

Chapter 17

1 Cultural Resources

2 17.1 Introduction

3 Cultural resources are defined as prehistoric and historic archaeological sites,
4 architectural features (e.g., buildings, bridges, flumes, trestles, railroads), and
5 traditional cultural properties. However, the focus of this chapter is more on
6 cultural resources than historic properties.

7 This chapter describes the known existing cultural resources conditions in the
8 study area and the potential changes that could occur as a result of implementing
9 the alternatives evaluated in this Environmental Impact Statement (EIS).

10 Implementation of the alternatives could affect cultural and historic resources
11 through potential changes in the operation of the Central Valley Project (CVP)
12 and State Water Project (SWP). Changes in CVP and SWP operations could
13 increase the frequency and duration of low-elevation reservoir conditions that
14 would increase the time of exposure of inundated cultural resources within
15 reservoirs that store CVP and SWP water. Changes in CVP and SWP operations
16 also could reduce water supply availability to agricultural lands, and those lands
17 could be subject to land use changes that could increase disturbances of cultural
18 resources if present.

19 17.2 Regulatory Environment and Compliance 20 Requirements

21 Potential actions that could be implemented under the alternatives evaluated in
22 this EIS could affect reservoirs, streams, and lands served by CVP and SWP
23 water supplies located on lands with cultural resources. Actions implemented,
24 funded, or approved by Federal and state agencies would need to be compliant
25 with appropriate Federal and state agency policies and regulations, as summarized
26 in Chapter 4, Approach to Environmental Analyses.

27 17.3 Affected Environment

28 This section describes the types of cultural resources that could be potentially
29 affected by the implementation of the alternatives considered in this EIS.
30 Changes in areas with cultural resources due to changes in CVP and SWP
31 operations may occur at reservoirs that store CVP and SWP water and on lands
32 that use CVP and SWP water supplies in the Trinity River, Central Valley, San
33 Francisco Bay Area, and Central Coast and Southern California regions.

1 **17.3.1 Prehistoric Context**

2 **17.3.1.1 Introduction to the Prehistoric Context**

3 The study area has a long and complex cultural history with distinct regional
4 patterns that extend back more than 11,000 years (Reclamation 1997). The first
5 generally agreed upon evidence for the presence of prehistoric peoples in the
6 study area is represented by the distinctive fluted spear points called Clovis
7 points. These artifacts have been found on the margins of extinct lakes in the San
8 Joaquin Valley. The Clovis points are found on the same surface with the bones
9 of animals that are now extinct, such as mammoths, sloths, and camels. The
10 subsequent period from about 10000 to 8000 BP (before present) was
11 characterized by a small number of sites with stemmed spear points instead of
12 fluted spear points. Approximately 8,000 years ago, many California cultures
13 shifted the main focus of their subsistence strategies from hunting to seed
14 gathering as evidenced by the increase in food-grinding implements found in
15 archaeological sites dating to this period. In the last 3,000 years, the
16 archaeological record becomes more complex as specialized adaptations to locally
17 available resources were developed and populations expanded. Many sites dated
18 to this time period contain mortars and pestles or are associated with bedrock
19 mortars, implying that the occupants exploited acorns intensively. The range of
20 subsistence resources that were used increased, exchange systems expanded, and
21 social stratification and craft specialization occurred as indicated by well-made
22 artifacts such as charm stones and beads, which were often found with burials.

23 **17.3.1.2 Prehistory of the Trinity River Region**

24 The Trinity River Region includes portions of Trinity County including Trinity
25 Lake, Lewiston Reservoir, and Trinity River from Lewiston Reservoir to the
26 Humboldt County boundary (near the eastern boundary of Hoopa Valley Indian
27 Reservation); portions of Humboldt County including the Hoopa Valley Indian
28 Reservation, Trinity River from the Humboldt County border to the Del Norte
29 County border (near the confluence of the Trinity and Klamath rivers); and Del
30 Norte County including the Lower Klamath River from the confluence with the
31 Trinity River to the Pacific Ocean.

32 The area surrounding the present Trinity Lake and the Trinity River to its
33 confluence with the Klamath River and along the Klamath River to the Pacific
34 Ocean was inhabited by the Wintu, Chimariko, Yurok, and Hupa Indians at the
35 time of Euroamerican contact.

36 **17.3.1.3 Prehistory of the Central Valley Region**

37 The Central Valley Region extends from above Shasta Lake to the Tehachapi
38 Mountains and includes the Sacramento Valley, San Joaquin Valley, and the
39 Delta and Suisun Marsh areas. The Sacramento Valley and San Joaquin Valley
40 are divided into Eastern and Western subregions.

1 **17.3.1.3.1 Prehistory of the Sacramento Valley**

2 The western Sierra Nevada foothills appear to have been first used by Great Basin
3 people around 8000 BP (Reclamation 1997). By approximately 4000 BP, people
4 possibly from the Great Basin were seasonally hunting and gathering in the Sierra
5 Nevada and the Sacramento Valley.

6 In the northern western portion of Sacramento Valley, between approximately
7 12,000 and 150 years ago (12000 to 100 BP), the prehistoric societies of northern
8 California underwent a series of slow but significant changes in subsistence and
9 economic orientation, population densities and distribution, and social
10 organization. These changes are thought to reflect migrations of various peoples
11 into the area and displacement of earlier populations (Jensen and Reed 1980;
12 Farber 1985; Reclamation 1997). Early archaeological investigations within
13 Nomlaki and Wintu ethnographic territory, particularly the present Redding area
14 and adjacent tracts of the southern Klamath Mountains, appear to indicate that
15 human occupation of this area began approximately 1050 to 950 BP.

16 Little is known of human occupation on the floor of the Sacramento Valley prior
17 to 4500 BP (Reclamation 1997). Because of alluvial and colluvial deposition
18 over the past 10,000 years, ancient cultural deposits have been deeply buried in
19 many areas. Initially, humans appeared to adapt to lakes, marshes, and grasslands
20 environments until approximately 8000 to 7000 BP (Placer County 2007). The
21 earliest evidence of widespread villages and permanent occupation of the lower
22 Sacramento Valley, Delta, and Suisun Marsh areas comes from several sites
23 assigned to the Windmill Pattern (previously, “Early Horizon”), dated circa
24 4500 to 2500 BP (Ragir 1972; Reclamation 1997; Reclamation et al. 2010).

25 From circa 2500 to 1500 BP in the Central Valley area, villages were
26 characterized by deep midden deposits, suggesting intensified occupation and a
27 broadened subsistence base (Reclamation 1997, 2005a; Reclamation et al. 2010;
28 Beardsley 1948; Heizer and Fenenga 1939; Moratto 1984).

29 During the late prehistoric period from 1500 to 100 BP, development may have
30 been initiated due to the southward expansion of Wintuan populations into the
31 Sacramento Valley (Moratto 1984; Reclamation 1997; Reclamation et al. 2010).
32 The period is characterized by intensified hunting, fishing, and gathering
33 subsistence with larger communities, highly developed trade networks, elaborate
34 ceremonial and mortuary practices, and social stratification.

35 **17.3.1.3.2 Prehistory of the San Joaquin Valley**

36 Evidence of prehistoric occupation of the central and southern Sierra Nevada
37 foothills goes back to 9,500 years ago. The vast majority of investigated sites,
38 however, are less than 500 years old, probably representing a relatively recent
39 proliferation of settlements by Yokut Indians (Moratto 1984; Reclamation 1997).
40 The chronological sequence developed in the south-central Sierra Nevada as a
41 result of the Buchanan Reservoir project in present Madera County is still used as
42 a general framework (Reclamation 1997). Similar findings were identified in

1 major settlement sites along the San Joaquin River and in the present New
2 Melones Reservoir area (Reclamation 2010; Reclamation and DWR 2011).

3 During the early Holocene period (10,000 to 12,000 years ago), peoples probably
4 inhabited or passed through the San Joaquin Valley; however, few indications of
5 this period have been discovered, probably due to burial beneath accumulated
6 river sediment (Reclamation 1997, 2012). Examples of early Holocene cultural
7 remains are known primarily from the Tulare Basin in the southern San Joaquin
8 Valley. Evidence along the southern shoreline of the ancient Tulare Lake
9 indicates that human presence may have occurred from 11000 BP (Reclamation
10 and State Parks 2013).

11 From approximately 1650 to 950 BP, there is evidence that the people of the
12 eastern San Joaquin Valley may have interacted with people in the Delta area
13 (Reclamation 1997, 2012).

14 From approximately 450 to 100 BP, the people of the eastern San Joaquin Valley
15 may have interacted with people in the Central Coast and Southern California
16 areas. Material found in Pacheco to Panoche strata indicates a trade relationship
17 with people of the Delta, Central Coast, and Southern California regions (Moratto
18 1984; Reclamation 1997, 2012).

19 **17.3.1.4 Prehistory of the San Francisco Bay Area Region**

20 The San Francisco Bay Area Region only includes portions of the Bay Area that
21 could be affected through implementation of the alternatives considered in this
22 EIS, which includes Contra Costa, Alameda, Santa Clara, and San Benito
23 counties. The prehistory context is different throughout the San Francisco Bay
24 Area Region. Human occupation in the northern valley regions of present San
25 Benito County occurred as described above for the western San Joaquin Valley
26 (San Benito County 2010).

27 Human occupation in the coastal regions of present Contra Costa and Alameda
28 counties occurred as described above for the southern portion of the Sacramento
29 Valley (Reclamation 1997; DWR 2008; Zone 7 2006). From 5000 to 2500 BP,
30 dense settlements extended from the coastal marshes to interior grasslands and
31 woodlands (Zone 7 2006). From about 2500 to 950 BP, coastal communities
32 relied upon shellfish, and major shellmounds were created near these
33 communities, including near the present Alameda County shorelines and some
34 interior valleys.

35 Settlement of the interior valleys of the present Contra Costa, Alameda, and Santa
36 Clara counties occurred during the past 12,000 years. From 6000 to 1700 BP,
37 settlements occurred, as there was less emphasis on nomadic hunting for large
38 animals and increased emphasis on the use of plant materials and hunting, fishing,
39 and shellfish collection (Santa Clara County 2012; CCWD et al. 2009). The
40 communities established economies and traded between the communities.

1 **17.3.1.5 Prehistory of the Central Coast Region**

2 The prehistory of the Central Coast Region for this EIS (present day San Luis
3 Obispo and Santa Barbara counties) is poorly known but may have begun around
4 11000 BP and probably represents mobile hunter-gatherers (Reclamation 1997;
5 San Luis Obispo County 2010; Santa Barbara 2010). Fishing, intensive shellfish
6 collecting, and hunting began around 9000 BP. Use of milling stones and
7 establishment of communities occurred after about 8500 BP. After about
8 5000 BP, there was greater reliance on hunting of land and sea mammals,
9 gathering of shellfish, and use of mortars and pestles. Subsequently, larger
10 settlements occurred for ethnographically known peoples, including the Chumash.

11 **17.3.1.6 Prehistory of the Southern California Region**

12 The Southern California Region includes the present Ventura, Los Angeles,
13 Orange, San Diego, Riverside, and San Bernardino counties, which have
14 substantially different prehistory characteristics.

15 In the coastal areas of the Southern California Region (present Ventura, Los
16 Angeles, Orange, and San Diego counties), early habitation extends over
17 12,000 years ago (Ventura County 2005; Los Angeles 2005; San Diego County
18 2011b). Between 12000 and 7500 BP, the inhabitants were hunter-gatherer
19 populations that used land and marine resources. The population along the
20 northern coast of Southern California began expanding between 9000 and
21 8500 BP. Permanent coastal settlements expanded as plants, shellfish, and marine
22 mammals became a large part of the subsistence (Glassow et al. 2007; Los
23 Angeles 2005). From 5000 to 450 BP, the use of plant materials and exploitation
24 of fish and sea mammals increased sedentism and socioeconomic interaction
25 (Glassow 1999; Los Angeles 2005; San Diego County 2011b).

26 The interior area within the Southern California Region considered in this EIS
27 includes portions of Riverside and San Bernardino counties that use SWP water
28 supplies, including the Mojave Desert and the Peninsular Ranges.

29 Clovis (circa 12000 to 10000 BP) is the only cultural complex dating from the
30 Pleistocene that can be consistently identified in the Mojave Desert (Sutton et al.
31 2007). The Clovis culture characteristics appear to be associated with Paleo-
32 Indian groups as big game hunters. More recently, there have been indications
33 that the people had greater cultural and economic diversity than previously
34 recognized (CDFG 2009). Paleo-Indian groups were likely small, highly mobile
35 populations living in small, temporary camps near permanent water sources
36 (Sutton et al. 2007).

37 From 10000 and 8000 BP, communities were organized around relatively small
38 social units (Sutton et al. 2007; Riverside County 2000). From 7000 to 4000 BP,
39 hunting continued while foraging subsistence transformed during this period to
40 more collection of plant and animal materials within adjacent ecological zones
41 (CDFG 2009; Riverside County 2000; Sutton et al. 2007). Between 4000 and
42 1750 BP, permanent seasonally occupied settlements occurred in the lower valley
43 with the use of oak woodlands and mesquite groves (Riverside County 2000;
44 Sutton et al. 2007).

1 From 1750 to 850 BP, communities increased and trade between communities
2 expanded (CDFG 2009; Gardner 2002, 2006; Riverside County 2000;
3 Sutton et al. 2007; Sutton 1988, 1996; Warren and Crabtree 1986). During this
4 period, the lower Coloradan culture became more prevalent along the shoreline of
5 the Lake Cahuilla area (site of the present Salton Sea and Coachella Valley Water
6 District) (Riverside County 2000). The lower Coloradans relied upon shellfish,
7 fish, aquatic birds, marsh and riparian vegetation, and mammals. The culture may
8 have been influenced by the Anasazi settlements of present Southern Nevada,
9 including cultivation of corns, beans, and squash. The Anasazi people also
10 occupied portions of present San Bernardino County where turquoise was mined.
11 Extensive trading occurred between the people in the inland areas and the people
12 along the coast.

13 After about 850 BP, populations appeared to decline, and several cultural
14 complexes emerged (Sutton et al. 2007). Late Prehistoric occupation sites were
15 based on hunting and gathering, especially of plant foods and small game
16 (Riverside County 2000). Villages in Antelope Valley began to disappear in the
17 later prehistoric times, probably due to the disappearance of lakes that were the
18 headwaters of the Mojave River or changes in trade route locations (DWR 2009).
19 Lake Cahuilla declined around 450 BP and the large populations dispersed to the
20 Colorado River, western Peninsular Ranges in present western Riverside County,
21 and the Pacific Ocean coast (Riverside County 2000).

22 **17.3.2 Ethnographic Context**

23 **17.3.2.1 Introduction to Ethnographic Context**

24 This section provides brief ethnographic sketches for each native cultural group
25 whose traditional territories are within the study area. Each ethnographic sketch
26 presents the territorial limits of each respective cultural group and then focuses
27 mainly on those aspects of culture that are potentially represented in the
28 archaeological record.

29 The study area encompasses lands occupied by more than 40 distinct Native
30 American cultural groups. Although most California tribes shared similar
31 elements of social organization and material culture, linguistic affiliation and
32 territorial boundaries primarily distinguish them from each other. Before
33 European settlement of California, an estimated 310,000 native Californians
34 spoke dialects of as many as 80 mutually unintelligible languages representing
35 six major North American language stocks (Cook 1978; Moratto 1984;
36 Reclamation 1997; Shipley 1978).

37 **17.3.2.2 Ethnography of the Trinity River Region**

38 The Trinity River Region includes portions of Shasta, Trinity, Siskiyou,
39 Humboldt, and Del Norte counties. This area is bounded by the Sacramento
40 River on the east, the Pacific Ocean on the west, and the middle and upper
41 Klamath Basin on the north. The ethnography of the Yurok, Hupa, Wintu, and
42 Chimariko is described below.

1 **17.3.2.2.1 Yurok**

2 The Yurok inhabited California's northwestern coastline from Little River to
3 Damnation Creek; along the Klamath River from the confluence with the Pacific
4 Ocean up past the Klamath-Trinity confluence to Slate Creek; and approximately
5 6 miles along the Trinity River upstream of the confluence with the Klamath
6 River (Pilling 1978; USFWS et al. 1999). The Yurok life, communities, society,
7 and ceremonies are deeply connected with the Klamath River (DOI and CDFG
8 2012). Yurok culture and traditional stories describe that the Klamath River was
9 created to facilitate the interaction with two neighboring people, the Hupa and the
10 Karuk, and with the salmon that lived in the Klamath River. Both the Hupa and
11 Karuk culture and traditional stories also describe this close interaction of the
12 peoples, salmon, and Klamath River.

13 Yurok are recognized for their highly stylized art forms and their skills in making
14 redwood canoes, weaving fine baskets, hunting, and especially riverine salmon
15 fishing. The ancient traditions are continued through contemporary times
16 (USFWS et al. 1999). The redwood canoes for ocean conditions can be 30 to
17 40 feet in length, designed to haul large amounts of fish and seal carcasses, and
18 paddled by 5 to 20 paddlers (DOI and CDFG 2012). The canoes are used to
19 gather food and materials, transport people and materials, and for ceremonial
20 aspects of the Yurok culture. The Jump and Deerskin ceremonies are held in late
21 fall to give thanks for abundant food supplies. The Deerskin Ceremony includes a
22 Boat Ceremony in which the participants travel down the Klamath River to thank
23 the river for continuing to flow and provide resources.

24 **17.3.2.2.2 Hupa**

25 The Hupa inhabited the area surrounding the lower reaches of the Trinity River
26 from approximately Salyer to approximately 6 miles upstream from the
27 confluence with the Klamath River (Wallace 1978a; USFWS et al. 1999). Hupa
28 life is defined by extended families affiliated with villages.

29 The Hupa believe that the Klamath and Trinity rivers were created to provide
30 interaction with other peoples (Yurok and Karuk) and with the salmon (DOI and
31 CDFG 2012). Many of the Hupa ceremonies highlight their relationship with the
32 rivers, including world renewal ceremonies and ceremonies for bountiful harvests.
33 The world renewal ceremonies include the White Deerskin and Jump ceremonies
34 to honor the earth and the creator for providing food and other resources. The
35 ceremonies for bountiful harvest of fish and acorns include the First Salmon
36 ceremony and the Acorn Feast.

37 **17.3.2.2.3 Wintu**

38 When the Europeans and Americans first explored California, most of the western
39 side of the Sacramento Valley north of about Suisun Bay was inhabited by
40 Wintun-speaking people (USFWS et al. 1999). Early in the anthropological study
41 of the region, a linguistic and cultural distinction was recognized between the
42 Wintun-speaking people in the southwestern Central Valley (the Patwin) and the

1 people occupying the northwestern Central Valley and Trinity River Valley
2 (LaPena 1978; USFWS et al. 1999).

3 **17.3.2.2.4 Chimariko**

4 The Chimariko lived in a 20-mile-long reach of the Trinity River from
5 approximately Big Bar to the confluence with the South Fork (Silver 1978a;
6 USFWS et al. 1999). Although the Chimariko language is now extinct, early
7 ethnographers recorded some words, and the language is thought to be of Hokan
8 stock.

9 **17.3.2.3 Ethnography of the Central Valley Region**

10 **17.3.2.3.1 Ethnography of the Sacramento Valley**

11 *Maidu, Konkow, and Nisenan*

12 Maidu (also known as northeastern Maidu), Konkow (also known as northwestern
13 Maidu), and Nisenan (also known as southern Maidu) inhabited an area of
14 California from Lassen Peak to the Cosumnes River, and from the Sacramento
15 River to Honey Lake (Reclamation 1997; Shipley 1978). Northeastern Maidu
16 territory extended from Lassen Peak on the west to Honey Lake on the east,
17 Sierra Buttes on the south, and Eagle Lake on the north. The Konkow inhabited
18 the region from the Lower Feather River in the north, to the Sutter Buttes in the
19 south, and to the west beyond the Sacramento River. The Nisenan lived in the
20 area east of the Sacramento River and along the Middle Fork Feather River, Bear
21 River, American River, and Cosumnes River from the Sacramento River
22 almost to Lake Tahoe (Riddell 1978; Wilson and Towne 1978; Reclamation
23 1997, 2005b).

24 *Yana*

25 The Yana of north-central California inhabited an area from Lassen Peak and the
26 southern Cascade foothills on the east, Rock Creek on the south, Pit River on the
27 north, and the eastern bank of the Sacramento River on the west. The western
28 boundary is the most uncertain (J. Johnson 1978a; Reclamation 1997).

29 *Achumawi, Atsugewi, and Shasta*

30 The Achumawi and Atsugewi of northeastern California are two linguistically and
31 culturally distinct but related groups (Reclamation 1997). The Achumawi and
32 Atsugewi languages belong to the Palaihnihan family, or Hokan stock. The
33 territory of the Achumawi extended generally to Mount Lassen, west to Mount
34 Shasta, northeast to Goose Lake, and east to the Warner Range (Kroeber 1925;
35 Olmsted and Stewart 1978; Garth 1978; Reclamation 1997). Overlapping this
36 area to some extent, the Atsugewi territory ranged from Mount Lassen in the
37 southwest, the Pit River in the north, and Horse Lake to the east.

38 The Shasta peoples were originally thought to be associated with the Achumawi
39 and Atsugewi but then were considered as a separate group (Kroeber 1925;
40 Reclamation 1997; Shipley 1978). The Shasta peoples inhabited the area from
41 southern Oregon at the Rogue River, south to the present Cecilville, and the area
42 between the Marble and Salmon mountains to Mount Shasta in the west and the

1 Cascade Range in the east. In California, the core areas of settlement were in
 2 Shasta Valley, Scotts Valley, and along the Klamath River from about Scotts
 3 River to the town of Hornbrook (Silver 1978b).

4 *Plains Miwok*

5 The Plains Miwok established villages along river courses in the foothills located
 6 east of Sacramento and the Delta (Reclamation 2005b).

7 *Nomlaki*

8 Two major divisions existed among the Nomlaki: the River and Hill Nomlaki
 9 (Goldschmidt 1978; DuBois 1935; Reclamation 1997). The River Nomlaki
 10 occupied the Sacramento River Valley in present eastern Tehama County. The
 11 Hill Nomlaki occupied the eastern side of the Coast Ranges in present Tehama
 12 and Glenn counties. The Nomlaki and Wintu conducted trading between the
 13 peoples (Goldschmidt 1978; DuBois 1935; Reclamation 1997).

14 *Patwin*

15 The Patwin lived along the western side of the Sacramento Valley from the
 16 present Princeton to Benicia, including Suisun Marsh (Kroeber 1925;
 17 Reclamation 1997; Reclamation et al. 2010). Within this large area, the Patwin
 18 have traditionally been divided into River, Hill, and Southern Patwin groups.
 19 Settlements generally were located on high ground along the Sacramento River or
 20 tributary streams, or in the eastern Coast Range valleys. The ethnographically
 21 recorded villages of Aguasto and Suisun were located near San Pablo and Suisun
 22 bays (P. Johnson 1978b; Reclamation 1997; Reclamation et al. 2010).

23 **17.3.2.3.2 Ethnography of the San Joaquin Valley**

24 *Eastern Miwok*

25 The Miwok cultures in present California include the Coast Miwok, Lake Miwok,
 26 and Eastern Miwok divisions. The Eastern Miwok included five separate groups
 27 (Bay, Plains, Northern Sierra, Central Sierra, and Southern Sierra) that inhabited
 28 the area from present Walnut Creek in Contra Costa County and the Delta, along
 29 the lower Mokelumne and Cosumnes rivers and along the Sacramento River from
 30 present Rio Vista to Freeport, the foothill and mountain areas of the upper
 31 Mokelumne River and Calaveras River watersheds, the upper Stanislaus River
 32 and Tuolumne River watersheds, and the upper Merced River and Chowchilla
 33 River watersheds, respectively (Levy 1978a; Reclamation 1997; Shipley 1978).
 34 No one Miwok tribal organization encompassed all the peoples speaking
 35 Miwokan languages, nor was there a single tribal organization that encompassed
 36 an entire division.

37 *Yokuts*

38 Yokuts are a large and diverse number of people in the San Joaquin Valley and
 39 Sierra Nevada foothills of central California, including the Southern San Joaquin
 40 Valley Yokuts, Northern San Joaquin Valley Yokuts, and Foothill Yokuts
 41 (Reclamation 1997; Reclamation et al. 2011a, 2011b). The three subdivisions of
 42 the Yokuts languages belong to the Yokutsan family, or Penutian stock (Shipley
 43 1978).

1 The Southern Valley Yokuts inhabited the southern San Joaquin Valley from
2 present Fresno to the Tehachapi Mountains (Wallace 1978b). The Northern
3 Valley Yokuts inhabited the northern San Joaquin Valley from Bear Creek to the
4 San Joaquin River near present Mendota, western San Joaquin Valley near present
5 San Luis Reservoir, and eastern present Contra Costa and Alameda counties
6 (ECCCHCPA et al. 2006; Wallace 1978c; Reclamation 2012; Reclamation and
7 DWR 2011). The Foothill Yokuts inhabited the western slopes of the Sierra
8 Nevada foothills from the Fresno River to the Kern River (Spier 1978b;
9 Reclamation and State Parks 2013). Yokuts were mobile hunters and gatherers
10 with semipermanent villages and seasonal travel corridors to food sources.

11 The Yokuts probably traded with the Costanoan people from the coastal areas
12 based upon the abalone and other mussel shells found in settlement sites
13 (Reclamation 2012).

14 *Dumna and Kechayi*

15 The Dumna and Kechayi lived along the San Joaquin River in the Sierra Nevada
16 foothills near the present Millerton Lake (Reclamation and State Parks 2013).

17 **17.3.2.4 Ethnography of the San Francisco Bay Area Region**

18 Native inhabitants of the San Francisco Bay Area Region include the Miwok,
19 Cholvon Northern Valley Yokuts, and the Costanoan Indians (Reclamation 1997;
20 CCWD et al. 2009; ECCCHCPA et al. 2006; EBMUD 2009; Reclamation 2005b;
21 Santa Clara County 2012; San Benito County 2013).

22 **17.3.2.4.1 Miwok**

23 In the San Francisco Bay Area Region, the Coast Miwok people lived along lower
24 San Joaquin River and San Pablo Bay and in the interior of the present Contra
25 Costa and Alameda counties (Reclamation 1997; ECCCHCPA et al. 2006; Kelly
26 1978). The Bay Miwok villages were located in the San Ramon Valley with other
27 settlements on the western slopes of the Diablo Range. The Volvons, speakers of
28 the Bay Miwok language, settled along Marsh Creek and Kellogg Creek on the
29 northern side of the Diablo Range and near the present Los Vaqueros Reservoir
30 (CCWD et al. 2009). The Miwok people may have held lands at the peak of
31 Mount Diablo.

32 **17.3.2.4.2 Costanoan**

33 The Costanoans (also known as Ohlone) are a linguistically defined group with
34 several autonomous tribelets that speak related languages (Levy 1978b;
35 Reclamation 1997; EBMUD 2009; Zone 7 2006; Santa Clara County 2012). The
36 Costanoans inhabited coastal shorelines along San Francisco, San Pablo, and
37 Suisun Bay and along the Pacific Ocean Coast from the Golden Gate to Monterey
38 Bay and interior valleys that extended approximately 60 miles inland, including
39 areas within Santa Clara and San Benito counties (Reclamation 1997;
40 ECCCHCPA et al. 2006; San Benito County 2010).

1 **17.3.2.5 Ethnography of the Central Coast Region**

2 The Central Coast Region considered in this EIS includes the coastal areas of
3 present San Luis Obispo and Ventura counties. This area was home to the
4 Salinan, Chumash, and Tataviam people.

5 The Salinan territory extends from about the present location of Soledad
6 (Monterey County) to San Luis Obispo (Hester 1978). The Chumash are
7 considered to have been one of the most elaborate cultures in California. The
8 Chumash culture is characterized by large villages with social ranking, intensive
9 trade, craft specialization, and well-developed art styles (Grant 1978b;
10 Greenwood 1978; Kroeber 1925; Moratto 1984; Reclamation 1997; San Luis
11 Obispo County 2010; Santa Barbara 2010; Santa Barbara County 2010). The
12 Chumash inhabited the central coastal area of California from approximately
13 present San Luis Obispo to Malibu Canyon and inland to western San Joaquin
14 Valley.

15 **17.3.2.6 Ethnography of the Southern California Region**

16 The coastal portion of the Southern California Region considered in this EIS
17 includes the present Ventura, Los Angeles, Orange, and San Diego counties. The
18 interior portion of the Southern California Region includes the present western
19 and central Riverside County and western San Bernardino County.

20 **17.3.2.6.1 Prehistory of Southern California Region, Coastal Portion**

21 The Chumash and Tataviam people lived in the present Ventura County and
22 northern Los Angeles County areas. The ethnography of the Chumash people is
23 similar to that described above for the Central Coast Region. The Tataviam
24 people lived inland of the Chumash and Gabrielino on the upper reaches of the
25 Santa Clara River drainage east of Piru Creek and extending over the Sawmill
26 Mountains to the edge of the southwestern Antelope Valley (King and
27 Blackburn 1978).

28 The Gabrielino and Juaneño people lived in the present Los Angeles and Orange
29 counties areas. The Gabrielino (also known as Gabrielino Tongva or Gabrieleño)
30 occupied the Southern California coast in the vicinity around Mission San
31 Gabrielal areas. The Juaneño occupied the area around the mission (Bean and
32 Smith 1978; Los Angeles 2005; Riverside County 2000). These people traded
33 with other people in Southern California.

34 The Luiseño and Tipai-Ipai people lived in the present Orange and San Diego
35 counties areas. The Luiseño occupied most of the San Luis Rey and Santa
36 Margarita River drainages near San Luis Rey Mission (Bean and Shipek 1978).
37 The Luiseño shared many cultural traits with the Gabrielino and Chumas people.
38 The Tipai-Ipai (also known as Kumeyaay) occupied extreme Southern California
39 and Northern Baja California in autonomous, seminomadic bands of patrilineal
40 clans (Luomala 1978; San Diego County 2011b; CDFG 2009). The Ipai occupied
41 the areas north of the San Diego River, and the Tipai occupied the area south of
42 the San Diego River (San Diego County 2011b).

1 **17.3.2.6.2 Prehistory of Southern California Region, Interior Portion**

2 The Cahuilla, Serrano, Tubatalabal, Kawaiisu, and Quechan people lived in
3 present Riverside, eastern Los Angeles, southeastern Kern, and western San
4 Bernardino counties. The Tubatalabal also lived in the southeastern San Joaquin
5 Valley in present southeastern Kern County.

6 *Cahuilla*

7 The Cahuilla lived inland within present Riverside County. Villages were located
8 in canyons or on alluvial fans close to food and water sources. The Cahuilla
9 interacted frequently with other people in Southern California (Bean 1978;
10 Riverside County 2000).

11 *Serrano*

12 The Serrano lived in the San Bernardino Mountains within present northeastern
13 Los Angeles County and southwestern San Bernardino County and in the
14 northwestern valleys and mountains of Riverside County. Villages were located
15 close to food and water sources along perennial streams and lakes. The Serrano
16 interacted frequently with other people in Southern California (Riverside County
17 2000; DWR 2009).

18 *Kawaiisu*

19 The Kawaiisu occupied a mountainous area between the Mojave Desert and the
20 southern San Joaquin Valley, mostly in Kern County, and the Tehachapi Valley
21 (Zigmond 1986; California State Parks 2014). The Kawaiisu lived in permanent
22 winter villages and traveled during the warmer months into the Mojave Desert
23 and Antelope Valley. They traded and interacted with neighboring groups,
24 including the Chumash, Yokuts, and Tubatalabal people.

25 *Quechan*

26 The Quechan were Yuman people that occupied areas along the Colorado River
27 and adjacent valleys, including present Coachella and Imperial valleys (Riverside
28 County 2000). The Quechan had a strong tribal identity and traveled extensively
29 for trade.

30 **17.3.3 Historical Context**

31 The historical context presented in this section is focused on historical activities
32 and resources that affected and/or were affected by implementation of water
33 resource actions of CVP and SWP water users. Changes in CVP and SWP
34 operations under implementation of alternatives considered in this EIS could not
35 only affect CVP and SWP facilities. These changes also could affect regional and
36 local water supplies, reservoirs, and associated land uses of those that use CVP
37 and SWP water.

38 **17.3.3.1 Introduction to Historical Context**

39 Initial contact with Europeans and Americans occurred with Spanish missionaries
40 and soldiers, who entered California from the south in 1769, eventually founding
41 21 missions along the California coast (Reclamation 1997). This period is
42 characterized by the establishment of missions and military presidios, the

1 development of large tracts of land owned by the missions, and subjugation of the
2 local Indian population for labor. This way of life began to change in 1822 when
3 Mexico became independent of Spain. The mission lands were divided by
4 government grants into large ranchos often consisting of tens of thousands of
5 acres. The owners of these large *estancias* built homes, often of adobe, and
6 maintained large herds of cattle and horses.

7 During the Spanish and Mexican periods, explorers entered the region. Fort Ross
8 on the Sonoma coast was established by the Russians from 1812 until 1841 to
9 support hunting, fishing, and whaling businesses (Reclamation 1997). American
10 explorer Jedediah Smith and Peter Skene Odgen, Chief Trader for the Hudson
11 Bay Company, with other members of the Hudson Bay Company also came to
12 California during this period.

13 In 1848, the Treaty of Guadalupe Hidalgo transferred the lands of California from
14 the Mexican Republic to the United States and initiated what is called the
15 American Period in California history (Reclamation 1997). During that same
16 year, gold was discovered in the foothills of the Sierra Nevada, and thousands of
17 hopeful miners as well as storekeepers, settlers, and farmers entered the region.
18 Mining in the Trinity River Region was expanded for both gold and copper mines
19 (Placer County 2007).

20 To support this growth, extensive transportation systems were created to support
21 wagon routes, steamboats on the major rivers, and numerous railroads
22 (Reclamation 1997). Many of the supply centers and shipment points along these
23 transportation corridors developed into cities, towns, and settlements. Logging
24 and ranching also expanded to meet the needs of the new settlers. American
25 ranchers found Central California ideally suited for grazing large herds of stock.
26 During the latter part of the 19th century, American ranchers amassed large tracts
27 of former rancho land, and several great cattle empires were formed. As
28 settlements grew, farming increased. A primary constraint to expansion of crop
29 diversity and areas under cultivation was the lack of water. Irrigation was
30 virtually unknown in California until the 1880s, when large-scale irrigation
31 systems were developed to improve agriculture yields. With the development of
32 irrigation and improved transportation, new crops were added to the grains
33 obtained from dry farming, including vegetables, fruits, and nuts.

34 Irrigation capabilities further expanded in the 1950s and 1960s with the
35 implementation of multiple water projects. The availability of water also
36 expanded the agricultural and urban water supplies in the Central Valley,
37 San Francisco Bay Area, Central Coast, and Southern California regions.

38 **17.3.3.2 History of the Trinity River Region**

39 Explorers from the Philippines and Europe may have visited and interacted with
40 the Yurok people as early as the late 1700s. Peter Skene Odgen and Jedediah
41 Smith initially visited the Lower and Middle Klamath River reaches in the 1820s.
42 In 1828, Jedediah Smith and his party of explorers were the first white men
43 known to have visited the Trinity River watershed (USFWS et al. 1999).

1 Although the area was first used extensively by trappers, gold was discovered on
2 the Trinity River in 1848, and by the late 1840s, gold mining was a major activity
3 along the Trinity River (Hoover et al. 1990; Del Norte County 2003; USFWS
4 et al. 1999). Weaverville was the center of gold mining activity after 1849 with
5 numerous mining camps and settlements along the Trinity River. Mining
6 continued along the Trinity River through the early and mid-1900s with
7 large-scale dragline and bucket dredging operations beginning in 1939.
8 Logging has occurred since the 1880s and continues in the Trinity River Region.
9 These activities resulted in significant changes to rivers and may have caused
10 the destruction of many prehistoric or historic archaeological sites (Hoover
11 et al. 1990).

12 Increased activities within the Trinity River Region led to conflicts between the
13 new residents and the Yurok and Hupa people. On November 16, 1855, the
14 Klamath Indian Reservation was established by Executive Order for lands from
15 the mouth of the Klamath River to a location upstream of Tectah Creek that
16 extended 1 mile wide on either side of the river for the approximately 20-mile
17 reach (DOI and CDFG 2012). The Hoopa Valley Reservation was established in
18 1864 and expanded in 1891 to include lands from the mouth of the Klamath River
19 to the Hoopa Valley that extended 1 mile wide on either side of the river
20 including portions of the Klamath Indian Reservation. In 1988, the Hoopa-Yurok
21 Settlement Act (Public Law 100-580) partitioned portions of the previously
22 established reservations into the Yurok Indian Reservation and Hoopa Valley
23 Reservation and established the Resighini Rancheria.

24 **17.3.3.3 History of the Central Valley Region**

25 **17.3.3.3.1 History of the Sacramento Valley**

26 Europeans, Americans, and Canadians may have initially entered the Sacramento
27 Valley in the late 1700s and early 1800s as part of missionary or military
28 expeditions (Reclamation 1997, 2005a; Reclamation et al. 2006; Placer County
29 2007). By 1776, Jose Canizares explored areas located south of the present
30 Sacramento community, and in 1813, there was a major battle between the
31 Spanish and the Miwok people near the confluence of the Cosumnes River along
32 the Sacramento River. Fur trappers moved through this area from the 1820s
33 to 1840s.

34 The first settlements in this area occurred in the 1830s and 1840s on Mexican
35 Land Grants. The New Helvetica Land Grant, which included more than
36 40,000 acres in the Sacramento Valley, was awarded to John Sutter in 1841
37 (DSC 2011).

38 Following the discovery of gold on the New Helvetica Land Grant in 1848 near
39 present-day Coloma, numerous mining-related settlements were established in
40 areas with the Nisenan, Maidu, Konkow, and Atsugewi people in the eastern
41 portion of the Sacramento Valley and in areas with the Nomlaki and Wintu people
42 in the western Sacramento Valley. Many of the Native Americans died after

1 exposure to diseases from the new settlers, including malaria. Numerous other
 2 Native American died during battles against the new settlers.

3 Mining activities in the northern Sacramento Valley foothills and mountains near
 4 present Redding primarily were related to gold and copper (Reclamation 2013a).
 5 Mining activities in the central Sierra Nevada foothills primarily were related to
 6 gold. In 1848, mining started along the Trinity River and upper Sacramento River
 7 tributaries, primarily for copper and gold (Reclamation 2013a; Reclamation et al.
 8 2006). Smelters, mills, and communities grew rapidly near the mining areas,
 9 including the town of Keswick, and communities were established within and
 10 adjacent to the present day Folsom Lake. The development of hydraulic mining
 11 in 1851 required establishment of substantial water diversions, flumes, and
 12 ditches to convey the water and displacement of vast amounts of sediment into the
 13 streams and along the banks of the waterways.

14 Logging also was a dominant industry in the western Sacramento Valley since the
 15 1850s (Reclamation 1997, 2013a). The logging industry grew as the railroads
 16 were extended. Establishment of logging in the Sierra Nevada foothills and
 17 mountains also led to development of water infrastructure to move and/or mill the
 18 logs. One of the first water system infrastructures developed for these purposes
 19 was the original Folsom Dam constructed in 1893 (Reclamation et al. 2006).

20 Agricultural activities were successful throughout the Sacramento Valley to serve
 21 the mining communities (Reclamation 1997). The completion of the first
 22 transcontinental railroad in 1869 increased the number of settlers and allowed
 23 transport of crops from the Sacramento Valley to Nevada, Utah, and subsequently
 24 to other areas of the nation (Reclamation 2005b). The expanded agricultural
 25 markets expanded due to the establishment and development of commercial
 26 crops, accessibility to markets, and new farming techniques and irrigation.

27 Construction of hydroelectric power and water storage facilities in the Sacramento
 28 Valley foothills started in the early 1900s to provide hydropower and water
 29 supplies to local and regional users, as well as export to other portions of the state
 30 using CVP, SWP, City and County of San Francisco, and East Bay Municipal
 31 Utility District facilities.

32 **17.3.3.3.2 History of the San Joaquin Valley**

33 The San Joaquin Valley area was not widely settled by Europeans or Mexicans
 34 when California lands were under Spanish rule (1769 to 1821) or Mexican rule
 35 (1821 to 1848). Numerous expeditions travelled through the San Joaquin Valley
 36 during this period but did not establish major settlements (Reclamation 2010).
 37 During the Spanish rule, several settlements occurred along Fresno Slough
 38 (Reclamation 2012; Reclamation and DWR 2011). There were several
 39 settlements along the San Joaquin River and along the western boundary of the
 40 San Joaquin Valley during Mexican rule when ranches were established in the
 41 Coast Range foothills, including in Pacheco Pass and along Los Banos Creek.

42 In the latter half of the 19th century, agricultural settlements and mining camps
 43 were established in the San Joaquin Valley along the railroad corridors

1 (Reclamation 1997; Reclamation and DWR 2011). The town of Rootville,
2 subsequently renamed Millerton in honor of Major Miller, was established near
3 the present Millerton Lake with a military post, Camp Barbour (later named Fort
4 Miller) to maintain order in the mining camps.

5 Initially, agricultural activities were related to ranching and dry farming.
6 Livestock ranching expanded in the late 1860s (Reclamation et al. 2011b). With
7 the increased availability of electric pumps, groundwater and surface water
8 irrigation was used throughout the valley. Many irrigation districts were formed
9 after the passage of the Wright Act in 1877 that provided methods to finance
10 major irrigation projects. One of the first irrigation systems constructed in the
11 eastern San Joaquin Valley was the “Main Canal” as part of the Miller and Lux’s
12 San Joaquin and Kings River Canal and Irrigation Company (Reclamation and
13 State Parks 2013).

14 Historic resources are related to the settlement of the valley and include
15 homesteads, transportation infrastructure (such as ship landings, ferry ports, and
16 bridges), food processing and other industrial facilities, residential properties,
17 commercial establishments, mining features (in the eastern portion), and
18 government facilities (Reclamation 1997, 2010; Reclamation and DWR 2011).

19 **17.3.3.3 History of the Delta and Suisun Marsh**

20 Communities were not established in the Delta and Suisun Marsh areas until the
21 mid-1800s. There were numerous Spanish expeditions under Spanish rule. In the
22 1830s and 1840s, Mexico established land grants, including Rancho Suisun
23 located west of present City of Fairfield (Reclamation et al. 2010).

24 Following the discovery of gold in the Sacramento Valley, settlements occurred in
25 the Delta to provide support services and agricultural products for those traveling
26 to the gold fields and the Sacramento and San Francisco areas. Passage of the
27 Swamp and Overflow Act in 1850 led to the transfer of lands from the U.S.
28 Government in the Delta to the State of California, which subsequently sold the
29 land to individuals. The new settlers in the Delta constructed levees to protect the
30 lands from periodic flooding and drained other lands to reduce the potential for
31 mosquito-borne diseases. By the 1920s, numerous communities were established
32 around food processing and packing houses that supported a wide range of crops
33 such as asparagus, barley, celery, corn, winter grain, sugar beets, onions, and
34 alfalfa for local dairy farms were introduced to the area (DSC 2011; Reclamation
35 et al. 2010). By the 1950s, major food packers and processors moved from the
36 Delta, and many communities became smaller. Recreational opportunities were
37 established in the 1850s with duck hunting opportunities in the Suisun Marsh
38 area.

39 **17.3.3.4 History of the San Francisco Bay Area Region**

40 In 1579, Sir Francis Drake and other Spanish explorers led expeditions into the
41 San Francisco Bay Area. However, in general, the Spanish did not settle Northern
42 California until the 1700s when other Europeans established trading settlements
43 for fur, mining, and other products. Initially, the Spanish confined their

1 settlement to the coastline to establish military bases, or presidios (Hoover et al.
 2 1990). Father Junipero Serra and other Franciscans worked with the Spanish
 3 explorers to establish missions along the Alta California coastal areas between
 4 present Sonoma County (San Francisco Solano established in 1823) to present
 5 Ventura County (San Buenaventura established in 1782), including three missions
 6 in areas that use CVP and SWP water (Mission San Jose established in 1797,
 7 Mission Santa Clara established in 1777, and Mission San Juan Bautista
 8 established in 1797).

9 San Jose was one the first towns established in Alta California as Pueblo de San
 10 José de Guadalupe (Santa Clara County 2012). The Spanish government awarded
 11 land grants in the San Francisco Bay Area Region (DWR 2008; EBMUD 2009;
 12 Hoover et al. 1990; Reclamation 2005b; San Benito County 2010; Zone 7 2006).
 13 In 1821, Mexico won independence from Spain, began to establish more secular
 14 communities around the missions, and divided many of the ranchos into smaller
 15 pueblos (Santa Clara County 2012). These actions supported growth in the
 16 present California coastal areas.

17 Following California statehood in 1849, ranching and farming communities were
 18 established in the interior valleys of the San Francisco Bay Area Region (Santa
 19 Clara County 2012; CCWD et al. 2009; ECCCHCPA et al. 2006). Starting in the
 20 late 1800s, expansion of the railroads in the area and use of improved irrigation
 21 systems led to the expansion of agriculture throughout the area. In mid-1900s,
 22 industrial expansion occurred in Contra Costa, Alameda, and Santa Clara
 23 counties.

24 **17.3.3.5 History of the Central Coast Region**

25 In 1542, Portuguese explorer Juan Rodríguez Cabrillo entered Santa Barbara
 26 Harbor (Puerto de Santa Bárbara). In 1587, Pedro de Unamuno brought his ship
 27 into Morro Bay, explored inland to the present site of the City of San Luis
 28 Obispo, and claimed the area for Spain. In 1595, Sebastián Rodríguez Cermeño
 29 entered San Luis Obispo Bay (Hoover et al. 1990). The explorations laid the
 30 foundation for the founding of five missions in the Central Coast Region
 31 considered in this EIS. Ranchos were granted throughout the region in the 1830s
 32 and 1840s.

33 Following the California statehood, ranching and farming continued to be the
 34 main economic activity of the Central Coast Region to the present.

35 **17.3.3.6 History of the Southern California Region**

36 In 1540, Hernando de Alarcón explored the inland areas of the Southern
 37 California Region with an expedition that had explored the Colorado River. In
 38 1542, Cabrillo apparently became the first European to sight the coast of Southern
 39 California, including the Los Angeles area and Santa Catalina Island, although he
 40 did not make landfall (Hoover et al. 1990).

41 In 1769, Gaspar de Portolá explored a trail by land from present San Diego
 42 through present San Diego, Orange, and Los Angeles counties (Hoover et al.
 43 1990). He camped near the Los Angeles River and the Indian Village of Yang-Na

1 (within the present City of Los Angeles). In 1772, Pedro Fages made an inland
2 journey from present San Diego through western Riverside County to San Luis
3 Obispo (Hoover et al. 1990; Riverside County 2000). In 1776, friar Francisco
4 Garcés explored from present San Gabriel Valley to the Antelope Valley. More
5 than 20 missions were established along the Southern California coastline (Los
6 Angeles 2005). Pueblos were established near the missions, including the Pueblo
7 of Los Angeles in 1781.

8 The first known discovery of gold in California was made between 1775 and 1780
9 in the Potholes district of southeastern California in present Imperial County
10 (Clark 1970). Other placer deposits were found in 1828 at San Ysidro in present
11 San Diego County, and in 1835 and 1842 at San Francisquito Canyon and
12 Placerita Canyon, respectively, in present Los Angeles County (Clark 1970;
13 Vredenburg 1991). Some of the mines continued to produce gold through the
14 early 1990s.

15 Following the end of Spanish Rule, the Mexican Government deeded the
16 extensive land holdings to ranchos to develop ranches and orchards (Riverside
17 County 2000). Oranges and lemons became major agricultural crops between the
18 1850s and 1880s, and railroads were built to transport the products.

19 Water supply systems were constructed to provide water to missions and pueblo
20 villages. One of the first systems was the Zanja Madre that was constructed in
21 1781 to convey water to the pueblo in the present City of Los Angeles (Los
22 Angeles 2005; DWR 2009). The system was expanded in the 1850s and 1860s to
23 convey water to vineyards and fruit orchards. During the late 1800s and early
24 1900s, numerous dams and conveyance facilities were constructed in the area to
25 support the communities and agriculture.

26 **17.3.4 Known Cultural Resources**

27 The following subsections describe known cultural resources in the counties
28 within the study area as determined through review of reports prepared for other
29 projects in the study area. No physical or record surveys were conducted for this
30 EIS because no site-specific construction actions were considered in this EIS.

31 The EIS evaluates alternatives to continue the coordinated long-term operation of
32 the CVP and SWP. The resources described in this subsection indicate the types
33 of resources that occur in areas served by CVP and SWP water and adjacent
34 areas. Therefore, some of the known resources presented in this chapter are
35 located in portions of the counties that are not within the CVP and SWP water
36 service areas.

37 **17.3.4.1 Known Cultural Resources of the Trinity River Region**

38 Within Trinity County, a cultural resources records search of the Trinity River
39 Region was conducted for the Trinity River Mainstem Fishery Restoration
40 EIS/Environmental Impact Report (EIR) (USFWS et al. 1999). The area covered
41 included 660 feet on either side of the Trinity River from Trinity Lake to the
42 eastern boundary of Hoopa Valley Indian Reservation and the inundation areas of
43 the Trinity Lake and Lewiston Reservoir. More than 150 recorded cultural

1 resources were identified along the mainstem of Trinity River within Trinity
 2 County, including 20 types of prehistoric and historic sites. Among these were
 3 Native American villages, camps, and lithic scatters; historic Indian sites; mines;
 4 ditches; cabins; structures; a school; USFWS stations and campgrounds;
 5 cemeteries; a rock wall; trails; a wagon road; and a bridge. Fifty-one sites are
 6 inundated within Trinity Lake and Lewiston Reservoir. Few of these sites have
 7 been evaluated for eligibility to be included in the National Register of Historic
 8 Places (NRHP). With respect to more recent historic sites in Trinity County, none
 9 of the sites listed in the NRHP, California State Historical Landmarks, California
 10 Register of Historical Resources (CRHR), and/or Points of Interest is located
 11 within or along banks of the Trinity River (CSPOHP 2014a).

12 Within Humboldt County, numerous culturally sensitive areas are located along
 13 the Lower Klamath and Lower Trinity rivers. The culturally sensitive areas
 14 include the areas along the riverbanks associated with religious and/or resource-
 15 producing important sites, in addition to specific known cultural resources. Many
 16 cultural resource locations are in the Hoopa Valley Indian Reservation and Yurok
 17 Reservation, including villages, cemeteries, ceremonial and gathering areas, and
 18 along ridgeline corridors that were used for traveling between villages (Humboldt
 19 County 2012). With respect to more recent historic sites in Humboldt County,
 20 none of the sites listed in the NRHP, California State Historical Landmarks,
 21 CRHR, and/or Points of Interest is located within or along banks of the Trinity or
 22 Klamath rivers (CSPOHP 2014b).

23 Within Del Norte County, numerous culturally sensitive areas are located along
 24 the Lower Klamath River, including areas within the Yurok Reservation and the
 25 Resighini Rancheria along the southern shoreline of the mouth of the Klamath
 26 River at the Pacific Ocean (Del Norte County 2003). The mouth of the Klamath
 27 River is of great spiritual significance for the Yurok people (Yurok Tribe 2005).
 28 The Yurok Tribe has suggested that the entire Klamath River, including the
 29 Lower Klamath River, be designated as a Cultural Riverscape and be submitted
 30 for consideration as a NRHP (Yurok Tribe 2005). With respect to more recent
 31 historic sites in Del Norte County, none of the sites listed in the NRHP, California
 32 State Historical Landmarks, CRHR, and/or Points of Interest is located within or
 33 along banks of the Klamath River (CSPOHP 2014c).

34 **17.3.4.2 Previously Recorded Cultural Resources in the Central Valley** 35 **Region**

36 The Central Valley Region is rich in both historic- and prehistoric-period
 37 resources (Reclamation 1997), including large, deep midden sites (which
 38 generally contains waste materials that indicate human inhabitation) that provide
 39 information on prehistoric culture extending over thousands of years.

40 As described above, implementation of the alternatives considered in this EIS
 41 could affect cultural resources at CVP and SWP reservoir facilities and in areas
 42 that use CVP and SWP water that could experience land uses because of changes
 43 in CVP and SWP water supply availability.

1 **17.3.4.2.1 Cultural Resources at CVP and SWP Reservoir Facilities in the**
2 **Sacramento Valley**

3 Previous cultural resource studies were conducted at and/or near Shasta Lake,
4 Lake Oroville, and Folsom Lake.

5 The studies near Shasta Lake surveyed approximately 8 percent of the study area
6 and identified 261 cultural resources, including 190 prehistoric properties,
7 45 historic resources, and 26 properties with prehistoric and historic resources
8 (Reclamation 2013a). The prehistoric sites include habitation sites, artifact and
9 lithic scatters, caves used as shelter, and cemeteries. The historic sites included
10 bridges, railways, a dam, buildings, ranches, orchards, mines, towns, and
11 cemeteries. Several prehistoric and historic cemeteries located within the
12 inundation area were moved prior to completion of the Shasta Lake complex. The
13 Dog Creek Bridge is the only resource in this area that is listed on the NRHP.
14 The Shasta and Keswick dams were determined to be NRHP-eligible.

15 The studies near Lake Oroville identified 261 cultural resources areas, including
16 234 prehistoric properties, 462 historic resources, and 91 properties with
17 prehistoric and historic resources (DWR 2004, 2007). Within the Lake Oroville
18 inundation area, 93 prehistoric properties and 19 historic sites were identified
19 prior to the completion of the reservoir. The prehistoric sites include habitation
20 sites, milling sites, quarries, artifact and lithic scatters, caves used as shelter, rock
21 art, fishing and hunting grounds, battle sites, trails, and cemeteries. The historic
22 sites included bridges, railways, a dam, buildings, ranches, orchards, mines,
23 towns, and cemeteries.

24 Oroville Dam and peripheral dams, Thermalito Diversion Dam, Thermalito
25 Forebay and Afterbay, Fish Barrier Dam, Hyatt Pumping-Generating Plant and
26 Intake Structure, Thermalito Power Plant and Power Canal, Lake Oroville Visitor
27 Center and Visitor Viewing Platform, and Feather River Fish Hatchery were
28 determined to be NRHP-eligible.

29 The studies near Folsom Lake identified 185 prehistoric properties and 59 historic
30 sites (Reclamation 2005b; Reclamation et al. 2006). The prehistoric sites include
31 habitation sites, middens, groundstones, and artifact and lithic scatters. The
32 historic sites included buildings, mining areas, and refuse dumps. Folsom Dam
33 was determined to be NRHP-eligible.

34 **17.3.4.2.2 Cultural Resources at CVP and SWP Reservoir and Pumping**
35 **Plant Facilities in the San Joaquin Valley**

36 Previous cultural resource studies were conducted at and/or near New Melones
37 Reservoir, San Luis Reservoir, and Millerton Lake and San Joaquin River
38 downstream of Friant Dam.

39 The studies near New Melones Reservoir surveyed approximately 78 percent of
40 the study area and identified 725 cultural resources within the New Melones
41 Reservoir area or within 0.25 mile of this area (Reclamation 2010). The
42 prehistoric sites include habitation sites, artifact and lithic scatters, mortars, caves,
43 rock art, and cemeteries. The historic sites included bridges, buildings, ranches,

1 orchards, towns, water and power systems, transportation infrastructure, and
 2 cemeteries. Many of the sites are located within the inundation area. However,
 3 substantial surveys were conducted prior to construction of New Melones
 4 Reservoir in the 1980s.

5 The studies near San Luis Reservoir identified 51 prehistoric and historic cultural
 6 resources (Reclamation 2012). The prehistoric sites include habitation sites and
 7 artifact and lithic scatters. The historic sites included bridges, water
 8 infrastructure, buildings, ranches, orchards, towns, and cemeteries. One of the
 9 major historic sites in this area is the remnant locations of Rancho San Luis
 10 Gonzaga. Many portions of the ranch are located within the inundation area.
 11 However, many of the structures were moved to a site near Pacheco Pass. The
 12 remaining portions of the ranch were deeded to the State of California in 1992 to
 13 become part of the Pacheco State Park. Rancho San Luis Gonzaga, a historic
 14 stock ranch landscape, has been designated by the state to be a Historic
 15 District/Cultural Landscape that is potentially NRHP-eligible and CRHR-eligible.

16 Recent studies along the San Joaquin River identified 19 prehistoric sites within
 17 the seasonal inundation area of Millerton Lake (Reclamation and DWR 2011;
 18 Reclamation and State Parks 2013). Additional sites are located within the area of
 19 the lake that is constantly inundated. Some of the known sites include the
 20 remains of Kuyu Illik; the Dumna “head” village; the Kechaye/”Dumna” village
 21 of Sanwo Kianu; remains of Fort Miller, Millerton, and Collins Sulphur Springs;
 22 and prehistoric sites with housepits, mortars, grinding sticks, and rock alignments
 23 (Reclamation and State Parks 2013).

24 Along the San Joaquin River downstream of Friant Dam (which forms Millerton
 25 Lake) to the confluence of the Merced River, 84 prehistoric sites, 18 historic sites,
 26 and 7 sites with both prehistoric and historic resources were identified as part of
 27 the San Joaquin River Restoration Program. The prehistoric sites include
 28 habitation sites, artifact and lithic scatters, and bedrock milling features. The
 29 historic sites included bridges, buildings, ranches, orchards, towns, water and
 30 power systems, and transportation infrastructure.

31 The Friant Dam, Friant-Kern Canal, associated features (berms, siphons, control
 32 structures, inlets, outlets, and check structures), approximately 40 bridges that
 33 cross the canal, and Little Dry Creek Wasteway Facility are considered historic
 34 resources (Reclamation and State Parks 2013; Reclamation et al. 2011b). The
 35 Friant Dam and Friant-Kern Canal was determined to be NRHP-eligible.

36 **17.3.4.2.3 Cultural Resources in the areas that use CVP and SWP Water** 37 **Supplies in the Central Valley**

38 Numerous cultural and historical resources are in the Central Valley, as
 39 summarized in Table 17.1. Most of the cultural resources are located within areas
 40 that would not be affected by land use changes that could result from changes in
 41 CVP and SWP water supplies. The resources listed in Table 17.1 also include the
 42 sites described above near CVP and SWP facilities.

1
2

Table 17.1 Previously Recorded Cultural and Historical Resources of the Central Valley Region

County	Historic Site Types	Prehistoric Site Types
Butte	26 NRHP properties, 8 California Historical Landmarks, and 21 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014e).	1,198 Known Prehistoric Site Types (Reclamation 1997).
Colusa	7 NRHP properties, 3 California Historical Landmarks, and 3 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014g).	115 Known Prehistoric Site Types (Reclamation 1997).
El Dorado	18 NRHP properties, 30 California Historical Landmarks, 8 California Points of Historical Interest; numerous historic sites, such as mining features, building foundations, trash scatters, and bridges, were inundated by Folsom Lake (Reclamation 1997; CSPOHP 2014h).	595 Known Prehistoric Site Types (Reclamation 1997).
Fresno	38 NRHP properties, 8 California Historic Landmarks, and 13 of which are California Points of Historical Interest (Reclamation 1997; CSPOHP 2014i).	2,603 Known Prehistoric Site Types (Reclamation 1997).
Glenn	2 NRHP properties, 2 California Historical Landmarks, and 17 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014j).	373 Known Prehistoric Site Types (Reclamation 1997).
Kern	20 NRHP properties, 47 California Historic Landmarks, and 11 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014k).	3,850 Known Prehistoric and Historic Site Types (Reclamation 1997).
Kings	4 NRHP properties, 3 California Historic Landmarks; the San Luis Canal, the only CVP facility in Kings County, has no historic or architectural resources in its vicinity (Reclamation 1997; CSPOHP 2014l).	56 Known Prehistoric Site Types (Reclamation 1997).
Madera	2 NRHP property, 1 California Historic Landmarks, and 9 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014n).	2,043 Known Prehistoric Site Types (Reclamation 1997).
Merced	14 NRHP properties, 5 California Historic Landmarks, 1 CRHR properties, and 8 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014p).	316 Known Prehistoric Site Types (Reclamation 1997).
Napa	76 NRHP properties, 17 California Historical Landmarks, and 13 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014q).	700 Known Prehistoric Site Types (Reclamation 1997).

County	Historic Site Types	Prehistoric Site Types
Placer	18 NRHP properties, 20 California Historical Landmarks, 21 California Points of Historical Interest; numerous historic sites, such as mining features, building foundations, trash scatters, and bridges, were inundated by Folsom Lake, which is a CVP facility (Reclamation 1997; CSPOHP 2014s).	627 Known Prehistoric Site Types (Reclamation 1997).
Plumas	6 NRHP properties, 13 California Historical Landmarks, and 5 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014t).	1,639 prehistoric sites in Plumas County (Plumas County 2012).
Sacramento	<p>90 NRHP properties, 56 California Historical Landmarks, 4 CRHR properties, 20 California Points of Historical Interest; numerous historic sites, such as mining features, building foundations, trash scatters, and bridges, were inundated by Folsom Lake; the Folsom Mining District surrounds Lake Natoma (Reclamation 1997; CSPOHP 2014u).</p> <p>There are over 40 historic sites along the Sacramento River between Sutter County boundary and Freeport (Reclamation 2005b); including Natomas Main Drainage Canal, Town of Freeport, Sacramento Weir, Yolo Bypass, homes and farms, and a church.</p> <p>There are 14 historic sites along the American River between Folsom Dam and the confluence with the Sacramento River (Reclamation 2005b).</p>	407 Known Prehistoric Site Types (Reclamation 1997). There are 24 prehistoric sites along the Sacramento River between Sutter County boundary and Freeport (Reclamation 2005b). There are 22 prehistoric sites along the American River between Folsom Dam and the confluence with the Sacramento River (Reclamation 2005b).
San Joaquin	31 NRHP properties, 25 California Historic Landmarks, 3 CRHR properties, and 7 are California Points of Historical Interest (Reclamation 1997; CSPOHP 2014v).	189 Known Prehistoric Site Types (Reclamation 1997).
Shasta	<p>26 NRHP properties, 19 California Historical Landmarks, 1 CRHR properties, 15 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014w).</p> <p>The Anderson-Cottonwood Irrigation District Diversion Dam has been determined to be eligible for NRHP listing (Reclamation 2013a).</p>	1,419 Known Prehistoric Site Types. Many of these sites occur along the Sacramento River near Redding and between Battle Creek and Table Mountain (Reclamation 2013a).
Solano	23 NRHP properties, 14 California Historical Landmarks, and 9 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014x).	300 Known Prehistoric Site Types (Reclamation 1997).
Stanislaus	21 NRHP properties, 5 California Historic Landmarks, and 7 are California Points of Historical Interest; the former right-of-way for the Patterson and Western Railroad, which was constructed in 1916, bisects the Delta-Mendota Canal (Reclamation 1997; CSPOHP 2014y).	280 Known Prehistoric Site Types (Reclamation 1997).

County	Historic Site Types	Prehistoric Site Types
Sutter	7 NRHP properties, 2 California Historical Landmarks, and 22 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014z).	62 Known Prehistoric Site Types (Reclamation 1997).
Tehama	10 NRHP properties, 3 California Historical Landmarks, and 1 California Point of Historical Interest (Reclamation 1997; CSPOHP 2014aa).	1,415 Known Prehistoric Site Types (Reclamation 1997).
Tulare	34 NRHP properties, 8 California Historic Landmarks, and no California Points of Historical Interest (Reclamation 1997; CSPOHP 2014ab).	1,857 Known Prehistoric Site Types (Reclamation 1997).
Yolo	21 NRHP properties, 2 California Historical Landmarks, 1 CRHR properties, and 8 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014ad).	175 Known Prehistoric Site Types (Reclamation 1997). Includes possible fishing stations along Putah and Cache Creeks, the Sacramento, and ephemeral tributaries to these watercourses.
Yuba	10 NRHP properties, 6 California Historical Landmarks, and 14 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014ae).	1,112 Known Prehistoric Site Types (Reclamation 1997).

1 **17.3.4.3 Previously Recorded Cultural Resources in the San Francisco**
 2 **Bay Area Region**

3 The San Francisco Bay Area Region includes Alameda, Contra Costa, Santa
 4 Clara, and San Benito counties. Much of this region is highly urbanized and that
 5 development has affected archaeological resources. Numerous cultural and
 6 historical resources are in the San Francisco Bay Area Region, as summarized in
 7 Table 17.2. Most of the cultural resources are located within areas that would not
 8 be affected by land use changes that could result from changes in CVP and SWP
 9 water supplies.

1 **Table 17.2 Previously Recorded Cultural Resources of the San Francisco Bay Area**
 2 **Region**

County	Historic Site Types	Prehistoric Site Types
Alameda	141 NRHP properties, 34 California Historical Landmarks, 2 CRHR properties, and 4 California Points of Historical Interest (CSPOHP 2014af).	No comprehensive inventory of prehistoric sites in Alameda County (Zone 7 2006).
Contra Costa	40 NRHP properties, 13 California Historical Landmarks, 1 CRHR property, and 12 California Points of Historical Interest (CSPOHP 2014ag).	No comprehensive inventory of prehistoric sites in Contra Costa County (Contra Costa County 2005). Up to 41 sites were identified in the Kellogg Creek Historic District near Los Vaqueros Reservoir (CCWD et al. 2009).
San Benito	12 NRHP properties, 5 California Historical Landmarks, and 2 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014ah).	180 Known Prehistoric Site Types (Reclamation 1997).
Santa Clara	101 NRHP properties, 41 California Historical Landmarks, and 58 California Points of Historical Interest (CSPOHP 2014ai; Santa Clara County 1994).	Between 1912 and 1960, 43 sites were recorded in the Santa Clara Valley portion of Santa Clara County (Santa Clara 2012).

3 **17.3.4.4 Previously Recorded Cultural Resources in the Central Coast**
 4 **and Southern California Regions**

5 The Central Coast Region includes San Luis Obispo and Santa Barbara counties.
 6 Within the Central Coast Region, the SWP provides water supplies to portions of
 7 San Luis Obispo and Santa Barbara counties. Within the Southern California
 8 Region, the SWP provides water supplies to portions of Ventura, Los Angeles,
 9 Orange, Riverside, San Bernardino, and San Diego counties. Numerous cultural
 10 and historical resources are in the Central Coast and Southern California regions,
 11 as summarized in Table 17.3. Most of the cultural resources are located within
 12 areas that would not be affected by land use changes that could result from
 13 changes in SWP water supplies.

1
2**Table 17.3 Previously Recorded Cultural and Historical Resources of the Central Coast and Southern California Regions**

County	Historic Site Types	Prehistoric Site Types
San Luis Obispo	34 NRHP properties, 2 California Historical Landmarks, and 4 California Points of Historical Interest (CSPOHP 2014ao).	The San Luis Obispo County General Plan discusses several hundred prehistoric resources throughout San Luis Obispo County related to the Chumash people (San Luis Obispo County 2010).
Santa Barbara	43 NRHP properties, 16 California Historical Landmarks, and 7 California Points of Historical Interest (CSPOHP 2014ap).	The 2010 Santa Barbara Conservation Element of the Comprehensive Plan noted prehistoric resources throughout Santa Barbara County related to the Chumash people (Santa Barbara County 2010).
Los Angeles	431 NRHP properties, 90 California Historical Landmarks, 6 CRHR property, and 65 California Points of Historical Interest (CSPOHP 2014aj).	Over 4,196 prehistoric sites in Los Angeles County (SCAG 2011).
Orange	108 NRHP properties, 24 California Historical Landmarks, and 20 California Points of Historical Interest (CSPOHP 2014ak).	Over 1,710 prehistoric sites in Orange County (SCAG 2011; Orange County 2005).
Riverside	52 NRHP properties, 23 California Historical Landmarks, and 72 California Points of Historical Interest (CSPOHP 2014al).	Over 19,858 prehistoric sites in Orange County (SCAG 2011). Some of the Cahuilla, Serrano, and Luiseño communities were inundated within Lake Perris (Reclamation and DWR 2003).
San Bernardino	56 NRHP properties, 39 California Historical Landmarks, 2 CRHR property, and 119 California Points of Historical Interest (CSPOHP 2014am).	Over 29,480 prehistoric sites in San Bernardino County, including the Calico "Early Man" Site (SCAG 2011).
San Diego	130 NRHP properties, 63 California Historical Landmarks, 3 CRHR property, and 16 California Points of Historical Interest (CSPOHP 2014an).	The San Diego County General Plan discussed that there are many prehistoric sites within San Diego County; however, the number and locations are not identified to protect the resources (San Diego County 2011a).
Ventura	34 NRHP properties, 11 California Historical Landmarks, and 4 California Points of Historical Interest (CSPOHP 2014aq).	Over 1,806 prehistoric sites in San Bernardino County (SCAG 2011).

1 **17.4 Impact Analysis**

2 This section describes the potential mechanisms for change in cultural resources
3 and analytical methods, results of the impact analysis, potential mitigation
4 measures, and potential cumulative effects.

5 **17.4.1 Potential Mechanisms for Change and Analytical Tools**

6 As described in Chapter 4, Approach to Environmental Analysis, the
7 environmental consequences assessment considers changes in cultural resources
8 conditions related to changes in CVP and SWP operations under the alternatives
9 as compared to the No Action Alternative and Second Basis of Comparison that
10 could result in land disturbance or increased exposure of cultural resources sites.

11 **17.4.1.1 Changes in the Potential for Land Disturbance**

12 Under Alternatives 1 through 5, No Action Alternative, and Second Basis of
13 Comparison, CVP and SWP water supplies would continue to be provided within
14 the currently designated service areas. Implementation of the alternatives does
15 not include expansion of designated service areas or increased water contract
16 amounts. Land use in 2030 would be consistent with existing general plan
17 projections under all alternatives and the Second Basis of Comparison. The CVP
18 and SWP water contract amounts would be the same under all alternatives and the
19 Second Basis of Comparison. The alternatives would not result in expansion of
20 municipal or agricultural lands, or associated disturbances of cultural resources
21 because of expansion of development or cultivated lands in addition to the
22 conditions projected under existing general plans. Therefore, changes in CVP and
23 SWP water supply availability that would result in changes in land use and
24 associated potential for disturbance of cultural resources are not analyzed in
25 this EIS.

26 **17.4.1.2 Changes in Potential Exposure of Cultural Resources at 27 Reservoirs that Store CVP and SWP Water**

28 Changes in CVP and SWP operations under the alternatives as compared to the
29 No Action Alternative and Second Basis of Comparison could result in increased
30 periods of time when low water elevations occur in reservoirs that store CVP and
31 SWP water, including the CVP and SWP reservoirs. The lowest reservoir
32 elevations generally occur in September in dry and critical dry years, as described
33 in Chapter 5, Surface Water Resources and Water Supplies. The minimum and
34 maximum elevations of the reservoir surface water under Alternatives 1
35 through 5, No Action Alternative, and Second Basis of Comparison would be
36 the same as under current conditions.

37 **17.4.1.3 Effects Related to Cross Delta Water Transfers**

38 Water transfer programs have been used to provide water to existing agricultural
39 and municipal service areas when other water supplies are not available. It is
40 anticipated that water transfers under all alternatives and the Second Basis of
41 Comparison would continue in this manner to provide water supplies to land uses
42 projected under existing general plans which would not result in expansion of

1 municipal or agricultural lands, or associated disturbances of cultural resources
2 because of expansion of development or cultivated lands in addition to conditions
3 projected under existing general plans. Therefore, effects related to cross Delta
4 water transfers and associated potential for disturbance of cultural resources are
5 not analyzed in this EIS.

6 **17.4.2 Conditions in Year 2030 without Implementation of** 7 **Alternatives 1 through 5**

8 The impact analysis in this EIS is based upon the comparison of the alternatives to
9 the No Action Alternative and the Second Basis of Comparison in the Year 2030.
10 Many of the changed conditions would occur in the same manner under both the
11 No Action Alternative and the Second Basis of Comparison (e.g., climate change,
12 sea level rise, general plan development, and implementation of reasonable and
13 foreseeable projects). Because of these changes, especially climate change and
14 sea level rise, it is anticipated that reservoir elevations at the end of September
15 would be lower, flows patterns in the rivers downstream of the reservoirs would
16 be different than under recent condition, and CVP and SWP water deliveries
17 would be less than under recent condition, as described in Chapter 5, Surface
18 Water Resources and Water Supplies. In all regions, the minimum reservoir
19 elevations under the No Action Alternative and Second Basis of Comparison
20 would be similar to minimum elevations during recent conditions.

21 **17.4.3 Evaluation of Alternatives**

22 As described in Chapter 4, Approach to Environmental Analysis, Alternatives 1
23 through 5 have been compared to the No Action Alternative, and the No Action
24 Alternative and Alternatives 1 through 5 have been compared to the Second Basis
25 of Comparison.

26 During review of the numerical modeling analyses used in this EIS, an error was
27 determined in the CalSim II model assumptions related to the Stanislaus River
28 operations for the Second Basis of Comparison, Alternative 1, and Alternative 4
29 model runs. Appendix 5C includes a comparison of the CalSim II model run
30 results presented in this chapter and CalSim II model run results with the error
31 corrected. Appendix 5C also includes a discussion of changes in the comparison
32 of the following alternatives analyses.

- 33 • No Action Alternative compared to the Second Basis of Comparison
- 34 • Alternative 1 compared to the No Action Alternative
- 35 • Alternative 3 compared to the Second Basis of Comparison
- 36 • Alternative 5 compared to the Second Basis of Comparison

37 **17.4.3.1 No Action Alternative**

38 As described in Chapter 4, Approach to Environmental Analysis, the No Action
39 Alternative is compared to the Second Basis of Comparison.

1 **17.4.3.1.1 Potential Exposure of Cultural Resources at Reservoirs that Store**
 2 **CVP and SWP Water**

3 As described above, the minimum reservoir elevations in all regions under the No
 4 Action Alternative and the Second Basis of Comparison would be within historic
 5 ranges and would not expose lands that are not currently exposed. Therefore,
 6 conditions of cultural resources would be similar under the No Action Alternative
 7 and Second Basis of Comparison.

8 **17.4.3.2 Alternative 1**

9 Alternative 1 is identical to the Second Basis of Comparison. Alternative 1 is
 10 compared to the No Action Alternative and the Second Basis of Comparison.
 11 However, because cultural resource conditions under Alternative 1 are identical to
 12 cultural resource conditions under the Second Basis of Comparison, Alternative 1
 13 is only compared to the No Action Alternative.

14 **17.4.3.2.1 Alternative 1 Compared to the No Action Alternative**

15 *Potential Exposure of Cultural Resources at Reservoirs that Store CVP and SWP*
 16 *Water*

17 As described above, the minimum reservoir elevations in all regions under
 18 Alternative 1 as compared to the No Action Alternative would be within historic
 19 ranges and would not expose lands that are not currently exposed. Therefore,
 20 conditions of cultural resources would be similar under Alternative 1 and the No
 21 Action Alternative.

22 **17.4.3.2.2 Alternative 1 Compared to the Second Basis of Comparison**

23 Alternative 1 is identical to the Second Basis of Comparison.

24 **17.4.3.3 Alternative 2**

25 The cultural resources conditions under Alternative 2 would be identical to the
 26 conditions under the No Action Alternative; therefore, Alternative 2 is only
 27 compared to the Second Basis of Comparison.

28 **17.4.3.3.1 Alternative 2 Compared to the Second Basis of Comparison**

29 Changes to cultural resources conditions under Alternatives 2 as compared to the
 30 Second Basis of Comparison would be the same as the impacts described in
 31 Section 17.4.3.1, No Action Alternative.

32 **17.4.3.4 Alternative 3**

33 CVP and SWP operations under Alternative 3 are similar to the Second Basis of
 34 Comparison with modified Old and Middle River flow criteria and New Melones
 35 Reservoir operations.

1 **17.4.3.4.1 Alternative 3 Compared to the No Action Alternative**

2 *Potential Exposure of Cultural Resources at Reservoirs that Store CVP and SWP*
3 *Water*

4 As described above, the minimum reservoir elevations in all regions under
5 Alternative 3 as compared to the No Action Alternative would be within historic
6 ranges and would not expose lands that are not currently exposed. Therefore,
7 conditions of cultural resources would be similar under Alternative 3 as compared
8 to the No Action Alternative.

9 **17.4.3.4.2 Alternative 3 Compared to the Second Basis of Comparison**

10 *Potential Exposure of Cultural Resources at Reservoirs that Store CVP and*
11 *SWP Water*

12 As described above, the minimum reservoir elevations in all regions under
13 Alternative 3 as compared to the Second Basis of Comparison would be within
14 historic ranges and would not expose lands that are not currently exposed.
15 Therefore, conditions of cultural resources would be similar under Alternative 3
16 and Second Basis of Comparison.

17 **17.4.3.5 Alternative 4**

18 The cultural resources conditions under Alternative 4 would be identical to the
19 conditions under the Second Basis of Comparison. Therefore, Alternative 4 is
20 only compared to the No Action Alternative.

21 **17.4.3.5.1 Alternative 4 Compared to the No Action Alternative**

22 Changes in cultural resources conditions under Alternative 4 as compared to the
23 No Action Alternative would be the same as the impacts described in
24 Section 17.4.3.2.1, Alternative 1 Compared to the No Action Alternative.

25 **17.4.3.6 Alternative 5**

26 The CVP and SWP operations under Alternative 5 are similar to the No Action
27 Alternative with modified Old and Middle River flow criteria and New Melones
28 Reservoir operations.

29 **17.4.3.6.1 Alternative 5 Compared to the No Action Alternative**

30 *Potential Exposure of Cultural Resources at Reservoirs that Store CVP and*
31 *SWP Water*

32 As described above, the minimum reservoir elevations in all regions under
33 Alternative 5 as compared to the No Action Alternative would be within historic
34 ranges and would not expose lands that are not currently exposed. Therefore,
35 conditions of cultural resources would be similar under Alternative 5 as compared
36 to the No Action Alternative.

1 **17.4.3.6.2 Alternative 5 Compared to the Second Basis of Comparison**

2 *Potential Exposure of Cultural Resources at Reservoirs that Store CVP and*
 3 *SWP Water*

4 As described above, the minimum reservoir elevations in all regions under
 5 Alternative 5 as compared to the Second Basis of Comparison would be within
 6 historic ranges and would not expose lands that are not currently exposed.
 7 Therefore, conditions of cultural resources would be similar under Alternative 5
 8 and Second Basis of Comparison.

9 **17.4.3.7 Summary of Impact Analysis**

10 The results of the impact analysis of implementation of Alternatives 1 through 5
 11 as compared to the No Action Alternative and the Second Basis of Comparison
 12 are presented in Tables 17.4 and 17.5.

13 **Table 17.4 Comparison of Alternatives 1 through 5 to No Action Alternative**

Alternative	Potential Change	Consideration for Mitigation Measures
Alternative 1	No effects to cultural resources	None needed
Alternative 2	No effects to cultural resources	None needed
Alternative 3	No effects to cultural resources	None needed
Alternative 4	No effects to cultural resources	None needed
Alternative 5	No effects to cultural resources	None needed

14 **Table 17.5 Comparison of No Action Alternative and Alternatives 1 through 5 to**
 15 **Second Basis of Comparison**

Alternative	Potential Change	Consideration for Mitigation Measures
Alternative 1	No effects to cultural resources	None needed
Alternative 2	No effects to cultural resources	None needed
Alternative 3	No effects to cultural resources	None needed
Alternative 4	No effects to cultural resources	None needed
Alternative 5	No effects to cultural resources	None needed

16 **17.4.3.8 Potential Mitigation Measures**

17 Implementation of Alternatives 1 through 5 as compared to the No Action
 18 Alternative would not result in increased potential exposure or disturbance of
 19 cultural resources. Therefore, there would be no adverse impacts to cultural
 20 resources because of implementation of the alternatives; and no mitigation
 21 measures are needed.

1 **17.4.3.9 Cumulative Effects Analysis**

2 As described in Chapter 3, the cumulative effects analysis considers projects,
3 programs, and policies that are not speculative and are based upon known or
4 reasonably foreseeable long-range plans, regulations, operating agreements, or
5 other information that establishes them as reasonably foreseeable.

6 The No Action Alternative, Alternatives 1 through 5, and Second Basis of
7 Comparison include climate change and sea level rise, implementation of general
8 plans, and completion of ongoing projects and programs (see Chapter 3,
9 Description of Alternatives). The effects of these items were analyzed
10 quantitatively and qualitatively, as described in the impact analysis of this
11 chapter. The discussion below focuses on the qualitative effects of the
12 alternatives and other past, present, and reasonably foreseeable future projects
13 identified for consideration of cumulative effects (see Chapter 3, Description of
14 Alternatives).

15 **17.4.3.9.1 No Action Alternative and Alternatives 1 through 5**

16 Continued coordinated long-term operation of the CVP and SWP under the No
17 Action Alternative would result in changed reservoir storage and stream flows as
18 compared to recent conditions because of climate change and sea level rise.
19 These changes would probably result in higher stream flows in the winter as
20 snowfall declines and rainfall increases, and lower flows in the spring and
21 summer when the reservoirs are not refilled with melting snow. These conditions
22 are included in the analysis presented above.

23 Future water resource management projects considered in cumulative effects
24 analysis (see Chapter 3, Description of Alternatives) could increase reservoir
25 storage and change stream flows through the development or expansion of major
26 surface water storage projects, such as the Shasta Lake Water Resources
27 Investigation, Upper San Joaquin River Basin Storage Investigation, North-of-the-
28 Delta Offstream Storage, Los Vaqueros Reservoir Expansion Project, and Delta
29 Wetlands. Environmental analyses prepared for these projects have indicated that
30 there would be increased potential for disturbance during construction of these
31 facilities (Reclamation 2013a, 2014d; DWR 2013; Reclamation, CCWD, and
32 Western 2010; SWSD 2011).

33 There would be no adverse impacts to cultural resources associated with
34 implementation of the No Action Alternative and Alternatives 1 through 5 as
35 compared to the No Action Alternative or the Second Basis of Comparison.
36 Therefore, implementation of the No Action Alternative and Alternatives 1
37 through 5 would not contribute cumulative impacts to the Indian Trust Assets.

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