

Chapter 4

1 **Approach to Environmental Analysis**

2 This chapter describes the organization of the remaining chapters in the
3 Environmental Impact Statement (EIS). It also defines the scope, extent, and
4 framework of the environmental analysis, including a description of resources
5 areas evaluated and not evaluated.

6 The resource chapters in this EIS (Chapters 5 through 21) describe the affected
7 environment and the impact analysis for each resource associated with
8 implementation of the No Action Alternative, Second Basis of Comparison, and
9 Alternatives 1 through 5. Potential cumulative effects that would occur with
10 implementation of the alternatives are described in each resource chapter.
11 Potential mitigation measures (if necessary and available) to avoid, reduce, or
12 otherwise minimize potential adverse impacts to the environment due to
13 implementation of Alternatives 1 through 5 as compared to conditions under the
14 No Action Alternative are discussed within each resource section. Potential
15 cumulative effects that would occur with implementation of the alternatives are
16 described in each resource chapter.

17 **4.1 Basis of the Environmental Analysis**

18 The impact analysis is focused on the coordinated long-term operation of the
19 Central Valley Project (CVP) and the State Water Project (SWP). This EIS
20 addresses conditions that would result from the long-term operation of
21 Alternatives 1 through 5 as compared to the long-term conditions that would
22 occur under the No Action Alternative and the Second Basis of Comparison in the
23 Year 2030. This EIS does not address interim changes that would occur between
24 now and 2030.

25 This EIS does not address the impacts that could occur between now and 2030
26 due to the construction of projects that are assumed to be implemented under the
27 No Action Alternative, Second Basis of Comparison, and Alternatives 1
28 through 5. As described in Chapter 3, Description of Alternatives, there are
29 several ongoing projects that are assumed to be implemented in 2030, including
30 facilities that require construction. The 2030 conditions assume the projected
31 long-term conditions for each ongoing project as described in their respective
32 environmental documents. This EIS does not address the construction activities
33 of each ongoing project because those impacts are addressed in separate
34 environmental documents for each project.

35 Implementation of the No Action Alternative and Alternatives 1, 3, 4, and 5 also
36 could result in construction of facilities (e.g., fish passage facilities around dams
37 or across the Delta under these alternatives). Because, at this time, it is not known
38 if construction will be required to implement these provisions or the nature of
39 future facilities, this EIS does not address the construction activities of the future

1 facilities. Impacts of future facilities will be addressed in separate environmental
2 documents for each project. It is assumed that the provisions in the alternatives,
3 including construction activities, would be implemented in 2030.

4 **4.2 Resources Considered for Environmental** 5 **Analysis**

6 The resources and issues included in Chapters 5 through 22 were identified
7 through a review of scoping comments and subsequent comments received from
8 agencies and the public during preparation of this EIS, as described in Chapter 3,
9 Description of Alternatives. The resources and issues are described and analyzed
10 in the following chapters of this EIS.

- 11 • Chapter 5 – Surface Water Resources and Water Supplies
- 12 • Chapter 6 – Surface Water Quality
- 13 • Chapter 7 – Groundwater Resources and Groundwater Quality
- 14 • Chapter 8 – Energy
- 15 • Chapter 9 – Fish and Aquatic Resources
- 16 • Chapter 10 – Terrestrial Biological Resources
- 17 • Chapter 11 – Geology and Soils Resources
- 18 • Chapter 12 – Agricultural Resources
- 19 • Chapter 13 – Land Use
- 20 • Chapter 14 – Visual Resources
- 21 • Chapter 15 – Recreation Resources
- 22 • Chapter 16 – Air Quality and Greenhouse Gas Emissions
- 23 • Chapter 17 – Cultural Resources
- 24 • Chapter 18 – Public Health
- 25 • Chapter 19 – Socioeconomics
- 26 • Chapter 20 – Indian Trust Assets
- 27 • Chapter 21 – Environmental Justice
- 28 • Chapter 22 – Other National Environmental Policy Act (NEPA)
29 Considerations
- 30 • Chapter 23 – Consultation and Coordination
- 31 • Chapter 24 – Distribution of Draft EIS
- 32 • Chapter 25 – List of Preparers

1 As described above, this EIS only addresses long-term operational impacts. It is
2 assumed that the coordinated long-term operation of the CVP and SWP would not
3 result in substantial impacts to transportation, noise, hazards and hazardous
4 materials, infrastructure related to public services and utilities, and
5 paleontological resources because there would not be ongoing construction
6 activities and the operation and maintenance activities would be similar to
7 conditions under the No Action Alternative or the Second Basis of Comparison.

8 Scoping comments were received related to potential impacts to transportation on
9 highways and airports due to dust generated from noncultivated agricultural lands.
10 The potential for changes in dust generation is addressed in Chapter 16, Air
11 Quality and Greenhouse Gas Emissions; based upon the impact assessment, it
12 does not appear that the amount of noncultivated land would change substantially
13 between the alternatives and result in substantial change in dust generation.

14 It is recognized that the ability to fund some public services and utilities could be
15 affected through implementation of the alternatives evaluated in this EIS. These
16 potential changes related to water supply costs are addressed in Chapter 19,
17 Socioeconomics.

18 Chapter 23 includes a discussion of comments received during scoping and
19 meetings that were held throughout preparation of the EIS with stakeholders.
20 Chapter 24 includes a list of recipients of this Draft EIS. Chapter 25 includes a
21 list of preparers of this Draft EIS.

22 **4.3 Methodology for the Environmental Analysis**

23 This EIS assesses the potential impacts of changes that could result on the
24 resources identified above from implementation of each of the alternatives as
25 compared to the No Action Alternative and the Second Basis of Comparison. The
26 impact analysis includes an evaluation of potential direct, indirect, and cumulative
27 effects by resource.

28 **4.3.1 Geographic Range of Analysis**

29 The project area that could be affected varies by resource. As described in
30 Chapter 1, Introduction, the project area includes most of the CVP facilities and
31 CVP service areas, and all of the SWP facilities and the SWP service areas. For
32 the analysis purposes, the project area was divided into five regions, as shown in
33 Figure 4.1 at the end of this chapter. The geographic extent for each resource is
34 described by applicable regions in Chapters 5 through 21. The geographic range
35 of the project area encompasses 35 counties. The locations of CVP and SWP
36 water supply facilities, locations of CVP and SWP water users, and areas
37 potentially affected by the long-term coordinated operation of the CVP and SWP,
38 are summarized in Table 4.1.

1 **Table 4.1 Geographic Range of the EIS Analysis**

Region	County	Reasons for Inclusion of County in Project Area
Trinity River	Trinity	CVP Facilities: Trinity Lake, and Lewiston and Whiskeytown reservoirs Trinity River downstream of Lewiston Dam
	Humboldt	Trinity River to confluence of lower Klamath River Lower Klamath River from Trinity County border to Del Norte County border
	Del Norte	Lower Klamath River from Humboldt County border to Pacific Ocean
Central Valley	Shasta	CVP Facilities: Shasta Lake and Keswick Reservoir Sacramento River downstream of Keswick Dam to Tehama County border
		CVP Water Users: Anderson-Cottonwood Irrigation District Bella Vista Water District Centerville Community Services District City of Redding City of Shasta Lake Clear Creek Community Services District Mountain Gate Community Services District Redding Rancheria Tribe Shasta Community Services District Shasta County Service Area No. 25 Shasta County Water Agency U.S. Forest Service Multiple Contracts with Individuals and Businesses
	Plumas	SWP Facilities: Antelope Lake, Lake Davis, and Frenchman Lake
		SWP Water Users: Plumas County Flood Control and Water Conservation District
	Tehama	CVP Facilities: Portion of the Tehama Colusa Canal and Corning Canal Sacramento River within Tehama County
		CVP Water Users: Corning Water District Kirkwood Water District Thomes Creek Water District Proberta Water District Lake California Property Owners Association Multiple Contracts with Individuals and Businesses

Region	County	Reasons for Inclusion of County in Project Area
Central Valley (continued)	Glenn	CVP Facilities: Portion of the Tehama Colusa Canal Sacramento River within Glenn County
		CVP Water Users: 4-E Water District Elk Creek Community Services District Glenn-Colusa Irrigation District Glide Water District Kanawha Water District Orland-Artois Water District Provident Irrigation District Stony Creek Water District U.S. Forest Service Portion of Sacramento National Wildlife Refuge
	Colusa	CVP Facilities: Portion of the Tehama Colusa Canal Sacramento River within Colusa County
		CVP Water Users: 4-M Water District Cachil Dehe Band of Wintu Indians of the Colusa Indian Community Carter Mutual Water Company Colusa County Water District Colusa Drain Mutual Water Company Cortina Water District County of Colusa County of Colusa (Stonyford) Davis Water District Glenn Valley Water District Holthouse Water District La Grande Water District Maxwell Irrigation District Myers-Marsh Mutual Water Company Princeton-Codora-Glenn Irrigation District Reclamation District No. 1004 Reclamation District No. 108 Roberts Ditch Irrigation Company Sartain Mutual Water Company Westside Water District Colusa National Wildlife Refuge Delevan National Wildlife Refuge Portion of Sacramento National Wildlife Refuge Multiple Contracts with Individuals and Businesses
	Butte	SWP Facilities: Lake Oroville and Thermalito Reservoir Sacramento River within Butte County
		CVP Water User: Gray Lodge Wildlife Area SWP Water User: Butte County Water and Resources Conservation District

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Region	County	Reasons for Inclusion of County in Project Area
Central Valley (continued)	Sutter	Sacramento River within Sutter County
		CVP Water Users: Feather Water District Meridian Farms Water Company Natomas Basin Conservancy Pleasant Grove Verona Mutual Water Company Sutter Mutual Water Company Tisdale Irrigation and Drainage Company Sutter National Wildlife Refuge
		SWP Water Users: City of Yuba City
	Yuba	Sacramento River within Yuba County
		Water Supplies from Yuba County Water Agency are available to CVP and SWP
	Nevada	Water Supplies from Nevada County flow in the Bear River into CVP facilities on the American River
	Placer	CVP Water Facilities: Portion of Folsom Lake
		CVP Water Users: Placer County Water Agency City of Roseville San Juan Water District
	El Dorado	CVP Water Facilities: Portion of Folsom Lake
		CVP Water Users: El Dorado Irrigation District El Dorado County Water Agency
	Sacramento	CVP Water Facilities: Portion of Folsom Lake, Lake Natoma, and Folsom South Canal American River downstream of Nimbus Dam to confluence with Sacramento River Sacramento River and Delta within Sacramento County
		CVP Water Users: City of Folsom City of Sacramento Natomas Central Mutual Water Company Reclamation District No. 1000 Regional Water Authority Sacramento County Sacramento County Water Agency Sacramento Municipal Utility District Sacramento Suburban Water District San Juan Water District Natomas Basin Conservancy

Region	County	Reasons for Inclusion of County in Project Area
Central Valley Valley (continued)	Yolo	CVP Facilities: Portion of the Tehama Colusa Canal Sacramento River and Delta within Yolo County Yolo Bypass
		CVP Water Users: City of West Sacramento Conaway Preservation Group Dunnigan Water District Eastside Mutual Water Company Pelger Mutual Water Company Reclamation District No. 900 Multiple Contracts with Individuals and Businesses
	Solano (included in San Francisco Bay Area Region in some chapters)	SWP Facilities: Portion of the North Bay Aqueduct Sacramento River and Delta within Solano County Yolo Bypass
		SWP Water Users: Solano County Water Agency
	Stanislaus	CVP Facilities: New Melones Reservoir and portion of the Delta Mendota Canal Stanislaus River downstream of New Melones Dam to confluence with San Joaquin River San Joaquin River within Stanislaus County
		SWP Facilities: Portion of the California Aqueduct
		CVP Water Users: Del Puerto Water District Oakdale Irrigation District Patterson Irrigation District West Stanislaus Irrigation District Portion of San Luis National Wildlife Refuge
		SWP Water Users: Oak Flat Water District
	Merced	CVP Facilities: San Luis and O'Neill reservoirs, portions of Delta-Mendota Canal and San Luis Canal San Joaquin River within Merced County
		SWP Facilities: San Luis and O'Neill reservoirs and portion of California Aqueduct

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Region	County	Reasons for Inclusion of County in Project Area
Central Valley (continued)	Merced (continued)	CVP Water Users: Centinella Water District Central California Irrigation District City of Dos Palos Del Puerto Water District Eagle Field Water District Grasslands Water District Laguna Water District Oro Loma Water District San Luis Canal Company San Luis Water District Turner Island Water District U.S. Department of Veterans Affairs, San Joaquin Valley National Cemetery Widren Water District Merced National Wildlife Refuge Portion of San Luis National Wildlife Refuge Kesterson National Wildlife Refuge Los Banos and Volta Wildlife Areas, Grasslands Resources Conservation District
	Madera	CVP Facilities: Madera Canal
	San Joaquin	San Joaquin River and Delta within San Joaquin County
		CVP Water Users: Banta-Carbona Irrigation District Byron-Bethany Irrigation District Central San Joaquin Water Conservation District City of Tracy Del Puerto Water District South San Joaquin Irrigation District Stockton-East Water District The West Side Irrigation District West Stanislaus Irrigation District
Fresno	CVP Facilities: Portions of Delta-Mendota Canal and San Luis Canal, Friant Dam and Millerton Lake San Joaquin River within Fresno County	

Region	County	Reasons for Inclusion of County in Project Area
Central Valley (continued)	Fresno (continued)	CVP Water Users: Broadview Water District California Department of Fish and Wildlife Central California Irrigation District City of Avenal City of Coalinga City of Huron Coelho Family Trust Columbia Canal Company County of Fresno Eagle Field Water District Firebaugh Canal Company Fresno Slough Water District Hills Valley Irrigation District James Irrigation District Laguna Irrigation District Mercy Springs Water District Meyers Farm Pacheco Water District Panoche Water District Pleasant Valley Water District Reclamation District No. 1606 San Luis Water District Tranquility Irrigation District Tranquility Public Utility District Tri-Valley Water District Westlands Water District Widren Water District
		SWP Water Users: Dudley Ridge Water District
	Kings	SWP Facilities: Portion of the California Aqueduct
		CVP Water Users: Angiola Water District Atwell Island City of Avenal
		SWP Water Users: County of Kings Empire West Side Irrigation District Tulare Lake Basin Water Storage District
	Tulare	CVP Water Users: County of Tulare Tranquility Public Utility District Pixley National Wildlife Refuge
	Kern	CVP Facilities: Cross Valley Canal and portion of the California Aqueduct
		SWP Facilities: Portion of the California Aqueduct

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Region	County	Reasons for Inclusion of County in Project Area
Central Valley (continued)	Kern (continued)	CVP Water Users: Kern National Wildlife Refuge Kern Tulare Water District Pixley Irrigation District
		SWP Water Users: Kern County Water Agency
San Francisco Bay Area	Alameda	CVP Facilities: Jones Pumping Plant and northern reaches of Delta-Mendota Canal
		SWP Facilities: Banks Pumping Plant, Bethany Reservoir, Lake Del Valle, and portions of the South Bay Aqueduct and California Aqueduct
		CVP Water Users: East Bay Municipal Utility District
		SWP Water Users: Alameda County Water District Zone 7 Water Agency
	Contra Costa	CVP Facilities: Contra Costa Pumping Plant, Contra Loma Reservoir, and Contra Costa Canal Delta within Contra Costa County
		SWP Facilities: Clifton Court Forebay
		CVP Water Users: Byron-Bethany Irrigation District Contra Costa Water District
	Santa Clara	CVP Facilities: Santa Clara Conduit
		SWP Facilities: Portion of the South Bay Aqueduct
		CVP and SWP Water Users: Santa Clara Valley Water District
	San Benito	CVP Water Facilities: Pacheco Conduit, San Justo Reservoir, and Hollister Conduit
		CVP Water Users: San Benito County Water District
	Napa	SWP Facilities: Portion of the North Bay Aqueduct
		SWP Water Users: County of Napa
Central Coast	San Luis Obispo	SWP Facilities: Portion of Coastal Branch Aqueduct
		SWP Water Users: Central Coast Water Authority San Luis Obispo County Flood Control and Water Conservation District

Region	County	Reasons for Inclusion of County in Project Area
Central Coast (continued)	Santa Barbara	SWP Facilities: Portion of Coastal Branch Aqueduct
		SWP Water Users: Central Coast Water Authority Santa Barbara County Flood Control and Water Conservation District
Southern California	Ventura	SWP Water Users: Ventura County Watershed Protection District
	Los Angeles	SWP Facilities: Portion of California Aqueduct
		SWP Water Users: Antelope Valley-East Kern Water Agency Castaic Lake Water Agency Littlerock Creek Irrigation District Metropolitan Water District of Southern California Palmdale Water District San Gabriel Valley Municipal Water District
	Orange	SWP Water Users: Metropolitan Water District of Southern California
	San Diego	SWP Water Users: Metropolitan Water District of Southern California
	Riverside	SWP Facilities: Portion of California Aqueduct
		SWP Water Users: Desert Water Agency Coachella Valley Water District Metropolitan Water District of Southern California San Gorgonio Pass Water Agency
	San Bernardino	SWP Facilities: Portion of California Aqueduct
		SWP Water Users: Crestline Lake Arrowhead Water Agency Metropolitan Water District of Southern California Mojave Water Agency San Bernardino Valley Municipal Water District

1 **4.3.2 Regulatory Environment and Compliance Requirements**
2 Potential actions that could be implemented under the alternatives evaluated in
3 this EIS that are located on Federal or state lands, or actions that are implemented,
4 funded, or approved by Federal and state agencies, need to be compliant with
5 appropriate Federal and state agency policies and regulations. Federal and state
6 policies and regulations that could be relevant to implementation of the
7 alternatives evaluated in this EIS are summarized in Appendix 4A.

1 **4.3.3 Affected Environment**

2 The Affected Environment portions of Chapters 5 through 21 provide an adequate
3 level of detail for the quantitative and qualitative impact analyses presented in this
4 EIS. Changes in CVP and SWP operations could result in changes to:

- 5 • Water elevations in reservoirs that store CVP and SWP water supplies,
6 including reservoirs owned by regional and local water agencies that use CVP
7 and/or SWP water, and associated use of the reservoir or surrounding areas to
8 support biological resources, visual resources, recreation, and cultural
9 resources
- 10 • Flow rates and water quality in rivers downstream of CVP and SWP
11 reservoirs, and associated use of the rivers to support biological resources,
12 protection of soils from erosion along the rivers, and recreation
- 13 • Flows and water quality in the Delta, including Delta outflow and reverse
14 flows, and associated use of the rivers to support beneficial uses including
15 biological resources and food and water supplies for human consumption
- 16 • CVP and SWP deliveries, and associated changes in groundwater use, CVP
17 and SWP energy use and generation, and land use which could affect air
18 quality, human health, soil erosion, and cultural resources.

19 References are provided for each chapter and not compiled for the entire EIS.

20 **4.3.4 Impact Analysis**

21 In accordance with the Council on Environmental Quality regulations, an EIS
22 must evaluate the effects of implementation of the alternatives on the
23 environment, any adverse environmental effects which cannot be avoided, the
24 relationship between short-term uses of the human environment and long-term
25 productivity, and any irreversible or irretrievable commitments of resources if the
26 alternatives are implemented. The impact analyses sections address direct,
27 indirect, and cumulative effects of the alternatives in each resource chapter
28 (Chapters 5 through 21) and are organized to describe the approach of the impact
29 assessment and present the results from the impact assessment.

- 30 • Potential Mechanisms for Change and Analytical Tools
- 31 • Conditions in Year 2030 without Implementation of Alternatives 1 through 5
- 32 • Evaluation of Alternatives
 - 33 – Comparison of the No Action Alternative to the Second Basis of
 - 34 Comparison
 - 35 – Comparison of Alternatives 1 through 5 to the No Action Alternative
 - 36 – Comparison of Alternatives 1 through 5 to the Second Basis of
 - 37 Comparison
 - 38 – Summary of Impact Analysis
 - 39 – Potential Mitigation Measures
 - 40 – Cumulative Effects Analysis

1 An EIS must identify relevant, reasonable mitigation measures that are not
2 already included in the proposed action or alternatives to the proposed action that
3 could avoid, minimize, rectify, reduce, eliminate, or compensate for the project's
4 adverse environmental effects (40 Code of Federal Regulations [CFR] 1502.14,
5 1502.16, 1508.8). Mitigation measures are presented for each resource to avoid,
6 minimize, rectify, reduce, eliminate, or compensate for adverse environmental
7 effects of Alternatives 1 through 5 as compared to the No Action Alternative.
8 Mitigation measures were not included to address adverse impacts under the
9 alternatives as compared to the Second Basis of Comparison because this analysis
10 was included in this EIS for information purposes only.

11 The cumulative effects of implementation of reasonably foreseeable projects and
12 the alternatives as compared to conditions under the No Action Alternative and
13 Second Basis of Comparison are discussed for each resource in Chapters 5
14 through 21. Cumulative effects are impacts on the environment that result from
15 the incremental impacts of an alternative when added to other past, present, and
16 reasonably foreseeable future actions of Federal, state, or local agencies or
17 individual entities or persons (40 CFR 1508.7). Such impacts can result from
18 individually minor, but collectively significant, actions taking place over time
19 (40 CFR 1508.8).

20 References are provided for each chapter and not compiled for the entire EIS.

21 **4.3.5 Other NEPA Considerations**

22 The irreversible and ir retrievable commitments of resources, and the relationship
23 between short-term uses of the environment and long-term productivity are
24 discussed in Chapter 22, Other NEPA Considerations.

25 **4.3.6 Consultation and Coordination**

26 Public outreach and agency involvement efforts related to preparation of the Draft
27 EIS are presented in Chapter 23, Consultation and Coordination. A listing of the
28 agencies, other entities, and interest groups that received a copy of this Draft EIS
29 is presented in Chapter 24, Distribution of Draft EIS. A list of preparers of the
30 Draft EIS is presented in Chapter 25.



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2 **Figure 4.1 Study Area**