

Section 10

Cultural Resources

This section describes the cultural resources located in study area and the potential changes that could occur as a result of implementing the Delta Plan and the project alternatives. It describes the environmental setting, potential environmental impacts, and proposed mitigation measures.

The Delta Plan (the Proposed Project) does not propose implementation of any particular physical project; rather it seeks to influence, either through limited policy regulation or through recommendations, other agencies to take certain actions that will lead to achieving the dual goals of Delta ecosystem protection and water supply reliability. Those actions, if taken, could lead to physical changes in the environment. This is described in more detail in part 2.1 of Section 2A, Proposed Project and Alternatives, and Section 2B, Introduction to Resource Sections.

These physical changes could alter, damage, or destroy cultural resources resulting in an impact on these resources. For example, construction of a new dam and creation of a new reservoir could flood land containing an undiscovered cultural resource. Construction and Operations-related impacts on cultural resources could be significant and would depend on various project- and site-specific factors that are presently undefined. This section identifies mitigation measures for future projects involving cultural resources. The mitigation may reduce impacts to less than significant; however, depending on the specific characteristics of the project and the environment, not all mitigation measures identified would mitigate impacts to a less-than-significant level.

10.1 Study Area

The study area is defined as the geographical area in which the majority of potential impacts are expected. The cultural resources study area is the legal Delta and the Suisun Marsh. As described in Section 2A, Proposed Project and Alternatives, facilities could be constructed, modified, or reoperated in the Delta, Delta watershed, or areas located outside the Delta that use Delta water. It is unclear where actions would be located. The Delta is the focus of the Delta Reform Act, so the study area for this resource is focused on the Delta, although other areas are also covered.

10.2 Regulatory Framework

Appendix D provides an overview of the plans, policies, and regulations relating to cultural resources within the study area.

10.3 Environmental Setting

This section describes the cultural resources that could be potentially affected as a result of adopting the Delta Plan or implementing the alternatives. Cultural resources are prehistoric and historic-era archaeological sites; historic-era buildings, structures, and other properties; places important to Native Americans and other heritage groups; and human remains.

10.3.1 Major Sources of Information

Information for this section was compiled from primary and secondary sources, including records search documentation obtained from the North Central Information Center, Central California Information Center, and Northwest Information Center of the California Historical Resources Information System (CHRIS), as well as review of materials found at various State and local repositories. A more detailed discussion of the records search materials is presented in Section 10.4, Impacts Analysis of Project and Alternatives.

10.3.2 Delta and Suisun Marsh

10.3.2.1 Prehistoric Setting

The earliest well-documented human presence in California occurred approximately 12,000–8,000 years Before Present (B.P.) (the Paleo-Indian Period) (Table 10-1). Social units were small and highly mobile in comparison to later adaptive patterns. Sites have been identified along prehistoric lakeshores and coastlines where implements such as fluted projectile points and distinctive crescent-shaped stone implements have been found. No sites dating to this period have been found in the Delta or the Suisun Marsh. Although Paleo-Indian groups may have passed through these regions, their presence was likely minimal, and traces of their occupation have probably been deeply buried under alluvial deposits or otherwise completely destroyed by erosion or development.

Table 10-1
Prehistoric Cultural Periods for the Delta and Suisun Marsh

Period	Dates (B.P.)	Typical Characteristics
Paleo-Indian	12,000–8,000	Small mobile groups, settlements associated with lakeshores, fluted points; no sites known in the Delta or the Suisun Marsh
Lower Archaic	8,000–5,000	Small mobile groups, settlements in more varied settings, wider range of tool forms; no sites known in the Delta or the Suisun Marsh
Middle Archaic	5,000–2,500	Diversified subsistence possibly including acorn, permanent settlements along major waterways; no sites known in the Delta or the Suisun Marsh
Upper Archaic	2,500–1,300	Social status increasingly linked with material wealth, exchange networks complex and extensive; sites found in the Delta and the Suisun Marsh
Emergent	1,300–200	Introduction of bow/arrow, tribal territories well established, increased link between status and material wealth, sophisticated trade networks, clamshell beads became monetary unit, sustained contact with Euro-Americans during latter decades; sites found in the Delta and the Suisun Marsh

Sources: Fredrickson 1974, p. 49; Moratto 1984, p. 184. Compiled by EDAW (now AECOM) in 2009.

A handful of sites dating to the Lower Archaic Period (8,000–5,000 B.P.) have been found in the Central Valley but none in the Delta. However, archaeologists have recovered a great deal of data from sites in the Delta occupied by the Middle Archaic Period (5,000–2,500 B.P.). The small incidence of low and early archaic sites may be caused by high sedimentation rates that left the earliest sites deeply buried and inaccessible. During the Middle Archaic Period, subsistence patterns were diversified, possibly including

1 the introduction of acorn processing technology. Permanent villages that were occupied throughout the
2 year were established, primarily along major waterways. The subsequent Upper Archaic Period
3 (2,500–1,300 B.P.) shows increased evidence of social status being linked to material wealth. Exchange
4 systems became complex and formalized, and evidence of regular, sustained trade between groups was
5 seen for the first time in the archaeological record (Fredrickson 1974, pp. 48–49).

6 The Emergent Period witnessed technological and social changes (1,300–200 B.P.). The bow and arrow
7 were introduced, replacing the spear-throwers (atlatls) used in earlier prehistory. Territorial boundaries
8 between groups became well marked. Distinctions in an individual's social status could be linked to
9 material wealth. In the latter portion of this period (500–200 B.P.), exchange relations between groups
10 became highly regularized and sophisticated. The clamshell disk bead emerged as a monetary unit. Trade
11 goods were exchanged in greater quantities over larger distances relative to earlier prehistoric behavior.
12 Toward the end of this period, contact with Euro-American populations increased and rapidly led to the
13 decimation of native populations through introduced diseases, conflict, and forced removal to limited
14 reservations or rancherias (Moratto 1984, p. 573).

15 The Middle Archaic, Upper Archaic, and Emergent Periods are further divided using the Central
16 California Taxonomic System (Moratto 1984, p. 181). These three periods are well represented in
17 archaeological assemblages documented in the Delta and the Suisun Marsh. The assemblages are
18 described in detail by Bennyhoff and Fredrickson (1969, pp. 22–23) and Moratto (1984, pp. 200–214).
19 The general nature of these patterns is described below.

- 20 ♦ The Windmill Pattern (5,000–1,500 B.P.) of archaeological assemblages shows an increased
21 emphasis on acorn use, as well as a continuation of hunting and fishing subsistence activity.
22 Ground and polished charmstones, twined basketry, baked-clay artifacts, and worked shell and
23 bone are common in Windmill sites. Widely ranging trade patterns brought goods in from the
24 Coast Ranges and trans-Sierran sources, as well as nearby sources. Distinctive burial practices
25 (ventrally extended, oriented westward) identified with the Windmill Pattern also appeared in
26 the Sierra Nevada foothills, indicating possible seasonal migration into the Sierra Nevada.
27 Perforated charmstones are found in some burials of this pattern. Manos, metates, and small
28 mortars were used but are only rarely found in archaeological assemblages.
- 29 ♦ The Berkeley Pattern (2,200–1,300 B.P.) shows an increase in reliance on acorns as a subsistence
30 resource. Distinctive stone and shell artifacts differentiate this pattern from earlier and later
31 cultural expressions. Burials typically place the deceased in a tightly flexed position and
32 frequently include red ochre. Minimally shaped mortar and pestle technology are much more
33 prevalent than mano and metate milling equipment. Nonstemmed projectile points increase in
34 frequency in this pattern relative to earlier assemblages.

35 Dating of the Berkeley Pattern varies across central California; in the Stockton region, the
36 Windmill Pattern continued longer than in other areas, gradually giving way to the changes that
37 marked the Berkeley Pattern. The Berkeley Pattern may represent the emergence of the Northern
38 Valley Yokuts in this area. The Meganos Aspect of the Berkeley Pattern represents a localized
39 intrusion of Windmill people into the Stockton District (Bennyhoff 1982, p. 66). These people
40 combined Windmill and Berkeley pattern traits, as seen in mortuary practices and the stone tool
41 industries. The Meganos culture can be distinguished by the unique practice of placing burials in
42 nonmidden cemeteries in the tops of sand mounds near the mouths of the Sacramento and
43 San Joaquin rivers (Bennyhoff 1968, p. 7).

- 1 ♦ The Augustine Pattern (1,300–200 B.P.) saw increasing populations and a commensurate increase
2 in subsistence activity and intensity. This pattern also includes a marked change in burial
3 practices and increased trade activities. Hallmarks of this period were intensive fishing, hunting,
4 and gathering; complex exchange systems; and a wider variety in mortuary patterns. Mortars and
5 pestles were more carefully shaped; bow and arrow technology was present. Fishing implements
6 became more common, and trade increased. Burial behavior is distinguished by cremation, which
7 was used for some higher status individuals.

8 **10.3.2.2 Ethnographic Setting**

9 During the ethnographic period, at least four main Native American cultural groups inhabited large
10 traditional territories in the Delta and the Suisun Marsh. These groups are the Nisenan, Miwok, Northern
11 Valley Yokuts, and southern Patwin.

12 Peoples associated with the Nisenan would have resided at the northernmost extent of the Delta, although
13 the southern boundary of their territory is unclear (Wilson and Towne 1978, p. 387). The Miwok
14 (“Plains” or “Eastern” Miwok) inhabited lands from just south of Sacramento, west toward Suisun Bay,
15 south to approximately the Calaveras River, and east to the Sierra Nevada foothills. The westernmost
16 extension of the Plains/Eastern Miwok, referred to as the Bay Miwok, occupied an area south of Suisun
17 Bay in the Walnut Creek region (Levy 1978, p. 398). The Northern Valley Yokuts occupied lands from
18 just north of the Calaveras River to as far south as present-day Mendota and from the Sierra Nevada
19 foothills in the east to the base of the Coast Ranges in the west (Wallace 1978, p. 462).

20 **10.3.2.2.1 Nisenan**

21 Kroeber (1932, p. 261) indicates that the west side of the Sacramento River marks the approximate
22 southern boundary of the Nisenan territory with several ethnographic Nisenan villages documented
23 along the western bank of the river (see Heizer and Hester [1970, pp. 79–90]). Wilson and Towne
24 (1978, p. 387) defined three main dialects within the Nisenan tribe: Northern Hill Nisenan, Southern Hill
25 Nisenan, and Valley Nisenan. The Valley Nisenan resided in the northern portion of the Delta.

26 Valley Nisenan located their permanent settlements along the riverbanks on elevated natural levees near
27 an adequate food and water supply, in fairly open terrain. Southern exposures were preferred (Beals 1933,
28 p. 363). Villages ranged from minor “tribelets” of small extended families consisting of 15–25 individuals
29 to larger communities with more than 100 people (Kroeber 1925, p. 397). Usually one large village
30 played an important role in the social-political organization of a particular area as a central social and
31 political power structure. One of these larger villages was that of Pusuna, located at the confluence of the
32 American and Sacramento rivers. Although the hereditary position of a headman was appointed for each
33 village (Beals 1933, p. 359; Faye 1923, p. 42), little authority was directly attributed to this individual
34 without the actual support of the larger social group (Beals 1933, p. 359; Wilson and Towne 1978,
35 p. 393).

36 Nisenan lifeways remained largely unchanged until the arrival of European populations during the
37 19th century. While various Spanish missionaries and explorers and Hudson’s Bay Company trappers and
38 traders traversed California during the late 1700s and early 1800s, they tended to have relatively little
39 effect on the native cultures. However, in a fairly brief period before the Gold Rush, traditional Nisenan
40 lifestyles and belief systems were almost completely destroyed through disease and forced removal from
41 their traditional territory. The most significant event to affect the Nisenan, and many other tribes
42 throughout the region, was the series of devastating epidemics (possibly malaria) that swept through the
43 Central Valley and Delta—in particular, during the early 1830s. Although other epidemics had been
44 spread among native peoples throughout California during earlier periods, the 1830–1833 period was

1 particularly devastating, and numerous accounts relate how it largely decimated many tribes in the
2 Central Valley (see Cook 1955, p. 70). Although much of the Nisenan culture was certainly lost during
3 this and subsequent periods, present-day Nisenan descendants constitute a revitalized and thriving
4 community taking their place in the broader economic and social patterns of the Sacramento area.

5 10.3.2.2.2 Miwok

6 The eastern Miwok, and more specifically the Plains Miwok, occupied the lower Sacramento River valley
7 from just north of the Cosumnes River southward to the lower San Joaquin River drainage, including the
8 western reaches of the Mokelumne River and Jackson Creek. This area is roughly bounded by the
9 present-day cities of Sacramento on the north and Stockton on the south. The northern boundary may not
10 have been as firm over time as indicated in the ethnographic literature. Archaeological evidence along the
11 Cosumnes River suggests that the Nisenan may have displaced the Miwok in this region just before the
12 Emergent Period (Deis 1994).

13 Although the Plains Miwok shared a common language and cultural background, they consisted of a
14 number of separate and politically independent social units. Each tribelet consisted of a number of
15 permanently inhabited and seasonally occupied locales, with control of the natural resources contained
16 within a defined area and political independence (Levy 1978, p. 398).

17 The Miwok used a wide variety of animal and plant species for subsistence. The valley oak was the most
18 valued plant species, with buckeye, laurel, and hazelnut also consumed. Wild oats and balsam root,
19 several species of edible roots, greens such as wild pea and miner's lettuce, berries, and a number of
20 different mushroom varieties were eaten when available. Tule elk and pronghorn antelope were the most
21 important faunal species for food, hides, bone, and ligament. Various species of rabbit were hunted in
22 summer. Waterfowl and fish, especially salmon, were also critical food sources for the Miwok
23 (Aginsky 1943, pp. 395–402; Levy 1978, pp. 402–403).

24 Spanish expeditions to the Sacramento–San Joaquin Valley in the latter years of the 18th century made
25 their first contact with indigenous populations in the westernmost Delta portions of the Miwok territory.
26 Several names of Native Americans appear in the Book of Baptisms of Mission San Jose in 1811,
27 indicating that Spanish raids on Miwok settlements may have resulted in the capture or at least religious
28 conversion of tribe members. In general, Miwok lifeways in the Central Valley and Delta remained
29 comparatively unchanged during the early years of their contact with Euro-Americans. However as
30 contact with nonnative groups became sustained, violent conflict and introduced diseases devastated the
31 Miwok and traditional culture. As with many Native American groups, by the late 19th century, the
32 Miwok were economically, socially, and politically marginalized, but today they have a growing native
33 community in contemporary California.

34 10.3.2.2.3 Northern Valley Yokuts

35 The Yokuts historically included 40–50 distinct sociopolitical units (Kroeber 1925, p. 474), occupying the
36 entire San Joaquin Valley and adjacent Sierra Nevada foothills south of the Fresno River. Tribal divisions
37 were based partially on dialects and generally fell into two categories: valley and foothill. Each of these
38 then split into differing dialects for the various tribes. Individual dialects were mutually intelligible but
39 distinct enough to define the individual groups. Because of the presence of streams draining the Sierra
40 Nevada into the eastern edge of the valley and the lack of water coming from the Coast Ranges to the
41 west, most research indicates that the bulk of Yokuts settlement occurred in the eastern portions of the
42 valley. Tribes neighboring the Northern Valley Yokuts included the Costanoans and Salinans to the west,
43 Southern Valley Yokuts to the south, Miwoks to the north and east, and Foothill Yokuts to the southeast
44 (Wallace 1978, p. 462).

1 During the ethnographic era, the Northern Valley Yokuts occupied lands on both sides of the San Joaquin
2 River from the Delta to south of Mendota. The Diablo Range probably marked the Yokuts' western
3 boundary (Wallace 1978, p. 462). The eastern edge would have been the Sierra Nevada foothills. The
4 Yokuts clearly occupied the area during the Spanish Colonial period, demonstrated by mixed historic and
5 prehistoric artifact assemblages found in northern valley archaeological sites. The late prehistoric Yokuts
6 may have been the largest cultural group in prehistoric California.

7 Northern Valley Yokuts material culture included a wide range of artifacts. Acorn mortars were pecked
8 into bedrock outcrops or could be made from wooden material as a portable tool; pestles were frequently
9 irregular or somewhat crude and often were left in place at bedrock outcrops (Kroeber 1925, p. 527).
10 Smaller mortars may have been used for preparing tobacco or medicine for consumption. Snares, bows,
11 and spears were used in hunting game. Prey animals were hunted as part of organized animal drives or
12 after animals were lured in with decoys. Fish were speared, netted, or poisoned with soap root
13 (*Chlorogalum pomeridianum*) then gathered. Tule boats were used to travel on rivers and lakes.
14 Dwellings were small and roofed with tule woven into mats (Wallace 1978, p. 464).

15 Early Northern Valley Yokuts experience with Euro-American contact was similar to that of the
16 neighboring Miwok and Nisenan tribes and consisted largely of intermittent contact with Spanish
17 explorers and missionaries. The records the Spanish prepared documenting these interactions provide
18 some ethnographic data, and Cook (1955, pp. 67–69) and Schenck (1926) were able identify San Joaquin
19 Valley village and tribal groups based on early accounts from Spanish explorers and mission records.
20 Increasing interaction with the Spanish invaders brought disease and conflict. The Yokuts population and
21 culture were decimated by the mid-19th century. As with the Miwok and Nisenan, however, tribal
22 population has surged in the latter decades of the 20th century, along with a resurgence of interest in
23 traditional Yokuts culture.

24 10.3.2.2.4 Southern Patwin

25 The southern Patwin were a series of linguistically and culturally related sociopolitical groups that
26 occupied a portion of the lower Sacramento Valley west of the Sacramento River and north of Suisun
27 Bay. These groups had no common name but spoke dialects of a single language family that extended
28 southward to the Delta. Patwin tribelets maintained their own autonomy and sense of territoriality and
29 typically consisted of one primary and several satellite villages. Villages were located along waterways,
30 often near the juncture with another major topographic feature, such as foothills or another waterway. The
31 ethnographically documented villages nearest to the Delta were Aguasto and Tolenas, both situated
32 immediately north of San Pablo Bay to the west-northwest (Johnson 1978, p. 350).

33 Dwellings in these villages usually consisted of earth-covered, semisubterranean structures with either an
34 elliptical (River Patwin) or circular (Hill Patwin) form (Kroeber 1932, cited in Johnson 1978,
35 pp. 357–358). All except the individual family dwellings were built with the assistance of everyone in the
36 village. Ethnographic accounts indicate that one's paternal relatives built single-family homes in the
37 village.

38 The Patwin exploited a wide variety of edible resources. Netting and cordage were of particular
39 importance in fishing and hunting activities, and wild hemp (*Apocynum cannabinum*) and milkweed
40 (*Asclepias* sp.) provided particularly suitable fibers for the production of fishing nets and lines.
41 Anadromous fish, such as sturgeon and salmon, were part of the staple Patwin diet (Johnson 1978, p. 355)
42 and were typically caught in large numbers using weirs made from stone and wood and nets.

43 In general, the Patwin territory had numerous waterways that supported tule elk, deer, antelope, bear,
44 various duck species, geese, turtles, and other small animals hunted by the Patwin. Although hunting and
45 fishing were clearly important subsistence activities among the Patwin, as with many Native American
46 groups throughout the region, their primary staple food was the acorn. Two species of valley oak acorns
47 were used: hill and mountain oak. The oak groves themselves were considered as "owned" communally

1 by the particular tribelet. Other commonly exploited floral food resources included buckeye, pine nuts,
2 juniper, manzanita and black berries, wild grape, and tule roots in the valley. Sunflower, alfilaria, clover,
3 bunchgrass, and wild oat seeds were also gathered and ground into coarse flours. As with the oak groves,
4 particularly fruitful tracts of seed-bearing lands were controlled by individual families or the tribelets
5 themselves (Kroeber 1932, p. 296).

6 A distinctive aspect of the Patwin culture was the Kuksu or “big-head” dances cult system, also found in
7 other tribes through much of north-central California. In each cult were secret societies, each with its own
8 series of dances and mythologies centered on animal figures, such as Sede-Tsiak (Old Man Coyote) or
9 Ketit (Peregrine Falcon). The Patwin were unique in possessing three secret societies. In the central
10 California cult system, almost all groups possessed the Kuksu, but the Patwin also had the ghost dance
11 (way saltu) and Hesi societies (Kroeber 1932, p. 312). Each secret society engaged in specific spiritual
12 activities—for example, the way saltu society administered medicine and performed shamanism.

13 As with other tribal groups in the Central Valley and elsewhere in California, the Patwin saw dramatic
14 decreases in their population with the increasing presence of Euro-American explorers, trappers, and
15 settlers during the 19th century. The same epidemics that plagued other regional tribes also affected
16 Patwin groups and their culture. The Patwin, however, survive to the present day and have a vibrant and
17 resurgent culture.

18 **10.3.2.3 Historical Setting**

19 Since the mid-19th century, the region comprising the Delta and the Suisun Marsh has been a region
20 changed by flood control and agricultural activities. The Delta islands, canals, and rivers bear little
21 resemblance to how the region appeared before Euro-Americans arrived in the early 19th century. A
22 history of the Delta and the Suisun Marsh is best presented and interpreted through major themes that
23 ultimately influenced development and culture of the region. Predominant themes relate to exploration
24 and settlement of the area, as well as land reclamation and agriculture.

25 **10.3.2.3.1 Early History**

26 *Exploration*

27 Captain Pedro Fages led an overland expedition from the Spanish Mission at Monterey through the Delta
28 and Suisun Marsh region in the late 18th century. As part of his expedition, Fages skirted the eastern
29 shores of present-day San Francisco and San Pablo bays and continued east to Suisun Bay, then south
30 toward Mount Diablo, eventually arriving at an enormous expanse of marshland that was the Delta
31 (Thompson 1957, pp. 89–90).

32 During this period, as a means to establish and maintain Spanish sovereignty in California, the Spanish
33 built numerous missions in coastal areas. The Native American people who were enticed to live in and
34 near the mission sites, or who were taken captive and held against their will, were critical to the
35 establishment and operation of the missions. In the late 18th and into the early 19th century, the Spanish
36 military and the Catholic Church sought new mission sites and assessed the economic potential of the
37 region. Missions that were established functioned as religious and military outposts and were also used to
38 assimilate the Native American into European culture and the Catholic religion.

39 In 1813, Jose Arguello led an expedition to recapture “missionized” Native Americans who had fled the
40 missions into the Delta region. Arguello, a dozen Spanish soldiers, and nearly 100 native allies set out to
41 capture or punish the nearly 1,000 escaped natives who had retreated to an area on present-day Andrus
42 Island. Although casualties were heavy, it is not known how many natives were actually recaptured and
43 returned to the coastal missions. At the time, the expedition was the largest confrontation to date between
44 the Native Americans of the Delta region and the Spaniards (Thompson 1957, pp. 96–97).

1 Additional expeditions continued in the Delta and Suisun Marsh during the early years of the
2 19th century. Luis Arguello and fathers Ramon Abelland and Narcisso Duran led one of the largest of
3 these expeditions in 1817. The party sailed from San Francisco to the Sacramento River to a point near
4 Clarksburg and Freeport, just south of present-day Sacramento. They made efforts to head south to
5 present-day Brannan Island, but after encountering difficulties along the route, headed back to the
6 Presidio in San Francisco. Records indicate the expedition camped briefly near present-day Courtland and
7 traveled along the river east of Grand Island to the confluence of the Mokelumne and the San Joaquin
8 rivers, where it divided into two groups. Arguello continued to pursue the escaped neophytes and explore
9 the Delta, while fathers Abelland and Duran traveled south toward present-day Stockton. A lasting
10 contribution of the Arguello expedition party was that it explored and mapped a large portion of the Delta
11 region (Beck and Haase 1974, pp. 12–17; Thompson 1957, pp. 96–97).

12 In 1822, Alta California ceded to the Mexican government, and the punitive expeditions into the Delta
13 and Central Valley continued, although at a much smaller scale. Overall, explorations and expeditions
14 into the Delta region took on a distinctly military character as native resistance to the Spanish and later
15 Mexican incursions became more commonplace, organized, and effective.

16 By the 1830s, the native groups became increasingly involved in the raiding of farms and stealing of
17 livestock. The Mexican government provided little support to settlers in quelling these raids. Organized
18 military expeditions to the Sacramento Valley by Mexican troops did not materialize; however, starting in
19 1833, the military guarded many passes. Attacks on the natives also continued. This war of attrition and
20 the introduction of devastating epidemics to the Central Valley drastically reduced the Native American
21 populations, ultimately destroying the social ties that bound their cultures and eliminating their ability to
22 mount an organized and effective resistance to Euro-Americans in the region (Beck and Haase 1974,
23 pp. 12–17; Thompson 1957, pp. 96–97).

24 In the 1840s, John C. Fremont, an explorer, soldier, and politician, obtained a commission from the
25 prestigious U.S. Topographical Engineers and began leading expeditions into the western part of the
26 United States, including the Delta region. He first ventured into Mexican-controlled California in 1843
27 when he took the Oregon Trail east of the Rocky Mountains. He crossed the Sierra Nevada in winter 1844
28 and later ventured into the Central Valley and Delta and Suisun Marsh, eventually reaching the “Old
29 Spanish Trail,” which again took him eastward. In a later expedition in 1846, Fremont and a party of
30 55 men left St. Louis for California to find the source of the Arkansas River. For unknown reasons, he
31 headed for California, splitting his group in Nevada to cover additional ground. Fremont traveled through
32 present-day Donner Pass, entering the Central Valley and the Delta region, then headed south, eventually
33 reuniting with the remainder of his party (Beck and Haase 1974, p. 46).

34 *Trappers and the Fur Trade*

35 During the first half of the 19th century, Euro-American trappers and traders also played an important
36 role in the exploration of the Delta and Suisun Marsh. The trappers pursued their trade vigorously in the
37 Delta, resulting in a plummet in commercially viable fur-bearing animal population in the area. The
38 “golden age” of trapping lasted roughly 15 years, ending in the early 1840s.

39 Trappers Peter Ogden and Alexander McLeod led large Hudson’s Bay Company expeditions into the
40 Central Valley during this period. They entered the Sacramento and San Joaquin valleys in 1829 and
41 stayed in the region for approximately 1 year, having confirmed that earlier reports on the density of
42 beaver and other fur-bearing animals in the region by trappers such as Jedediah Smith in 1827 were not
43 exaggerated. The Hudson’s Bay Company sent additional trapping parties into California, including one
44 led by Michel LaFramboise that included 65 trappers. The parties followed McLeod’s trail into portions
45 of present-day Solano County, eventually reaching the San Francisco Bay in 1832. At the same time, John
46 Work led a party of more than 100 throughout the Delta region (Barker 1948, pp. 73–74, 84, 137, 161).

1 During these years, the Hudson's Bay Company continued to send trapping expeditions to the region,
 2 although it experienced spotty success, and the Mexican government did little to cooperate with the
 3 trappers in the region and often hindered their operations. In 1840, the Mexican government and the
 4 Hudson's Bay Company reached an agreement that established the licensing of trappers, duties on pelts,
 5 and a Hudson's Bay Company trading post in San Francisco. John Sutter, who founded his New Helvetia
 6 settlement in present-day Sacramento in 1839, was unhappy with the new trading arrangements and
 7 attempted to stem competition by prohibiting the company from operating in his land grant. This,
 8 combined with the general decline of the fur trade industry, caused the Hudson's Bay Company to cease
 9 large-scale commercial trapping in the Delta region. In 1842, the governing board of the Hudson's Bay
 10 Company terminated its California operation, and by 1845, the company's San Francisco post was closed
 11 (Thompson 1957, p. 101; Barker 1948, p. 161).

12 10.3.2.3.2 Settlement

13 Starting in the early 1830s, the Mexican government began awarding large land grant holdings, or
 14 ranchos, to Mexican citizens born in Alta California or to those with political connections
 15 (which allowed numerous non-Mexicans to obtain land grants) (Table 10-2). The Mexican government
 16 awarded 813 land grants of qualified parties throughout California between 1824 and 1846. Of the
 17 813 land grants, 346 were granted to non-Mexican citizens (Beck and Haase 1974, p. 24).

18 Many of the land grants awarded, however, remained tenuous until the State ratified the Land Act of 1851
 19 to any address legal issues associated with the ranchos. The act established a commission to adjudicate
 20 title disputes. Overall, the commission approved 553 claims totaling approximately 8,850,000 acres. Over
 21 the years, most of the finalized land grants were broken up or sold off by their owners. Only 19 land
 22 grants remain intact today. None of these grants are located in the Delta and Suisun Marsh (Beck and
 23 Haase 1974, pp. 28–30).

Table 10-2
Mexican Land Grants In and Near the Delta

Grant	Original Acreage	Present-Day County	Date Established
Los Meganos	13,316	Contra Costa	1835
Arroyo Seco	48,858	Sacramento, San Joaquin	1839
Los Medanos	8,859	Contra Costa	1839
New Helvetia	48,839	Sacramento, Sutter, Yuba	1841
Rancho San Juan	19,983	Sacramento	1841
Cosumnes	26,605	Sacramento	1842
Rio de los Americanos	35,521	Sacramento	1842
Cañada de los Vaqueros	17,760	Contra Costa, Alameda	1843
El Pescador	35,546	Sacramento	1843
El Pescador	35,446	San Joaquin, Stanislaus	1843
Omochumnes	18,662	Sacramento	1843
Campo de los Franceses	48,747	San Joaquin	1844
Los Ulpinos	17,726	Solano	1844
Nueva Flandria	76,201	Yolo	1844
Rancho del Paso	44,371	Sacramento	1844
Sanjon de los Moquelumnes	35,508	Sacramento, San Joaquin	1844
Thompson's	35,533	San Joaquin, Stanislaus	1844

Source: Beck and Haase 1974

1 The land grants noted in Table 10-2 played an important role in the overall political, social, economic,
2 and cultural development of California. The New Helvetia land grant awarded to John Sutter in 1841 was
3 one of the most significant. Sutter, a Swiss immigrant, became a Mexican citizen in 1840, qualifying him
4 for his grant, which included roughly 49,000 acres of land in the Sacramento Valley. Upon receiving the
5 grant title, Sutter secured and developed his land by planting wheat, corn, and cotton and raising
6 livestock. Highly successful and prosperous, Sutter employed a large labor force to tend his lands and
7 livestock, which included 1,700 horses and mules, 4,000 cattle, and 3,000 sheep by 1845
8 (Thompson 1957, pp. 116–118).

9 In the 1840s, despite natural disasters (such as seasonal flooding), resistance from Mexican landowners
10 and the Mexican government, and the difficulties of travel, Americans began arriving by the hundreds to
11 California. They were attracted to the region by accounts of rich farmland and pastures and a temperate
12 climate. The region encompassing the Delta and the Suisun Marsh, however, was not particularly well
13 suited for agricultural pursuits because the soil was typically underwater for part of the year, and other
14 land was barren and did not afford good pasture. Despite inherent difficulties, settlers established towns,
15 ranches, and outposts throughout the Central Valley and Delta in the mid-19th century. Over time, the
16 flood of Euro-American immigrants eroded Mexican control over much of California. By the time gold
17 was discovered in the Sierra Nevada foothills in 1848, Mexican governance of much of Alta California
18 had essentially been ceded to American interests (Thompson 1957, pp. 125, 139–141).

19 The Gold Rush of 1849 turned the Delta and the Suisun Marsh region into a series of busy transportation
20 routes bringing would-be miners and supplies to “jumping off” points, including Sacramento, Stockton,
21 French Camp, and other settlements in the region. During this period, the Delta and the Suisun Marsh
22 were still in a completely natural state (the large-scale land reclamation efforts that would define the
23 character of the region would occur in the latter 19th and early 20th centuries). Although the Delta and
24 the Suisun Marsh region offered no gold and little in the way of farmable land, the twisting waterways of
25 the Delta and the Suisun Marsh proved vital as a means of transport for mining-related activities.

26 By the mid-1850s, would-be miners drawn to California by tales of easy riches soon realized that gold
27 was often more difficult to find than commonly thought. Thus, many of these settlers turned to more
28 reliable occupations, such as agriculture and subsistence farming. In addition, supplying the miners with
29 basic goods, such as vegetables, meat, and tallow, became highly lucrative. Trade markets designed to
30 supply the mines, farmers, and ranchers quickly developed along the Sacramento River and Delta region
31 in particular (Thompson 1957, pp. 139–144).

32 10.3.2.3.3 Land Reclamation

33 As early as the mid-19th century, settlers in the Delta and the Suisun Marsh region built a network of
34 levees to drain and reclaim fertile land for farming. Although farming proved to be highly successful in
35 the Delta, it failed in the Suisun Marsh because of high soil salinities. Therefore, much of the Suisun
36 Marsh was flooded to create seasonal wetlands.

37 Many of the initial levees provided little protection beyond periodic high tides, leading to frequent repairs
38 and modifications. Early settlers expanded and widened the levees seasonally, as the need arose
39 (Thompson 1957, p. 33). In the 1860s, the Tide Land Reclamation Company (directed by George
40 Roberts) and the Glasgow-California Land and Reclamation Company (directed by Morton Fischer)
41 formed; the two companies dominated reclamation activities in the Delta throughout much of the latter
42 part of the 19th century. Throughout the late 19th century, workforce turnover for levee construction was
43 high. Chinese laborers formed the bulk of the unskilled labor force in the early levee and canal projects.
44 They were eventually joined by Japanese and Indian laborers. With the passing of the Chinese Exclusion
45 Act of 1882, the Chinese labor force declined dramatically (Leung 1984, pp. 2–9; Maniery 1993, p. 9).

1 As a result of the reclamation activities, numerous “islands” were formed in the Delta, and in general, the
2 region bore little resemblance to the landscape that existed before the Gold Rush period. As islands were
3 formed throughout the Delta, the canals and widened river channels served as a source for irrigation and a
4 recreational boating waterway and dredge access for levee construction and maintenance.

5 In 1861, the California Legislature created the State Board of Swampland Commissioners in an effort to
6 address the frequent flooding of towns and agricultural land in the state. In 1866, the State Legislature
7 terminated the commission and the counties became responsible for reclamation efforts of unproductive
8 land (McGowan 1961, pp. 173–174; Thompson 1957, pp. 208–209). In 1913, the California Legislature
9 established the California Reclamation Board (now called the Central Valley Flood Protection Board)
10 with jurisdiction over reclamation districts and levee plans in California (Thompson 1957, p. 490).

11 10.3.2.3.4 Agriculture

12 The Delta and Suisun Marsh and surrounding area became known for its farming and agriculture output in
13 the late 19th and early 20th centuries. The area’s rich and fertile soils and land that is essentially flat and
14 easy to grade, excavate, and irrigate all contributed toward successful agricultural endeavors. The
15 following sections provide an overview of historical farming practices in the Delta and Suisun Marsh by
16 era (Thompson 1957, pp. 309–310).

17 In the mid-19th to late 19th century, during and after the Gold Rush, agricultural activities in the Delta
18 and Suisun Marsh consisted primarily of subsistence gardening and small-scale farming fostered in large
19 part by the proximity of the Delta and Suisun Marsh to San Francisco and the goldfields of the Sierra
20 Nevada foothills. Early crops tended to be grown primarily on higher lands, such as natural levees and
21 rises and included potatoes, onions, and beans. Beef cattle grazed during summer in the tule swamps. By
22 the 1870s, fruits, grains, and dairy products became profitable commodities in the region. Agricultural
23 activity in the Delta and Suisun Marsh was flourishing. Various ethnic groups, such as the Chinese,
24 Italian, and Portuguese, as well as Euro-Americans, became involved in farming in the region
25 (Thompson 1957, pp. 310–311).

26 The transition of the region from garden to field agriculture was primarily a 20th-century phenomenon
27 attributable to the continued reclamation of acreage and introduction of electric pumps (in wide use by
28 1905). By 1916, major crops in the region included barley, with 120,000 acres, followed by beans and
29 potatoes, with 30,000 acres each. Additional crops included onions, sugar beets, field corn, and celery
30 (Thompson 1957, pp. 312–313).

31 Following World War I, changes occurred in farming practices in the region as small family operations
32 were replaced by farms that used mechanization and contract laborers rather than sharecropping. Crops
33 thriving during this period included field corn, sugar beets, celery, and onions in the San Joaquin River
34 region; asparagus and sugar beets were more prevalent in the Sacramento River districts.

35 Following World War II, major crops growing in the region included winter grain, asparagus, corn, and
36 alfalfa. In 1945, farmers planted 62,300 acres of land with asparagus in the San Joaquin Delta. In the early
37 1950s, asparagus acreage increased to 75,800 acres, and it was valued at \$11 million, representing
38 approximately one-half of the nation’s production (Thompson 1957, pp. 315–316).

39 Continued use of mechanization in farming, coupled with greater use of fertilizer, resulted in increased
40 agricultural production. While agricultural markets expanded, the same basic crops continued to be
41 planted in the region. Ethnic laborers continued to be heavily involved in farming in the area. Although
42 early workers were of Chinese, Japanese, and Indian descent, more recent workforce was primarily
43 composed of laborers from the Philippines, Mexico, Central America, and South America. The patterns of

1 shifting immigrant groups working in the Delta and the Suisun Marsh region mirror the trends found in
2 the late 19th century, when various ethnic groups were involved in the construction of canals and levees
3 that transformed the region into one of the most important agricultural centers in the nation
4 (Thompson 1957, p. 369).

5 10.3.2.3.5 Development

6 The Delta and the Suisun Marsh cover thousands of acres that include a maze of rivers and sloughs
7 surrounding approximately 57 islands, most of which are now agricultural. Before humans changed the
8 environment, ocean water from the San Francisco Bay meandered up Delta channels during the summers
9 when mountain runoff ebbed. During winter, heavy runoff from the mountains kept the ocean water from
10 extending far into the Delta. Initially settled in 1850 by disillusioned miners, the region would soon
11 become an area known for its fertile soils. Over time, through settlement, reclamation, and the
12 develop-ment of agriculture, the Delta and Suisun Marsh region would become a cornerstone in
13 California's agricultural foundation. The following discussion, organized by county, describes major
14 towns and cities in the Delta and Suisun Marsh region.

15 *Sacramento County*

16 Sacramento

17 The City of Sacramento, incorporated in 1850, has served as the State capital since 1854. After it was
18 established, the city served as a major gateway to the gold fields of the Sierra foothills by shipping
19 supplies to miners and serving as a jumping-off point for gold prospectors. As the city grew, commerce
20 and municipal facilities also spread to encompass a larger area. Most of the downtown center, including
21 the waterfront area, was developed by 1870. River traffic and development of the city as a railroad hub
22 led Sacramento to become the most important land port city in California in the 19th century. Sacramento
23 remains an important commercial center in Northern California.

24 The location of Sacramento near the confluence of two major rivers (the Sacramento and American) has
25 resulted in serious flooding problems throughout the history of the city. Several times in the mid-19th and
26 late 20th centuries, parts of Sacramento were several feet under water (Sacramento County Historical
27 Society 1971, Vol. 17, p. 1). To address the flooding issues, the city constructed a series of levees and
28 rechanneled the mouth of the American River to a location approximately 1 mile upstream. Additional
29 levee maintenance and upgrade work has continued through the years.

30 Courtland

31 The town of Courtland, a lower Sacramento River town, was initially settled and developed in the early
32 1850s. Major settlers in the town were of Portuguese descent. By the mid-19th to late 19th century,
33 Courtland had developed into an important agricultural-support center for the Delta region (Sanborn Fire
34 Insurance Map Company 1919, p. 1). The transport of agricultural goods, especially pears, continued into
35 the early 20th century, and by the 1920s, the community was a major shipping center for the region. It
36 remains known for its pear crops (McGowan 1961, p. 215).

37 Locke

38 Locke was founded in 1915 after a fire in the Chinese section in the nearby town of Walnut Grove
39 prompted many of its residents to establish a town of their own. A committee of merchants approached
40 landowner George Locke, inquiring whether they could purchase a portion of his land. In time, Chinese
41 architects laid out the small rural town, which was occupied primarily by Chungshan Chinese laborers.
42 The town exhibited an eclectic mix of traditional Chinese building patterns and Delta vernacular
43 architecture along the 12-foot-wide main street (Kyle 1990, p. 298).

1 The Chinese were originally drawn to the Delta area because of levee construction work; however, by the
2 time Locke was built, most of its Chinese residents worked in the orchards and fields in the Delta region.
3 Historic records indicate that Locke supported canneries, grocery stores, restaurants, and several
4 gambling houses in its early years. By the 1940s, boarding houses, brothels, and a theater lined the streets,
5 and as many as 1,500 people occupied the town. Although much smaller today, the main town center of
6 Locke remains intact (Sanborn Fire Insurance Map Company 1919, p. 1; Sanborn Fire Insurance Map
7 Company 1930, p. 1; Kyle 1990, p. 298).

8 Walnut Grove

9 Settler John W. Sharp established the community of Walnut Grove in 1850. Located approximately
10 30 miles south of Sacramento, it was one of the earliest settlements along the Sacramento River and was
11 distinguished by the fact that it occupied both banks of the lower Sacramento River. Sharp immigrated to
12 California from Ohio and chose the site of Walnut Grove because walnut and oak forests were abundant
13 in the area. The town quickly prospered as an agricultural center and riverboat stop, becoming a major
14 shipping port by 1865 for agricultural produce. By 1870, it was a thriving town complete with businesses,
15 a school, a post office, and an armory (Kyle 1990, p. 298).

16 By the turn of the 20th century, a large Japanese and Chinese community lived in Walnut Grove in an
17 area identified as the “Oriental District.” Although a devastating fire caused much of the Chinese
18 population to leave Walnut Grove and settle in nearby Locke, the Japanese maintained a stable presence
19 in the community. Overall, the town continued to thrive in the early 20th century, boasting several
20 restaurants, movie theaters, barbershops, and drug stores by the 1920s. Today, the community caters
21 primarily to tourism and recreation. Encroaching suburban growth has gradually altered its agricultural
22 character (Sanborn Fire Insurance Map Company 1921, p. 1; Sanborn Fire Insurance Map
23 Company 1927, pp. 1–2, Sanborn Fire Insurance Map Company 1933, pp. 1–2).

24 Other Delta Communities in Sacramento County

25 Several historic Delta agricultural communities are located along the Sacramento River in Sacramento
26 County, including Hood and Isleton. These communities continue to support workers from surrounding
27 agricultural lands, as well as recreationists and year-round residents.

28 *Yolo County*

29 West Sacramento

30 The first Euro-American to travel through the West Sacramento area was Jedediah Strong Smith in the
31 late 1820s; he was followed by Joseph Walker and Ewing Young in the 1830s. Within 20 years, settlers
32 included Jan Lows de Swart (also known as John Schwartz and holder of the Rancho Nueva Flandria land
33 grant) and James McDowell. Upon McDowell’s death in 1849, his widow, Margaret, platted the town of
34 Washington (later known as Broderick and now part of the city of West Sacramento). In 1911, the West
35 Sacramento Company developed the community of Riverbank (later called Bryte), located directly east of
36 present-day Interstate 80 near the Sacramento River (Walters 1987, p. 26; Kyle 1990, pp. 533–535).

37 West Sacramento remained largely unsettled and was populated primarily by small farms and a handful of
38 industries and residences until the early 20th century. By the 1920s, the main east-west transcontinental
39 highway (U.S. Highway 40 and now West Capitol Avenue) traveled through the community. Within a
40 few years, several businesses, including hotels and motels, lined this segment of road. During World War
41 II and the postwar years, the region prospered as local industries flourished, ushering in a housing boom
42 that would last for decades. In 1987, after several previous attempts, the city of West Sacramento
43 officially incorporated. The newly created city was composed of the former communities of Broderick,
44 Bryte, and Riverbank, as well as surrounding urban and rural areas on the west side of the Sacramento
45 River into Southport (Walters 1987, pp. 32–33, 38–39, 46).

1 Clarksburg

2 The community of Clarksburg is located on the west bank of the Sacramento River. One of the first
3 settlers in the region was Frederick Babel, who arrived in 1849. In time, other settlers, including the
4 Portuguese, arrived in the Clarksburg area to farm. Frequent winter flooding, however, posed a challenge
5 to the early farmers, and the issue was not resolved until extensive levees and canals were put in place by
6 the early 20th century. The town was formally established in the 1920s (Kyle 1990, p. 537).

7 *Solano County*

8 Rio Vista

9 Rio Vista was established in 1857 by Colonel N. H. Davis, who laid out the town on his land near the
10 confluence of Cache Slough and the Sacramento River. Major flooding in 1862 washed away the early
11 settlement of Rio Vista, and a new site was chosen from nearby ranches held by Joseph Bruning and
12 T. J. McWorthy (Kyle 1990, p. 473).

13 Rio Vista, like many of the towns along the Sacramento River, served as a major transit point and
14 shipping hub for agricultural goods produced on the local farms. Throughout the 19th century, the town
15 flourished as a supply post for goods primarily bound for urban centers, such as Sacramento and
16 San Francisco, as well as the foothill goldfields. Agriculture remains a mainstay of the community
17 (Kyle 1990, p. 473).

18 Fairfield

19 The city of Fairfield is located on lands that were originally part of the Tolenas and Suisun land grants. In
20 1839, Jose Francisco Armijo petitioned for land, including the present-day city. He eventually received
21 the grant, which, upon his death in 1850, passed to his son. Captain R. H. Waterman acquired a portion of
22 the grant in 1858 and offered up 16 acres to create a county seat. Solano County accepted Waterman's
23 offer, and the town of Fairfield was established. Fairfield became the county seat and grew slowly over
24 the next century, mostly as an agriculture-based town. The completion of Travis Air Force Base in the
25 mid-20th century and the construction of nearby I-80 hastened development of the community. The City
26 of Fairfield annexed the base in 1966, thereby increasing its overall size. The city is a thriving
27 commercial and industrial region of the greater Bay Area (Kyle 1990, pp. 463, 464; City of
28 Fairfield 2011).

29 Benicia

30 The city of Benicia is located on the north side of the Carquinez Strait and served as the State capital from
31 1853 to 1854. Dr. Robert Semple laid out the town in 1847, after General Vallejo deeded the land,
32 including the site of the present-day Benicia, to Dr. Semple and Thomas O. Larkin. Dr. Semple also
33 established a ferry between Benicia and Martinez that operated successfully for more than a century, until
34 the Benicia-Martinez Bridge was constructed in 1962. Benicia was home to the Benicia Arsenal, which
35 served the U.S. Army for several decades. The arsenal site was deactivated in 1965, when the
36 U.S. Department of Defense transferred ownership to the City of Benicia. Although its population has
37 fluctuated over time, in its early years, Benicia flourished as a military, religious, and educational
38 metropolis. Throughout the 20th century, major city industries included tanneries, canneries, and
39 shipyards. Presently, the city serves as a bedroom community for nearby Oakland and San Francisco
40 (Kyle 1990, pp. 465–466; City of Benicia 1999, pp. 100–101).

41 Suisun City

42 In 1854, Captain Josiah Wing and John Owen laid out the town of Suisun City. The city was incorporated
43 in 1868, and in 1869, the Transcontinental Railroad laid an alignment through the area. The arrival of the
44 railroad and Suisun City's location on the waterfront helped to establish the community as a
45 transportation and commercial hub. In the mid-20th to late 20th century, the city's population lagged as

1 nearby Fairfield, the county seat, began to thrive with the establishment of Travis Air Force Base. The
2 construction of I-80, which bypassed Suisun City, also contributed to an overall decline in growth for the
3 city during this period. In recent years, Suisun City has enjoyed resurgence as a Bay Area bedroom
4 community and recreation center (Kyle 1990, p. 417; City of Suisun City 2011).

5 *San Joaquin County*

6 Stockton

7 Charles M. Weber founded the city of Stockton in 1850, and the city was incorporated that same year.
8 Weber designed Stockton around five sloughs of the Delta. The sloughs converged to form the Stockton
9 Channel, which served as the city's port. Weber named the town Stockton in honor of U.S. Navy Officer
10 Commodore Robert F. Stockton (Davis 1984, pp. 25, 29).

11 In 1848, when gold was discovered in the Sierra Nevada foothills, Stockton's Delta location made it an
12 ideal gateway and supply post for the gold country. As thousands of people flocked through the area on
13 their way to the gold fields, many others decided instead to seek their fortune by remaining in Stockton.
14 These settlers noticed the rich Delta soil surrounding Stockton and realized its potential for farming. The
15 city grew into a major commercial center that included grain warehousing, flour milling, grain and flour
16 export, and farm implement manufacturing (Hillman and Covello 1985, p. 5).

17 By the 20th century, Stockton served as an important processing and shipping center for fruits, nuts, and
18 vegetables produced throughout the San Joaquin Valley. It also became home to manufacturing and Navy
19 shipyards during World War II. The city continues to be involved in agriculture and manufacturing
20 (Hillman and Covello 1985, pp. 5, 22).

21 Tracy

22 In 1869, the Central Pacific Railroad (now Southern Pacific Railroad) completed a rail line through the
23 area that is now Tracy. The result of the new rail line was the founding of Tracy on September 8, 1878.
24 For many years, Tracy grew as a railroad center, and settlers typically became involved in agriculture.
25 Tracy was incorporated in 1910 and grew rapidly after the first irrigation district was established in 1915.
26 Although railroad operations began to decline in the 1950s, Tracy continues to prosper as an agricultural
27 center (City of Tracy 2010).

28 Lathrop and Manteca

29 During the Gold Rush, French Camp, located approximately 2 miles north of Manteca, was one of the
30 first settlements in San Joaquin County. French Camp not only served travelers to the gold fields but was
31 the western terminus of the Oregon-California Trail, which was used by trappers who worked for the
32 Hudson's Bay Company. By the mid-1860s, agricultural practices were well developed in the Manteca
33 area. In the 1870s, Lathrop was settled at the junction of two rail lines and replaced French Camp as a
34 major community. Grain was a major crop in the area and became more prominent in 1909 through the
35 development of the South San Joaquin Irrigation District, which allowed expansion of grain fields into
36 areas not located adjacent to waterways. The types of agricultural crops were expanded in the early 1900s
37 to include watermelons, sugar beets, tomatoes, and sunflowers; dairies were also established in the area
38 during this time. Manteca became incorporated in 1918. Manteca continued to grow in the early 20th
39 century through the establishment of food-processing industries, including sugar (Spreckles Sugar
40 Company) and cheese (Kraft Foods). Lathrop continued to grow to support industries such as the
41 Libbey-Owens-Ford Company auto glass facility, which relied on the large sand reserves near Lathrop,
42 and the Simplot agricultural materials plant.

1 During the 1950s, residential areas in Lathrop and Manteca grew to support the workers at the Sharpe
2 Army Depot in Lathrop. In the late 20th century, Lathrop and Manteca continued to support workers from
3 other portions of the Central Valley and the San Francisco Bay Area (City of Manteca 2003, pp. 7-3
4 and 7-4).

5 *Contra Costa County*

6 Pittsburg

7 The town of Pittsburg was established in 1849 by Colonel Jonathan D. Stevenson. Stevenson named the
8 settlement New York of the Pacific after his hometown. The discovery of coal in the hills near Pittsburg
9 in 1855 attracted many settlers to the community. The town became known as Black Diamond in honor of
10 the coal discovery. Coal mining quickly became one of the most important industries in Contra Costa
11 County. By the early 20th century, steel became a major industry in the town. In 1911, the city changed
12 its name from Black Diamond to Pittsburg, after the eastern birthplace of the steel industry. Today, the
13 city is a major manufacturing center in Contra Costa County (Kyle 1990, p. 62).

14 Antioch

15 Smith's Landing was initially established in the early 19th century as a commercial center during the
16 Gold Rush. The community was renamed Antioch in 1951. A coal mining industry flourished east of
17 Antioch on the foothills of Mt. Diablo from the 1850s to 1880s. The Antioch waterfront served as the port
18 for coal to be transported to the San Francisco Bay. In 1909, the Oakland and Antioch Railway connected
19 Antioch to the greater San Francisco Bay Area. In the late 19th century and early 20th century, industries
20 moved to Antioch because of its waterfront and the railway and because the San Joaquin River water
21 supply was generally fresh at Antioch except during major droughts. The industries included pottery, soda
22 works, a distillery, canneries, brickyards, and paper mills. In the late 20th century, Antioch became a
23 residential community for Contra Costa County and other portions of the San Francisco Bay Area (City of
24 Antioch 2003 pp. 4.4-3 and 4.4-4).

25 Brentwood

26 The community of Brentwood started as a farming settlement in the late 19th century. Agricultural crops
27 included cherries, corn, and peaches. The small town grew quickly and soon included a bank, schools,
28 and a Masonic lodge (Hulaniski 1917, pp. 212, 281–282, 298–299). Prominent settlers in the Brentwood
29 area included John Marsh, who purchased part of the Los Meganos grant in 1837. A housing boom at the
30 turn of the 21st century has led to the development of many orchards.

31 Oakley

32 The city of Oakley remained largely unsettled until the late 19th century, when settlers, James O'Hara and
33 R. C. Marsh purchased hundreds of acres in the area and planted nut and fruit trees. Marsh subdivided his
34 land to develop the Oakley Township. With the help of Chinese laborers, O'Hara, Marsh, and other early
35 settlers reclaimed portions of the nearby Delta and waterways and planted thousands of acres of orchards
36 and vineyards, which flourished in the area's sandy soil. The township deeded of right-of-way to the
37 Atchison Topeka and Santa Fe Railroad, and soon agricultural goods grown in the area were shipped by
38 carload to the east coast. Crops included celery, asparagus, tomatoes, apricots, and wine grapes, as well as
39 hay and grain. In addition, many large dairies and cattle ranches operated in the surrounding areas. In the
40 mid-20th to late 20th century, manufacturing in addition to agriculture helped the area thrive. In 1989, the
41 city of Oakley was officially incorporated (Emanuel 1986, pp. 209–211; Munro-Fraser 1926, p. 172).

1 Other Unincorporated Communities in Eastern Contra Costa County

2 Several historic Delta agricultural communities are located in eastern Contra Costa County, including
3 Byron. These communities continue to support major agricultural production. Several recreational
4 communities were developed in the mid-20th century, such as Discovery Bay and Bethel Island, and have
5 subsequently become year-round residential communities.

6 **10.3.2.4 Known Cultural Resources**

7 Historical research and more than 500 cultural resources investigations conducted since the 1930s have
8 identified approximately 700 prehistoric and historic-era sites, features, artifacts, structures, and buildings
9 in the Delta and the Suisun Marsh. These resources include Native American habitation and burial mound
10 sites and 19th and early 20th to mid-20th century residences, ranches and farmsteads, railroads,
11 shipwrecks, water conveyance systems, levees, and bridges. With few exceptions, research up until the
12 1970s and 1980s focused on prehistoric sites. As a result, dozens of prominent habitation and burial
13 mound sites were identified in the Delta. In general, many of the sites recorded during the early 20th to
14 mid-20th century have not been revisited by archaeologists since they were first recorded or since they
15 were identified after having been partially destroyed in earlier decades. This has been the case regarding
16 numerous mound sites (habitation and burial) that were noted as having been leveled by agricultural
17 activities when they were initially documented. Despite often considerable historic-era impacts on such
18 sites, significant archaeological contexts and undisturbed human interments can remain in subsurface
19 contexts throughout the Delta and the Suisun Marsh.

20 It is important to note, however, that much of the Delta and the Suisun Marsh has not been the subject of
21 cultural resources surveys. Consequently, numerous presently unrecorded cultural resources almost
22 certainly exist in these areas. In addition, in the Delta and the Suisun Marsh, two specific landforms are
23 highly sensitive for containing undocumented prehistoric sites and human remains. In general, the banks
24 and terraces along natural river courses (e.g., Sacramento, San Joaquin, Mokelumne) and higher ground
25 around the edges of marsh environments (e.g., the Suisun Marsh) are considered to be likely settings for
26 encountering surface and subsurface traces of early Native American habitation and activities. Numerous
27 such sites have been identified in the Delta and the Suisun Marsh, and most sites are situated directly
28 along riverbanks and in associated riparian corridors. The presence of these occupation/habitation sites in
29 these settings illustrates the importance of these environments to traditional lifeways of Native
30 Americans. Whether serving as transportation routes, as water supplies, or as environments supporting a
31 diverse array of natural resources, river and stream corridors have long been known by researchers to be
32 particularly sensitive areas.

33 In addition to the numerous rivers and streams in the Delta and the Suisun Marsh, specific soil types are
34 also known to be highly sensitive for containing prehistoric archaeological sites. In the Delta, these soils
35 consist of the Piper series (Piper fine sandy loam, Piper loamy sand, and Piper sandy loam [partially
36 drained]). Before the reclamation of Delta lands, these Piper formations represented high, well-drained
37 ground in an otherwise wet and, at best, marginally habitable landscape. In general, although the Delta
38 was an environment that was extremely rich in natural resources, the wetlands and low-lying terrain that
39 were the source of such floral and faunal diversity would not have been conducive to extended habitation.
40 Consequently, natural “islands” of well-drained high ground were particularly important to the local
41 Native American groups and were occupied frequently and over long periods.

42 Historic-era sites and features, such as 19th and early 20th to mid-20th century residences, farm
43 complexes, water conveyance infrastructure, and levee systems, are among the most predominant cultural
44 resources on the Delta landscape. In many respects, the Delta is at least as much a cultural landscape as it
45 is a natural one. Massive reclamation projects and subsequent industrial-scale agricultural activities have
46 shaped the landscape and influenced the culture to a point where the entire Delta can be viewed as a
47 single “cultural landscape” bound by common features and themes. For this reason, most manifestations

1 of historic-era activity (e.g., buildings, canals, fields, levees) in the Delta result from or are in some way
2 related to reclamation of the Delta and the subsequent production of row, tree, and seed crops, along with
3 livestock ranching and dairying.

4 10.3.2.4.1 Rural Historic Landscapes

5 Two historic-era landscapes that appear to be eligible for National Register of Historic Places (NRHP)
6 listing are located in the Delta and Suisun Marsh area: the Montezuma Slough Rural Historic Landscape
7 and Bacon Island Rural Historic District.

8 *Montezuma Slough Rural Historic Landscape*

9 The Montezuma Slough Rural Historic Landscape is a historic landscape district extending the length of
10 Montezuma Slough, from the town of Collinsville on the east to Grizzly Bay on the west. The district
11 comprises numerous buildings, structures, sites, and objects. Typical resources include siphons and pump
12 stations, pilings, landscaping such as eucalyptus windbreaks, railroad crossings, levees, shipwrecks, cuts,
13 salinity control gates, landings (such as Mein's and Dutton's landings), and railroad sidings. The district
14 appears eligible for NRHP listing for its association with maritime transportation and economy
15 (Reclamation et al. 2010, p. 7.7-6).

16 *Bacon Island Rural Historic Landscape*

17 Bacon Island Rural Historic District is a historic landscape district located on Bacon Island. The district is
18 made up of various working camps that include boarding and bunkhouses, barns, warehouses, packing
19 sheds, orchards, and gardens, in addition to spatially organized levees, ditches, and agricultural fields.
20 Bacon Island Rural Historic District appears eligible for NRHP listing for its association with early
21 20th century reclamation and agriculture relating to Japanese Americans and George Shima (a key figure
22 in Japanese American history) in particular (Maniery 1993, pp. iii, 93–94).

23 10.3.3 Delta Watershed

24 10.3.3.1 Prehistoric Setting

25 The Delta watershed extends over a large geographical area that includes a wide variety of natural
26 environments and topography and that encompasses a variety of prehistoric cultural areas, including the
27 north coastal region, the Modoc Plateau, the Sierra Nevada region, and the Central Valley region.
28 Archaeological data show that humans have inhabited California for the past 10,000–12,000 years. In part
29 because of the varied topography and climate of the state, technological adaptations to these conditions
30 vary greatly from region to region and vary over long periods. In the early 1970s, Fredrickson
31 (1973, 1974) proposed a sequence of cultural patterns for the central districts of the North Coast Ranges,
32 placing them within a framework of cultural periods that he believed were applicable to California as a
33 whole. This broad system has been refined as more information has become available through
34 archaeological excavations and explorations and through the use of new radiocarbon dates adjusted with
35 modern calibration (Rosenthal et al. 2007, pp. 147–153). These different cultural patterns are
36 characterized by:

- 37 ♦ Similar technological skills and devices (specific cultural items)
- 38 ♦ Similar economic modes (production, distribution, consumption), including especially
39 participation in trade networks and practices surrounding wealth
- 40 ♦ Similar mortuary and ceremonial practices

41 The economic and cultural component of each pattern is manifested in geographic regions according to
42 the presence of stylistically different artifact assemblages. This integrative framework provides the means
43 for discussing temporally equivalent cultural patterns across a broad geographic space.

1 In the Sacramento Valley and San Joaquin Valley, the prehistoric sequence has been described as the
2 Paleo-Indian Period (12,000–8,000 B.P.); the Lower Archaic Period (8,000–5,000 B.P.); the Middle
3 Archaic Period (5,000–3,000 B.P.); the Upper Archaic Period (3,000–1,500 B.P.); and the Emergent
4 Period, ending in the historic era.

5 Archaeological research within the Sierra Nevada and lower foothill regions over the past several decades
6 has resulted in researchers developing numerous proposed cultural periods in an attempt to trace cultural
7 and technological change during prehistory. For the Sacramento Valley and foothill regions, Lillard and
8 Purves (1936) recognized a three-part cultural sequence (Early, Middle, and Late horizons) that was
9 derived from the archaeological analysis of midden and cemetery sites in central California. This scheme
10 was later described in more detail by Lillard et al. (1939) and was later refined by Beardsley (1948,
11 1954). In an attempt to unify the various hypothesized cultural periods in California, Fredrickson (1973,
12 1974, 1993) proposed an all-encompassing scheme for cultural development while acknowledging that
13 these general trends may manifest themselves differently and that there may be variation between
14 subregions. These general cultural periods are the Late Pleistocene Period (more than 10,000 B.P.), Early
15 Holocene Pattern (ca. 10,000–7,000 B.P.), the Archaic Pattern (ca. 7,000–3,200 B.P.), the Early Sierran
16 (ca. 3,200–1,400 B.P.), the Middle Sierran (ca. 1,400–600 B.P.), and the Late Sierran (ca. 600–150 B.P.).

17 **10.3.3.2 Historical Setting**

18 **10.3.3.2.1 Northern Region**

19 The Delta watershed encompasses 28 counties in northern and central California. The northern California
20 counties, including Trinity, Siskiyou, Modoc, and Lassen, were all established during the early years of
21 statehood, between 1850 and 1874. The Gold Rush of 1849 served as a major impetus to the rapid
22 population growth throughout much of California including this region. Incoming masses of people
23 sought out the most accessible routes for safe and expedient passage to the gold fields and entered
24 California using immigrant trails, such as Nobles Trail, Lassen Trail, and Applegate Cutoff, which pass
25 through these counties. The discovery of gold and other mining activities in this region also encouraged
26 settlement and the establishment of towns such as Weaverville (1850) and Yreka (1851) in this part of the
27 state (Kyle 1990, pp. 504, 460). Today, the region is home to some of California's largest outdoor
28 recreational areas.

29 **10.3.3.2.2 Sacramento Valley**

30 Some of California's original 27 counties, such as Shasta, Butte, Colusa, Sutter, Yuba, El Dorado,
31 Calaveras, and Tuolumne, are located in the Sacramento Valley (Hart 1987, p. 61). This region was
32 settled in the mid-19th century during California's Gold Rush. Early settlers included John Bidwell,
33 owner of Rancho Chico, who operated one of the largest agricultural enterprises in the region and
34 established the town of Chico in Butte County in 1860 (Hart 1987, p. 46). Mining was also an important
35 industry in the other counties of this region and led to the development of towns such as Yuba City,
36 Marysville, Sonora, and Coloma. By the late 19th century, agricultural pursuits became more lucrative
37 than mining, and most of the Sacramento Valley was used for farming and ranching. Agriculture activities
38 remain important to this region and the economies of these counties.

39 **10.3.3.2.3 San Joaquin Valley**

40 The San Joaquin Valley was settled in the mid-1800s to late 1800s and includes Stanislaus (1854),
41 Merced (1855), and Madera (1893) counties. The development of these counties, including the cities of
42 Modesto, Merced, Atwater, and Madera, was the result of the construction of the Central Pacific Railroad
43 in 1869 (Kyle 1990, pp. 170, 203, and 492). Agriculture and ranching were important industries for the
44 San Joaquin Valley. Large landowners, such as Miller and Lux, developed extensive irrigation systems
45 that not only added value to their landholdings but encouraged this region to become one of the most
46 agriculturally rich in California. The Central Valley Project, a product of the New Deal in the 1930s, was

1 a massive irrigation project responsible for the construction of dams, reservoirs, and canal systems like
2 the Delta-Mendota Canal, which carries water from the Sacramento River south for 117 miles (Beck and
3 Haase 1974, pp. 76–77).

4 **10.3.3.3 Known Cultural Resources**

5 As described in Section 2A, Proposed Project and Alternatives, facilities could be constructed, modified,
6 or reoperated in the Delta watershed, in addition to the Delta. Agricultural, residential, and urban
7 development throughout the Delta watershed has damaged many archaeological and paleontological
8 resources. Archeological sites remain in areas that have not been fully developed. Subsurface deposits
9 also can be found in agricultural, residential, and urban areas. Hundreds of sites have been listed in these
10 areas in the NRHP and California Historical Landmarks, and California Points of Historical Interest
11 listings. These sites include historic buildings, prehistoric native American villages primarily along rivers
12 and estuarine shorelines, and historic infrastructure such as railroad structures and water supply facilities
13 in the Sacramento and San Joaquin valleys. Paleontological resources occur throughout the areas at
14 depths below historic soil disturbance.

15 **10.3.4 Areas Outside the Delta That Use Delta Water**

16 **10.3.4.1 Prehistoric Setting**

17 **10.3.4.1.1 Northern Region**

18 The northern portions of areas outside the Delta that use Delta water, such as Alameda and Santa Clara
19 Counties, have prehistoric cultural sequences generally similar to the Delta and Suisun Marsh cultural
20 sequences, although localized prehistoric cultural periods have been developed for each area. Before
21 5,500–4,500 years ago, Native American occupation of the central coast of California appears to have
22 been intermittent and sparse. Substantial evidence for early occupation along the bayshore may be lacking
23 because rising sea levels submerged sites and sedimentation buried sites as the infilling of the bay's
24 marshland occurred over the last 7,000 years (Moratto 1984).

25 Native American occupation sites appear to have been selected for their accessibility, protection from
26 seasonal flooding, and proximity to abundant and easily obtained resources. Early groups, similar to those
27 that would come later, probably focused on hunting, the gathering of vegetal resources, and the
28 procurement of shellfish. The Early Period appears to date from 7,000 to 2,500 B.P., the Middle Period
29 from 2,500 to 1,300 B.P., and the Late Period from 1,300 B.P. to anno domini (A.D.) 1800.

30 Archaeological evidence suggests an increase in occupation over time with a correlation in permanent
31 settlements with larger populations in later periods (Breschini and Haversat 1992). Changes in subsistence
32 strategies from the Early Period's hunter-gatherer mode to permanently settled villages by the Late Period
33 can be traced to improvements in technology; food storage; a focus on staple food exploitation; and an
34 increase in sociopolitical complexity, including long-distance trade networks. The general pattern shows
35 that coastal sites were focused on gathering and processing and village locations were found slightly
36 inland. Although the population became larger and more dispersed during the Late Period, Middle Period
37 sites appear to have been abandoned rather than continuously occupied (Jones and Klar 2005).

38 **10.3.4.1.2 Southern Region**

39 The southern portions of areas outside the Delta that use Delta water extend over a large geographical
40 area that includes a wide variety of natural environments and topography and that encompasses a variety
41 of prehistoric cultural areas, including the desert region, southern coastal region, and southern Central
42 Valley. The prehistoric cultural chronology of the desert areas is generally similar to that of the other
43 areas of California but is characterized by specialized technology, trade networks, and greater
44 diversification of subsistence strategies in response to more arid environments.

1 **10.3.4.2 Historical Setting**

2 **10.3.4.2.1 Southern San Joaquin Valley**

3 The counties south of Madera County also receive Delta water, and agriculture was central to the
4 development of Fresno, Kings, Tulare, and Kern counties. Commercial irrigation companies, land
5 companies, and mutual water companies stimulated water development projects between the 1860s and
6 1880s. Later, irrigation districts and county water districts assumed responsibility for creating and
7 administering irrigation systems in the region (JRP Historical Consulting Services 2000, pp. 19–22). The
8 early towns in these counties, including Fresno and Bakersfield, also benefited from the construction of
9 the railroad. Agriculture remains a major activity in this region.

10 **10.3.4.2.2 Northern Coastal Region**

11 The northern coastal counties, such as San Francisco County and Monterey County, were part of some of
12 the earliest Spanish expeditions. Monterey and San Francisco each has a presidio, and San Francisco's
13 was maintained by the United States as an active military post until the 1990s. These coastal counties
14 played an important role in the fishing and canning industry, particularly the Monterey Cannery Row,
15 which thrived in the early years of the 20th century (Kyle 1990, pp. 215, 229–230, 332).

16 **10.3.4.2.3 Southern Region**

17 The southern counties, including Santa Barbara, Los Angeles, and San Diego counties, were part of the
18 early Spanish settlement of California and were some of the first established California counties. In each
19 of these counties, missions were established and the lands were divided into large ranchos. Until the early
20 20th century, growth and development in this region was relatively slow. Growth of Los Angeles was
21 aided by construction of an interurban electric railway and the Los Angeles Aqueduct (Bean 1973,
22 pp. 280–281). Also important was the development of agriculture and its related industries, construction,
23 and a growing tourism industry, which attracted more than 1 million people to the city (Starr 2005,
24 pp. 177–178, 182). Today, Los Angeles is one of the largest cities in California. San Diego experienced
25 steady growth and in the 20th century, like Los Angeles, became a health and tourist destination. By the
26 1920s, the population had nearly doubled, largely as a result of a large military (Naval and Marine Corps)
27 presence (Starr 2005, pp. 182–183; City of San Diego 2007, pp. 23).

28 **10.3.4.3 Known Cultural Resources**

29 The discussion of known cultural resources for the Delta watershed also applies to areas outside the Delta
30 that use Delta water. The sites include historic buildings, prehistoric native American villages primarily
31 along rivers and estuarine shorelines, historic infrastructure such as railroad structures and water supply
32 facilities in the northern coastal and southern regions, and historic ports and wharfs in these regions.

33 **10.4 Impacts Analysis of Project and** 34 **Alternatives**

35 **10.4.1 Assessment Methods**

36 The Proposed Project (Delta Plan) and alternatives would not directly result in construction or operation
37 of projects or facilities and therefore would result in no direct impacts on cultural resources.

38 The Proposed Project and alternatives could result in implementation of actions or development of
39 projects, such as facilities or infrastructure, as described in Sections 2A, Proposed Project and
40 Alternatives, and 2B, Introduction to Resource Sections. Projects may include water and wastewater
41 treatment plants; conveyance facilities, including pumping plants; surface water or groundwater storage

1 facilities; ecosystem restoration projects; flood control levees; or recreation facilities. Implementation of
2 these types of actions and construction and operation of these types of facilities could result in impacts on
3 cultural resources.

4 The precise magnitude and extent of project-specific cultural resources–related impacts would depend on
5 the type of action or project being evaluated, its specific location, its total size, and a variety of
6 project- and site-specific factors that are undefined at the time of preparation of this program-level study.
7 Cultural resource impacts are largely based on the construction disturbance footprint of the activity being
8 evaluated. The precise location of the activity, therefore, must be known to evaluate more definitely the
9 potential impacts to cultural resources. This would be addressed in project-specific environmental studies
10 conducted by the lead agency proposing the projects at the time the projects are proposed for
11 implementation, because precise project details would be known then. This program-level analysis,
12 therefore, identifies generally the types of cultural resources that could be affected by the types of projects
13 the Delta Plan seeks to influence or encourage, based on the general likely locations of cultural resources
14 (e.g., along river banks) and the general likely locations of the Delta-Plan-encouraged projects
15 (e.g., levees in the Delta).

16 This Environmental Impact Report (EIR) proposes mitigation measures for cultural resources impacts.
17 The ability of these measures to reduce cultural resources impacts to less-than-significant levels depends
18 on project-specific environmental studies; enforceability of these measures depends on whether or not the
19 project being proposed is a covered action. This is discussed in more detail in Section 10.5.3.6 and in
20 Section 2B, Introduction to Resource Sections.

21 **10.4.1.1 Records Search**

22 This analysis is based on information obtained from existing documentation on the Delta, Delta
23 watershed, and areas outside the Delta that use Delta water and in which projects could be located. These
24 investigations included a records search conducted by the CHRIS; a review of materials located at the
25 California State Library, Sacramento; a review of published and unpublished literature; and coordination
26 with the Native American community.

27 The primary sources for records of previous cultural resource study areas and recorded cultural resources
28 were files maintained at the North Central Information Center, Central California Information Center, and
29 the Northwest Information Center of the CHRIS, which were reviewed for information related to the
30 Delta. The following inventories also were consulted: the NRHP (2009), the California Register of
31 Historical Resources (CRHR) (2004), the Office of Historic Preservation Historic Property Directory
32 (2005), the California Inventory of Historic Resources (1976), California State Historical Landmarks
33 (1996), California Points of Historical Interest (1992), the California Department of Transportation
34 Bridge Inventory (1987, 2000), historic U.S. Geological Survey (USGS) topographic maps, and General
35 Land Office plats. Appendix D, Regulatory Framework, describes these inventories.

36 The CHRIS was provided with relevant USGS topographic quadrangle maps with the boundaries of the
37 Delta clearly delineated. It used these maps as base maps for the records search and provided copies of
38 California Department of Parks and Recreation (DPR) Series 523 Primary Records, Archaeological Site
39 Records, other DPR forms, and additional records for cultural resources documented in the Delta. The
40 CHRIS also provided copies of historic maps, NRHP and CRHR evaluation forms, historic district
41 studies, historic inventory reports, and maps depicting the bounds of previous cultural resources
42 investigations in and immediately adjacent to the Delta.

1 The hard-copy USGS map data provided by the information centers were then digitized into geographic
2 information system format. This digitization consisted of the transfer of hand-marked archaeological site
3 locations and previous investigation boundaries into a geospatial format suitable for database
4 management, future determinations of resource locations, and development of habitat restoration
5 activities.

6 Research and review of secondary materials was also conducted at the California State Library,
7 Sacramento, and involved other published and unpublished materials. Information gathered from this
8 research was used to prepare the historic context for the region and to gain a general understanding of the
9 resource types in the Delta.

10 **10.4.1.2 Resource Types**

11 Review of existing information indicates that various resource types have been identified and documented
12 in the Delta. These include early Native American habitation, burial, and activity sites; late 19th century
13 residences, ranches, and farmplexes (typically, a small complex with a residence and agricultural-related
14 buildings); early 20th to mid-20th century residential and farm buildings, levees, canals, and other
15 water-related systems; railroad segments; commercial properties; and landscape features (e.g., trees,
16 walls, and curbs). In addition, some cultural landscapes are located in the Delta. Cultural resources do not
17 always consist of individual sites, buildings, structures, or features. They also can include landscapes,
18 including those in rural contexts, such as are found throughout the Delta region. According to the
19 National Park Service (McClelland et al. 1999), a rural historic landscape is defined as the following:

20 *a geographical area that historically has been used by people, or shaped or modified by*
21 *human activity, occupancy, or intervention, and that possesses a significant*
22 *concentration, linkage, or continuity of areas of land use, vegetation, buildings and*
23 *structures, roads and waterways, and natural features.*

24 *Rural landscapes commonly reflect the day-to-day occupational activities of people*
25 *engaged in traditional work such as mining, fishing, and various types of agriculture.*
26 *Often, they have developed and evolved in response to both the forces of nature and the*
27 *pragmatic need to make a living.*

28 **10.4.2 Thresholds of Significance**

29 Based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, an impact related
30 to cultural resources is considered significant if the Proposed Project would do any of the following:

- 31 ♦ Cause a substantial adverse change in the significance of a historical resource as defined in
32 15064.5
- 33 ♦ Cause a substantial adverse change in the significance of an archaeological resource pursuant to
34 15064.5
- 35 ♦ Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature
- 36 ♦ Disturb any human remains, including those interred outside of formal cemeteries

37 Impacts on unique paleontological resources (State CEQA Guidelines Appendix G, Section V.c)) are
38 analyzed in Section 12.

39 Public Resources Code Section 21084.1 establishes that “a project that may cause a substantial adverse
40 change in the significance of an historical resource is a project that may have a significant effect on the
41 environment.” Public Resources Code Section 21084.1 also defines a historical resource as a resource
42 listed in, or determined to be eligible for listing in, the CRHR. Section 15064.5 of the State CEQA

1 Guidelines defines a significant effect as one with the potential to cause a substantial adverse change in
2 the significance of a historical resource. “Substantial adverse change in the significance of a resource”
3 means the physical demolition, destruction, relocation, or alteration of the resource or its immediate
4 surroundings such that the significance of the resource would be materially impaired. The significance of
5 a historical resource is materially impaired when a project would result in demolition or material
6 alteration in an adverse manner of those physical characteristics of a resource that (1) convey its historical
7 significance and justify its inclusion in, or eligibility for inclusion in, the CRHR; (2) account for its
8 inclusion in a local register of historical resources pursuant to Public Resources Code 5020.1(k) or its
9 identification in a historical resources survey meeting the requirements of Public Resources Code
10 5024.1(g), unless the public agency reviewing the effects of the project establishes by a preponderance of
11 evidence that the resource is not historically or culturally significant; or (3) convey its historical
12 significance and justify its eligibility for inclusion in the CRHR as determined by a lead agency for
13 purposes of CEQA (California Code of Regulations Section 15064.5[b]).

14 CEQA requires lead agencies to use specific criteria in evaluating the significance of historical resources
15 potentially affected by a proposed project. The criteria required under CEQA are the same as the CRHR
16 significance criteria discussed under “California Register of Historical Resources” in Appendix D of this
17 EIR.

18 The following discussion of environmental impacts is limited to those potential impacts that could result
19 in some level of potentially significant environmental change, as defined by CEQA. As individual
20 projects are proposed, these individual projects will need to be evaluated in site-specific environmental
21 documents prepared by their lead agencies.

22 10.4.3 Proposed Project

23 10.4.3.1 *Reliable Water Supply*

24 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
25 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
26 implemented under the direct authority of the Delta Stewardship Council (Council). However, the Delta
27 Plan seeks to improve water supply reliability by encouraging various actions that, if taken, could lead to
28 completion, construction, and/or operation of projects that could provide a more reliable water supply.
29 Such projects and their features could include the following:

- 30 ♦ Surface water projects (water intakes, treatment and conveyance facilities, reservoirs)
- 31 ♦ Groundwater projects (wells, wellhead treatment, conveyance facilities)
- 32 ♦ Ocean desalination projects (water intakes, brine outfalls, treatment and conveyance facilities)
- 33 ♦ Recycled wastewater and stormwater projects (treatment and conveyance facilities)
- 34 ♦ Water transfers
- 35 ♦ Water use efficiency and conservation program implementation
- 36 ♦ Hydroelectric generation (e.g., powerhouse, transmission lines)

37 The number and location of all potential projects that would be implemented are not known at this time.
38 Three possible projects, however, are known to some degree and are named in the Delta Plan: the North
39 of Delta Offstream Storage Investigation (aka Sites Reservoir), Los Vaqueros Reservoir Project (Phase 2),
40 and Upper San Joaquin River Basin Storage Investigation Plan (aka Temperance Flat). Of these three, the
41 Los Vaqueros Reservoir Project has undergone project-specific environmental review (Los Vaqueros
42 Reservoir Expansion Environmental Impact Statement/Environmental Impact Report [EIS/EIR])
43 (Reclamation et al. 2009). The Delta Plan also refers to California Department of Water Resources
44 (DWR) Bulletin 118. The bulletin presents a list of 10 recommendations for the management of
45 groundwater but does not result in a specific project the construction or operation of which could affect
46 cultural resources; therefore, Bulletin 118 is not evaluated in this section.

1 10.4.3.1.1 Impact 10-1a: Disturbance or Destruction of Prehistoric and Historic-Era Archaeological 2 Resources

3 Construction-related activities at construction sites for treatment plants, surface water and groundwater
4 storage facilities, conveyance facilities (intakes, canals, pipelines, tunnels, siphons, and pumping plants),
5 and groundwater wells, could require the use of heavy equipment, such as excavators, graders, scrapers,
6 bulldozers, backhoes, and concrete mixing and pumping trucks. The facilities could be located in the
7 Delta, in the Delta watershed, or in areas outside the Delta that use Delta water, as described in
8 Section 2A, Proposed Project and Alternatives.

9 The CHRIS record search identified approximately 276 prehistoric archaeological resources in the Delta,
10 including habitation locales, burial sites, and isolated artifacts. Prehistoric archaeological resources tend
11 to be concentrated along water courses or in the vicinity of wetlands, where diverse natural resources and
12 water transportation routes were abundant and readily accessible to early Native American peoples. These
13 areas would generally be where activities in the Delta watershed or areas outside the Delta that use Delta
14 water would be most likely to encounter archaeological resources.

15 In addition, specific soil types are known to be highly sensitive for containing prehistoric archaeological
16 deposits. In the Delta, these soils consist of the Piper series (Piper fine sandy loam, Piper loamy sand, and
17 Piper sandy loam [partially drained]). Before reclamation of Delta lands started in the mid-19th century,
18 these Piper formations represented high, well-drained ground in an otherwise wet and, at best, marginally
19 habitable landscape. These formations have been noted on the present-day Bouldin Island, Brentwood,
20 Clifton Court Forebay, Jersey Island, and Woodward island USGS topographic quadrangle maps.

21 In addition to prehistoric sites, features, and artifacts, archaeological sites dating to the historic era may
22 also be found in the Delta, the Delta watershed, and areas outside the Delta that use Delta water. In the
23 Delta, these could include subsurface building and structural remains, artifact scatters, and features
24 associated with early Euro-American activities dating to the early to middle decades of the 19th century.
25 Although few such resources have been documented in the Delta by the CHRIS records search, and
26 although extensive land reclamation activities may have destroyed such properties, some may still exist in
27 relatively undisturbed contexts potentially subject to future development-related disturbances.

28 Construction of water control and supply facilities, and inundation of land as part of water storage
29 projects, have the potential to disturb or destroy prehistoric archaeological resources that have been or
30 could be identified through additional archival research and field surveys. In addition, project-related
31 ground-disturbing activities have the potential to uncover prehistoric archaeological resources not
32 documented in archival sources or identified during field surveys.

33 The extent and intensity of effects on prehistoric and historic-era archaeological resources in the Delta
34 would depend on the size and placement of facilities and restoration activities. A wide range of potential
35 effects could occur based on the proposed variability in water intake. Larger and more numerous facilities
36 such as intakes would, solely by virtue of their larger development footprint, be more likely to affect
37 archaeological resources. Greater degrees of water conveyance capacity would entail the construction of a
38 larger number of intakes and support facilities, contributing to larger construction footprints on riverbanks
39 that are known to be more sensitive for containing archaeological resources than areas outside the riparian
40 corridor. In addition, the placement of in-channel structures has the potential to affect archaeologically
41 sensitive riverbanks where prehistoric sites are more likely to be present. River channels can also contain
42 archaeological resources such as mid-19th-century shipwrecks (several of which are known to be present
43 in the Delta) that would be subject to degrees of disturbance or destruction varying according to increases
44 in development footprints associated with additional intakes and higher conveyance capacities.

1 It is unclear at this time how implementation of the Proposed Project would result in specific construction
2 activities, including the location, number, capacity, methods, and duration of construction activities.
3 However, the Delta Plan encourages at least to some degree implementation of the North of Delta
4 Offstream Storage Investigation, Los Vaqueros Reservoir Project (Phase 2), and the Upper San Joaquin
5 River Basin Storage Investigation Plan. These are possible new or expanded surface water storage
6 facilities.

7 The Los Vaqueros EIS/EIR provides analogous information about the impacts expected from construction
8 of the other projects, which are similar to the Los Vaqueros Project. In addition, the project-specific EIR
9 for another surface storage project (not named in the Delta Plan)—the Calaveras Dam Replacement
10 Project (SFPUC 2011)—also provides analogous information. The Los Vaqueros Reservoir Expansion
11 EIS/EIR (Reclamation et al. 2009) found that the project could adversely impact archaeological resources
12 due to ground disturbance (particularly from buried facilities such as pipelines) but that these impacts
13 could be reduced by relocating certain project components to avoid those impacts, implementing a data
14 recovery plan consistent with State law and guidelines of the U.S. Secretary of Interior, and implementing
15 a construction monitoring plan with a qualified archeologist.

16 Although not named in the Delta Plan, the following projects, based on a review of their project-specific
17 EIRs, are illustrative of the types of cultural resource impacts associated with water supply reliability
18 projects: the Davis-Woodland Water Supply Project (City of Davis et al. 2007), which includes a water
19 intake in the Sacramento River, pumping plants, and conveyance and water treatment facilities; the
20 Huntington Beach Seawater Desalination Project (City of Huntington Beach 2005) and the Carlsbad
21 Precise Development Plan and Desalination Plant Project (City of Carlsbad 2005), both of which illustrate
22 some of the likely short-term impacts of constructing seawater desalination plants; and the Western
23 Municipal Water District (WMWD) Riverside-Corona Feeder Pipeline Project (WMWD and
24 Reclamation 2011), which includes the installation of a 28-mile-long underground pipeline and
25 groundwater treatment, water storage, and pumping facilities. These EIRs, like the Los Vaqueros EIR,
26 concluded that ground disturbance activities could adversely affect archaeological resources including not
27 previously identified archeological resources, but that these impacts could be reduced by stopping
28 construction if a resource is encountered, identifying the archeological resources, evaluating its
29 significance, relocating project components if possible, assessing project effects if relocation is not
30 possible, and treating the effects.

31 Review of these environmental documents provides information helpful to understanding how Delta
32 Plan–encouraged projects for which there are no project-specific details or associated reviews (except Los
33 Vaqueros) might affect archaeological resources. Project-level impacts would be addressed in future
34 site-specific environmental analysis conducted at the time such projects are proposed by lead agencies.
35 However, because named projects and projects encouraged by the Delta Plan could result in changes to
36 significant prehistoric archaeological resources through the destruction or damage of the data potential
37 retained by significant prehistoric archaeological resources (CRHR Criterion D), this potential impact is
38 considered **significant**.

39 10.4.3.1.2 Impact 10-2a: Discovery of Unrecorded Human Remains

40 Construction-related activities at construction sites for treatment plants, surface water and groundwater
41 storage facilities, conveyance facilities (intakes, canals, pipelines, tunnels, siphons, and pumping plants),
42 and groundwater wells, could require the use of heavy equipment, such as excavators, graders, scrapers,
43 bulldozers, backhoes, and concrete mixing and pumping trucks. The facilities could be located in the
44 Delta, in the Delta watershed, or in areas outside the Delta that use Delta water, as described in
45 Section 2A, Proposed Project and Alternatives.

1 The CHRIS records search results indicate that numerous early Native American human interments have
2 been documented in the Delta, and interments are also likely to be present in the Delta watershed or areas
3 outside the Delta that use Delta water. California law recognizes the need to protect historic-era and
4 Native American human burials, skeletal remains, and items associated with Native American interments
5 from vandalism and inadvertent destruction. The procedures for the treatment of Native American human
6 remains are described in California Health and Safety Code sections 7050.5 and 7052 and in California
7 Public Resources Code section 5097.

8 Analyses of projects exhibiting representative characteristics and similar types of impacts
9 (Davis-Woodland Water Supply Project EIR, Huntington Beach Seawater Desalination Project EIR,
10 Carlsbad Precise Development Plan and Desalination Plant Project EIR, Western Municipal Water
11 District Riverside-Corona Feeder Pipeline Project EIR; see section 10.4.3.1.1) found that the impacts on
12 unrecorded human remains that may be associated with the construction and operation of surface water
13 storage, intake structures, pumping plants, conveyance, water treatment facilities, seawater desalination
14 plants, underground pipeline and groundwater treatment had the potential for significant impacts on
15 human remains. However, these impacts were less than significant with mitigation through appropriate
16 investigation, consultation (with the Native American Heritage Commission (NAHC), if necessary), and
17 management. Project-level impacts would be addressed in future site-specific environmental analysis
18 conducted at the time such projects are proposed by lead agencies. However, because human remains
19 could be unearthed during project construction, this potential impact is considered **significant**.

20 10.4.3.1.3 Impact 10-3a: Disturbance or Destruction of Historic Buildings, Structures, and Linear 21 Features

22 Construction-related activities at construction sites for treatment plants, surface water and groundwater
23 storage facilities, conveyance facilities (intakes, canals, pipelines, tunnels, siphons, and pumping plants),
24 and groundwater wells, could require the use of heavy equipment, such as excavators, graders, scrapers,
25 bulldozers, backhoes, and concrete mixing and pumping trucks. The facilities could be located in the
26 Delta, in the Delta watershed, or in areas outside the Delta that use Delta water, as described in
27 Section 2A, Proposed Project and Alternatives.

28 Existing documentation identifies numerous known historic-era (50 years old or older) buildings,
29 structures, and linear features such as levees and canals in the affected areas, especially in the northern
30 part of the Delta, including the older historic-era communities of Clarksburg, Courtland, Hood, Locke,
31 Walnut Grove, Ryde, and Freeport. Resources in the Delta and Suisun Marsh typically date from the
32 mid-19th to late 19th century to the early to mid-20th century.

33 In the Delta, but also in the Delta watershed and areas outside the Delta that use Delta water, a denser
34 concentration of historic-period resources, such as residences, farmplexes, and commercial or industrial
35 buildings, is generally found near established towns, whereas the more rural regions tend to include
36 numerous linear features in addition to farmplexes. Areas with a higher concentration of historic-era
37 buildings and structures will also have a higher percentage of NRHP- or CRHR-eligible properties,
38 thereby making these areas, in general, more sensitive to land-disturbing activities. The historic-era towns
39 may also include historic districts or groups of buildings eligible for listing in the NRHP or CRHR
40 (for example, the town of Locke is an NRHP historic district).

41 Proposed activities occurring in areas with denser concentrations of historic-era resources (such as the
42 established communities mentioned above) would in turn have a higher potential to affect eligible
43 resources. Implementation of the Delta Plan could result in changes to eligible cultural resources through
44 the removal or alteration of those physical characteristics of an eligible property that convey its historical
45 significance (character-defining features). An eligible property can include an individual building or
46 structure, group of buildings, a neighborhood, or a town (e.g., Locke). Alterations could materially impair
47 the resource's significance, so the potential impact would be **significant**.

1 Construction of water control and supply facilities and inundation of land have a high potential to harm or
2 destroy any historic buildings, structures, and linear features located in the area where such facilities or
3 inundation would occur. The installation of conveyance facilities could involve the construction of intakes
4 and water management facilities with the potential to damage historic structures and features.

5 Construction activity associated with conveyance facilities, including pile driving, has the potential to
6 cause vibration that could physically damage or alter nearby historic buildings and structures or linear
7 features.

8 It is also possible that new structures associated with the Proposed Project, such as water control and
9 supply facilities, could be constructed in the immediate vicinity of historic buildings and structures.
10 Alterations to the general setting of resources eligible for listing in the NRHP and CRHR could also result
11 in a potential impact if they would impair the character-defining features of those resources, including
12 existing viewsheds.

13 Analyses of projects exhibiting representative characteristics and similar types of impacts
14 (see Section 10.4.3.1.1) found that the construction and operation of surface water storage and water
15 supply projects had the potential for significant impacts on historical buildings, structures, or linear
16 features. The City of Davis avoided significant impacts to historical linear features by employing jack and
17 bore installation of pipelines. The City of Huntington Beach did not find any historic structures during its
18 study, whereas the City of Carlsbad did. The City of Carlsbad grouped prehistoric, historic, and human
19 remains together under the nomenclature cultural resources and determined that the mitigation measures
20 would be the same for all of these resources. It concluded that with the mitigation previously described,
21 impacts would be reduced to a less-than-significant level. The Western Municipal Water District made
22 the same finding as the City of Carlsbad. Impacts were either less than significant or less than significant
23 with mitigation through similar mitigation measures as those summarized in Section 10.4.3.1.1.

24 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
25 time such projects are proposed by lead agencies. However, because named projects and projects
26 encouraged by the Delta Plan could result in changes to character-defining features of resources eligible
27 for listing in the NRHP and CRHR through destruction or damage, this potential impact is considered
28 **significant**.

29 10.4.3.1.4 Impact 10-4a: Disturbance or Destruction of Cultural Landscapes and Traditional 30 Cultural Properties

31 Construction-related activities at construction sites for treatment plants, surface water and groundwater
32 storage facilities, conveyance facilities (intakes, canals, pipelines, tunnels, siphons, and pumping plants),
33 and groundwater wells, could require the use of heavy equipment, such as excavators, graders, scrapers,
34 bulldozers, backhoes, and concrete mixing and pumping trucks. The facilities could be located in the
35 Delta, in the Delta watershed, or in areas outside the Delta that use Delta water, as described in
36 Section 2A, Proposed Project and Alternatives.

37 Cultural landscapes, including subtle alterations of the natural landscape by social or cultural groups, are
38 considered cultural resources and are protected under existing law and regulations. Several identifiable
39 cultural landscapes exist in the Delta region (e.g., Bacon Island and Montezuma Slough Rural Historic
40 Landscape). These landscapes typically include agriculture-related buildings and structures dating to the
41 early 20th century and typify the large-scale agricultural enterprises that were once common to the region.
42 Considering the agricultural nature of much of the land in the Delta, it is likely that unrecorded cultural
43 landscapes exist in the area and retain sufficient important historical associations and integrity to be
44 eligible for NRHP or CRHR listing. In addition to identified cultural landscapes, traditional cultural
45 properties may also be present. A traditional cultural property is a property or site that is eligible for
46 inclusion in the NRHP or CRHR because of its association with cultural practices or the beliefs of a living

1 community that are rooted in that community's history and are important to maintaining the continuing
2 cultural identity of the community. Although the visual characteristics of identifiable cultural landscapes
3 in the Delta watershed and areas outside the Delta that use Delta water would differ from those in the
4 Delta, both cultural landscapes and traditional cultural properties are also identified in these areas.

5 Construction of water supply facilities, including intakes and water conveyance facilities, has the
6 potential to result in the alteration or removal of character-defining features of a cultural landscape that
7 has been or could be identified through research and field survey. These structures could compromise or
8 alter the character-defining features of cultural landscapes, which often include the visual and auditory
9 settings. Alterations to the general setting of resources eligible for listing in the NRHP and CRHR would
10 be a significant impact. A larger footprint of activities encouraged by the Delta Plan activities would in
11 turn have a higher probability of affecting cultural landscapes.

12 Analyses of projects exhibiting representative characteristics and similar types of impacts
13 (see Section 10.4.3.1.1) found that the construction and operation of surface water storage and water
14 supply projects had the potential for significant impacts on cultural landscapes. Only the Western
15 Municipal Water District found cultural landscapes to be an issue to be evaluated. These impacts were
16 less than significant with mitigation through similar mitigation measures as summarized in
17 Section 10.4.3.1.1, particularly avoidance.

18 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
19 time such projects are proposed by their lead agencies. However, because named projects and projects
20 encouraged by the Delta Plan could result in alterations to the general setting of listing in the NRHP and
21 CRHR in a way that materially impairs the significance of the landscape, this potential impact is
22 considered **significant**.

23 *10.4.3.2 Delta Ecosystem Restoration*

24 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
25 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
26 implemented under the direct authority of the Council. However, the Delta Plan seeks to improve the
27 Delta ecosystem by encouraging various actions and projects that, if taken, could lead to completion,
28 construction, and/or operation of projects that could improve the Delta ecosystem.

29 Features of such projects and actions that could be implemented as part of efforts to restore the Delta
30 ecosystem include the following:

- 31 ♦ Floodplain restoration
- 32 ♦ Riparian restoration
- 33 ♦ Tidal marsh restoration
- 34 ♦ Ecosystem stressor management (e.g., continuation of ongoing programs managing pesticide
35 runoff, water quality, water flows)
- 36 ♦ Invasive species management (including removal of invasive vegetation)

37 The number and location of all potential projects that would be implemented are not known at this time.
38 The following restoration areas, projects, and programs, however, are known to various degrees and are
39 named in the Delta Plan:

- 40 ♦ Cosumnes River-Mokelumne River Confluence: North Delta Flood Control and Ecosystem
41 Restoration Project

- 1 ♦ Suisun Marsh Habitat Management, Preservation, and Restoration Plan (includes Hill Slough
- 2 Restoration Project)
- 3 ♦ Cache Slough Complex (includes Prospect Island Restoration Project)
- 4 ♦ Yolo Bypass
- 5 ♦ Lower San Joaquin River Bypass Proposal
- 6 ♦ Water Quality Control Plan Update for the San Francisco Bay/Sacramento–San Joaquin Delta
- 7 Estuary (water flow objectives update)
- 8 ♦ Delta Conservancy Strategic Plan
- 9 ♦ Variance of the U.S. Army Corps of Engineers’ (USACE’s) Vegetation Policy
- 10 ♦ California Department of Fish and Game’s (DFG’s) Stage Two Actions for Nonnative Invasive
- 11 Species included in the Ecosystem Restoration Plan for the Sacramento-San Joaquin Bay Delta.

12 Of these, the North Delta Flood Control and Ecosystem Restoration Project (North Delta Flood Control
13 and Ecosystem Restoration Project EIR) (DWR 2010) and the Suisun Marsh project (Suisun Marsh
14 Habitat Management, Preservation, and Restoration Plan Draft EIS/EIR (Reclamation et al. 2010) have
15 undergone project-specific environmental review.

16 The Proposed Project encourages the State Water Resources Control Board (SWRCB) to update the
17 Water Quality Control Plan Update for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and
18 develop, implement, and enforce updated flow requirements for the Delta and high-priority tributaries in
19 the Delta watershed that are necessary to achieve coequal goals. As described in Section 2A, Proposed
20 Project and Alternatives, these actions likely would result in a more natural flow regime in the Delta and
21 Delta tributaries, and reduced export of water from the Delta. Water users in the areas outside the Delta
22 that use Delta water would likely respond to reduced supplies by constructing facilities to improve water
23 supply reliability and improve water quality. The cultural resources impacts associated with these actions
24 would be the same as those described above in Section 10.4.3.1 (Reliable Water Supply) and
25 Section 10.4.3.3 (Water Quality Improvement) below.

26 The Delta Conservancy Strategic Plan is anticipated to provide a framework that would facilitate
27 ecosystem restoration in the Delta. The general impacts associated with the ecosystem restoration that
28 could result from that planning process are described below.

29 The impacts associated with obtaining a variance to the USACE Vegetation Policy are described in
30 Section 10.4.3.4 (Flood Risk Reduction).

31 DFG’s Stage Two Actions for Nonnative Invasive Species (DFG 2011) identifies six actions for
32 preventing the establishment of additional nonnative invasive species and reduce their economic and
33 ecological impacts. These actions focus on monitoring, study, and coordination, and encouragement of
34 the continuation of these actions would not represent a physical change relative to existing conditions that
35 could impact cultural resources.).

36 **10.4.3.2.1 Impact 10-1b: Disturbance or Destruction of Prehistoric and Historic-era Archaeological** 37 **Resources**

38 Construction-related activities at construction sites for ecosystem restoration areas, including the projects
39 identified in Section 10.4.3.2, could require the use of heavy equipment, such as excavators, graders,
40 scrapers, bulldozers, and backhoes. The facilities would be located in the Delta.

1 Because the mechanism for this impact is ground-disturbing activities, generally construction activities,
2 the effects of Delta ecosystem restoration projects related to the disturbance or destruction of prehistoric
3 and historic-era archaeological resources would be generally similar to those described for water supply
4 projects in Section 10.4.3.1.1.

5 In addition to the effects similar to those described in Section 10.4.3.1.1, restoration activities would
6 allow for the permanent or seasonal flooding of presently reclaimed lands that were created during the
7 latter decades of the 19th century and the early years of the 20th century to reduce seasonal inundation. In
8 general, many of the presently reclaimed lands did not exist before extensive levee construction, or they
9 were inundated seasonally or by tidal action on a routine basis. As a result, many of these areas were not
10 suited for habitation by early Native American peoples or by Euro-Americans, and archaeological
11 remains dating before reclamation activities are virtually nonexistent in many parts of the Delta.

12 However, isolated landforms that were not historically inundated for long periods and that
13 characteristically exhibit traces of prehistoric occupation are present, especially in the southern Delta. In
14 addition, relatively early historic-era archaeological resources (before the beginning of large-scale Delta
15 reclamation efforts starting in the 1870s) may be found on other areas of relatively high ground or along
16 riverbanks and at town sites that were the focus of intensive commercial and transportation activities and
17 settlements. Named projects or projects encouraged by the Delta plan could affect these archaeological
18 resources.

19 The Delta Plan encourages implementation of several ecosystem restoration projects, including the
20 Cosumnes River-Mokelumne River Confluence: North Delta Flood Control and Ecosystem Restoration
21 Project; Suisun Marsh Habitat Management, Preservation, and Restoration Plan; Cache Slough Complex
22 Project; Yolo Bypass Project; and the Lower San Joaquin River Bypass Proposal. It is not known at this
23 time what specific activities would occur that could affect cultural resources. Two of the named projects
24 have undergone project-level environmental reviews. These projects are the Suisun Marsh Habitat
25 Management, Preservation, and Restoration Plan (a project encouraged by the Delta Plan) and North
26 Delta Flood Control and Ecosystem Restoration Project.

27 Documents reviewed for potential impacts included the final EIR for the North Delta Flood Control and
28 Ecosystem Restoration Project (DWR 2010), which analyze proposed flood management and ecosystem
29 restoration projects in the Delta, and the Suisun Marsh Habitat Management, Preservation, and
30 Restoration Plan EIS/EIR (Reclamation et al. 2010), which addressed ecosystem restoration in the Suisun
31 Marsh.

32 Both the North Delta EIR and Suisun Marsh EIS/EIR concluded that construction, removal, and
33 degrading/modification of levees and other improvements and facilities for ecosystem restoration could
34 have a significant impact on archeological resources because such activities would likely result in the
35 destruction of historic archaeological sites and subsurface deposits that had not yet been evaluated but
36 could contain archeological resources. Depending on the options available for feasible mitigation (such as
37 avoidance, reduction in ground-disturbing activities, investigation and documentation of archeological
38 resources prior to destruction), the North Delta and Suisun Marsh documents found most impacts after
39 mitigation could be reduced to less than significant. However, some impacts remained significant and
40 unavoidable even after mitigation (for example, due to the infeasibility of investigating all deposits that
41 could contain archeological resources but had not yet been evaluated prior to their disturbance).

42 For other named projects where an environmental impact analysis has not been prepared, it is expected
43 that this impact analysis provides a reasonable and representative analysis of potential effects that would
44 occur if the projects encouraged by the Delta Plan were implemented.

1 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
2 time such projects are proposed by their lead agencies. However, because named projects and projects
3 encouraged by the Delta Plan could result in changes to significant prehistoric archaeological resources
4 through the destruction or damage of the data potential retained by significant prehistoric archaeological
5 resources (CRHR Criterion D), this potential impact is considered **significant**.

6 10.4.3.2.2 Impact 10-2b: Discovery of Unrecorded Human Remains

7 Construction-related activities at construction sites for ecosystem restoration areas, including the projects
8 identified in Section 10.4.3.2, could require the use of heavy equipment, such as excavators, graders,
9 scrapers, bulldozers, and backhoes. The facilities would be located in the Delta.

10 Because the mechanism for this impact is ground-disturbing activities, generally construction activities,
11 the effects of Delta ecosystem restoration projects related to the discovery of unrecorded human remains
12 would be generally similar to those described for water supply projects in Section 10.4.3.1.2.

13 The CHRIS records search results indicate that numerous early Native American human interments have
14 been documented in the Delta. California law recognizes the need to protect historic-era and Native
15 American human burials, skeletal remains, and items associated with Native American interments from
16 vandalism and inadvertent destruction. The procedures for the treatment of Native American human
17 remains are described in California Health and Safety Code sections 7050.5 and 7052 and in California
18 Public Resources Code section 5097.

19 Although the details of many of the aspects of named projects and projects encouraged by the Delta Plan
20 are not known, based on the analyses presented in the example documents identified previously, it is
21 likely that the cultural resources impacts of projects encouraged by the Delta Plan could be mitigated to a
22 less-than-significant level. Both the North Bay and Suisun Marsh EIRs found potential impacts on
23 unrecorded human remains to be significant for reasons similar to those summarized in
24 Section 10.4.3.2.1, but that could be mitigated to less than significant in most instances.

25 For other named projects where an environmental impact analysis has not been prepared, it is expected
26 that this impact analysis of the Delta Plan provides a reasonable analysis of potential effects that would
27 occur if the projects were implemented.

28 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
29 time such projects are proposed by lead agencies. However, because human remains could be unearthed
30 during project construction, this potential impact is considered **significant**.

31 10.4.3.2.3 Impact 10-3b: Disturbance or Destruction of Historic Buildings, Structures, and Linear 32 Features

33 Construction-related activities at construction sites for ecosystem restoration areas, including the projects
34 identified in Section 10.4.3.2, could require the use of heavy equipment, such as excavators, graders,
35 scrapers, bulldozers, and backhoes. The facilities would be located in the Delta.

36 Because the mechanisms for this impact are ground-disturbing activities, generally construction activities,
37 activities that require the alteration or removal of buildings or structures, or activities that alter the context
38 of historic resources the effects of Delta ecosystem restoration projects related to the disturbance or
39 destruction of historic buildings, structures, and linear features would be generally similar to those
40 described for water supply projects in Section 10.4.3.1.3. Although many ecosystem restoration projects
41 are not likely be located where historic buildings or structures would be affected, it is possible that some
42 projects could impact these historic resources because most ecosystem restoration (except in the Suisun
43 Marsh) will occur on lands currently designated and used for agriculture. Many agricultural areas contain
44 houses, barns, walls and fences, storage and processing facilities, and other buildings and structures that
45 could qualify as historic sites or buildings under State and federal guidelines.

1 The details of many of the aspects of named projects and projects encouraged by the Delta Plan are not
2 known, based on the analyses presented in the example documents identified previously. Both the North
3 Bay and Suisun Marsh EIRs found potentially significant impacts related to disturbance or destruction of
4 historic buildings, structures, and linear features because of modifications to historic levees and sloughs.
5 DWR found that impacts could be reduced by implementing the mitigation measures described in
6 Section 10.4.3.1.1 (identifying the historic resources, evaluating its significance, relocating project
7 components if possible, assessing project effects if relocation is not possible, and treating the effects). The
8 Suisun Marsh EIR concluded impacts on Montezuma Slough would remain significant and unavoidable
9 because ground disturbance caused by the project would permanently alter one of its defining
10 characteristics.

11 For other named projects where an environmental impact analysis has not been prepared, it is expected
12 that this impact analysis provides a reasonable and representative analysis of potential effects on historic
13 resources that would occur if the projects encouraged by the Delta Plan were implemented.

14 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
15 time such projects are proposed by lead agencies. However, because named projects and projects
16 encouraged by the Delta Plan could result in changes to character-defining features of resources eligible
17 for listing in the NRHP and CRHR through destruction or damage, this potential impact is considered
18 **significant**.

19 10.4.3.2.4 Impact 10-4b: Disturbance or Destruction of Cultural Landscapes and Traditional 20 Cultural Properties

21 Construction-related activities at construction sites for ecosystem restoration areas, including the projects
22 identified in Section 10.4.3.2, could require the use of heavy equipment, such as excavators, graders,
23 scrapers, bulldozers, and backhoes. The facilities would be located in the Delta.

24 Because the mechanism for this impact is ground-disturbing activities, generally construction activities or
25 operational changes that affect the surrounding landscape, the effects of Delta ecosystem restoration
26 projects that may cause the disturbance or destruction of cultural landscapes and traditional cultural
27 properties would be generally similar to those described for water supply projects in Section 10.4.3.1.3.
28 This disturbance would most likely occur where working (agricultural) landscapes contribute to the
29 history and culture of communities in the Delta. Disturbance could occur to landscape features such as
30 mature vineyards or orchards; farmhouses, other buildings, walls and fences, and other structures
31 associated with the landscape; and other prominent features resulting from human activity that shape the
32 cultural character of the area.

33 Construction at restoration areas has the potential to result in the alteration or removal of
34 character-defining features of a cultural landscape that has been or could be identified through research
35 and field survey. The visual changes associated with changes in land cover could compromise or alter the
36 character-defining features of cultural landscapes, which often include the visual and auditory settings.

37 Both the North Bay and Suisun Marsh EIRs found potentially significant impacts related to disturbance or
38 destruction of cultural landscapes and traditional cultural properties because ground disturbance related to
39 the Suisun Marsh Restoration Project would damage the Montezuma Slough Rural Historic Landscape
40 and Mein's Landing. In the case of the Suisun Marsh Restoration Project, mitigation could not reduce the
41 significance of the impact to a less-than-significant level because the ground disturbance would
42 permanently alter the landscape's defining characteristics.

43 For other named projects where an environmental impact analysis has not been prepared, it is expected
44 that this impact analysis provides a reasonable and representative analysis of potential effects that would
45 occur if the projects the Delta Plan would encourage were implemented.

1 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
2 time such projects are proposed by their lead agencies. However, because named projects and projects
3 encouraged by the Delta Plan could result in alterations to the general setting of resources eligible for
4 listing in the NRHP and CRHR in a way that materially impairs the significance of the landscape, this
5 potential impact is considered **significant**.

6 ***10.4.3.3 Water Quality Improvement***

7 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
8 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
9 implemented under the direct authority of the Council. However, the Delta Plan seeks to improve water
10 quality by encouraging various actions and projects that, if taken, could lead to completion, construction,
11 and/or operation of projects that could improve water quality.

12 Features of such actions and projects that could be implemented as part of efforts to improve water
13 quality include the following:

- 14 ♦ Water treatment plants
- 15 ♦ Conveyance facilities (pipelines, pumping plants)
- 16 ♦ Wastewater treatment and recycle facilities
- 17 ♦ Municipal stormwater treatment facilities
- 18 ♦ Agricultural runoff treatment (eliminate, capture and treat/reuse)
- 19 ♦ Wellhead treatment facilities
- 20 ♦ Wells (withdrawal, recharge, and monitoring)

21 The number and location of all potential actions and projects that would be implemented are not known at
22 this time. Various projects, however, are known to varying degrees and are named in the Delta Plan:

- 23 ♦ North Bay Aqueduct Alternative Intake Project
- 24 ♦ Central Valley Drinking Water Policy
- 25 ♦ Central Valley Pesticide Total Maximum Daily Load and Basin Plan Amendment for diazinon
26 and chlorpyrifos (regulatory processes, research, and monitoring)
- 27 ♦ Central Valley Pesticide Total Maximum Daily Load and Basin Plan Amendment for pyrethroids
28 (regulatory processes, research, and monitoring)
- 29 ♦ Total Maximum Daily Load and Basin Plan Amendments for selenium and methylmercury
30 (regulatory processes, research, and monitoring)
- 31 ♦ Water Quality Control Plan Update for the San Francisco Bay/Sacramento-San Joaquin Delta
32 Estuary (water flow objectives update)
- 33 ♦ SWRCB/Central Valley Regional Water Quality Control Board Strategic Workplan
- 34 ♦ Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS)

35 Of these named projects/actions, only the North Bay Aqueduct Project and the CV-SALTS effort would
36 involve construction and/or operation of facilities that could have impacts on cultural resources. The
37 remaining six are programs, policies, or studies that would not result in a specific project, the construction
38 or operation of which, could impact cultural resources; therefore, these programs, policies, and studies are
39 not evaluated in this section.

1 10.4.3.3.1 Impact 10-1c: Disturbance or Destruction of Prehistoric and Historic-Era Archaeological 2 Resources

3 Construction-related activities for the types of water quality improvement actions/projects listed in
4 Section 10.4.3.3 are similar to the construction-related activities listed for reliable water supply actions
5 (Section 10.4.3.1). Construction-related activities at construction sites for water quality improvement
6 projects, including projects identified in Section 10.4.3.3 and water treatment plants, pipelines,
7 wastewater treatment plants, stormwater treatment facilities, and agricultural runoff treatment could
8 require the use of heavy equipment, such as excavators, graders, scrapers, bulldozers, backhoes, and
9 concrete mixing and pumping trucks. The facilities would be located in the Delta, the Delta watershed,
10 and areas outside the Delta that use Delta water, as described in Section 2A, Proposed Project and
11 Alternatives.

12 Because the mechanism for this impact is ground-disturbing activities, generally construction activities,
13 the effects of water quality improvement projects related to the disturbance or destruction of prehistoric
14 and historic-era archaeological resources would be generally similar to those described for water supply
15 projects in Section 10.4.3.1.1.

16 It is unclear at this time how implementation of the Proposed Project would result in specific activities,
17 including the location, number, methods, and duration of construction activities. However, water quality
18 projects could be located in areas with deposits known to contain prehistoric or archeological resources or
19 in areas with similar deposits not yet evaluated but with the potential to contain such resources.

20 The Delta Plan encourages implementation of the North Bay Aqueduct Alternative Intake Project and the
21 CV-SALTS effort. CV-SALTS would result in the construction of new wastewater treatment facilities.
22 The new North Bay Alternative Intake Structure serves the purpose of meeting CV-SALTS and water
23 discharge requirements. The new alternative intake structure would be located on the Sacramento River in
24 a rural area of Sacramento or Yolo County, and the new pipeline would extend from the new intake
25 structure to the existing North Bay Regional Water Treatment Plant. The diversion/intake structure and
26 water conveyance pipeline are similar to those associated with the Davis-Woodland Water Supply
27 Project, which while not named in the Delta Plan nevertheless provides analogous information and has
28 undergone project-specific environmental review. The Grasslands Bypass Project also provides analogous
29 information because it included continuing operation of a water treatment plant and various drainage,
30 pumping, and conveyance facilities with possible expansion and construction of new facilities, including
31 subsurface facilities, with the potential for ground disturbance in an area requiring investigation to
32 determine presence of and impact to other cultural resources.

33 Documents reviewed for potential impacts included the EIRs and EISs for the Davis-Woodland Water
34 Supply Project (City of Davis et al. 2007), which includes a water intake in the Sacramento River,
35 pumping plants, and conveyance and water treatment facilities, and the Grasslands Bypass Project
36 (Reclamation and San Luis & Delta-Mendota Water Authority 2008). These analyses found that the
37 impacts on cultural resources were either less than significant or significant prior to mitigation (but could
38 be mitigated to less than significant).

39 The Davis-Woodland EIR found that neither existing project operations nor the transfer of water supplies
40 from senior water users in the Sacramento River basin would create a significant impact to cultural
41 resources within the Project area. However, construction of new conveyances and associated facilities
42 would involve excavation and other ground disturbing activities with the potential to disturb unknown,
43 buried paleontological resources, even though no unique paleontological resources, sites, or geologic
44 features were identified during a study undertaken for the EIR. Implementation of mitigation measures

1 would reduce this impact to a less-than-significant level, including inventorying and documentation of
2 cultural resources according to State and federal guidelines, project redesign to avoid impacts, data
3 recovery, or archival documentation, and following of established State and federal protocols for
4 identification and treatment of cultural resources if discovered during construction.

5 The Grasslands Bypass Project EIS/EIR found no impacts to historic resources because none were present
6 in areas where facility expansion or newly constructed facilities would likely take place within the
7 Grasslands Drainage Area. However, facility expansion and new construction could involve ground
8 disturbance, particularly related to subsurface drainage and conveyance facilities, in areas with the
9 potential for subsurface cultural resources that had not yet been investigated. This impact was found to be
10 potentially significant, but could be mitigated to a less-than-significant level through cultural resource
11 inventories and evaluation meeting State and federal guidelines, consultation with local Native American
12 tribes, project redesign to avoid significant resources, and/or data recovery and documentation of any
13 significant resources.

14 Although the details of the water quality projects named in the Delta Plan that could have cultural
15 resources impacts, and general project types encouraged by the Delta Plan, are not known, based on these
16 examples and the analysis above, it is likely that the archeological resources impacts of projects
17 encouraged by the Delta Plan would be significant prior to mitigation.

18 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
19 time such projects are proposed by their lead agencies. However, because named projects and projects
20 encouraged by the Delta Plan could result in changes to significant prehistoric archaeological resources
21 through the destruction or damage of the data potential retained by significant prehistoric archaeological
22 resources (CRHR Criterion D), this potential impact is considered **significant**.

23 10.4.3.3.2 Impact 10-2c: Discovery of Unrecorded Human Remains

24 Construction-related activities at construction sites for water quality improvement projects, including
25 projects identified in Section 10.4.3.3 and water treatment plants, pipelines, wastewater treatment plants,
26 stormwater treatment facilities, and agricultural runoff treatment could require the use of heavy
27 equipment, such as excavators, graders, scrapers, bulldozers, backhoes, and concrete mixing and pumping
28 trucks. The facilities would be located in the Delta, the Delta watershed, and areas outside the Delta that
29 use Delta water, as described in Section 2A, Proposed Project and Alternatives.

30 Because the mechanism for this impact is ground-disturbing activities, generally construction activities,
31 the effects of water quality improvement projects related to the discovery of unrecorded human remains
32 would be generally similar to those described for water supply projects in Section 10.4.3.1.2.

33 The CHRIS records search results indicate that numerous early Native American human interments have
34 been documented in the Delta, and interments are also likely to be present in the Delta watershed or areas
35 outside the Delta that use Delta water. California law recognizes the need to protect historic-era and
36 Native American human burials, skeletal remains, and items associated with Native American interments
37 from vandalism and inadvertent destruction. The procedures for the treatment of Native American human
38 remains are described in California Health and Safety Code sections 7050.5 and 7052 and in California
39 Public Resources Code section 5097.

40 Both the Davis-Woodland EIR and Grassland Bypass Project EIS/EIR found potentially significant
41 impacts to unrecorded human remains because both projects involve ground disturbance. However, those
42 potential impacts could be mitigated to a less-than-significant level by adopting the mitigation measures
43 described in Section 10.4.3.3.1 with compliance with the California Health and Safety and Public
44 Resources codes.

1 Although the details of the water quality projects named in the Delta Plan that could have cultural
2 resources impacts, and general project types encouraged by the Delta Plan, are not known, based on these
3 examples and the analysis above, it is likely that the impacts on undiscovered human remains of projects
4 encouraged by the Delta Plan would be significant prior to mitigation.

5 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
6 time such projects are proposed by their lead agencies. However, because human remains could be
7 unearthed during project construction, this potential impact is considered **significant**.

8 10.4.3.3.3 Impact 10-3c: Disturbance or Destruction of Historic Buildings, Structures, and Linear 9 Features

10 Construction-related activities at construction sites for water quality improvement projects, including
11 projects identified in Section 10.4.3.3 and water treatment plants, pipelines, wastewater treatment plants,
12 stormwater treatment facilities, and agricultural runoff treatment could require the use of heavy
13 equipment, such as excavators, graders, scrapers, bulldozers, backhoes, and concrete mixing and pumping
14 trucks. The facilities would be located in the Delta, the Delta watershed, and areas outside the Delta that
15 use Delta water, as described in Section 2A, Proposed Project and Alternatives.

16 Because the mechanisms for this impact are ground-disturbing activities, generally construction activities,
17 activities that require the alteration or removal of buildings or structures, or activities that alter the context
18 of historic resources, the effects of water quality improvement projects related to the disturbance or
19 destruction of historic buildings, structures, and linear features would be generally similar to those
20 described for water supply projects in Section 10.4.3.1.3. The likelihood of such impacts and potential to
21 mitigate to a less-than-significant level will depend on whether future projects involve modification or
22 expansion of existing facilities within previously disturbed footprints and whether new construction
23 occurs in areas where cultural resource inventories and documentation or subsurface investigations have
24 not yet been undertaken.

25 Both the Davis-Woodland EIR and Grassland Bypass Project EIS/EIR evaluated potential effects of
26 project construction on historic buildings, structures, and linear features. The City of Davis avoided
27 impacts on historic linear features by using jack and bore techniques for pipeline installation. The lead
28 agencies identified measures for reducing potential impacts similar to the mitigation measures described
29 in Section 10.4.3.3.1 (identify historic properties, evaluate the properties' significance, evaluate effects,
30 treat effects).

31 Although the details of the water quality projects named in the Delta Plan that could have cultural
32 resources impacts, and general project types encouraged by the Delta Plan, are not known, based on these
33 examples and the analysis above, it is likely that the potential impacts on historic resources of projects
34 encouraged by the Delta Plan would be significant prior to mitigation.

35 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
36 time such projects are proposed by their lead agencies. However, because named projects and projects
37 encouraged by the Delta Plan could result in changes to character-defining features of resources eligible
38 for listing in the NRHP and CRHR through destruction or damage, this potential impact is considered
39 **significant**.

1 **10.4.3.3.4 Impact 10-4c: Disturbance or Destruction of Cultural Landscapes and Traditional**
2 **Cultural Properties**

3 Construction-related activities at construction sites for water quality improvement projects, including
4 projects identified in Section 10.4.3.3 and water treatment plants, pipelines, wastewater treatment plants,
5 stormwater treatment facilities, and agricultural runoff treatment could require the use of heavy
6 equipment, such as excavators, graders, scrapers, bulldozers, backhoes, and concrete mixing and pumping
7 trucks. The facilities would be located in the Delta, the Delta watershed, and areas outside the Delta that
8 use Delta water, as described in Section 2A, Proposed Project and Alternatives.

9 Because the mechanism for this impact is ground-disturbing activities, generally construction activities, or
10 operational changes that affect the surrounding landscape, the effects of water quality improvement
11 projects related to the disturbance or destruction of cultural landscapes and traditional cultural properties
12 would be generally similar to those described for water supply projects in Section 10.4.3.1.3. The
13 likelihood of such significant impacts and potential to mitigate to a less-than-significant level will depend
14 on whether future projects involve modification or expansion of existing facilities within previously
15 disturbed footprints and whether new construction occurs in areas where cultural resource inventories and
16 documentation or subsurface investigations have not yet been undertaken.

17 Construction of water quality improvement facilities has the potential to result in the alteration or removal
18 of character-defining features of a cultural landscape that has been or could be identified through research
19 and field survey. The visual changes associated with changes in land cover could compromise or alter the
20 character-defining features of cultural landscapes, which often include the visual and auditory settings.
21 Alterations to the general setting of resources eligible for listing in the NRHP and CRHR would be a
22 significant impact.

23 Neither cultural landscapes nor traditional cultural properties were an issue of concern, and therefore,
24 neither the Davis-Woodland EIR nor the Grassland Bypass Project EIS/EIR included a discussion of
25 these resources.

26 Although the details of the water quality projects named in the Delta Plan that could have cultural
27 resources impacts, and general project types encouraged by the Delta Plan, are not known, based on these
28 examples and the analysis above, it is likely that the potential impacts on cultural landscapes and
29 traditional cultural properties of projects encouraged by the Delta Plan would be significant prior to
30 mitigation. Project-level impacts would be addressed in future site-specific environmental analysis
31 conducted at the time such projects are proposed by their lead agencies. However, because named
32 projects and project types encouraged by the Delta Plan could result in alterations to the general setting of
33 resources eligible for listing in the NRHP and CRHR in a way that materially impairs the significance of
34 the landscape, this potential impact is considered **significant**.

35 **10.4.3.4 Flood Risk Reduction**

36 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
37 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
38 implemented under the direct authority of the Council. However, the Delta Plan seeks to reduce the risk
39 of floods in the Delta by encouraging various actions that, if taken, could lead to completion,
40 construction, and/or operation of projects that could reduce flood risks in the Delta. Such projects and
41 their features could include the following:

- 42 ♦ Setback levees
- 43 ♦ Floodplain expansion
- 44 ♦ Levee maintenance
- 45 ♦ Levee modification

- 1 ♦ Dredging
- 2 ♦ Stockpiling of rock for flood emergencies
- 3 ♦ Subsidence reversal
- 4 ♦ Reservoir reoperation

5 The number and location of all potential projects that would be implemented are not known at this time.
6 One possible project, however, is known to some degree and is named in the Delta Plan: the Sacramento
7 Deep Water Ship Channel and Stockton Deep Water Ship Channel Dredging (the United States Army
8 Corps of Engineer's *Delta Dredged Sediment Long-Term Management Strategy* included in Appendix C,
9 Attachment C-7 of this EIR). The Proposed Project also names DWR's A Framework for Department of
10 Water Resources Investments in Delta Integrated Flood Management, which could, upon completion,
11 provide guidance on the prioritization of flood protection investments of the types listed above (any
12 resulting geographic preference/redistribution of such investments is not known at this time).

13 10.4.3.4.1 Impact 10-1d: Disturbance or Destruction of Prehistoric and Historic-Era Archaeological 14 Resources

15 Construction-related activities at construction sites for flood risk reduction projects, including expansion
16 and modification of levees, construction of setback levees, dredging, and operable barriers along the
17 levees, could require the use of heavy equipment, such as excavators, graders, scrapers, bulldozers,
18 backhoes, and concrete mixing and pumping trucks. The facilities would be located in the Delta and the
19 Delta watershed.

20 Because the mechanism for this impact is ground-disturbing activities, generally construction activities,
21 the effects of flood risk reduction projects related to the disturbance or destruction of prehistoric and
22 historic-era archaeological resources would be generally similar to those described for water supply
23 projects in Section 10.4.3.1.1. The likelihood of such impacts and potential to mitigate to a
24 less-than-significant level will depend on whether future projects involve modification or expansion of
25 existing facilities within previously disturbed footprints and whether new construction occurs in areas
26 where cultural resource inventories and documentation or subsurface investigations have not yet been
27 undertaken.

28 It is not known at this time what specific flood risk reduction projects would occur. However, the Delta
29 Plan encourages implementation of the Sacramento Deep Water Ship Channel and Stockton Deep Water
30 Ship Channel Dredging Project, which has not undergone project-specific environmental review. An
31 analogous project that involves hydraulic dredging similar to this ship channel project is the North Delta
32 Flood Control and Ecosystem Restoration Project, which includes levee raising and other modifications
33 and construction of setback levees. In addition to dredging projects, a variety of levee improvement,
34 modification, and maintenance activities, including construction of setback levees, could be part of
35 projects encouraged by the Delta Plan.

36 Documents reviewed for potential impacts from flood control projects included the final EIR for the
37 North Delta Flood Control and Ecosystem Restoration Project (DWR 2010), which analyzed proposed
38 flood management and ecosystem restoration projects in the Delta, and the Sacramento River Deep Water
39 Ship Channel SEIS/EIR (USACE and Port of West Sacramento 2011), which analyzed the proposed
40 deepening and selective widening of the Channel from an authorized depth of 30 feet to 35 feet.

41 As noted in Section 10.4.3.2.1, the North Delta Flood Control and Ecosystem Restoration Project EIR
42 found that impacts related to destruction of archaeological resources, including archaeological resources
43 not yet evaluated, could be significant depending on the options available for feasible mitigation, but that
44 some impacts could remain significant and unavoidable even after mitigation. The Sacramento River
45 Deep Water Ship Channel SEIS/EIR found no impacts on archeological resources because the deep water
46 ship channel itself, areas used for maintenance dredging and storage of dredged materials, and placement

1 of dredge pipelines were found to contain no archeological sites or would not further disturb areas known
2 to contain such sites (for example, by placement of dredge pipelines on existing levees in an area with
3 known archeological sites). For both projects, potential impacts to archeological resources in areas that
4 had not yet been evaluated or inventoried would be mitigated to a less-than-significant-level through
5 documentation and monitoring protocols similar to those described in Section 10.4.3.2.1.

6 Although the details of the flood risk projects named in the Delta Plan that could have cultural resources
7 impacts, and the general types of projects encouraged by the Delta Plan, are not known, based on these
8 examples and the analysis above, it is likely that the potential impacts on archeological resources could
9 have significant impacts prior to mitigation. Mitigation measures however, such as preparation of a plan
10 for documentation of archeological resources and monitoring of construction activities for discovery and
11 proper treatment of such resources, could reduce the significance of those impacts. However, some
12 impacts could remain significant and unavoidable even after mitigation (for example, due to the
13 infeasibility of investigating all deposits that could contain archeological resources but had not yet been
14 evaluated prior to their disturbance). Project-level impacts would be addressed in future site-specific
15 environmental analysis conducted at the time such projects are proposed by their lead agencies. However,
16 because named projects and projects related to flood risk reduction encouraged by the Delta Plan could
17 result in changes to significant prehistoric archaeological resources through the destruction or damage of
18 the data potential retained by significant prehistoric archaeological resources (CRHR Criterion D), this
19 potential impact is considered **significant**.

20 10.4.3.4.2 Impact 10-2d: Discovery of Unrecorded Human Remains

21 Construction-related activities at construction sites for flood risk reduction projects, including expansion
22 and modification of levees, construction of setback levees, dredging, and operable barriers along the
23 levees, could require the use of heavy equipment, such as excavators, graders, scrapers, bulldozers,
24 backhoes, and concrete mixing and pumping trucks. The facilities would be located in the Delta and the
25 Delta watershed.

26 Because the mechanism for this impact is ground-disturbing activities, generally construction activities,
27 the effects of flood risk reduction projects related to the discovery of unrecorded human remains would be
28 generally similar to those described for water supply projects in Section 10.4.3.1.2.

29 The CHRIS records search results indicate that numerous early Native American human interments have
30 been documented in the Delta, and interments are also likely to be present in the Delta watershed or areas
31 outside the Delta that use Delta water. California law recognizes the need to protect historic-era and
32 Native American human burials, skeletal remains, and items associated with Native American interments
33 from vandalism and inadvertent destruction. The procedures for the treatment of Native American human
34 remains are described in California Health and Safety Code sections 7050.5 and 7052 and in California
35 Public Resources Code section 5097.

36 The North Delta Flood Control Project found that ground disturbing activities could unearth interned
37 human remains. With implementation of the standard mitigation measures, stopping construction,
38 notifying the coroner, notifying the MLD, and reinterring the remains with any grave goods, the impact
39 would be reduced to a less-than-significant level. The Sacramento Deep Water Ship Channel SEIS/EIR
40 did not find human remains to be an issue of concern.

41 Although the details of the flood risk projects named in the Delta Plan that could have cultural resources
42 impacts, and the general types projects encouraged by the Delta Plan, are not known, based on these
43 examples and the analysis above, it is likely that the potential impacts on undiscovered human remains
44 archeological resources of projects encouraged by the Delta Plan would be significant and unavoidable
45 for reasons noted in Section 10.4.3.4.1.

1 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
2 time such projects are proposed by lead agencies. However, because human remains could be unearthed
3 during project construction, this potential impact is considered **significant**.

4 10.4.3.4.3 Impact 10-3d: Disturbance or Destruction of Historic Buildings, Structures, and Linear 5 Features

6 Construction-related activities at construction sites for flood risk reduction projects, including expansion
7 and modification of levees, construction of setback levees, dredging, and operable barriers along the
8 levees, could require the use of heavy equipment, such as excavators, graders, scrapers, bulldozers,
9 backhoes, and concrete mixing and pumping trucks. The facilities would be located in the Delta and the
10 Delta watershed.

11 Because the mechanisms for this impact are ground-disturbing activities, generally construction activities,
12 activities that would require the alteration or removal of buildings or structures, or activities that alter the
13 context of historic resources the effects of flood risk reduction projects related to the disturbance or
14 destruction of historic buildings, structures, and linear features would be generally similar to those
15 described for water supply projects in Section 10.4.3.1.3. The likelihood of such significant impacts and
16 potential to mitigate to a less-than-significant level will depend on whether future projects involve
17 modification or expansion of existing facilities within previously disturbed footprints and whether new
18 construction occurs in areas where cultural resource inventories and documentation or subsurface
19 investigations have not yet been undertaken.

20 The North Delta Flood Control Project EIR found that construction of the project would have a
21 potentially significant impact on historic structures because an exhaustive site evaluation was not
22 undertaken prior to preparation of the EIR to exclude these resources from consideration. With
23 implementation of the standard mitigation measures (conduct an evaluation, identify historic properties,
24 determine the properties' significance, evaluate the effects, treat effects), the impacts would be reduced to
25 a less-than-significant level. The Sacramento Deep Water Ship Channel SEIS/EIR came to the same
26 conclusion as the lead agencies for the North Delta Flood Control Project.

27 Although the details of the flood risk projects named in the Delta Plan that could have cultural resources
28 impacts, and the general types projects encouraged by the Delta Plan, are not known, based on these
29 examples and the analysis above, it is likely that the potential impacts on historic resources of projects
30 encouraged by the Delta Plan would be significant prior to mitigation. Project-level impacts would be
31 addressed in future site-specific environmental analysis conducted at the time such projects are proposed
32 by lead agencies. However, because named projects and projects encouraged by the Delta Plan could
33 result in changes to character-defining features of resources eligible for listing in the NRHP and CRHR
34 through destruction or damage, this potential impact is considered **significant**.

35 10.4.3.4.4 Impact 10-4d: Disturbance or Destruction of Cultural Landscapes and Traditional 36 Cultural Properties

37 Construction-related activities at construction sites for flood risk reduction projects, including expansion
38 and modification of levees, construction of setback levees, dredging, and operable barriers along the
39 levees, could require the use of heavy equipment, such as excavators, graders, scrapers, bulldozers,
40 backhoes, and concrete mixing and pumping trucks. The facilities would be located in the Delta and the
41 Delta watershed.

42 Because the mechanism for this impact is ground-disturbing activities, generally construction activities, or
43 operational changes that affect the surrounding landscape, the effects of flood risk reduction projects
44 related to the disturbance or destruction of cultural landscapes and traditional cultural properties would be
45 generally similar to those described for water supply projects in Section 10.4.3.1.3. The likelihood of such
46 significant impacts and potential to mitigate to a less-than-significant level will depend on whether future

1 projects involve modification or expansion of existing facilities within previously disturbed footprints and
2 whether new construction occurs in areas where cultural resource inventories and documentation or
3 subsurface investigations have not yet been undertaken.

4 Construction of flood risk reduction facilities has the potential to result in the alteration or removal of
5 character-defining features of a cultural landscape that has been or could be identified through research
6 and field survey. The visual changes associated with changes in land cover could compromise or alter the
7 character-defining features of cultural landscapes, which often include the visual and auditory settings.
8 Alterations to the general setting of resources eligible for listing in the NRHP and CRHR would be a
9 significant impact.

10 Neither cultural landscapes nor traditional cultural properties were an issue of concern, and therefore,
11 neither the North Delta Flood Control Project EIR nor the Deep Water Ship Channel SEIS/EIR included a
12 discussion of these resources.

13 Although the details of the flood risk projects named in the Delta Plan that could have cultural resources
14 impacts, and the general types projects encouraged by the Delta Plan, are not known, based on these
15 examples and the analysis above, it is likely that the potential impacts on cultural landscapes and
16 traditional cultural properties would be significant prior to mitigation. The likelihood of such significant
17 impacts and potential to mitigate to a less-than-significant level will depend on whether future projects
18 involve modification or expansion of existing facilities within previously disturbed footprints and whether
19 new construction occurs in areas where cultural resource inventories and documentation or subsurface
20 investigations have not yet been undertaken.

21 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
22 time such projects are proposed by their lead agencies. However, because named projects and projects
23 encouraged by the Delta Plan could result in alterations to the general setting of resources eligible for
24 listing in the NRHP and CRHR in a way that materially impairs the significance of the landscape, this
25 potential impact is considered **significant**.

26 *10.4.3.5 Protection and Enhancement of Delta as an Evolving Place*

27 As described in Sections 2A, Proposed Project and Alternatives, and 2B, Introduction to Resource
28 Sections, the Delta Plan does not direct the construction of specific projects, nor would projects be
29 implemented under the direct authority of the Council. However, the Delta Plan seeks to protect and
30 enhance the Delta as an evolving place by encouraging various actions and projects that, if taken, could
31 lead to completion, construction, and/or operation of associated projects. Features of such actions and
32 could include the following:

- 33 ♦ Gateways, bike lanes, parks, trails, and marinas and facilities to support wildlife viewing, angling,
34 and hunting opportunities
- 35 ♦ Additional retail and restaurants in legacy towns to support tourism

36 The number and location of all potential projects that would be implemented are not known at this time.
37 However, four possible projects are known to some degree and are named in the Delta Plan: new State
38 Parks at Barker Slough, at Elkhorn Basin, and in the southern Delta and the Economic Sustainability Plan.
39 The Economic Sustainability Plan is not an activity that would generate cultural resources impacts
40 because it does not involve ground disturbing activities; therefore, it is not evaluated in this section.

1 10.4.3.5.1 Impact 10-1e: Disturbance or Destruction of Prehistoric and Historic-Era Archaeological 2 Resources

3 Construction-related activities at construction sites for Delta enhancement projects, including those
4 identified in Section 10.4.3.5, could require the use of heavy equipment, such as excavators, graders,
5 scrapers, bulldozers, backhoes, and concrete mixing and pumping trucks. The facilities would be located
6 in the Delta.

7 Because the mechanism for this impact is ground-disturbing activities, generally construction activities,
8 the effects of Delta enhancement projects related to the disturbance or destruction of prehistoric and
9 historic-era archaeological resources would be generally similar to those described for water supply
10 projects in Section 10.4.3.1.1.

11 It is not known at this time what types of specific Delta as evolving place-type projects that could affect
12 cultural resources would occur or where all of them would be constructed. However, the Delta Plan
13 describes implementation of the California State Parks' Delta Recreation Proposal for the
14 Sacramento-San Joaquin Delta and Suisun Marsh as a key document for enhancing the Delta as a cultural
15 place, and specifically recommends improvement of the Barker Slough and Elkhorn Basin State Parks,
16 and a new park somewhere in the Southern Delta (as recommended in the Delta Recreation Proposal).

17 More generally, documents reviewed for potential impacts were the EIR for the Bidwell-Sacramento
18 River State Park Habitat Restoration and Outdoor Recreation Facilities Development Project (The Nature
19 Conservancy and the California Department of Parks and Recreation 2008) and the San Luis Rey River
20 Park Master Plan (San Diego County Department of Parks and Recreation 2008), illustrate some of the
21 types of impacts associated with park and environmental enhancement projects. While neither project is
22 located in or near the Delta, both projects have characteristics of the types of Delta recreation projects that
23 could be expected after adoption of the Delta Plan, the types of cultural resources issues and impacts that
24 may arise, and how significant impacts would be addressed and mitigated. The Bidwell-Sacramento
25 River State Park project found that including the standard cultural resources (both agencies grouped
26 prehistoric and historic archeological resources, historic structures, and human remains together with the
27 nomenclature of cultural resources) mitigation measures (stop construction, determine the significance of
28 the find, evaluate the effects, treat the effects) would ensure that the project would have
29 less-than-significant impacts on cultural resources. The San Luis Rey River Park found that construction
30 of the project would have a potentially significant impact on cultural resources because an exhaustive site
31 evaluation was not undertaken prior to preparation of the EIR to exclude these resources from
32 consideration. With implementation of the standard mitigation measures (conduct an evaluation, identify
33 cultural resources, determine the properties' significance, evaluate the effects, treat effects), the impacts
34 would be reduced to a less-than-significant level.

35 Although the precise details of Delta enhancement projects named in the Delta Plan that could have
36 cultural resources impacts, and the general types of enhancement projects encouraged by the Delta Plan,
37 are not known, based on these examples and the analysis above, it is likely that the potential impacts on
38 archaeological resources would be significant prior to mitigation.

39 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
40 time such projects are proposed by lead agencies. However, because named projects and projects
41 encouraged by the Delta Plan could result in changes to significant prehistoric archaeological resources
42 through the destruction or damage of the data potential retained by significant prehistoric archaeological
43 resources (CRHR Criterion D), this potential impact is considered **significant**.

1 10.4.3.5.2 Impact 10-2e: Discovery of Unrecorded Human Remains

2 Construction-related activities at construction sites for Delta enhancement projects, including those
3 identified in Section 10.4.3.5, could require the use of heavy equipment, such as excavators, graders,
4 scrapers, bulldozers, backhoes, and concrete mixing and pumping trucks. The facilities would be located
5 in the Delta.

6 Because the mechanism for this impact is ground-disturbing activities, generally construction activities,
7 the effects of Delta enhancement projects related to the discovery of unrecorded human remains would be
8 generally similar to those described for water supply projects in Section 10.4.3.1.2.

9 The CHRIS records search results indicate that numerous early Native American human interments have
10 been documented in the Delta. California law recognizes the need to protect historic-era and Native
11 American human burials, skeletal remains, and items associated with Native American interments from
12 vandalism and inadvertent destruction. The procedures for the treatment of Native American human
13 remains are described in California Health and Safety Code sections 7050.5 and 7052 and in California
14 Public Resources Code section 5097.

15 Both the Bidwell-Sacramento River State Park and San Luis Rey River Park EIRs found that activities
16 related to project implementation (removal of current natural habitat or agricultural uses, discing, seeding,
17 planting, development of recreational facilities, trails, installation of irrigation systems involving trench
18 and backfill techniques, etc.) have the potential for impacting buried cultural resources due to ground
19 disturbing activities. The EIRs further concluded that proximity to the Sacramento River and previous
20 investigations in the region have resulted in the discovery of human remains often associated with Native
21 American habitation locales, leading to a potential for human remains to be uncovered during ground
22 disturbing activities. This same type of impact could occur in parts of the Delta with ground disturbing
23 activities, particularly near waterways on higher ground that was not seasonally inundated. Both EIRs
24 also found that these impacts could be reduced to a less-than significant level with mitigations such as
25 those described in Section 10.4.3.2.1.

26 Although the precise details of Delta enhancement projects named in the Delta Plan that could have
27 cultural resources impacts, and the general types of enhancement projects encouraged by the Delta Plan,
28 are not known, based on these examples and the analysis above, it is likely that the potential impacts on
29 undiscovered human remains would be (significant prior to mitigation or less than significant).

30 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
31 time such projects are proposed by lead agencies. However, because human remains could be unearthed
32 during project construction, this potential impact is considered **significant**.

33 10.4.3.5.3 Impact 10-3e: Disturbance or Destruction of Historic Buildings, Structures, and Linear 34 Features

35 Construction-related activities at construction sites for Delta enhancement projects, including those
36 identified in Section 10.4.3.5, could require the use of heavy equipment, such as excavators, graders,
37 scrapers, bulldozers, backhoes, and concrete mixing and pumping trucks. The facilities would be located
38 in the Delta.

39 Because the mechanisms for this impact are ground-disturbing activities, generally construction activities,
40 activities that require the alteration or removal of buildings or structures, or activities that alter the context
41 of historic resources the effects of Delta enhancement projects related to the disturbance or destruction of
42 historic buildings, structures, and linear features would be generally similar to those described for water
43 supply projects in Section 10.4.3.1.3. The likelihood of such significant impacts and potential to mitigate

1 to a less-than-significant level will depend on whether future projects involve modification or expansion
2 of existing facilities within previously disturbed footprints and whether new construction occurs in areas
3 where cultural resource inventories and documentation or subsurface investigations have not yet been
4 undertaken.

5 The Bidwell –Sacramento River State Park EIR found that including the standard cultural resources (both
6 agencies grouped prehistoric and historic archeological resources, historic structures, and human remains
7 together with the nomenclature of cultural resources) mitigation measures (stop construction, determine
8 the significance of the find, evaluate the effects, treat the effects) would ensure that the project would
9 have less-than-significant impacts on cultural resources. The San Luis Rey River Park EIR found that
10 construction of the project would have a potentially significant impact on cultural resources because an
11 exhaustive site evaluation was not undertaken prior to preparation of the EIR to exclude these resources
12 from consideration. With implementation of the standard mitigation measures (conduct an evaluation,
13 identify cultural resources, determine the properties' significance, evaluate the effects, treat effects), the
14 impacts would be reduced to a less-than-significant level.

15 Although the precise details of Delta enhancement projects named in the Delta Plan that could have
16 cultural resources impacts, and the general types of enhancement projects encouraged by the Delta Plan,
17 are not known, based on these examples and the analysis above, it is likely that the potential impacts on
18 historic resources would be (significant prior to mitigation or less than significant).

19 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
20 time such projects are proposed by lead agencies. However, because named projects and projects
21 encouraged by the Delta Plan to enhance the Delta could result in changes to character-defining features
22 of resources eligible for listing in the NRHP and CRHR through destruction or damage, this potential
23 impact is considered **significant**.

24 10.4.3.5.4 Impact 10-4e: Disturbance or Destruction of Cultural Landscapes and Traditional 25 Cultural Properties

26 Construction-related activities at construction sites for Delta enhancement projects, including those
27 identified in Section 10.4.3.5, could require the use of heavy equipment, such as excavators, graders,
28 scrapers, bulldozers, backhoes, and concrete mixing and pumping trucks. The facilities would be located
29 in the Delta.

30 Because the mechanism for this impact is ground-disturbing activities, generally construction activities, or
31 operational changes that affect the surrounding landscape, the effects of Delta enhancement projects
32 related to the disturbance or destruction of cultural landscapes and traditional cultural properties would be
33 generally similar to those described for water supply projects in Section 10.4.3.1.3. The likelihood of such
34 significant impacts and potential to mitigate to a less-than-significant level will depend on whether future
35 projects involve modification or expansion of existing facilities within previously disturbed footprints and
36 whether new construction occurs in areas where cultural resource inventories and documentation or
37 subsurface investigations have not yet been undertaken.

38 Construction of Delta enhancement facilities has the potential to result in the alteration or removal of
39 character-defining features of a cultural landscape that has been or could be identified through research
40 and field survey. The visual changes associated with changes in land cover could compromise or alter the
41 character-defining features of cultural landscapes, which often include the visual and auditory settings.
42 Alterations to the general setting of resources eligible for listing in the NRHP and CRHR would be a
43 significant impact.

44 Neither cultural landscapes nor traditional cultural properties were considered issues of concern and
45 neither the Bidwell-Sacramento River State Park nor San Luis Rey River Park EIRs included a discussion
46 of these resources.

1 Although the precise details of Delta enhancement projects named in the Delta Plan that could have
2 cultural resources impacts, and the general types of enhancement projects encouraged by the Delta Plan,
3 are not known, based on these examples and the analysis above, it is likely that the potential impacts on
4 cultural landscapes and traditional cultural properties would be significant prior to mitigation or less than
5 significant.

6 Project-level impacts would be addressed in future site-specific environmental analysis conducted at the
7 time such projects are proposed by their lead agencies. However, because named projects and projects
8 encouraged by the Delta Plan to enhance the Delta could result in alterations to the general setting of
9 resources eligible for listing in the NRHP and CRHR in a way that materially impairs the significance of
10 the landscape, this potential impact is considered **significant**.

11 **10.4.3.6 Mitigation Measures**

12 Any covered action that would have one or more of the significant environmental impacts listed above
13 shall incorporate the following features and/or requirements related to such impacts.

14 With regard to covered actions implemented under the Delta Plan, these mitigation measures will reduce
15 the impacts of the Proposed Project. Project-level analysis by the agency proposing the covered action
16 will determine whether the measures are sufficient to reduce those impacts to a less-than-significant level.
17 Generally speaking, many of these measures are commonly employed to minimize the severity of an
18 impact and in many cases would reduce impacts to a less-than-significant level, as discussed below in
19 more detail.

20 With regard to actions taken by other agencies on the basis of Delta Plan recommendations (i.e., activities
21 that are not covered actions), the implementation and enforcement of these measures would be within the
22 responsibility and jurisdiction of public agencies other than the Council. Those agencies can and should
23 adopt these measures as part of their approval of such actions, but the Council does not have the authority
24 to require their adoption. Therefore, significant impacts of noncovered actions could remain **significant**
25 **and unavoidable**.

26 How mitigation measures in this EIR relate to covered and noncovered actions is discussed in more detail
27 in Section 2B, Introduction to Resource Sections.

28 **10.4.3.6.1 Mitigation Measure 10-1**

29 The following mitigation measures would reduce the effects of Impact 10-1a through e, Disturbance or
30 Destruction of Prehistoric and Historic-era Archaeological Resources:

- 31 ♦ Before any ground-disturbing activities begin, conduct intensive archaeological surveys,
32 including subsurface investigations to identify the locations, extent, and integrity of presently
33 undocumented archaeological resources that may be located in areas of potential disturbance. In
34 addition, if ground-disturbing activities are planned for an area where a previously documented
35 prehistoric archaeological site has been recorded but no longer may be visible on the ground
36 surface, conduct test excavations to determine whether intact archaeological subsurface deposits
37 are present. Also conduct surveys at the project site for the possible presence of cultural
38 landscapes and traditional cultural properties.
- 39 ♦ If potentially CRHR-eligible prehistoric or historic-era archeological resources are discovered
40 during the survey phase, additional investigations may be necessary. These investigations could
41 include, but not necessarily be limited to, measures providing resource avoidance, archival
42 research, archaeological testing and CRHR eligibility evaluations, and contiguous excavation unit
43 data recovery. In addition, upon discovery of potentially CRHR-eligible prehistoric resources,
44 coordinate with the NAHC and the Native American community to provide for an opportunity for
45 suitable individuals and tribal organizations to comment on the proposed research.

- 1 ♦ If CRHR-eligible archaeological resources or cultural landscapes/properties are present and
2 would be physically impacted, specific strategies to avoid or protect these resources should be
3 implemented if feasible. These measures may include:
- 4 • Planning construction to avoid the sensitive sites
 - 5 • Deeding the sensitive sites into permanent conservation easements
 - 6 • Capping or covering archaeological sites
 - 7 • Planning parks, green space, or other open space to incorporate the sensitive sites
- 8 ♦ If federal agencies are participants in the activity and Section 106 of the National Historic
9 Preservation Act applies, conduct formal consultation with the State Historic Preservation Officer
10 and the Native American community. Potential adverse effects on cultural resources
11 recommended as eligible for listing in the NRHP will be resolved through the development of a
12 memorandum of agreement and/or a program-level agreement.

13 These mitigation measures are commonly employed on a variety of projects. In many cases, they reduce
14 potential significant impacts on archaeological resources and cultural landscapes/properties to
15 less-than-significant levels. The reference EIRs mentioned earlier for Impact 10-1 across the five general
16 categories of potential Delta-Plan-influenced projects generally applied these types of mitigation
17 measures for archaeological resource impacts and concluded they would mitigate the impacts to
18 less-than-significant levels, except when subsurface areas that had not yet been evaluated for the presence
19 of archeological resources could be disturbed by the project.

20 Implementation of the mitigation measures listed above would reduce the significance of impacts on
21 archaeological resources, cultural landscapes, and traditional cultural properties by requiring that surveys
22 for the presence of cultural and archaeological resources be conducted prior to beginning construction
23 activities and requiring that construction and/or project siting be planned to avoid archaeological sites
24 where possible. In cases where it is not feasible to relocate construction/project activities away from
25 cultural resources, impacts would remain **significant and unavoidable**.

26 Although the details of many of the aspects of named projects and projects encouraged by the Delta Plan
27 are not known, based on these examples, it is likely that the archaeological resources impacts of at least
28 some projects encouraged by the Delta Plan could be significant prior to mitigation, particularly if ground
29 disturbing activities affect subsurface areas that have not yet been evaluated for the presence of cultural
30 resources. Even with mitigation, is possible that an impact would remain significant and unavoidable if
31 project redesign cannot avoid destruction or alteration of cultural resources or if these resources cannot be
32 properly evaluated and documented.

33 10.4.3.6.2 Mitigation Measure 10-2

34 The following mitigation measures would reduce the effects of Impact 10-2a through e, Discovery of
35 Unrecorded Human Remains:

- 36 ♦ If human remains are encountered during ground-disturbing construction activities, stop work that
37 would potentially affect the find and contact the county coroner.
- 38 • In accordance with the California Health and Safety Code, if human remains are uncovered
39 during ground-disturbing activities, the contractor shall immediately halt potentially
40 damaging excavation in the area of the burial and notify the county coroner and a
41 professional archaeologist to determine the nature of the remains. The coroner is required to
42 examine all discoveries of human remains within 48 hours of receiving notice of a discovery
43 on private or State lands (Health and Safety Code section 7050.5[b]). If the coroner
44 determines that the remains are those of a Native American, he or she must contact the

- 1 NAHC by telephone within 24 hours of making that determination (Health and Safety Code
2 section 7050[c]).
- 3 • Following the coroner’s findings, the property owner, contractor or project proponent, an
4 archaeologist, and the NAHC-designated Most Likely Descendent (MLD) shall determine the
5 ultimate treatment and disposition of the remains and take appropriate steps to ensure that
6 additional human interments are not disturbed. The responsibilities for acting upon
7 notification of a discovery of Native American human remains are identified in California
8 Public Resources Code section 5097.9.
 - 9 • Upon the discovery of Native American remains, the landowner shall ensure that the
10 immediate vicinity (according to generally accepted cultural or archaeological standards and
11 practices) is not damaged or disturbed by further development activity until consultation with
12 the MLD has taken place. The MLD shall have 48 hours to complete a site inspection and
13 make recommendations after being granted access to the site.
 - 14 • A range of possible treatments for the remains, including nondestructive removal and
15 analysis, preservation in place, relinquishment of the remains and associated items to the
16 descendents, or other culturally appropriate treatment, may be discussed. California Public
17 Resources Code section 5097.9 suggests that the concerned parties may extend discussions
18 beyond the initial 48 hours to allow for the discovery of additional remains. The following is
19 a list of site protection measures that the landowner shall employ:
 - 20 (1) Record the site with the NAHC or the appropriate information center.
 - 21 (2) Use an open space or conservation zoning designation or easement.
 - 22 (3) Record a document with the county in which the property is located.
 - 23 • The landowner or his or her authorized representative shall rebury the Native American
24 human remains and associated grave goods with appropriate dignity on the property in a
25 location not subject to further subsurface disturbance if the NAHC is unable to identify a
26 MLD or if the MLD fails to make a recommendation within 48 hours after being granted
27 access to the site. The landowner or his or her authorized representative may also reinter the
28 remains in a location not subject to further disturbance if he or she rejects the
29 recommendation of the MLD and mediation by the NAHC fails to provide measures
30 acceptable to the landowner.
 - 31 ♦ If the discovery of human remains occurs on lands owned and administered by a federal agency,
32 the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) will
33 apply. NAGPRA requires federal agencies and certain recipients of federal funds to document
34 Native American human remains and cultural items in their collections, notify native groups of
35 their holdings, and provide an opportunity for repatriation of these materials. The act also requires
36 planning for dealing with potential future collections of Native American human remains and
37 associated funerary objects, sacred objects, and objects of cultural patrimony.

38 These mitigation measures are commonly employed on a variety of projects. In most cases, they reduce
39 significant impacts on undiscovered human remains to less-than-significant levels. The reference EIRs
40 mentioned earlier for Impact 10-2 across the five general categories of potential Delta-Plan-influenced
41 projects generally (applied these types of mitigation measures for potential impacts to undiscovered
42 human remains and concluded they would mitigate the impacts to less-than-significant levels, except
43 when subsurface areas that had not yet been evaluated for the pretense of archeological resources could be
44 disturbed by the project.)

1 Implementation of these mitigation measures would reduce the significance of impacts of
2 Delta-Plan-influenced projects on human remains by requiring training of workers, notification of the
3 coroner and professional archaeologist, and notification of MLDs. In cases where it is not feasible to
4 relocate construction activities away from human remains or in the case of large discoveries, these
5 impacts would remain **significant and unavoidable**.

6 Although the details of many of the aspects of named projects and projects encouraged by the Delta Plan
7 are not known, based on these examples, it is likely that potential impacts on unrecorded human remains
8 of at least some projects encouraged by the Delta Plan would be significant prior to mitigation. Even with
9 mitigation, is possible that an impact would remain significant and unavoidable if project redesign cannot
10 avoid destruction or alteration of cultural resources or if these resources cannot be properly evaluated and
11 documented.

12 10.4.3.6.3 Mitigation Measure 10-3

13 The following mitigation measures would reduce the effects of Impact 10-3a through e, Disturbance or
14 Destruction of Historic Buildings, Structures, and Linear Features:

- 15 ♦ Inventory and evaluate historic-era buildings, structures, and linear features. Conduct cultural
16 resources studies to determine whether historic-era buildings, structures, and linear features in the
17 project area are eligible for listing in the CRHR.
- 18 ♦ Before construction activities begin, an inventory and evaluation of historic-era resources in the
19 project area should be conducted under the direct supervision of an architectural historian
20 meeting the Secretary of the Interior's Professional Qualification Standards for history or
21 architectural history. The documentation should include conducting an intensive field survey,
22 background research on the history of the project area, and property-specific research. Based on
23 this research, the eligibility of historic-era resources located in the project area should be
24 evaluated by the architectural historian using criteria for listing in the CRHR. The resources
25 would be recorded on DPR 523 forms and the findings documented in a technical report. If
26 federal funding or approval is required, then the project implementation agencies would comply
27 with Section 106 of the National Historic Preservation Act
- 28 ♦ Identify measures to avoid significant historic resources. Avoidance through project redesign is
29 the preferred mitigation measure for mitigating potential effects on historic-era buildings,
30 structures, linear features, and archaeological sites that appear to be eligible for listing in the
31 NRHP or CRHR.
- 32 ♦ Record photographic and written documentation to Historic American Building Survey
33 (HABS)/Historic American Engineering Record (HAER) standards. If avoidance of a significant
34 historic resource is not feasible, the lead agency should ensure that HABS/HAER documentation
35 is completed. Through HABS/HAER documentation, a qualified architectural historian and
36 qualified photographer should formally document the historic resource through large-format
37 photography, measured drawings, written architectural descriptions, and historical narratives. The
38 completed documentation should be submitted to the Library of Congress.
- 39 ♦ Conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for
40 Rehabilitating Historic Buildings in the event of relocation. If any historic buildings, structures,
41 or levees are relocated or altered, the lead agency should ensure that any changes to significant
42 buildings or structures conform to the Secretary of the Interior's Standards for Rehabilitation and
43 Guidelines for Rehabilitating Historic Buildings. Implementation of this measure can mitigate
44 potential changes to significant architectural resources.

1 These mitigation measures are commonly employed on a variety of projects. In many cases, they reduce
2 significant impacts on historic resources to less-than-significant levels. The reference EIRs mentioned
3 earlier for Impact 10-3 across the five general categories of potential Delta-Plan-influenced projects
4 generally (applied these types of mitigation measures for potential impacts to historic resources and
5 concluded they would mitigate the impacts to less-than-significant levels, except when subsurface areas
6 that had not yet been evaluated for the pretense of archeological resources could be disturbed by the
7 project).

8 Implementation of these mitigation measures would reduce the significance of construction-related
9 impacts on historic resources by requiring that historic resources be inventoried prior to beginning
10 construction activities and requiring that construction be planned to avoid these resources where possible.
11 In cases where it is not feasible to relocate construction activities away from cultural resources,
12 construction-related impacts would remain **significant and unavoidable**.

13 Although the details of many of the aspects of named projects and projects encouraged by the Delta Plan
14 are not known, based on these examples, it is likely that potential impacts on historic resources of at least
15 some projects encouraged by the Delta Plan would be significant prior to mitigation. Even with
16 mitigation, is possible that an impact would remain significant and unavoidable if project redesign cannot
17 avoid destruction or alteration of cultural resources or if these resources cannot be properly evaluated and
18 documented.

19 10.4.3.6.4 Mitigation Measure 10-4

20 Mitigation measures MM 10-1 and MM 10-3 will also mitigate Impact 10-4a through e, Disturbance or
21 Destruction of Cultural Landscapes and Traditional Cultural Properties. However, to mitigate
22 Impact 10-4, MM 10-1 surveys and MM-3 inventories would focus on cultural landscapes and traditional
23 cultural properties.

24 The reference EIRs mentioned earlier for Impact 10-4 across the five general categories of potential
25 Delta-Plan-influenced projects generally applied these types of mitigation measures for potential impacts
26 to cultural landscapes and traditional cultural properties and concluded they would mitigate the impacts to
27 less-than-significant levels, except when subsurface areas that had not yet been evaluated for the pretense
28 of archeological resources could be disturbed by the project. Even with mitigation, is possible that an
29 impact would remain **significant and unavoidable** if project redesign cannot avoid destruction or
30 alteration of cultural resources or if these resources cannot be properly evaluated and documented.

31 10.4.4 No Project Alternative

32 As described in Section 2A, Proposed Project and Alternatives, the No Project Alternative is based on the
33 continuation of existing plans and policies and the continued operation of existing facilities into the future
34 and permitted and funded projects. Seven ongoing projects have been identified as part of the No Project
35 Alternative. The list of projects included in the No Project Alternative is presented in Table 2-2.

36 The significance of cultural resources impacts is associated with the potential effects of
37 Delta-Plan-influenced-project construction on historic resources, archaeological resources, human
38 remains, or cultural landscapes and traditional cultural properties. These effects are generally greater in
39 areas that are currently or have been occupied or used by human populations. With the No Project
40 Alternative, project construction at the seven specific project sites is expected to be completed within the
41 next 2–5 years.

42 To the extent that the specific projects have the potential to affect known or presently unknown cultural
43 resources, disturbance of the project footprint during construction of these facilities could have significant
44 impacts. After construction is completed, construction-related impacts would cease, but effects of
45 constructed improvements on cultural landscapes could continue.

1 With the No Project Alternative, the Delta Plan would not be in place to encourage various other projects
2 to move forward. To the extent that the absence of the Delta Plan prevents those projects from moving
3 forward, there could be fewer construction-related impacts in the near and long term. Because cultural
4 resources impacts are related to the location of resources in areas where construction may or must occur
5 as part of a particular project, the No Project Alternative could result in significant construction-related
6 cultural resources impacts like those of the Proposed Project.

7 The No Project Alternative is expected to have fewer cultural resources impacts than the Proposed Project
8 in the near term because there would be less construction and therefore the reduced possibility of
9 encountering or affecting cultural resources. Therefore, the No Project Alternative would have fewer
10 occurrences of cultural resources impacts when compared to the Proposed Project; however, these
11 occurrences may be **significant** depending on site-specific conditions.

12 10.4.5 Alternative 1A

13 Under Alternative 1A, the construction and operation of surface water projects (water intakes, treatment
14 and conveyance facilities, and reservoirs) would be the same as under the Proposed Project. As described
15 in Section 2A, Proposed Project and Alternatives, there would be fewer groundwater projects (wells,
16 wellhead treatment, conveyance facilities), ocean desalination projects, recycled wastewater and
17 stormwater projects (treatment and conveyance facilities), and water transfers compared with the
18 Proposed Project. Water use efficiency and conservation programs also would be reduced relative to the
19 Proposed Project.

20 Projects to restore the Delta ecosystem would be reduced relative to the Proposed Project.

21 Projects and actions to improve water quality would be the same as under the Proposed Project. Flood
22 risk reduction projects also would be the same as under the Proposed Project, except that there would be
23 less emphasis on levee maintenance and modification for levees that protect agricultural land and more
24 emphasis on levees that protect water supply corridors, which could result in an overall reduction in these
25 activities. Projects to protect and enhance the Delta as an evolving place would be the same as for the
26 Proposed Project.

27 Overall, significant impacts to cultural resources from Alternative 1A would be **less than** under the
28 Proposed Project, both for construction and operations. Related to cultural resource impacts from
29 construction, Alternative 1A would generally involve less construction so fewer impacts. Related to
30 cultural resource impacts from operations of Delta-Plan encouraged projects, more construction-related
31 impacts does not necessarily translate to more long-term/operational impacts. Of the projects the Delta
32 Plan and Alternative 1A would encourage, the majority would not result in significant operations-related
33 impacts after mitigation because impacts of ground disturbing activities could be mitigated in most
34 instances through mitigations proposed in Section 10.4.3.6. Projects most likely to result in significant
35 impacts to cultural resources during operation would be projects that require ongoing or periodic ground
36 disturbance as part of project operations and maintenance to repair or replace buried pipelines and other
37 facilities.

38 10.4.5.1.1 Impact 10-1: Disturbance or Destruction of Prehistoric and Historic-era Archaeological 39 Resources

40 The same type of impacts on archaeological resources would occur under Alternative 1A as described for
41 the Proposed Project.

1 Under this alternative, there would be fewer of the projects described in Sections 10.4.3.1 (Reliable Water
2 Supply), 10.4.3.2 (Delta Ecosystem Restoration), and 10.4.3.4 (Flood Risk Reduction). Because fewer
3 water supply, Delta ecosystem restoration, and flood risk reduction projects would occur under this
4 alternative compared to the Proposed Project, there would be a smaller geographic area of potential
5 physical effect and therefore a reduced likelihood that archaeological resources would be encountered
6 under Alternative 1A.

7 Alternative 1A would have the same number and type of projects described for the Proposed Project in
8 Sections 10.4.3.3 (Water Quality Improvement), and 10.4.3.5 (Delta Enhancement). There would be a
9 similar area of potential physical effect and therefore a similar likelihood that archaeological resources
10 would be encountered under Alternative 1A for these projects.

11 Overall, significant impacts on archaeological resources under Alternative 1A would be **less than** under
12 the Proposed Project.

13 As compared to existing conditions, the impacts on archaeological resources under Alternative 1A would
14 be **significant**.

15 10.4.5.1.2 Impact 10-2: Discovery of Unrecorded Human Remains

16 The same type of adverse effects on unrecorded human remains would occur under Alternative 1A as
17 described for the Proposed Project.

18 Under this alternative, there would be fewer of the projects described in Sections 10.4.3.1 (Reliable Water
19 Supply), 10.4.3.2 (Delta Ecosystem Restoration), and 10.4.3.4 (Flood Risk Reduction). Because fewer
20 water supply, Delta ecosystem restoration, and flood risk reduction projects would occur under this
21 alternative compared to the Proposed Project, there would be a smaller geographic area of potential
22 physical effect and therefore a reduced likelihood that human remains would be encountered under
23 Alternative 1A.

24 Alternative 1A would have the same number and type of projects described for the Proposed Project in
25 Sections 10.4.3.3 (Water Quality Improvement) and 10.4.3.5 (Delta Enhancement). There would be a
26 similar area of potential physical effect and therefore a similar likelihood that human remains would be
27 encountered under Alternative 1A for these projects.

28 Overall, significant impacts on unrecorded human remains under Alternative 1A would be **less than**
29 under the Proposed Project.

30 As compared to existing conditions, the impacts on unrecorded human remains under Alternative 1A
31 would be **significant**.

32 10.4.5.1.3 Impact 10-3: Disturbance or Destruction of Historic Buildings, Structures, and Linear 33 Features

34 The same type of permanent impacts on historic resources would occur under Alternative 1A as described
35 for the Proposed Project.

36 Under this alternative, there would be fewer of the projects described in Sections 10.4.3.1 (Reliable Water
37 Supply), 10.4.3.2 (Delta Ecosystem Restoration), and 10.4.3.4 (Flood Risk Reduction). Because fewer
38 water supply, Delta ecosystem restoration, and flood risk reduction projects would occur under this
39 alternative compared to the Proposed Project, there would be a smaller geographic area of potential
40 physical effect and therefore a reduced likelihood that historic resources would be affected under
41 Alternative 1A.

1 Alternative 1A would have the same number and type of projects described for the Proposed Project in
2 Sections 10.4.3.3 (Water Quality Improvement) and 10.4.3.5 (Delta Enhancement). There would be a
3 similar area of potential physical effect and therefore a similar likelihood that historic resources would be
4 affected under Alternative 1A for these projects.

5 Overall, significant impacts on historic resources under Alternative 1A would be **less than** under the
6 Proposed Project.

7 As compared to existing conditions, the impacts on historic resources under Alternative 1A would be
8 **significant**.

9 10.4.5.1.4 Impact 10-4: Disturbance or Destruction of Cultural Landscapes and Traditional Cultural 10 Properties

11 The same type of permanent impacts on cultural landscapes and traditional cultural properties would
12 occur under Alternative 1A as described for the Proposed Project.

13 Under this alternative, there would be fewer of the projects described in Sections 10.4.3.1 (Reliable Water
14 Supply), 10.4.3.2 (Delta Ecosystem Restoration), and 10.4.3.4 (Flood Risk Reduction). Because fewer
15 water supply, Delta ecosystem restoration, and flood risk reduction projects would occur under this
16 alternative compared to the Proposed Project, there would be a smaller geographic area of potential
17 physical effect and therefore a reduced likelihood that cultural landscapes would be affected under
18 Alternative 1A.

19 Alternative 1A would have the same number and type of projects described for the Proposed Project in
20 Sections 10.4.3.3 (Water Quality Improvement) and 10.4.3.5 (Delta Enhancement). There would be a
21 similar area of potential physical effect and therefore a similar likelihood that cultural landscapes would
22 be affected under Alternative 1A for these projects.

23 Overall, significant impacts on cultural landscapes and traditional cultural properties under
24 Alternative 1A would be **less than** under the Proposed Project.

25 As compared to existing conditions, the impacts on cultural landscapes and traditional cultural properties
26 under Alternative 1A would be **significant**.

27 10.4.5.2 Mitigation Measures

28 Mitigation measures for Alternative 1A would be the same as those described in Sections 10.4.3.6.1
29 (Mitigation Measure 10-1), 10.4.3.6.2 (Mitigation Measure 10-2), 10.4.3.6.3 (Mitigation Measure 10-3),
30 and 10.4.3.6.4 (Mitigation Measure 10-4) for the Proposed Project. Because it is not known whether the
31 mitigation measures listed above would reduce Impacts 10-1, 10-2, 10-3, and 10-4 to a
32 less-than-significant level for Alternative 1A, these potential impacts are considered **significant and**
33 **unavoidable**.

34 10.4.6 Alternative 1B

35 Under Alternative 1B, the construction and operation of surface water projects (water intakes, treatment
36 and conveyance facilities, and reservoirs) would be the same as under the Proposed Project. As described
37 in Section 2A, Proposed Project and Alternatives, there would be fewer groundwater projects (wells,
38 wellhead treatment, conveyance facilities), recycled wastewater and stormwater projects (treatment and
39 conveyance facilities), and water transfers compared with the Proposed Project. There would be no ocean
40 desalination projects.

41 Projects to restore the Delta ecosystem would be reduced in extent relative to the Proposed Project and
42 would not emphasize restoration of floodplains in the lower San Joaquin River.

1 Water quality improvement projects, including water treatment plants, conveyance facilities, and wells
2 and wellhead treatment facilities, would be less emphasized relative to the Proposed Project, and greater
3 emphasis would be placed on the construction and operation of wastewater treatment and recycle facilities
4 and municipal stormwater treatment facilities.

5 Flood risk reduction would place greater emphasis on levee modification/maintenance and dredging than
6 under the Proposed Project, but there would be no setback levees or subsidence reversal projects.
7 Floodplain expansion projects would be fewer or less extensive, and use of reservoir reoperation would be
8 reduced. Actions to protect and enhance the Delta as an evolving place would be consistent with the
9 Economic Sustainability Plan, but the locations for new parks, as encouraged by the Proposed Project,
10 would not be emphasized.

11 Overall, significant impacts to cultural resources from Alternative 1B would be **less than** under the
12 Proposed Project, both for construction and operations as there would be fewer groundwater, recycled
13 wastewater, stormwater, and water transfer projects and no ocean salination project. Related to cultural
14 resource impacts from construction, Alternative 1B would generally involve less construction so fewer
15 impacts. Related to cultural resource impacts from operations of Delta-Plan encouraged projects, more
16 construction-related impacts does not necessarily translate to more long-term/operational impacts. Of the
17 projects the Delta Plan and Alternative 1B would encourage, the majority would not result in significant
18 operations-related impacts after mitigation because impacts of ground disturbing activities could be
19 mitigated in most instances through mitigations proposed in Section 10.4.3.6. Projects most likely to
20 result in significant impacts to cultural resources during operation would be projects that require ongoing
21 or periodic ground disturbance as part of project operations and maintenance to repair or replace buried
22 pipelines and other facilities.

23 10.4.6.1.1 Impact 10-1: Disturbance or Destruction of Prehistoric and Historic-Era Archaeological 24 Resources

25 The same type of impacts on archaeological resources would occur under Alternative 1B as described for
26 the Proposed Project.

27 This alternative would have fewer reliable water supply projects (as described in Section 10.4.3.1),
28 ecosystem restoration projects (as described in Section 10.4.3.2), and Delta enhancement projects
29 (as described in Section 10.4.3.5). Because this alternative would have fewer of these types of projects
30 compared to the Proposed Project, there would be a smaller geographic area of new facilities and uses and
31 therefore a reduced likelihood that archaeological resources would be encountered.

32 Although some types of water quality projects (as described in Section 10.4.3.3) would be more likely
33 under this alternative, there would be less emphasis on water treatment plants and conveyance facilities,
34 and it is uncertain how these changes would affect the overall footprint in comparison to the Proposed
35 Project.

36 Similarly, although there would be more of some types of flood risk reduction projects (as described in
37 Section 10.4.3.4), Alternative 1B would have fewer setback levees and floodplain expansion projects, and
38 it is uncertain how these changes would affect the overall footprint in comparison to the Proposed Project.

39 Overall, significant impacts on archaeological resources under Alternative 1B would be **less than** under
40 the Proposed Project.

41 As compared to existing conditions, the impacts on archaeological resources under Alternative 1B would
42 be **significant**.

1 10.4.6.1.2 Impact 10-2: Discovery of Unrecorded Human Remains

2 The same type of adverse effects on unrecorded human remains would occur under Alternative 1B as
3 described for the Proposed Project.

4 This alternative would have fewer reliable water supply projects (as described in Section 10.4.3.1),
5 ecosystem restoration projects (as described in Section 10.4.3.2), and Delta enhancement projects
6 (as described in Section 10.4.3.5). Because this alternative would have fewer of these types of projects
7 compared to the Proposed Project, there would be a smaller geographic area of new facilities and uses and
8 therefore a reduced likelihood that human remains would be encountered.

9 Although some types of water quality projects (as described in Section 10.4.3.3) would be more likely
10 under this alternative, there would be less emphasis on water treatment plants and conveyance facilities,
11 and it is uncertain how these changes would affect the overall footprint in comparison to the Proposed
12 Project.

13 Similarly, although there would be more of some types of flood risk reduction projects (as described in
14 Section 10.4.3.4), Alternative 1B would have fewer setback levees and floodplain expansion projects, and
15 it is uncertain how these changes would affect the overall footprint in comparison to the Proposed Project.

16 Overall, significant impacts on unrecorded human remains under Alternative 1B would be **less than**
17 under the Proposed Project.

18 As compared to existing conditions, the impacts on unrecorded human remains under Alternative 1B
19 would be **significant**.

20 10.4.6.1.3 Impact 10-3: Disturbance or Destruction of Historic Buildings, Structures, and Linear 21 Features

22 The same impacts to historic resources would occur under Alternative 1B as described for the Proposed
23 Project.

24 This alternative would have fewer reliable water supply projects (as described in Section 10.4.3.1),
25 ecosystem restoration projects (as described in Section 10.4.3.2), and Delta enhancement projects
26 (as described in Section 10.4.3.5). Because this alternative would have fewer of these types of projects
27 compared to the Proposed Project, there would be a smaller geographic area of new facilities and uses and
28 therefore a reduced likelihood that historic resources would be affected.

29 Although some types of water quality projects (as described in Section 10.4.3.3) would be more likely
30 under this alternative, there would be less emphasis on water treatment plants and conveyance facilities,
31 and it is uncertain how these changes would affect the overall footprint in comparison to the Proposed
32 Project.

33 Similarly, although there would be more of some types of flood risk reduction projects (as described in
34 Section 10.4.3.4), Alternative 1B would have fewer setback levees and floodplain expansion projects, and
35 it is uncertain how these changes would affect the overall footprint in comparison to the Proposed Project.

36 Overall, significant impacts on historic resources under Alternative 1B would be **less than** under the
37 Proposed Project.

38 As compared to existing conditions, the impacts on historic resources under Alternative 1B would be
39 **significant**.

1 **10.4.6.1.4 Impact 10-4: Disturbance or Destruction of Cultural Landscapes and Traditional Cultural**
2 **Properties**

3 The same impact on cultural landscapes and traditional cultural properties would occur under
4 Alternative 1B as described for the Proposed Project.

5 This alternative would have fewer reliable water supply projects (as described in Section 10.4.3.1),
6 ecosystem restoration projects (as described in Section 10.4.3.2), and Delta enhancement projects
7 (as described in Section 10.4.3.5). Because this alternative would have fewer of these types of projects
8 compared to the Proposed Project, there would be a smaller geographic area of new facilities and uses and
9 therefore a reduced likelihood that cultural landscapes would be affected.

10 Although some types of water quality projects (as described in Section 10.4.3.3) would be more likely
11 under this alternative, there would be less emphasis on water treatment plants and conveyance facilities,
12 and it is uncertain how these changes would affect the overall footprint in comparison to the Proposed
13 Project.

14 Similarly, although there would be more of some types of flood risk reduction projects (as described in
15 Section 10.4.3.4), Alternative 1B would have fewer setback levees and floodplain expansion projects, and
16 it is uncertain how these changes would affect the overall footprint in comparison to the Proposed Project.

17 Overall, significant impacts on cultural landscapes and traditional cultural properties under Alternative 1B
18 would be **less than** under the Proposed Project.

19 As compared to existing conditions, the impacts on cultural landscapes and traditional cultural properties
20 under Alternative 1B would be **significant**.

21 **10.4.6.2 Mitigation Measures**

22 Mitigation measures for Alternative 1B would be the same as those described in Sections 10.4.3.6.1
23 (Mitigation Measure 10-1), 10.4.3.6.2 (Mitigation Measure 10-2), 10.4.3.6.3 (Mitigation Measure 10-3),
24 and 10.4.3.6.4 (Mitigation Measure 10-4) for the Proposed Project. Because it is not known whether the
25 mitigation measures listed above would reduce Impacts 10-1, 10-2, 10-3, and 10-4 to a
26 less-than-significant level for Alternative 1B, these potential impacts are considered **significant and**
27 **unavoidable**.

28 **10.4.7 Alternative 2**

29 As described in Section 2A, Proposed Project and Alternatives, as compared to the Proposed Project
30 Alternative 2 would place greater emphasis on groundwater, ocean desalination, water transfers, water use
31 efficiency and conservation, and recycled water projects and less emphasis on surface water projects. The
32 surface storage reservoirs considered under the DWR Surface Water Storage Investigation would not be
33 encouraged; instead, surface storage in the Tulare Basin would be emphasized. Ecosystem restoration
34 projects similar to but less extensive than those encouraged by the Proposed Project would be emphasized
35 without the requirement to conform to the Ecosystem Restoration Program habitat types and elevation
36 map.

37 Actions to improve water quality would be similar to or greater than those under the Proposed Project,
38 especially the treatment of wastewater and agricultural runoff. Actions to reduce flood risk under
39 Alternative 2 would emphasize floodplain expansion and reservoir reoperation rather than levee
40 construction and modification. The stockpiling of rock and encouragement of subsidence reversal projects
41 would be the same as under the Proposed Project, as would actions to protect and enhance the Delta as an
42 evolving place.

1 Overall, significant impacts to cultural resources from Alternative 2 would be **less than** under the
2 Proposed Project, both for construction and operations as there would be fewer large surface water and
3 levee construction projects involving extensive ground disturbing activities. There would be a larger
4 number of groundwater, desalination, water transfer, recycled water projects, but these projects would
5 have smaller footprints of ground disturbance than surface water and levee projects. Related to cultural
6 resource impacts from construction, Alternative 2 would generally involve construction of smaller
7 footprint projects with fewer impacts. Related to cultural resource impacts from operations of Delta-Plan
8 encouraged projects, more construction-related impacts does not necessarily translate to more
9 long-term/operational impacts. Of the projects the Delta Plan and Alternative 2 would encourage, the
10 majority would not result in significant operations-related impacts after mitigation because impacts of
11 ground disturbing activities could be mitigated in most instances through mitigations proposed in
12 Section 10.4.3.6. Projects most likely to result in significant impacts to cultural resources during
13 operation would be projects that require ongoing or periodic ground disturbance as part of project
14 operations and maintenance to repair or replace buried pipelines and other facilities.

15 10.4.7.1.1 Impact 10-1: Disturbance or Destruction of Prehistoric and Historic-era Archaeological 16 Resources

17 The same types of impacts on archaeological resources would occur under Alternative 2 as described for
18 the Proposed Project.

19 This alternative would have less extensive ecosystem restoration projects (described in Section 10.4.3.2),
20 resulting in a smaller footprint and therefore a reduced likelihood that archaeological resources would be
21 encountered.

22 Alternative 2 would have more water quality projects (as described in Section 10.4.3.3), resulting in a
23 larger area potentially affected by new facilities and therefore a greater likelihood that archaeological
24 resources would be encountered.

25 Although some types of water supply projects (described in Section 10.4.3.1) would be more likely under
26 this alternative, Alternative 2 would have no water storage facilities except a reservoir in the Tulare Lake
27 Basin, and it is uncertain how these changes would affect the overall footprint in comparison to the
28 Proposed Project.

29 Although some types of flood risk reduction projects (described in Section 10.4.3.4), including floodplain
30 expansion projects, would be more likely under Alternative 2, there would be fewer levee improvements
31 compared to the Proposed Project, and it is uncertain how these changes would affect the overall footprint
32 in comparison to the Proposed Project.

33 This alternative would have the same number and type of projects described for the Proposed Project in
34 Section 10.4.3.5 (Delta Enhancement). There would be a similar area of potential physical effect and
35 therefore a similar likelihood that archaeological resources would be encountered for this topic area.

36 Overall, significant impacts on archaeological resources under Alternative 2 would be **less than** under the
37 Proposed Project.

38 As compared to existing conditions, the impacts on archaeological resources under Alternative 2 would
39 be **significant**.

40 10.4.7.1.2 Impact 10-2: Discovery of Unrecorded Human Remains

41 The same types of adverse effects on unrecorded human remains would occur under Alternative 2 as
42 described for the Proposed Project.

1 This alternative would have less extensive ecosystem restoration projects (described in Section 10.4.3.2),
2 resulting in a smaller footprint and therefore a reduced likelihood that human remains would be
3 encountered.

4 Alternative 2 would have more water quality projects (as described in Section 10.4.3.3), resulting in a
5 larger area potentially affected by new facilities and therefore a greater likelihood that human remains
6 would be encountered.

7 Although some types of water supply projects (described in Section 10.4.3.1) would be more likely under
8 this alternative, Alternative 2 would have no major water storage facilities, and it is uncertain how these
9 changes would affect the overall footprint in comparison to the Proposed Project.

10 Although some types of flood risk reduction projects (described in Section 10.4.3.4), including floodplain
11 expansion projects, would be more likely under Alternative 2, there would be fewer levee improvements
12 compared to the Proposed Project, and it is uncertain how these changes would affect the overall footprint
13 in comparison to the Proposed Project.

14 This alternative would have the same number and type of projects described for the Proposed Project in
15 Section 10.4.3.5 (Delta Enhancement). There would be a similar area of potential physical effect and
16 therefore a similar likelihood that human remains would be encountered for this topic area.

17 Overall, significant impacts on unrecorded human remains under Alternative 2 would be **less than** under
18 the Proposed Project.

19 As compared to existing conditions, the impacts on unrecorded human remains under Alternative 2 would
20 be **significant**.

21 10.4.7.1.3 Impact 10-3: Disturbance or Destruction of Historic Buildings, Structures, and Linear 22 Features

23 The same impacts related to historic resources would occur under Alternative 2 as described for the
24 Proposed Project.

25 This alternative would have less extensive ecosystem restoration projects (described in Section 10.4.3.2),
26 resulting in a smaller footprint and therefore a reduced likelihood that historic resources would be
27 affected.

28 Alternative 2 would have more water quality projects (as described in Section 10.4.3.3), resulting in a
29 larger area potentially affected by new facilities and therefore a greater likelihood that historic resources
30 would be affected.

31 Although some types of water supply projects (described in Section 10.4.3.1) would be more likely under
32 this alternative, Alternative 2 would have no major water storage facilities, and it is uncertain how these
33 changes would affect the overall footprint in comparison to the Proposed Project.

34 Although some types of flood risk reduction projects (described in Section 10.4.3.4), including floodplain
35 expansion projects, would be more likely under Alternative 2, there would be fewer levee improvements
36 compared to the Proposed Project, and it is uncertain how these changes would affect the overall footprint
37 in comparison to the Proposed Project.

38 This alternative would have the same number and type of projects described for the Proposed Project in
39 Section 10.4.3.5 (Delta Enhancement). There would be a similar area of potential physical effect and
40 therefore a similar likelihood that historic resources would be affected for this topic area.

41 Overall, significant impacts on historic resources under Alternative 2 would be **less than** under the
42 Proposed Project.

1 As compared to existing conditions, the impacts on historic resources under Alternative 2 would be
2 **significant**.

3 10.4.7.1.4 Impact 10-4: Disturbance or Destruction of Cultural Landscapes and Traditional Cultural 4 Properties

5 The same impacts related to cultural landscapes and traditional cultural properties would occur under
6 Alternative 2 as described for the Proposed Project.

7 This alternative would have less extensive ecosystem restoration projects (described in Section 10.4.3.2),
8 resulting in a smaller footprint and therefore a reduced likelihood that cultural landscapes would be
9 affected.

10 Alternative 2 would have more water quality projects (as described in Section 10.4.3.3), resulting in a
11 larger area potentially affected by new facilities and therefore a greater likelihood that cultural landscapes
12 would be affected.

13 Although some types of water supply projects (described in Section 10.4.3.1) would be more likely under
14 this alternative, Alternative 2 would have no major water storage facilities, and it is uncertain how these
15 changes would affect the overall footprint in comparison to the Proposed Project.

16 Although some types of flood risk reduction projects (described in Section 10.4.3.4), including floodplain
17 expansion projects, would be more likely under Alternative 2, there would be fewer levee improvements
18 compared to the Proposed Project, and it is uncertain how these changes would affect the overall footprint
19 in comparison to the Proposed Project.

20 This alternative would have the same number and type of projects described for the Proposed Project in
21 Section 10.4.3.5 (Delta Enhancement). There would be a similar area of potential physical effect and
22 therefore a similar likelihood that cultural landscapes would be affected for this topic area.

23 Overall, significant impacts on cultural landscapes and traditional cultural properties under Alternative 2
24 would be **less than** under the Proposed Project.

25 As compared to existing conditions, the impacts on cultural landscapes and traditional cultural properties
26 under Alternative 2 would be **significant**.

27 10.4.7.2 Mitigation Measures

28 Mitigation measures for Alternative 2 would be the same as those described in Sections 10.4.3.6.1
29 (Mitigation Measure 10-1), 10.4.3.6.2 (Mitigation Measure 10-2), 10.4.3.6.3 (Mitigation Measure 10-3),
30 and 10.4.3.6.4 (Mitigation Measure 10-4) for the Proposed Project. Because it is not known whether the
31 mitigation measures listed above would reduce Impacts 10-1, 10-2, 10-3, and 10-4 to a
32 less-than-significant level for Alternative 2, these potential impacts are considered **significant and**
33 **unavoidable**.

34 10.4.8 Alternative 3

35 As described in Section 2A, Proposed Project and Alternatives, the water supply reliability projects and
36 actions under Alternative 3 would be similar to those of the Proposed Project, although there would be
37 less emphasis on surface water projects. Ecosystem restoration (floodplain restoration, riparian
38 restoration, tidal marsh restoration, and floodplain expansion) would be reduced relative to the Proposed
39 Project, and restoration on publicly owned lands, especially in Suisun Marsh and the Yolo Bypass, would
40 be emphasized. There would be more stressor management actions (e.g., programs for water quality,
41 water flows), and more management for nonnative invasive species. Water quality improvements would
42 be the same as for the Proposed Project. Actions under Alternative 3 to reduce flood risk would not

1 include setback levees or subsidence reversal but would result in greater levee modification/maintenance
2 and dredging relative to the Proposed Project. Reservoir reoperation and rock stockpiling would be the
3 same as for the Proposed Project, as would activities to protect and enhance the Delta as an evolving
4 place.

5 Overall, significant impacts to cultural resources from Alternative 3 would be **less than** under the
6 Proposed Project, both for construction and operations as there would be fewer large surface water,
7 ecosystem restoration, and levee construction projects involving extensive ground disturbing activities.
8 Alternative 3 would include more dredging of existing channels, however. Related to cultural resource
9 impacts from construction, Alternative 3 would generally involve construction of smaller footprint
10 projects with fewer impacts. Related to cultural resource impacts from operations of Delta-Plan
11 encouraged projects, more construction-related impacts does not necessarily translate to more
12 long-term/operational impacts. Of the projects the Delta Plan and Alternative 3 would encourage, the
13 majority would not result in significant operations-related impacts after mitigation because impacts of
14 ground disturbing activities could be mitigated in most instances through mitigations proposed in
15 Section 10.4.3.6. Projects most likely to result in significant impacts to cultural resources during
16 operation would be projects that require ongoing or periodic ground disturbance as part of project
17 operations and maintenance to repair or replace buried pipelines and other facilities.

18 10.4.8.1.1 Impact 10-1: Disturbance or Destruction of Prehistoric and Historic-Era Archaeological 19 Resources

20 The same types of impacts on archaeological resources would occur under Alternative 3 as described for
21 the Proposed Project.

22 This alternative would have less extensive ecosystem restoration projects (described in Section 10.4.3.2),
23 resulting in a smaller footprint and therefore a reduced likelihood that archaeological resources would be
24 encountered.

25 Although some types of flood risk reduction projects (described in Section 10.4.3.4), including
26 modification of levees, would be more likely under Alternative 3, there would be no setback levees or
27 subsidence reversal, and it is uncertain how these changes would affect the overall footprint in
28 comparison to the Proposed Project.

29 This alternative would have the same number and type of projects described for the Proposed Project in
30 Section 10.4.3.1 (Reliable Water Supply), Section 10.4.3.3 (Water Quality Improvement), and
31 Section 10.4.3.5 (Delta Enhancement). There would be a similar area of potential physical effect and
32 therefore a similar likelihood that archaeological resources would be encountered for these topic areas.

33 Overall, significant impacts on archaeological resources under Alternative 3 would be **less than** under the
34 Proposed Project.

35 As compared to existing conditions, the impacts on archaeological resources under Alternative 3 would
36 be **significant**.

37 10.4.8.1.2 Impact 10-2: Discovery of Unrecorded Human Remains

38 Adverse effects on unrecorded human remains under Alternative 3 would be similar to those under the
39 Proposed Project.

40 This alternative would have less extensive ecosystem restoration projects (described in Section 10.4.3.2),
41 resulting in a smaller footprint and therefore a reduced likelihood that human remains would be
42 encountered.

1 Although some types of flood risk reduction projects (described in Section 10.4.3.4), including
2 modification of levees, would be more likely under Alternative 3, there would be no setback levees or
3 subsidence reversal, and it is uncertain how these changes would affect the overall footprint in
4 comparison to the Proposed Project.

5 This alternative would have the same number and type of projects described for the Proposed Project in
6 Section 10.4.3.1 (Reliable Water Supply), Section 10.4.3.3 (Water Quality Improvement), and
7 Section 10.4.3.5 (Delta Enhancement). There would be a similar area of potential physical effect and
8 therefore a similar likelihood that human remains would be encountered for these topic areas.

9 Overall, significant impacts on unrecorded human remains under Alternative 3 would be **less than** under
10 the Proposed Project.

11 As compared to existing conditions, the impacts on unrecorded human remains under Alternative 3 would
12 be **significant**.

13 10.4.8.1.3 Impact 10-3: Disturbance or Destruction of Historic Buildings, Structures, and Linear 14 Features

15 The same impacts related to historic structures would occur under Alternative 3 as described for the
16 Proposed Project.

17 This alternative would have less extensive ecosystem restoration projects (described in Section 10.4.3.2),
18 resulting in a smaller footprint and therefore a reduced likelihood that historic resources would be
19 affected.

20 Although some types of flood risk reduction projects (described in Section 10.4.3.4), including
21 modification of levees, would be more likely under Alternative 3, there would be no setback levees or
22 subsidence reversal, and it is uncertain how these changes would affect the overall footprint in
23 comparison to the Proposed Project.

24 This alternative would have the same number and type of projects described for the Proposed Project in
25 Section 10.4.3.1 (Reliable Water Supply), Section 10.4.3.3 (Water Quality Improvement), and
26 Section 10.4.3.5 (Delta Enhancement). There would be a similar area of potential physical effect and
27 therefore a similar likelihood that historic resources would be affected for these topic areas.

28 Overall, significant impacts on historic resources under Alternative 3 would be **less than** under the
29 Proposed Project.

30 As compared to existing conditions, the impacts on historic resources under Alternative 3 would be
31 **significant**.

32 10.4.8.1.4 Impact 10-4: Disturbance or Destruction of Cultural Landscapes and Traditional Cultural 33 Properties

34 The same impacts related to cultural landscapes and traditional cultural properties would occur under
35 Alternative 3 as described for the Proposed Project.

36 This alternative would have less extensive ecosystem restoration projects (described in Section 10.4.3.2),
37 resulting in a smaller footprint and therefore a reduced likelihood that cultural landscapes would be
38 affected.

39 Although some types of flood risk reduction projects (described in Section 10.4.3.4), including
40 modification of levees, would be more likely under Alternative 3, there would be no setback levees or
41 subsidence reversal, and it is uncertain how these changes would affect the overall footprint in
42 comparison to the Proposed Project.

1 This alternative would have the same number and type of projects described for the Proposed Project in
2 Section 10.4.3.1 (Reliable Water Supply), Section 10.4.3.3 (Water Quality Improvement), and
3 Section 10.4.3.5 (Delta Enhancement). There would be a similar area of potential physical effect and
4 therefore a similar likelihood that cultural landscapes would be affected for these topic areas.

5 Overall, significant impacts on cultural landscapes and traditional cultural properties under Alternative 3
6 would be **less than** under the Proposed Project.

7 As compared to existing conditions, the impacts on cultural landscapes and traditional cultural properties
8 under Alternative 3 would be **significant**.

9 **10.4.8.2 Mitigation Measures**

10 Mitigation measures for Alternative 3 would be the same as those described in Sections 10.4.3.6.1
11 (Mitigation Measure 10-1), 10.4.3.6.2 (Mitigation Measure 10-2), 10.4.3.6.3 (Mitigation Measure 10-3),
12 and 10.4.3.6.4 (Mitigation Measure 10-4) for the Proposed Project. Because it is not known whether the
13 mitigation measures listed above would reduce Impacts 10-1, 10-2, 10-3, and 10-4 to a
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