management Measures for Lands Surrounding Reservoirs 3. Unanticipated Discoveries
	Less than Significant	
	Changes in streamflows could result in inundation and exposure of historic or archaeological resources	—
Impact CUL-c: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
Impact CUL-d: Disturb any human remains, including those interred outside of dedicated cemeteries	**Potentially Significant**	
	Changes in reservoir levels could expose previously inundated land containing human burials, which could result in disturbance of the burial and impacts from human activity	1. **MM-CUL-d: Mitigate impacts of project that could disturb any human remains, including those interred outside of dedicated cemeteries** 2. Implement MM-CUL-a,b
	Less than Significant	
	Changes in river flows could alter the baseline conditions of human burials interred within or outside of dedicated cemeteries	—
ENERGY		
Impact EN-a: The effects of the project on energy resources **Impact EN-b:** The effect of the project on peak and base period demands for electricity and other forms of energy **Impact EN-c:** The effects of the project on local and regional energy supplies and requirements for additional capacity **Impact EN-d:** The degree to which the project complies with existing energy standards **Impact EN-e:** Energy requirements and energy use efficiencies by amount and fuel type for each stage of the project	**Potentially Significant**	
	Changes in hydrology would result in a decrease in hydropower generation in the summer which could be significant for an individual project or community Changes in water supply could cause an increase in energy use to replace Sacramento/Delta supplies from actions such as increased groundwater pumping and other water management actions	**MM-EN-a–e: Mitigate the project effects on energy resources** 1. Voluntary Implementation Plans 2. Temperature Control and Reservoir Management in the Sacramento/Delta 3. Coordination with Existing Requirements 4. Diversify Water Portfolios 5. Increase Water Efficiency 6. Promote the Use of Renewable Energy 7. Implement Greenhouse Gas Emissions Mitigation (MM-GHG-a and MM-GHG-b)
	Beneficial	
	Changes in water supply could result in a reduction in the energy used to export water from the Delta Water conservation could result in a reduction in energy use	—
Impact EN-f: The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives	**Less than Significant**	
	Reduction in agricultural production could increase energy use for transportation	—

Impact	Impact Conclusions	Proposed Mitigation
GEOLOGY AND SOILS		
Impact GEO-a: Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death involving: rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure including liquefaction, or landslides	**No Impact**	
	—	—
Impact GEO-b: Result in substantial soil erosion or the loss of topsoil	**Less than Significant**	
	Agriculture fallowing could temporarily increase erosion and sedimentation	—
Impact GEO-c: Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse	**Potentially Significant**	
	Lower groundwater levels could exacerbate existing problems associated with ground subsidence	**MM-GEO-c: Mitigate impacts associated with unstable soils and steep slopes (landslide, lateral spreading, subsidence, liquefaction, or collapse)** 1. Actions to Reduce Subsidence 2. Reduce Impacts on Groundwater (MM-GW-b)
I**mpact GEO-d:** Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property	**No Impact**	
	—	—
Impact GEO-e: Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
GREENHOUSE GAS EMISSIONS		
Impact GHG-a: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	**Potentially Significant**	
	Increased groundwater pumping from wells with diesel-powered pumps could generate additional greenhouse gas emissions Groundwater storage and recovery, water transfers, and water recycling could result in emissions associated with energy use	**MM-GHG-a: Mitigate impacts from greenhouse gas emissions** 1. Water Use Efficiency 2. Water Conservation 3. Energy Efficiency 4. Irrigation Systems 5. Restoration, Pricing Strategies, and Mitigation Credits 6. Implement Energy Mitigation (Mitigation Measure MM-EN-a–e: 1–6) 7. Implement Mitigation Measure MM-GHG-b, Comply with applicable greenhouse gas emissions reduction plans, policies, or regulations
	Less than Significant	
	Reductions in hydropower generation could result in additional energy generation at fossil-fuel facilities Increased groundwater pumping from wells with electric fuel pumps could generate additional greenhouse gas emissions	—
	Beneficial	
	Changes in water supply could result in a reduction in the energy used to export water from the Delta and a corresponding reduction in greenhouse gas emissions Water conservation could result in a reduction in energy use and greenhouse gas emissions	—

Impact	Impact Conclusions	Proposed Mitigation
Impact GHG-b: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases	**Potentially Significant**	
	Increased groundwater pumping from wells with diesel-powered pumps could result in emissions in excess of existing thresholds and could conflict with the state's long-term emission reduction trajectory	**MM-GHG-b: Comply with applicable greenhouse gas emission reduction plans, policies, or regulations** 1. Implement Air Quality Plans and Programs 2. Renewable Energy 3. Implement Mitigation Measure (MM-GHG-a): 1–6, Mitigate impacts from greenhouse gas emissions
	Beneficial	
	Water use efficiency, water recycling, and reuse of urban runoff would be beneficial in meeting other state and local GHG goals	—
HAZARDS AND HAZARDOUS MATERIALS		
Impact HAZ-a: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	**No Impact**	
	—	—
Impact HAZ-b: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	**No Impact**	
	—	—
Impact HAZ-c: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	**No Impact**	
	—	—
Impact HAZ-d: Be located on a site	**No Impact**	

Impact	Impact Conclusions	Proposed Mitigation
which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment	—	—
Impact HAZ-e: For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area	**No Impact**	
	—	—
Impact HAZ-f: For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area	**No Impact**	
	—	—
Impact HAZ-g: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	**No Impact**	
	—	—
Impact HAZ-h: Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	**Less than Significant**	
	Changes in reservoir levels in areas likely to continue experiencing forest fires could affect wildland fire suppression practices	—
HYDROLOGY AND WATER QUALITY—SURFACE WATER		
Impact SW-a: Violate any water quality standards or waste discharge requirements **Impact SW-f**: Otherwise substantially degrade water quality	**Potentially Significant**	
	Reduced streamflows of smaller streams below some reservoirs could result in less dilution and increased concentration of contaminants Increased flows could result in increased input of mercury and methylmercury production downstream, including in areas such as the Yolo	**MM-SW-a,f: Avoid or reduce violations of water quality standards or waste discharge requirements, and/or degradations of water quality** 1. Water Quality Contaminants and Regulation of Waste Discharges

Impact	Impact Conclusions	Proposed Mitigation
	Bypass Increases in water level fluctuation at some reservoirs could result in increased bioaccumulation of methylmercury in fish Changes in reservoir levels and lowered streamflows below reservoirs could result in increased water temperature in some locations and times of year, particularly while specific cold water habitat implementation measures are refined Changes in reservoir levels could result in increased production of harmful algal blooms (HABs) in some locations Lower summer and fall flows in some Delta channels could result in incremental increased production of HABs and invasive aquatic plants Changes in water supply could result in temporary exceedances of maximum contaminant levels in municipal water supply Changes in water supply and indoor water conservation could result in site-specific exceedances of waste discharge requirements due to changes in wastewater treatment plant (WWTP) influent and effluent quality and quantity Reductions in delivery of higher quality Sacramento/Delta supplies to wildlife refuges and managed wetlands could affect water quality Reductions in groundwater accretions could cause decreases in water quality associated with lower streamflows or higher temperatures Diversion of surface water for groundwater storage and recovery could limit the dilution effect of existing flows and exacerbate existing water quality impairments* Increased use of water transfers could affect water quality in some locations Increased water recycling could reduce instream	2. Minimize Mercury Impacts 3. Temperature Control and Reservoir Management (MM-AQUA-a,d: 1) 4. Avoid or Reduce Harmful Algal Blooms and Invasive Aquatic Weeds 5. Protect Municipal Water Quality 6. Reduce Impacts on Groundwater (MM-GW-b) 7. Agricultural Drainage Control 8. Diversify Water Portfolios 9. Support and Approval of Groundwater Storage and Recovery 10. Oversight and Approval of Water Transfers 11. Support and Approval of Water Recycling

Impact	Impact Conclusions	Proposed Mitigation
	flows, which could reduce dilution of local sources of contaminants*	
	Less than Significant	
	Changes in flows could result in moderately elevated turbidity and total suspended solids (TSS) levels in some locations, and reduced occurrence of the highest turbidity and TSS levels Increased Delta outflow would result in little change or beneficial reductions in electrical conductivity (EC) in the Delta Increased Delta outflow would result in little change or beneficial reductions in chloride and bromide at municipal intakes in the Delta Increased floodplain inundation could affect nutrients, organic material, invasive aquatic plants, and HABs	—
	Beneficial	
	Reduced seawater intrusion could result in water quality improvements in the Delta, including dilution and flushing of some contaminants and reductions in EC, bromide, and chloride Increased flows would enhance water quality for fish Increased flows could dilute certain constituents in waterbodies that would provide a water quality benefit Changes in Delta outflows could reduce HABs and invasive vegetation	—
Impact SW-c: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site **Impact SW-d:** Substantially alter the	**Potentially Significant**	
	Increases in Clear Creek flow downstream of Whiskeytown Lake could increase risk of erosion and flooding in this area*	**MM-SW-i: Avoid or reduce exposure of people or structures to flood risk on Clear Creek**
	Beneficial	
	A more natural flow regime could contribute to the restoration of beneficial geomorphic processes (i.e., those that clean fine sediment from spawning	—

Impact	Impact Conclusions	Proposed Mitigation
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	gravels, maintain a diversity of bed forms, and help maintain functional floodplain and riparian habitats through floodplain inundation) Changes in Delta inflows would provide for floodplain inundation to benefit native species	
Impact SW-e: Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff	**No Impact**	
	—	—
Impact SW-g: Place 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 **Impact SW-h:** Place within a 100-year flood hazard area structures which would impede or redirect flood flows	**No Impact**	
	—	—
Impact SW-i: 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	**Potentially Significant**	
	Increases in Clear Creek flow downstream of Whiskeytown Lake could increase the risk of downstream flooding in this area*	**MM-SW-i: Avoid or reduce exposure of people or structures to flood risk on Clear Creek**
Impact SW-j: Inundation by seiche, tsunami, or mudflow	**No Impact**	
	—	—
HYDROLOGY AND WATER QUALITY—GROUNDWATER		
Impact GW-b: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby	**Potentially Significant**	
	Increased groundwater pumping and reductions in incidental groundwater recharge from applied irrigation could lower groundwater levels and contribute to groundwater overdraft Lower groundwater levels could result in an increase in frequency and severity of critical shortages or dry	**MM-GW-b: Mitigate the substantial depletion of groundwater supplies or the substantial interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level**

Impact	Impact Conclusions	Proposed Mitigation
wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)	wells occurring in some areas for communities that rely on groundwater, including economically disadvantaged communities Reduced Sacramento/Delta supplies could have localized impacts on groundwater storage in areas where Sacramento/Delta supplies are used for groundwater banking Surface water transfers through groundwater substitution could result in lower groundwater levels in basin of origin Agricultural conservation measures could reduce incidental groundwater recharge that would lower groundwater levels	1. Implement the Sustainable Groundwater Management Act (SGMA) 2. SGMA Oversight 3. Diversify Water Portfolios 4. Support and Approval of Groundwater Storage and Recovery 5. Support and Approval of Water Recycling Projects 6. Oversight and Approval of Water Transfers 7. Voluntary Implementation Plans
	Less than Significant	
	Reduced flows downstream of reservoirs could affect stream-aquifer interactions Increased water recycling could have effects on groundwater levels Municipal water conservation measures could reduce incidental groundwater recharge from urban runoff	—
	Beneficial	
	Groundwater storage and recovery could enhance groundwater levels Water recycling could increase groundwater levels in some areas if a portion of the recycled water reaches the aquifer or if the recycled water offsets a use that previously was supplied by groundwater	—
Impact GW-a: Violate any water quality standards or waste discharge requirements **Impact GW-f:** Otherwise substantially degrade water quality	**Potentially Significant**	
	Lower groundwater levels can result in changes in groundwater flow direction and gradients in localized areas, which could exacerbate the migration of contaminants In some locations, lower groundwater levels may concentrate salts and nutrients in groundwater over	**MM-GW-a,f: Mitigate impacts to groundwater quality from depletion of groundwater supplies or the substantial interference with groundwater recharge** 1. Drinking Water Programs 2. Implement the State and Regional Board's

Impact	Impact Conclusions	Proposed Mitigation
	time through evaporative enrichment Lower groundwater levels could affect groundwater quality and potentially affect drinking water wells in some areas, including economically disadvantaged communities Lower groundwater levels could have localized effects on groundwater quality by concentrating pollutants where groundwater contamination already exists Groundwater storage and recovery projects that use poor quality water to recharge groundwater basins could contribute to salt and nutrient loading or introduce contaminants to the underlying aquifer* Other water management actions (water transfers through groundwater substitution and agriculture water conservation) could result in lower groundwater levels, which could exacerbate groundwater quality impairments or contribute to contaminant loading in localized areas	Irrigated Lands Regulatory Program 3. Reduce Impacts on Groundwater (MM-GW-b)
	Less than Significant	
	Recycled water may percolate into the underlying groundwater basin, and could affect groundwater quality	—
	Beneficial	
	Increased infiltration from stream-aquifer interactions from increased flows in the Sacramento/Delta could improve groundwater quality Groundwater storage and recovery projects that use high-quality water to recharge groundwater basins may provide an effective strategy to maintain or improve groundwater quality	—

Impact	Impact Conclusions	Proposed Mitigation
LAND USE AND PLANNING		
Impact LU-a: Physically divide an established community	**No Impact**	
	—	—
Impact LU-b: Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect	**No Impact**	
	—	—
Impact LU-c: Conflict with any applicable habitat conservation plan or natural community conservation plan	**Less than Significant**	
	See Section 7.6.1, *Terrestrial Biological Resources,* Impact TER-f	—
MINERAL RESOURCES		
Impact MIN-a: Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state	**No Impact**	
	—	—
Impact MIN-b: Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan	**No Impact**	
	—	—
NOISE		
Impact NOI-a: Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies **Impact NOI-c:** A substantial permanent increase in ambient noise levels in the	**Potentially Significant**	
	Increased groundwater pumping for replacement water supply, groundwater storage and recovery, or groundwater substitution transfers could result in higher noise levels	**MM-NOI-a,c,d: Mitigate exposure of persons to or generation of noise levels in excess of established standards and to substantial permanent or temporary increases in ambient noise levels in the project vicinity**

Impact	Impact Conclusions	Proposed Mitigation
project vicinity above levels existing without the project **Impact NOI-d:** A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project		1. Applicable Policies and Regulations 2. Noise-Reduction Consideration in Operations
Impact NOI-b: Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels	**Less than Significant**	
	Increased groundwater pumping could result in localized and intermittent perceptible vibration	—
Impact NOI-e: For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels	**No Impact**	
	—	—
Impact NOI-f: For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels	**No Impact**	
	—	—
POPULATION AND HOUSING		
Impact POP-a: Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)	**No Impact**	
	—	—
Impact POP-b: Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere	**No Impact**	
	—	—

Impact	Impact Conclusions	Proposed Mitigation
Impact POP-c: Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere	**No Impact**	
	—	—
PUBLIC SERVICES		
Impact PS-a: Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: fire protection, police protection, schools, parks, or other public facilities	**No Impact**	
	—	—
RECREATION		
Impact REC-a: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated	**Potentially Significant**	
	Changes in reservoir levels could affect boat ramp accessibility affecting recreation opportunities at some reservoirs	**MM-REC-a: Mitigate recreation impacts associated with reservoir level changes** 1. Reservoir Management (MM-AQUA-a–d: 1) 2. Recreation Management Measures
	Less than Significant	
	Reduced summer flows could affect the boating difficulty of rapids for rafting and kayaking at some locations Increased spring and early summer flows could reduce opportunities for swimming or wading in rivers at some locations Incremental increase in potential harmful algal blooms could cause closures to recreation in some waterbodies	—

Impact	Impact Conclusions	Proposed Mitigation
	Changes in reservoir water surface area and elevation could affect sportfish populations and reduce fishing opportunities at some locations Reduced deliveries to wildlife refuges could affect recreational opportunities (e.g., wildlife viewing) Reduced municipal water supply could affect municipal recreational opportunities at parks, playfields, and swimming pools	
	Beneficial	
	Changes in flow could improve recreational opportunities	—
Impact REC-b: Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment	**Potentially Significant**	
	Changes in reservoir levels could affect boat ramp accessibility and lead to modification of existing or development of new boat ramps in some locations	**MM-REC-b: Mitigate impacts from construction or expansion of recreational facilities (boat ramps)** 1. Implement MM-REC-a 2. If construction of new or modified boat ramps is necessary, implement mitigation measures described in Section 7.22, *New or Modified Facilities*
TRANSPORTATION/TRAFFIC		
Impact TRA-a: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit **Impact TRA-f:** Conflict with adopted policies, plans, or programs regarding	**Less than Significant**	
	Increased intermittent inundation of floodplains bounded by levees where roads and pedestrian and bicycle paths exist could affect transportation Increased closures of the Delta Cross Channel (DCC) gates could affect recreational boat navigation Changes in agricultural land use or fallowing could lead to changes in agricultural product-related transportation	—

Impact	Impact Conclusions	Proposed Mitigation
public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities		
Impact TRA-b: Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways	**No Impact**	
	—	—
Impact TRA-c: Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	**No Impact**	
	—	—
Impact TRA-d: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	**No Impact**	
	—	—
Impact TRA-e: Result in inadequate emergency access	**No Impact**	
	—	—
UTILITIES AND SERVICE SYSTEMS		
Impact UT-a: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board	**Potentially Significant**	
	Changes in hydrology and water supply could alter the assimilative capacity of some streams where treated wastewater is discharged Changes in water supply could result in the use of other lower quality water supply sources that affect WWTP influent and effluent Reduced municipal supply and increased indoor water conservation could lead to a decrease in the production of wastewater and increase chemical constituent concentrations in WWTP influent	**MM-UT-a: Avoid or reduce potential to exceed wastewater treatment requirements**

Impact	Impact Conclusions	Proposed Mitigation
	Groundwater storage and recovery or water transfers could increase concentrations of some pollutants of concern in WWTP influent, if the source of the stored groundwater or transfer is of lower quality	1. Water Quality Contaminants and Regulation of Waste Discharges 2. Protect Municipal Water Quality 3. Increased Coordination between Water Suppliers and Wastewater Agencies 4. Minimize Surface Water Quality Effects on Wastewater Treatment Plants (MM-SW-a,f) 5. Minimize Groundwater Quality Effects on Wastewater Treatment Plants (MM-GW-a,f)
Impact UT-b: Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	**Potentially Significant**	
	Changes in hydrology and water supply could result in construction to modify or expand existing treatment facilities in order to prevent or mitigate exceedances of drinking water standards and wastewater discharge water quality objectives	**MM-UT-b: Avoid or reduce impacts from the construction of new water or wastewater treatment facilities or expansion of existing facilities** 1. Implement MM-UT-a 2. If construction of new water or wastewater treatment facilities or expansion of existing facilities is necessary, implement mitigation measures described in Section 7.22, *New or Modified Facilities*
Impact UT-c: Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	**No Impact**	
	—	—
Impact UT-d: Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed	**Potentially Significant**	
	Reduced Sacramento/Delta supply to municipal use could affect municipal water supplies Reduced groundwater levels could affect water supplies for communities that rely on groundwater as their primary municipal water source, including economically disadvantaged communities Reduced streamflows and water levels at some	**MM-UT-d: Avoid or reduce impacts on municipal supplies** 1. Voluntary Implementation Plans 2. Diversify Water Portfolios 3. Increase Water Use Efficiency 4. Implement Municipal Water Shortage Policy

Impact	Impact Conclusions	Proposed Mitigation
	locations could affect the ability of existing diversion intakes to divert water, which could affect municipal water supplies	5. Prioritize Water Supplies for Health and Safety 6. Reduce Impacts on Groundwater (MM-GW-b) 7. Protect Municipal Water Supplies 8. Ensure Effectiveness of Diversion Intakes (MM-AG-a,e: 7)
	Beneficial	
	Other water management actions (groundwater storage and recovery, water transfers, water recycling, water conservation) could contribute to meeting water demands for municipal use	—
Impact UT-e: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments	**No Impact**	
	—	—
Impact UT-f: Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs **Impact UT-g:** Comply with federal, state, and local statutes and regulations related to solid waste	**Less than Significant**	
	Changes to agricultural crop type or production resulting from changes in water supply could generate solid waste Increased water recycling could lead to an increase in solid waste byproducts	—

Note:

[1] Additional impacts and mitigation measures associated with habitat restoration and other ecosystem projects, as well as new and modified facilities, are presented in Section 7.21, Habitat Restoration and Other Ecosystem Projects (Table 7.21-1) and Section 7.22, New and Modified Facilities (Table 7.22-1).

7.1.10 References Cited

7.1.10.1 Common References

^State Water Resources Control Board (SWRCB). 2017b. *Final Scientific Basis Report in Support of New and Modified Requirements for Inflows from the Sacramento River and its Tributaries and Eastside Tributaries to the Delta, Delta Outflows, Cold Water Habitat, and Interior Delta Flows.* Sacramento, CA.

^State Water Resources Control Board (SWRCB). 2018. *July 2018 Framework for the Sacramento/Delta Update to the Bay-Delta Plan.*

^SacWAM 2023. Sacramento Water Resources Control Board (SWRCB) 2023. *Sacramento Water Allocation Model (SacWAM) Documentation*.