

Appendix K Cultural Resources and Indian Sacred Sites

Technical Appendix

This appendix documents the cultural resources and Indian sacred sites technical analysis to support the impact analysis in the *Environmental Impact Statement* (EIS).

K.1 Background Information

K.1.1 Prehistoric Context

K.1.1.1 *Introduction to the Prehistoric Context*

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

K.1.1.2 *Prehistory of the Trinity River Region*

The Trinity River region includes portions of Trinity County including Trinity Lake, Lewiston Reservoir, and Trinity River from Lewiston Reservoir to the Humboldt County boundary (near the eastern boundary of Hoopa Valley Indian Reservation); portions of Humboldt County including the Hoopa Valley Indian Reservation, Trinity River from the Humboldt County border to the Del Norte County border (near the confluence of the Trinity and Klamath rivers); and Del Norte County including the lower Klamath River from the confluence with the Trinity River to the Pacific Ocean.

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

K.1.1.3 *Prehistory of the Central Valley*

For the purposes of this analysis, the Central Valley region encompasses the Sacramento Valley, San Joaquin Valley, and Bay-Delta regions of the study area. The Sacramento Valley and San Joaquin Valley are divided into Eastern and Western subregions. Sacramento Valley comprises of the upper Sacramento River, American River, and Feather River. The San Joaquin Valley comprises of the San Joaquin and Stanislaus River regions.

K.1.1.3.1 Prehistory of the Sacramento Valley

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

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

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

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

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

K.1.1.3.2 Prehistory of the San Joaquin Valley

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

1997). Similar findings were identified in major settlement sites along the San Joaquin River and in the present New Melones Reservoir area (Reclamation 2010; Reclamation and California Department of Water Resources [DWR] 2011a)).

During the early Holocene period (10,000 to 12,000 years ago), people probably inhabited or passed through the San Joaquin Valley; however, few indications of this period have been discovered, probably due to burial beneath accumulated river sediment (Reclamation 1997, 2013). Examples of early Holocene cultural remains are known primarily from the Tulare Basin in the southern San Joaquin Valley. Evidence along the southern shoreline of the ancient Tulare Lake indicates that human presence may have occurred from 11,000 BP (Reclamation and California Department of Parks [State Parks] 2013).

From approximately 1650 to 950 BP, there is evidence that the people of the eastern San Joaquin Valley may have interacted with people in the Delta area (Reclamation 1997, 2013).

From approximately 450 to 100 BP, the people of the eastern San Joaquin Valley may have interacted with people in the Central Coast and Southern California areas. Material found in Pacheco to Panoche strata indicates a trade relationship with people of the Delta, Central Coast, and Southern California regions (Moratto 1984; Reclamation 1997, 2013).

K.1.1.4 *Prehistory of the Bay-Delta Region*

The prehistory context is different throughout the Bay-Delta region. Human occupation in the northern valley regions of present San Benito County occurred as described above for the western San Joaquin Valley (San Benito County 2010).

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

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

K.1.2 *Ethnographic Context*

K.1.2.1 *Introduction to Ethnographic Context*

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

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

K.1.2.2 *Ethnography of the Trinity River Region*

The Trinity River region includes portions of Shasta, Trinity, Siskiyou, Humboldt, and Del Norte Counties. This area is bounded by the Sacramento River on the east, the Pacific Ocean on the west, and the middle and upper Klamath Basin on the north. The ethnography of the Yurok, Hoopa, Wintu, and Chimariko is described below.

K.1.2.2.1 Yurok

The Yurok inhabited California's northwestern coastline from Little River to Damnation Creek; along the Klamath River from the confluence with the Pacific Ocean up past the Klamath-Trinity confluence to Slate Creek; and approximately 6 miles along the Trinity River upstream of the confluence with the Klamath River (Pilling 1978; U.S. Fish and Wildlife Service [USFWS] et al. 1999). The Yurok life, communities, society, and ceremonies are deeply connected with the Klamath River (U.S. Department of the Interior [USDOI] and California Department of Fish and Game [CDFG] 2012). Yurok culture and traditional stories describe that the Klamath River was created to facilitate the interaction with two neighboring people, the Hoopa and the Karuk, and with the salmon that lived in the Klamath River. Both the Hoopa and Karuk culture and traditional stories also describe this close interaction of the peoples, salmon, and Klamath River.

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

K.1.2.2.2 Hoopa

The Hoopa inhabited the area surrounding the lower reaches of the Trinity River from approximately Salyer to approximately 6 miles upstream from the confluence with the Klamath River (Wallace 1978a; USFWS et al. 1999). Hoopa life is defined by extended families affiliated with villages. The majority of the tribe are members of the Hoopa Valley Tribe.

The Hoopa believe that the Klamath and Trinity Rivers were created to provide interaction with other peoples (Yurok and Karuk) and with the salmon (USDOI and CDFG 2012). Many of the Hoopa ceremonies highlight their relationship with the rivers, including world renewal ceremonies and ceremonies for bountiful harvests. The world renewal ceremonies include the White Deerskin and Jump

ceremonies to honor the earth and the creator for providing food and other resources. The ceremonies for bountiful harvest of fish and acorns include the First Salmon ceremony and the Acorn Feast.

K.1.2.2.3 **Wintu**

When the Europeans and Americans first explored California, most of the western side of the Sacramento Valley north of about Suisun Bay was inhabited by Wintun-speaking people (USFWS et al. 1999). Early in the anthropological study of the region, a linguistic and cultural distinction was recognized between the Wintun-speaking people in the southwestern Central Valley (the Patwin) and the people occupying the northwestern Central Valley and Trinity River Valley (LaPena 1978; USFWS et al. 1999).

K.1.2.2.4 **Chimariko**

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

K.1.2.3 ***Ethnography of the Central Valley Region***

K.1.2.3.1 **Ethnography of the Sacramento Valley**

Maidu, Konkow, and Nisenan

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

Yana

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

Achumawi, Atsugewi, and Shasta

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

The Shasta peoples were originally thought to be associated with the Achumawi and Atsugewi but then were considered as a separate group (Kroeber 1925; Reclamation 1997; Shipley 1978). The Shasta peoples inhabited the area from southern Oregon at the Rogue River, south to the present Cecilville, and the area between the Marble and Salmon mountains to Mount Shasta in the west and the Cascade Range in the east. In California, the core areas of settlement were in Shasta Valley, Scotts Valley, and along the Klamath River from about Scotts River to the town of Hornbrook (Silver 1978b).

Plains Miwok

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

Nomlaki

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

Patwin

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

K.1.2.3.2 Ethnography of the San Joaquin Valley

Eastern Miwok

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

Yokuts

Yokuts are a large and diverse group of people in the San Joaquin Valley and Sierra Nevada foothills of central California, including the Southern San Joaquin Valley Yokuts, Northern San Joaquin Valley Yokuts, and Foothill Yokuts (Reclamation 1997; Reclamation et al. 2011; San Joaquin River Restoration

Program [SJRRP] 2011). The three subdivisions of the Yokuts languages belong to the Yokutsan family, or Penutian stock (Shibley 1978).

The Southern Valley Yokuts inhabited the southern San Joaquin Valley from present Fresno to the Tehachapi Mountains (Wallace 1978b). The Northern Valley Yokuts inhabited the northern San Joaquin Valley from Bear Creek to the San Joaquin River near present Mendota, western San Joaquin Valley near present San Luis Reservoir, and eastern present Contra Costa and Alameda Counties (East Contra Costa County Habitat Conservation Plan Association [ECCCHCPA] and USFWS 2006; Wallace 1978c; Reclamation and DWR 2011a). The Foothill Yokuts inhabited the western slopes of the Sierra Nevada foothills from the Fresno River to the Kern River (Spier 1978; Reclamation and State Parks 2013). Yokuts were mobile hunters and gatherers with semipermanent villages and seasonal travel corridors to food sources.

Dumna and Kechayi

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

K.1.2.4 *Ethnography of the San Francisco Bay-Delta Region*

Native inhabitants of the Bay-Delta region include the Miwok, Cholvon Northern Valley Yokuts, and the Costanoan Indians (Reclamation 1997; CCWD et al. 2009; ECCCHCPA and USFWS 2006; East Bay Municipal Utility District [EBMUD] 2009; Reclamation 2005b; Santa Clara County 2012; San Benito County 2013).

K.1.2.4.1 Miwok

In the Bay-Delta region, the Coast Miwok people lived along lower San Joaquin River and San Pablo Bay and in the interior of the present Contra Costa and Alameda Counties (Reclamation 1997; ECCCHCPA and USFWS 2006; Kelly 1978). The Bay Miwok villages were located in the San Ramon Valley with other settlements on the western slopes of the Diablo Range. The Volvons, speakers of the Bay Miwok language, settled along Marsh Creek and Kellogg Creek on the northern side of the Diablo Range and near the present Los Vaqueros Reservoir (CCWD et al. 2009). The Miwok people may have held lands at the peak of Mount Diablo.

K.1.2.4.2 Costanoan

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

K.1.3 Historical Context

The historical context presented in this section is focused on historical activities and resources that affected and/or were affected by implementation of water resource actions of Central Valley Project

(CVP) and State Water Project (SWP) water users. Changes in CVP and SWP operations under implementation of alternatives considered in this EIS could affect CVP and SWP facilities. These changes also could affect regional and local water supplies, reservoirs, and associated land uses of those that use CVP and SWP water.

K.1.3.1 *Introduction to Historical Context*

Initial contact with Europeans and Americans occurred with Spanish missionaries and soldiers, who entered California from the south in 1769, eventually founding 21 missions along the California coast (Reclamation 1997). This period is characterized by the establishment of missions and military presidios, the development of large tracts of land owned by the missions, and subjugation of the local Indian population for labor. This way of life began to change in 1822 when Mexico became independent of Spain. The mission lands were divided by government grants into large ranchos often consisting of tens of thousands of acres. The owners of these large *estancias* built homes, often of adobe, and maintained large herds of cattle and horses.

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

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

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

Irrigation capabilities further expanded in the 1950s and 1960s with the implementation of multiple water projects. The availability of water also expanded the agricultural and urban water supplies in the Central Valley and Bay-Delta regions.

K.1.3.2 *History of the Trinity River Region*

Explorers from the Philippines and Europe may have visited and interacted with the Yurok people as early as the late 1700s. Peter Skene Odgen and Jedediah Smith initially visited the lower and middle

Klamath River reaches in the 1820s. In 1828, Jedediah Smith and his party of explorers were the first white men known to have visited the Trinity River watershed (USFWS et al. 1999).

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

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

K.1.3.3 *History of the Central Valley Region*

K.1.3.3.1 History of the Sacramento Valley

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

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

Following the discovery of gold on the New Helvetica Land Grant in 1848 near present-day Coloma, numerous mining-related settlements were established in areas with the Nisenan, Maidu, Konkow, and Atsugewi people in the eastern portion of the Sacramento Valley and in areas with the Nomlaki and Wintu people in the western Sacramento Valley. Many of the Native Americans died after exposure to diseases from the new settlers, including malaria. Numerous other Native Americans died during battles against the new settlers.

Mining activities in the northern Sacramento Valley foothills and mountains near present Redding primarily were related to gold and copper (Reclamation 2013). Mining activities in the central Sierra Nevada foothills primarily were related to gold. In 1848, mining started along the Trinity River and upper Sacramento River tributaries, primarily for copper and gold (Reclamation 2013; Reclamation et al. 2006).

Smelters, mills, and communities grew rapidly near the mining areas, including the town of Keswick, and communities were established within and adjacent to the present day Folsom Lake. The development of hydraulic mining in 1851 required establishment of substantial water diversions, flumes, and ditches to convey the water and displacement of vast amounts of sediment into the streams and along the banks of the waterways.

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

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

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

K.1.3.3.2 History of the San Joaquin Valley

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

In the latter half of the nineteenth century, agricultural settlements and mining camps were established in the San Joaquin Valley along the railroad corridors (Reclamation 1997; Reclamation and DWR 2011a). The town of Rootville, subsequently renamed Millerton in honor of Major Miller, was established near the present Millerton Lake with a military post, Camp Barbour (later named Fort Miller) to maintain order in the mining camps.

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

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

K.1.3.3 History of the Delta and Suisun Marsh

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

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

K.1.3.4 *History of the San Francisco Bay Area Region*

In 1579, Sir Francis Drake and other Spanish explorers led expeditions into the San Francisco Bay Area. However, in general, the Spanish did not settle Northern California until the 1700s when other Europeans established trading settlements for fur, mining, and other products. Initially, the Spanish confined their settlement to the coastline to establish military bases, or presidios (Hoover et al. 1990). Father Junípero Serra and other Franciscans worked with the Spanish explorers to establish missions along the Alta California coastal areas between present Sonoma County (San Francisco Solano established in 1823) to present Ventura County (San Buenaventura established in 1782), including three missions in areas that use CVP and SWP water (Mission San Jose established in 1797, Mission Santa Clara established in 1777, and Mission San Juan Bautista established in 1797).

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

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

K.1.4 CVP and SWP Service Areas (south to Diamond Valley) and Nearshore Pacific Ocean on the California Coast

No project or program-level measures or actions would take place with mechanisms for changes in cultural resources conditions in the nearshore Pacific Ocean on the California coast or CVP and SWP service areas. Therefore, no background setting information for these regions is provided for this analysis.

K.2 Known Cultural Resources

The following subsections describe known cultural resources in the counties in the study area, as determined through review of reports prepared for other projects in the study area. No physical or record surveys were conducted for this EIS because no site-specific construction actions were considered in this EIS. Project and program construction activities that constitute an undertaking under Section 106 of the National Historic Preservation Act (NHPA) would be analyzed in greater detail through execution of and compliance with a Section 106 programmatic agreement.

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

K.2.1 Known Cultural Resources of the Trinity River Region

A cultural resources records search of the Trinity River region in Trinity County was conducted for the *Trinity River Mainstem Fishery Restoration EIS/Environmental Impact Report* (USFWS et al. 1999). The area covered included 660 feet on either side of the Trinity River from Trinity Lake to the eastern boundary of Hoopa Valley Indian Reservation and the inundation areas of the Trinity Lake and Lewiston Reservoir. More than 150 recorded cultural resources were identified along the mainstem of Trinity River within Trinity County, including 20 types of prehistoric and historic sites. Among these were Native American villages, camps, and lithic scatters; historic Indian sites; mines; ditches; cabins; structures; a school; U.S. Fish and Wildlife Service stations and campgrounds; cemeteries; a rock wall; trails; a wagon road; and a bridge. Fifty-one sites are inundated within Trinity Lake and Lewiston Reservoir. Few of these sites have been evaluated for eligibility to be included in the National Register of Historic Places (NRHP). With respect to more recent historic sites in Trinity County, none of the sites listed in the NRHP, California State Historical Landmarks, California Register of Historical Resources (CRHR), and/or Points of Interest is located within or along banks of the Trinity River (California State Parks Office of Historic Preservation [CSPOHP] 2014a).

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

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

K.2.2 Previously Recorded Cultural Resources in the Central Valley Region

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

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

K.2.2.1 Cultural Resources at CVP and SWP Reservoir Facilities in the Sacramento Valley

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

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

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

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

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

K.2.2.2 Cultural Resources at CVP and SWP Reservoir and Pumping Plant Facilities in the San Joaquin Valley

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

The studies near New Melones Reservoir surveyed approximately 78% of the study area and identified 725 cultural resources within the New Melones Reservoir area or within 0.25 mile of this area (Reclamation 2010). The prehistoric sites include habitation sites, artifact and lithic scatters, mortars, caves, rock art, and cemeteries. The historic sites included bridges, buildings, ranches, orchards, towns, water and power systems, transportation infrastructure, and cemeteries. Many of the sites are located within the inundation area. However, substantial surveys were conducted prior to construction of New Melones Reservoir in the 1980s.

The studies near San Luis Reservoir identified 51 prehistoric and historic cultural resources (Reclamation and State Parks 2013). The prehistoric sites include habitation sites and artifact and lithic scatters. The historic sites included bridges, water infrastructure, buildings, ranches, orchards, towns, and cemeteries. One of the major historic sites in this area is the remnant locations of Rancho San Luis Gonzaga. Many portions of the ranch are located within the inundation area. However, many of the structures were moved to a site near Pacheco Pass. The remaining portions of the ranch were deeded to California in 1992 to become part of the Pacheco State Park. Rancho San Luis Gonzaga, a historic stock ranch landscape, has been designated by the state to be a Historic District/Cultural Landscape that is potentially NRHP-eligible and CRHR-eligible.

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

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

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

K.2.2.3 Cultural Resources in the areas that use CVP and SWP Water Supplies in the Central Valley

Numerous cultural and historical resources are in the Central Valley, as summarized in Table K.2-1. Most of the cultural resources are located within areas that would not be affected by land use changes that could result from changes in CVP and SWP water supplies. The resources listed in Table K.2-1 also include the sites described above near CVP and SWP facilities.

Table K.2-1. 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 2014d).	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 2014e).	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 2014f).	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 2014g).	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 2014h).	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 2014i).	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 2014j).	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 2014k).	2,043 Known Prehistoric Site Types (Reclamation 1997).

County	Historic Site Types	Prehistoric Site Types
Merced	14 NRHP properties, 5 California Historic Landmarks, 1 CRHR properties, and 8 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014l).	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 2014m).	700 Known Prehistoric Site Types (Reclamation 1997).
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 2014n).	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 2014o).	1,639 prehistoric sites in Plumas County (Plumas County 2012).
Sacramento	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 2014p). 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. There are 14 historic sites along the American River between Folsom Dam and the confluence with the Sacramento River (Reclamation 2005b).	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 2014q).	189 Known Prehistoric Site Types (Reclamation 1997).
Shasta	26 NRHP properties, 19 California Historical Landmarks, 1 CRHR properties, 15 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014r).	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 2013).

County	Historic Site Types	Prehistoric Site Types
	The Anderson-Cottonwood Irrigation District Diversion Dam has been determined to be eligible for NRHP listing (Reclamation 2013).	
Solano	23 NRHP properties, 14 California Historical Landmarks, and 9 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014s).	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 2014t).	280 Known Prehistoric Site Types (Reclamation 1997).
Sutter	7 NRHP properties, 2 California Historical Landmarks, and 22 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014u).	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 2014v).	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 2014w).	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 2014x).	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 2014y).	1,112 Known Prehistoric Site Types (Reclamation 1997).

NRHP = National Register of Historic Places

CRHR = California Register of Historic Resources

CSPOHP = California State Parks Office of Historic Preservation

K.2.3 Previously Recorded Cultural Resources in the Bay-Delta Region

The Bay-Delta region is highly urbanized and that development has affected archaeological resources. Numerous cultural and historical resources are in the Bay-Delta region, as summarized in Table K.2-2. Most of the cultural resources are located within areas that would not be affected by land use changes that could result from changes in CVP and SWP water supplies.

Table K.2-2. Previously Recorded Cultural Resources of the Bay-Delta 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 2014z).	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 2014aa).	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 Historic Landmarks, and 2 California Points of Historical Interest (Reclamation 1997; CSPOHP 2014ab).	180 Known Prehistoric Site Types (Reclamation 1997).
Santa Clara	101 NRHP properties, 41 California Historical Landmarks, and 58 California Points of Historical Interest (CSPOHP 2014ac; Santa Clara County 1994).	Between 1912 and 1960, 43 sites were recorded in the Santa Clara Valley portion of Santa Clara County (Santa Clara County 2012).

NRHP = National Register of Historic Places

CRHR = California Register of Historic Resources

CSPOHP = California State Parks Office of Historic Preservation

K.2.3.1 Indian Sacred Sites

Indian Sacred Sites are primarily identified during the process of tribal consultation. Because of this, an analysis of Indian Sacred Sites was not possible for the purposes of this document. Once a project is identified, the lead federal agency is required to consult with any tribes that have cultural affiliation with the proposed project area. It is during this process that any Indian Sacred Sites that could be affected by the proposed project would be identified.

K.3 Evaluation of Alternatives

This section describes the technical background for the evaluation of environmental consequences associated with the action alternatives and the No Action Alternative.

K.3.1 Methods and Tools

This analysis identifies potential project and program-level effects of implementation of the action alternatives on archaeological and built-environment historic properties. The effects analysis considers the known historic property environmental setting in the plan area, as well as the potential for previously undocumented historic properties and physical effects (i.e., disturbance, trenching, demolition) to known and previously undocumented properties that could result from implementation of the action alternatives. The analysis is also informed by the requirements of federal and state laws and regulations that apply to cultural resources.

There are three key potential impacts on cultural resources: (1) disturbance or destruction of archaeological historic properties; (2) exposure of buried archaeological historic properties; and (3) the alteration, destruction, or demolition of built-environment historic properties. Each alternative has been considered for its potential to involve activities that would include ground disturbance potentially disturbing or destroying archaeological historic properties, cause erosion exposing buried archaeological historic properties, or damage, alter, or demolish built-environment historic properties.

K.3.1.1 *Section 106 of the National Historic Preservation Act*

Because the coordinated long-term operation of the CVP and SWP is subject to Section 106 of the NHPA, Reclamation is responsible for compliance with Section 106. Section 106 requires Federal agencies to consider the effects of their undertakings on historic properties, properties determined eligible for inclusion in the NRHP, and to afford the Advisory Council on Historic Preservation an opportunity to comment. Compliance with Section 106 follows a series of steps, identified in its implementing regulations found at 36 Code of Federal Regulations (CFR) Part 800, that include identifying consulting and interested parties, delineating an area of potential effects (APE), identifying historic properties within the APE, and assessing effects on any identified historic properties, and resolving adverse effects through consultations with the State Historic Preservation Officer, Indian tribes, and other consulting parties.

Resolution of adverse effects may result in a memorandum of agreement or programmatic agreement stipulating how historic properties will be treated.

Project-level activities under the action alternatives will not result in changes to peak flows or reservoir levels compared to the No Action Alternative. As a result, in accordance with 36 CFR §800.3(a)(1), project-level actions do not have potential to cause effects on historic properties and do not require further consideration under Section 106 of the NHPA.

Program-level activities under the action alternatives have the potential to cause adverse effects on historic properties due to changes river flows, reservoir levels, and construction of new habitat restoration sites and a new conservation hatchery facility. However, since program-level activities are broad in scope and not fully defined, these activities will be subject to additional environmental compliance procedures in the future. Once a program alternative is selected, Reclamation will comply with Section 106 of the NHPA.

K.3.2 *No Action Alternative*

The No Action Alternative means that Reclamation and DWR would continue with current operations of the CVP and SWP. Implementation of the No Action Alternative would add approximately 8,000 acres of tidal habitat relative to existing conditions in Suisun Marsh and/or the north Delta. This would require construction activities resulting in ground disturbance potentially affecting historic properties. Consequently, there is a potential for new indirect or direct effects on cultural resources to occur compared to the No Action Alternative. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA, if required.

K.3.3 *Alternative 1*

Operation of the CVP and SWP under Alternative 1 would change river flows and reservoir levels, compared to the No Action Alternative, which would change existing flow conditions. If peak river flows

or reservoir levels have substantive increases beyond the No Action Alternative, it could result in erosion in areas with historic properties and has the potential to adversely affect the historic properties. However, evaluation of changes in peak flow rates taken from the surface water supply analysis conducted using the CalSim II model (as described in Appendix F, *Model Documentation*) indicates that none of the actions under Alternative 1 will result in changes to peak flows compared to the No Action Alternative.

Implementation of the project under Alternative 1 at the program level would require construction activities and ground disturbance that could disturb or destroy historic. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA.

K.3.3.1 *Project-Level Effects*

Potential changes to historic properties and/or human remains as a result of project-related activities.

Project-level actions under Alternative 1 do not have the potential to disturb or destroy archaeological historic properties and/or human remains because no actions would result in alteration, damage, or demolition of historic properties and because none of the actions proposed under Alternative 1 will increase peak flows beyond the No Action Alternative.

K.3.3.2 *Program-Level Effects*

Potential changes to historic properties and/or human remains as a result of project-related activities.

Program-level actions proposed under Alternative 1 that would require construction and habitat restoration activities do have potential to disturb or destroy historic properties and/or human remains. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA.

K.3.4 *Alternative 2*

Operation of the CVP and SWP under Alternative 2 includes potential changes in hydropower generation, fish transport, groundwater pumping, and water transfers. These project activities do not have the potential to adversely affect historic properties and/or human remains. There are no program-level elements under Alternative 2.

K.3.4.1 *Project-Level Effects*

Potential changes to historic properties and/or human remains as a result of project-related activities.

Project-level actions under Alternative 2 do not have the potential to affect historic properties and/or human remains because no actions that would result in alteration, damage, or demolition of historic properties are proposed and because none of the actions proposed under Alternative 2 will increase peak flows beyond the No Action Alternativ.

K.3.5 Alternative 3

Operation of the CVP and SWP under Alternative 3 would change river flows and reservoir levels, compared to the No Action Alternative, which would change existing flow conditions. If peak river flows or reservoir levels have substantive increases beyond the No Action Alternative, it could result in erosion in areas with historic properties and has the potential to adversely affect the historic properties. However, evaluation of changes in peak flow indicates that none of the actions under Alternative 3 will result in changes to peak flows compared to the No Action Alternative.

Implementation of the project under Alternative 3 at the program level would require construction activities and ground disturbance that could disturb or destroy historic properties. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA.

K.3.5.1 Project-Level Effects

Potential changes to historic properties and/or human remains as a result of project-related activities.

Project-level actions under Alternative 3 do not have the potential to affect historic properties and/or human remains because no actions that would result in alteration, damage, or demolition of historic properties are proposed and because none of the actions proposed under Alternative 3 will increase peak flows beyond the No Action Alternative.

K.3.5.2 Program-Level Effects

Potential changes to historic properties and/or human remains as a result project-related activities.

Program-level actions proposed under Alternative 3 that would require construction, habitat restoration activities, and conservation hatchery production do have potential to affect historic properties and/or human remains because associated ground disturbance and alteration, damage, or demolition of built environment resources could affect historic properties and/or human remains. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA.

K.3.6 Alternative 4

Operation of the CVP and SWP under Alternative 4 would change river flows and reservoir levels, compared to the No Action Alternative, which would change existing flow conditions. If peak river flows or reservoir levels have substantive increases beyond the No Action Alternative, it could result in erosion in areas with buried archaeological resources and therefore adversely affect the resources. However, evaluation of changes in peak flow indicates that none of the actions under Alternative 4 will result in changes to peak flows compared to the No Action Alternative.

Implementation of the project under Alternative 4 at the program level (actions to increase water use efficiency) would require construction activities and ground disturbance that could disturb, destroy, or alter historic properties and/or human remains. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA.

K.3.6.1 Project-Level Effects

Potential changes to historic properties and/or human remains as a result of project-related activities.

Project-level actions under Alternative 4 do not have the potential to affect archaeological historic properties and/ or human remains because no actions that would result in alteration, damage, or demolition of historic properties are proposed and because none of the actions proposed under Alternative 4 will increase peak flows beyond the No Action Alternative.

K.3.6.2 *Program-Level Effects*

Potential changes to historic properties and/or human remains as a result of project-related activities.

Program-level actions that would require ground disturbing activities such as installation of irrigation systems proposed under Alternative 4 do have potential to disturb, alter, damage, or demolish historic properties and/or human remains. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA.

K.3.7 *Mitigation Measures*

Mitigation measures are included in this document to avoid, minimize, or resolve adverse effects of alternatives compared to the No Action Alternative.

Mitigation Measure CUL-1: Conduct Archaeological Surveys before the Beginning of Any Project or Program-Related Action and Implement Further Mitigation as Necessary.

Before the beginning of any project or program-related action that could affect historic properties, qualified archaeologists survey all portions of the site. The survey is conducted during a time when vegetation can be reduced or cleared from the affected area, so the natural ground surface can be examined for traces of prehistoric and/or historic-era cultural resources. Surveys outside the defined APE would not be necessary if it is determined that they would not be affected by any project or program construction-related activity, including equipment staging or material stockpiling. If the survey reveals the presence of historic properties, on the project site, the procedures outlined in Mitigation Measure CUL-2 will be followed.

Mitigation Measure CUL-2: Restrict Ground Disturbance and Implement Measures to Protect Archaeological Resources if Discovered during Surveys or Ground-Disturbing Activities.

If unrecorded cultural resources (e.g., unusual amounts of shell, animal bone, bottle glass, ceramics, structure/building remains, etc.) are encountered during surveys where ground disturbance is planned or during project-related ground-disturbing activities, all ground-disturbing activities will be restricted from being conducted within a 100-foot radius of the find. A qualified archaeologist will identify the materials, determine if they are eligible for listing in the NRHP in consultation with the SHPO and consulting parties, and formulate appropriate measures for their treatment, which will be implemented by the lead agency and its contractors. Potential treatment methods for important and potentially important resources may include, but would not be limited to, no action (i.e., resources determined not to be historic properties), avoidance of the resource through changes in construction methods or project design, and implementation of a program of testing and data recovery, in accordance with all applicable Federal and State requirements.

Mitigation Measure CUL-3: Stop Potentially Damaging Work if Human Remains Are Uncovered During Construction, Assess the Significance of the Find, and Pursue Appropriate Management.

If Native American human remains are discovered on federal lands, the Native American Graves Protection and Repatriation Act requires that the individual notify the federal land manager of the discovery in writing. All ground disturbing activities within 100 feet of the find will cease, and the materials are to be protected until the land manager can assess the find. Upon receipt of written confirmation of the discovery, the manager is required to: 1) certify receipt of the notification; 2) take immediate steps, if necessary, to further protect the materials; 3) notify by telephone, with written confirmation, the tribes likely to be culturally affiliated with the materials; and 4) initiate consultation with such tribes. If, after consultation with tribes, the manager determines that the material will be protected adequately *in situ*, without the need to excavate or remove the material from the area of discovery, then the requirements under Native American Graves Protection and Repatriation Act will have been completed. If, after consultation with the tribes, the manager determines that the circumstances warrant intentional excavation or removal of the materials from the area of discovery, then 43 CFR 10.3 applies, and the manager must complete steps outlined therein for intentional excavations.

If Native American human remains are discovered outside of federal lands, California Health and Safety Code Sections 7050.5 and 7052 and California Public Resources Code Section 5097 procedures are to be followed. In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, all such activities within a 100-foot radius of the find will be halted immediately and a Reclamation cultural resources specialist (CRS) will be contacted. The Reclamation CRS will immediately notify the county coroner. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on non-federal lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission within 24 hours of making that determination (Health and Safety Code Section 7050[c]). The Native American Heritage Commission will immediately designate and contact the Most Likely Descendant, who has 48 hours from completion of their examination of the find in which to make recommendations for treatment of the remains, as required by California Public Resources Code Section 5097.98(a). Reclamation will then contact the landowner. Reclamation, the Most Likely Descendant, and the landowner will then devise a mitigation plan for treatment of the remains. Work in the area will continue only after the remains have been treated according to the above mitigation plan and Reclamation certifies that the mitigation plan was properly implemented.

If the remains are found not to be Native American in origin and do not appear to be in an archaeological context, construction will proceed at the direction of the coroner and Reclamation CRS. Once the remains have been appropriately and legally treated, construction may resume in the discovery area upon receipt of Reclamation's express authorization to proceed and under the direction of the CRS.

Mitigation Measure CUL-4: Complete Built-Environment Inventory and Evaluation prior to Construction and Implement Treatment Measures for Adverse Effects.

Mitigation for program or project effects on historic built-environment resources consists of identification and evaluation of built-environment historic properties and assessing program or project effects. Reclamation will ensure that a qualified architectural historian meeting Secretary of Interior's Professional Qualifications Standards for work in history and/or architectural history per 36 CFR Part

61 conducts a historic built-environment inventory and evaluation of unsurveyed parcels that have potential to be affected by the proposed action. All historic built-environment resources located during the survey will be photographed, mapped, and recorded on applicable State Parks 523 forms. For multi-faceted resources such as cultural landscapes and historic districts, locational data will be collected with a global positioning system (GPS) receiver. The significance of any identified historic built-environment resource will be evaluated for NRHP eligibility. The United States Bureau of Reclamation will forward the resulting State Parks 523 forms to the representative California Historical Resources Information System.

To mitigate for adverse effects on identified built-environment historic properties, a memorandum of agreement for detailed documentation of the historic property will be prepared prior to initiation of the project or program action; in cases when the action would prevent adequate completion of the documentation effort, documentation will be completed prior to initiating the program or project. This could include a range of specific mitigation measures to be determined in Section 106 consultation with the State Office of Historic Preservation. Documentation of identified built-environment historic properties could include a range of options, such as interpretive displays, online resources, archival quality photographic documentation, or historic contexts.

K.3.8 Summary of Impacts

Table K.4-1 includes a summary of impacts, the magnitude and direction of those impacts, and potential mitigation measures for consideration.

Table K.4-1. Impact Summary

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
Potential changes to archaeological historic properties and/or human remains as a result of project-related activities.. (Project-Level)	No Action	Ground disturbance associated with habitat restoration could affect historic properties and/or human remains. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA, if required.	–
	1	No impact	–
	2	No impact	–
	3	No impact	–
	4	No impact	–
Potential changes to historic properties and/or human remains as a result of project-related activities. (Program-Level)	No Action	Ground disturbance associated with habitat restoration could affect historic properties and/or human remains. These activities will be subject to additional environmental compliance procedures and review for compliance with the NHPA, if required.	–

Impact	Alternative	Magnitude and Direction of Impacts	Potential Mitigation Measures
	1	Potential to cause impact at program level because project-related activities could affect historic properties and/or human remains.	MM CUL-1-4
	2	No impact	–
	3	Potential to cause impact at program level because project-related activities could affect historic properties and/or human remains.	MM CUL-1-4
	4	Potential to cause impact at program level because project-related activities could affect historic properties and/or human remains.	MM CUL-1-4

CVP = Central Valley Project
 SWP = State Water Project

K.3.9 Cumulative Effects

K.3.9.1 No Action Alternative

The No Action Alternative would not result in changes to water operations. Anticipated tidal habitat restoration in the Delta may result in an adverse impact on cultural resources through those activities which require ground disturbing actions and/or alteration of a built historic property to implement (i.e., ecosystem restoration, hatchery construction, etc.) However, the extent of these construction activities, when compared to the probable projects included in the analysis would not be considered cumulatively considerable. Therefore, the No Action Alternative would not contribute to cumulative effects on cultural resources that may occur as a result of other projects within the study area. As such, the No Action Alternative is not evaluated further in this section.

K.3.9.2 Alternatives 1, 3, and 4

Alternatives 1, 3, and 4, along with the past, present, and reasonably foreseeable projects, described in Appendix Y, *Cumulative Methodology*, may result in an adverse impact on cultural resources through those activities which require ground disturbing actions and/or alteration of a built historic property to implement (e.g., ecosystem restoration, hatchery construction, irrigation system installation). However, the combined extent of the cumulative projects when compared to the probable projects included in the analysis would not be considered cumulatively considerable.

In the short-term, the implementation of Alternatives 1, 3, and 4, resource management plans, restoration measures, and water efficiency measures each have equal potential to contribute to cumulative impacts on cultural resources. However, until subsequent environmental review is completed, it cannot be determined if individual alternative impacts are substantial in comparison to the cumulative projects.

K.3.9.3 *Alternative 2*

Alternative 2 would not result in any activities that could require ground disturbance or alteration of a historic property. Therefore, Alternative 2 would not contribute to cumulative effects on cultural resources that may occur as a result of other projects within the study area.

K.4 References

- Beadsley, R. K. 1948. Cultural Sequences in Central California Archaeology. *American Antiquity* 14(1):1-28.
- California (State of California). 2011. *California's Legislature*. Summer.
- California Department of Water Resources (DWR). 2004. *The Archaeological and Historical Site Inventory at Lake Oroville, Butte County*.
- California Department of Water Resources (DWR) . 2007. *Draft Environmental Impact Report Oroville Facilities Relicensing—FERC Project No. 2100*. May.
- California Department of Water Resources (DWR) . 2008. *Dutch Slough Tidal Marsh Restoration Project, Draft Environmental Impact Report*. November.
- California State Parks Office of Historic Preservation (CSPOHP). 2014a. California Historical Landmarks: Trinity County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.
- California State Parks Office of Historic Preservation (CSPOHP). 2014b. California Historical Landmarks: Humboldt County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.
- California State Parks Office of Historic Preservation (CSPOHP). 2014c. California Historical Landmarks: Del Norte County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.
- California State Parks Office of Historic Preservation (CSPOHP). 2014d. California Historical Landmarks: Butte County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.
- California State Parks Office of Historic Preservation (CSPOHP). 2014e. California Historical Landmarks: Colusa County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.
- California State Parks Office of Historic Preservation (CSPOHP). 2014f. California Historical Landmarks: El Dorado County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014g. California Historical Landmarks: Fresno County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014h. California Historical Landmarks: Glenn County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014i. California Historical Landmarks: Kern County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014j. California Historical Landmarks: Kings County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014k. California Historical Landmarks: Madera County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014l. California Historical Landmarks: Merced County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014m. California Historical Landmarks: Napa County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014n. California Historical Landmarks: Placer County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014o. California Historical Landmarks: Plumas County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014p. California Historical Landmarks: Sacramento County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014q. California Historical Landmarks: San Joaquin County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014r. California Historical Landmarks: Shasta County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014s. California Historical Landmarks: Solano County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014t. California Historical Landmarks: Stanislaus County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014u. California Historical Landmarks: Sutter County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014v. California Historical Landmarks: Tehama County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014w. California Historical Landmarks: Tulare County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014x. California Historical Landmarks: Yolo County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014y. California Historical Landmarks: Yuba County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014z. California Historical Landmarks: Alameda County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: February 9, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014aa. California Historical Landmarks: Contra Costa County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014ab. California Historical Landmarks: San Benito County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

California State Parks Office of Historic Preservation (CSPOHP) . 2014ac. California Historical Landmarks: Santa Clara County. Available: <http://ohp.parks.ca.gov/listedresources/>. Accessed: January 31, 2014.

Contra Costa County. 2005. *Contra Costa County General Plan, 2005-2020*. January.

Contra Costa Water District (CCWD), Bureau of Reclamation (Reclamation), Western Area Power Administration. 2009. *Los Vaqueros Reservoir Expansion Project, Draft Environmental Impact Statement-Environmental Impact Report*. February.

- Cook, S. F. 1978. *Historical Demography*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 91-98 pp. Washington, D.C.: Smithsonian Institution.
- Del Norte County. 2003. *Del Norte County General Plan*. January 28.
- Dixon, R. B. 1910. The Chimariko Indians and Language. *University of California Publications in American Archaeology and Ethnology* 5(5):293–380. Berkeley, California.
- Driver, H. 1939. Culture Element Distributions, X, Northwest California. *University of California Anthropological Records* 1(6):297–433. Berkeley, California.
- Delta Stewardship Council (DSC). 2011. *Delta Plan Draft Program Environmental Impact Report*. November.
- DuBois, C. A. 1935. Wintu Ethnography. *University of California Publications in American Archaeology and Ethnology* 36(1):1–148. Berkeley, California.
- East Bay Municipal Utility District (EBMUD). 2009. *Water Supply Management Program 2040 Draft Program Environmental Impact Report*. February.
- East Contra Costa County Habitat Conservation Plan Association (ECCCHCPA) and U.S. Fish and Wildlife Service (USFWS). 2006. *East Contra Costa Habitat Conservation Plan and Natural Community Conservation Plan Final Environmental Impact Statement – Environmental Impact Report*. October.
- Farber, A. 1985. Alternative Approaches to the Shasta Complex and Adjacent Expressions: Assemblages, Cultural Ecology, and Taxonomies. *Journal of California and Great Basin Anthropology* 7(1):75–88.
- Garth, T. R. 1978. *Atsugewi*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 236–243 pp. Washington, D.C.: Smithsonian Institution.
- Goldschmidt, W. 1978. *Nomlaki*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 341–349 pp. Washington, D.C.: Smithsonian Institution.
- Heizer, R. F., and F. Fenenga. 1939. Archaeological Horizons in Central California. *American Anthropologist* 41(3):378–399.
- Hoover, M. B., H. E. Rensch, E. G. Rensch, and W. N. Abeloe. 1990. *Historic Spots in California*, Fourth edition. Revised and updated by Douglas E. Kyle. Stanford University Press.
- Humboldt County (County of Humboldt). 2012. *Humboldt County General Plan Update, Draft Environmental Impact Report*. April 2.
- Jensen, P. M., and P. R. Reed. 1980. *A Cultural Resources Inventory and Anthropological Overview of the Northern Sacramento Valley and Southern Cascade Range, Special Publication*. District Office: U.S. Bureau of Land Management. Redding, California.

- Johnson, J. J. 1978a. *Yana*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 361–369 pp. Washington, D.C.: Smithsonian Institution.
- Johnson, P. J. 1978b. *Patwin*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 350–360 pp. Washington, D.C.: Smithsonian Institution.
- Kelly, I. 1978. *Coast Miwok*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 414–425 pp. Washington, D.C.: Smithsonian Institution.
- Kroeber, A. L. 1925. *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Reprinted in 1976 by New York: Dover Publications, Inc.
- LaPena, F. R. 1978. *Wintu*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 324–340 pp. Washington, D.C.: Smithsonian Institution.
- Levy, R. 1978a. *Eastern Miwok*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 398–413 pp. Washington, D.C.: Smithsonian Institution.
- Levy, R. 1978b. *Costanoan*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 485–495 pp. Washington, D.C.: Smithsonian Institution.
- Moratto, M. J. 1984. *California Archaeology*. San Francisco, CA: Academic Press, Inc.
- Olmsted, D. L., and O. C. Stewart. 1978. *Achumawi*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 225–235 pp. Washington, D.C.: Smithsonian Institution.
- Pilling, A. R. 1978. *Yurok*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 137–154 pp. Washington, D.C.: Smithsonian Institution.
- Placer County. 2007. *North Fork American River Trail Project Draft Environmental Impact Report*. August.
- Plumas County. 2012. *2035 Plumas County General Plan Update, Draft Environmental Impact Report*. November.
- Ragir, S. R. 1972. *The Early Horizon in Central California Prehistory*. Contributions of the University of California Archaeological Research Facility 15. Berkeley, California.
- Riddell, F. A. 1978. *Maidu and Konkow*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 370–386 pp. Washington, D.C.: Smithsonian Institution.
- San Benito County (County of San Benito). 2010. *San Benito County General Plan Background Report, Public Review Draft*. November.
- San Benito County (County of San Benito). 2013. *2035 San Benito County General Plan Update Draft Program Environmental Impact Report*. November.
- Santa Clara County (County of Santa Clara). 1994. *Santa Clara County General Plan Draft Environmental Impact Report*. September.

- Santa Clara County (County of Santa Clara). 2012. *Santa Clara Valley Habitat Plan, Final Environmental Impact Report/Environmental Impact Statement*.
- San Joaquin River Restoration Program (SJRRP). 2011. *Friant-Kern Canal Capacity Restoration, Draft Environmental Assessment, San Joaquin River Restoration Program*. June.
- Shipley, W. F. 1978. *Native Languages of California*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 80–90 pp. Washington, D.C.: Smithsonian Institution.
- Silver, S. 1978a. *Chimariko*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 205-210 pp. Washington, D.C.: Smithsonian Institution.
- Silver, S. 1978b. *Shastan Peoples*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 211-224 pp. Washington, D.C.: Smithsonian Institution.
- Spier, R. F. G. 1978. *Foothill Yokuts*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 471-484 pp. Washington, D.C.: Smithsonian Institution.
- U.S. Department of the Interior (USDOI) and California Department of Fish and Game (CDFG). 2012. *Klamath Facilities Removal Final Environmental Impact Statement/Environmental Impact Report*. December.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 1997. *Draft Central Valley Project Improvement Act – Programmatic Environmental Impact Statement*. September.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2005a. *Sacramento River Division Contractors, Long-Term Renewal Contract Final Environmental Assessment*. February.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2005b. *American River Division Long-Term Renewal Contract Final Environmental Assessment*. February.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2010. *New Melones Lake Area, Final Resource Management Plan and Environmental Impact Statement*. February.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation). 2013. *Shasta Lake Water Resources Investigation Draft Environmental Impact Statement*. June.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR). 2011a. *San Joaquin River Restoration Program Environmental Impact Statement/Report*.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR). 2011b. *Friant-Kern Canal Capacity Restoration, Draft Environmental Assessment, San Joaquin River Restoration Program*. June.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and California Department of Parks (State Parks). 2013. *San Luis Reservoir State Recreation Area, Final Resource Management Plan/General Plan and Final Environmental Impact Statement/ Environmental Impact Report*. June.

- U.S. Department of the Interior, Bureau of Reclamation (Reclamation), U.S. Army Corps of Engineers, California Reclamation Board, Sacramento Area Flood Control Agency (SAFCA). 2006. *Folsom Dam Safety and Flood Damage Reduction Draft Environmental Impact Statement/Environmental Impact Report*. December.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation), California Department of Fish and Game (CDFG), and U.S. Fish and Wildlife Service (USFWS). 2010. *Suisun Marsh Habitat Management, Preservation, and Restoration Plan Draft Environmental Impact Statement/Environmental Impact Report*. October.
- U.S. Department of the Interior, Bureau of Reclamation (Reclamation), California Department of Fish and Game (CDFG), and U.S. Fish and Wildlife Service (USFWS). 2011. *Suisun Marsh Habitat Management, Preservation, and Restoration Plan Final Environmental Impact Statement/Environmental Impact Report*. November.
- U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior, Bureau of Reclamation (Reclamation), Hoopa Valley Tribe, and Trinity County. 1999. *Trinity River Mainstem Fishery Restoration Environmental Impact Statement/Report*.
- Wallace, W. J. 1978a. *Hupa, Chilula and Whilkut*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 164–179 pp. Washington, D.C.: Smithsonian Institution.
- Wallace, W. J. 1978b. *Southern Valley Yokuts*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 448–461 pp. Washington, D.C.: Smithsonian Institution.
- Wallace, W. J. 1978c. *Northern Valley Yokuts*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 462–470 pp. Washington, D.C.: Smithsonian Institution.
- Wilson, N. L., and A. H. Towne. 1978. *Nisenan*. Handbook of North American Indians, Volume 8. Edited by R. F. Heizer, 387–397 pp. Washington, D.C.: Smithsonian Institution.
- Yurok Tribe. 2005. *Tribal Park Concept Plan*. August.
- Zone 7 Water Agency (Zone 7). 2006. *Zone 7 Stream Management Master Plan Draft Environmental Impact Report*. March.