7.7 Cultural Resources

This section describes the environmental setting, potential impacts, and mitigation measures that could avoid or reduce any identified potentially significant impacts on cultural and paleontological resources from changes in hydrology and water supply. Most actions associated with changes in hydrology and water supply would not affect cultural resources because these activities do not involve increased ground disturbance from construction activity. Changes in hydrology and changes in water supply could expose or otherwise damage sensitive cultural resources, primarily from changes in reservoir water elevations.

Section 7.1, *Introduction, Project Description, and Approach to Environmental Analysis*, describes reasonably foreseeable methods of compliance and response actions, including actions that would require construction. These actions are analyzed for potential environmental effects in Section 7.21, *Habitat Restoration and Other Ecosystem Projects*, and Section 7.22, *New or Modified Facilities*.

Chapter 11, *Tribal Engagement*, describes the policies that have guided the State Water Board's outreach and engagement efforts with California Native American tribes, including Assembly Bill 52, Executive Order B-10-11, and the State Water Board Tribal Consultation Policy, among others. Although the Sacramento/Delta Update to the Bay-Delta Plan was initiated prior to the passage of Assembly Bill 52, the State Water Board plans to engage with all interested parties, including Native American tribes, as the planning process continues. The State Water Board is committed to the California Environmental Protection Agency Policy on Consultation with California Native American Tribes, which guides the agency and its boards, departments, and offices in their daily operations to ensure that they work with tribes in a knowledgeable, sensitive, and respectful manner. Engaging with California Native American tribes is not only directed by Governor Brown's Executive Order B-10-11, it also is fundamental to the mission of the State Water Board.

7.7.1 Environmental Checklist

V. Cultural Resources	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☒	☐	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☒	☐	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d. Disturb any human remains, including those interred outside of dedicated cemeteries?	☒	☐	☐	☐

Sections 7.7.2, *Environmental Setting*, and 7.7.3, *Regulatory Setting*, describe cultural and paleontological resources and the regulatory setting related to cultural and paleontological resources to inform the impact discussion in this section and in Section 7.21, *Habitat Restoration and Other Ecosystem Projects*; Section 7.22, *New or Modified Facilities*; and Chapter 9, *Proposed Voluntary Agreements*.

7.7.2 Environmental Setting

Cultural resources are buildings, structures, objects, sites, landscapes, or districts that are important for historical, scientific, or religious reasons and are of concern to cultures, communities, groups, or individuals. Cultural resources may include buildings and architectural remains, archaeological sites, or other artifacts that provide evidence of past human activity.

Paleontology is a branch of geology that studies life in the past geologic time. Fossils provide information about the kinds of plants and animals that existed in the past, when they lived, the types of environments they lived in, and how they used those environments. This information is used to understand the evolution of species and the relationship of species and groups of species to one another (CGS 2002).

Unlike archaeological sites, which are narrowly defined, paleontological sites are defined by the entire extent (both areal and stratigraphic) of a geologic unit or formation. In other words, once a unit is identified as containing vertebrate or other rare fossils, the entire unit is a paleontological site (SVP 2010). For this reason, the paleontological sensitivity of geologic units is described and analyzed broadly.

Paleontological sensitivity is a qualitative assessment based on the paleontological potential of the stratigraphic units present, the local geology and geomorphology, and other factors relevant to fossil preservation and potential yield. According to the Society of Vertebrate Paleontology (SVP) (2010), standard guidelines for sensitivity are (1) the potential for a geological unit to yield abundant or significant vertebrate fossils or to yield a few significant fossils, large or small, vertebrate, invertebrate, or paleobotanical remains; and (2) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecological, or stratigraphic data (Table 7.7-1). The rating system described in Table 7.7-1 was used to describe the paleontological sensitivity of geologic units in the study area.

Table 7.7-1. Paleontological Sensitivity Ratings

Potential	Definition
High	Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils, or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils; and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data.

Potential	Definition
Undetermined	Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources.
Low	Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus, will only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule.
None	Some rock units, such as high-grade metamorphic rocks (e.g., gneisses and schists) and plutonic igneous rocks (e.g., granites and diorites), have no potential to contain significant paleontological resources. Rock units with no potential require neither protection nor mitigation measures relative to paleontological resources.

Source: SVP 2010.

Unique paleontological resources generally are considered to include all vertebrate fossils because of their relative rarity and uncommon invertebrate, plant, and trace fossils and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information (SVP 2010).

7.7.2.1 Archaeological Resources

Archaeological data show that humans have inhabited California for the past 10,000–12,000 years. In part because of the varied topography and climate of the state, technological adaptations to these conditions vary greatly from one area to another and vary over long periods. In the early 1970s, Fredrickson (1973, 1974) proposed a sequence of cultural patterns for the central districts of the northern Coast Ranges, placing them within a framework of cultural periods that he believed were applicable to California as a whole. This broad system has been refined as more information has become available (Rosenthal et al. 2007). These different cultural patterns are characterized by the following.

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

The economic and cultural components of each pattern are manifested in geographic regions according to the presence of stylistically different artifact assemblages.

Village sites have been found throughout the study area along rivers and near other areas with permanent sources of water (Moratto 1984). However, extensive agriculture, reclamation, and construction have permanently altered the significance of rivers and streams as sources of archaeological resources. Some locations may be bereft of archaeological resources; others may still be quite sensitive. Precise project information would be necessary before any potential impacts on specific resources could be assessed.

The Sacramento River watershed extends over a large geographical area that encompasses a variety of prehistoric cultural areas, including the north coast, the Modoc Plateau, the Sierra Nevada, and the Central Valley.

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

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

The earliest well-documented human presence in California occurred approximately 12,000–8,000 years B.P. (the Paleo-Indian Period). 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 Suisun Marsh. The Delta was formed at the western edge of the Central Valley and consists of extensive inland river deltas formed by the confluence of the Sacramento and San Joaquin Rivers. The rivers connect to flow into the Suisun Bay. Although Paleo-Indian groups may have passed through these regions, their presence was likely minimal, and traces of their occupation probably have been deeply buried under alluvial deposits or otherwise completely destroyed by erosion or development.

Only a handful of sites dating to the Lower Archaic Period (8,000–5,000 B.P.) have been found in the Central Valley; these locations include isolated finds at Tulare Lake, and an ancient alluvial fan west of Orland, and no sites dating to this period have been found in the Delta (Rosenthal et al. 2007). 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 the introduction of acorn processing technology, which used groundstone technology and other tools (Hull 2007). Permanent villages that were occupied throughout the year were established, primarily along major waterways. The subsequent Upper Archaic Period (2,500–1,300 B.P.) shows increased evidence of social status being linked to material wealth. Exchange systems became complex and formalized, and evidence of regular, sustained trade between groups was seen for the first time in the archaeological record (Fredrickson 1974).

The Emergent Period (1,300–200 B.P.) witnessed technological and social changes. Exchange relations between groups became highly regularized and sophisticated. The clamshell disk bead

emerged as a monetary unit. Trade goods were exchanged in greater quantities over larger distances relative to earlier prehistoric behavior. Toward the end of this period, contact with Euro-American populations increased and rapidly led to the decimation of native populations through introduced diseases, conflict, and forced removal to limited reservations or rancherias (Moratto 1984).

The Middle Archaic, Upper Archaic, and Emergent Periods are well represented in archaeological assemblages documented in the Delta and Suisun Marsh. The assemblages are described in detail by Bennyhoff and Fredrickson (1969) and Moratto (1984). The general nature of these patterns is described in the following list.

- The Windmiller Pattern (5,000–1,500 B.P.) of archaeological assemblages shows an increased emphasis on acorn use, as well as a continuation of hunting and fishing subsistence activity.
- The Berkeley Pattern (2,200–1,300 B.P.) shows an increased reliance on acorns as a subsistence resource. Distinctive stone and shell artifacts differentiate this pattern from earlier and later cultural expressions.
- The Augustine Pattern (1,300–200 B.P.) saw increasing populations and a commensurate increase in subsistence activity and intensity. Hallmarks of this period were intensive fishing, hunting, and gathering; complex exchange systems; and a wider variety in mortuary patterns.

The following discussion describes the typical archaeological features, artifacts, and site types commonly recorded in the study area.

Prehistoric Archaeological Property Types

The term *property type* refers to a grouping of properties that share important characteristics. These types represent idealized and typical types. Individual resources may have characteristics associated with multiple types or may be unique. Sites that combine the characteristics of multiple types and that contain deposits from different time periods may be informally called *multi-component* or *multi-occupation* sites. Seven prehistoric archaeological property types have potential to be present in the study area: midden/mound sites, multiple-occupation sites, human burials, lithic scatters, bedrock milling features, baked clay deposits, and isolated artifacts.

Midden/Mound Sites

Midden is an organically rich soil generated during human habitation and typically is darker than surrounding native soils that were not used as a living surface. Many sites containing midden are referred to informally as *mound* sites because the site is elevated above the surrounding land and appears as a low mound. Mound sites almost always contain midden, but other site types also contain midden. Midden and mound sites are anticipated to be the most structurally complex and to have the greatest artifact diversity of all the prehistoric property types. Midden deposits can vary greatly in size; they are found where people ate shellfish and other invertebrates, fish, birds, sea mammals, ungulates, small mammals, acorns, seeds, tubers, and other foods. These food sources leave a large amount of debris, which customarily was piled up where the food was processed, eaten, and discarded.

Midden deposits generally were occupation sites, although some may have been used only on a seasonal basis. When deaths occurred, midden sites sometimes were used for burials. Constituents may include stone flakes (byproducts of stone-tool manufacture), bedrock mortars, ground-stone

tools, marine shell, bone remains, charcoal, baked clay, charred floral remains, and fire-affected rock. Non-utilitarian artifacts may include charmstones, shell ornaments, and beads. Discrete features, including house floors, hearths, and human burials, also may be located within these deposits.

Village sites typically contain midden. It should be noted that, while ethnographic sources often identify villages, villages are not discussed as a discrete site type because village locations typically manifest archaeologically as midden sites combined with other archaeological components such as burials. Therefore, midden sites are a cross-cutting category that may be associated with different functional uses. Some soils in the study area are rich in organic matter from natural rather than human sources and thus may appear similar to midden.

Multiple-Occupation Sites

Multiple-occupation sites are archaeological deposits that contain material associated with two or more distinct occupational periods. The cultural remains may be of the same kind (e.g., midden from two distinct periods) or may be functionally unrelated.

Human Burials

Burial features can range in complexity from a simple isolated inhumation (burial or cremation) to more elaborate interments containing numerous bodies. These features may represent specially designated interment areas or remnants of larger archaeological sites. Burial associations often include shell beads and ornaments, and ground and polished stone artifacts (e.g., charmstones, plummets). Human burials can be found in raised earthen mounds and midden sites, but burials also may be associated with lithic scatters and have been found in isolation in the archaeological record.

Lithic Scatters

Lithic scatters are accumulations of stone artifacts, including finished tools and debitage (all the waste material produced during lithic reduction and the production of chipped stone tools). These sites may or may not contain chronological information, depending on the presence and quantity of temporally diagnostic items such as projectile points and other artifacts or dateable materials such as obsidian. Lithic scatters can be simple, containing only flaked-stone debitage and tools, or complex, having primarily flaked-stone debris but some ground stone as well.

Bedrock Milling Features

Bedrock milling features are typically bedrock mortars (oval or circular depressions worked into rock) and/or milling-slicks (flat grinding surfaces). These features were used for processing vegetal resources such as acorns and other seeds. Because of a dearth of exposed bedrock in the Central Valley, milling features typically are associated with the Sierra Nevada foothills, where exposed bedrock is much more common (White 2011). These features often have associated artifacts such as pestles and handstones. Flotation analysis (a method of separating light organic material such as fine plant remains from the deposit to identify plant species pursued by prehistoric populations) of adjacent soils often can identify plant types that were processed at these sites.

Baked Clay Deposits

Baked clay artifacts and detritus emerged in response to the stone tool–impoverished environment of the Delta and surrounding alluvial plains. Accordingly, artifacts of this sort include utilitarian

implements, such as grinding tools and net weights for fishing. Bowls and decorative items were made of fired clay as well.

Isolated Artifacts

Isolated finds are three or fewer artifacts that occur within an area greater than 30 meters from each other (Society for California Archaeology 2020a). Information potential usually is limited to location, material type, style, and function of the individual artifact.

7.7.2.2 Historic Resources

Modern-day California was visited by every major European naval power but was claimed by the Spanish Empire in 1602. The influence of the northern California coastal missions established by the Spanish and the Franciscan Order between 1770 and 1797 soon reached into the interior of the Sacramento Valley. The discovery in 1848 of gold in the Sierra foothills and the ensuing Gold Rush resulted in drastic changes in population, resource access, and native lifeways for the remaining Native Americans. Thousands of prospectors traveled through the northern Sacramento Valley and into the foothills. Hundreds more settled in the valley and began farming (Levy 1978).

California became the 31st state in 1850, largely as a result of the Gold Rush. Outside the city ports of Sacramento, Stockton, and San Francisco, the increasing demand from miners for commodities and foodstuffs was met by enterprising individuals and businesses. By 1853, the population of the state exceeded 300,000; and in 1854, Sacramento became the state capital. With the completion of the Transcontinental Railroad in 1869, settlers and immigrants continued to arrive. Thousands of miles of railway lines were constructed throughout the state in the 1870s—along the coast, southern California, and the Central Valley. In 1872, the Southern Pacific Railroad completed its line through the west side of the valley. Settlement of the American West also was encouraged by the passage of the Swampland Acts of the mid-1800s to early 1900s and the Homestead Act of 1862.

In 1878, the Miller and Lux Company, a cattle company with vast land holdings in the West—including 1 million acres in California, mostly in Merced and Madera Counties—completed the first extensive agricultural irrigation canal in the state, the 67-mile San Joaquin and Kings River Canal in the San Joaquin Valley. This prompted the formation of irrigation districts throughout the state and passage of the Wright Act in 1887.

The formation of irrigation districts and related canal development, coupled with the extensive levee systems constructed after passage of the Swampland Act of 1850 to prevent flooding of prime agricultural lands and settlements in the greater Sacramento–San Joaquin Delta region, foreshadowed the extensive, twentieth-century federally funded water projects, like the CVP that delivers Sacramento River water to the arid San Joaquin Valley (JRP and Caltrans 2000). Irrigation and related flood control management had become an integral component of the history of the productive agricultural and livestock economy of the state.

Today the Delta is a unique and "evolving place," as described in the 2013 Delta Plan, with a rich cultural heritage represented largely by rural agricultural communities. The landscape is characterized by low-lying islands and tracts, many below the water level, which have been shaped by sloughs, tidal influences, levees, and other water controls. Because of its unique geography, rich natural resources, and mix of agricultural and recreational activities, the Delta is a unique spot in which to live or visit. Recognizing the value of the region's cultural, historic, and natural resources, in March 2019, the Delta Protection Commission designated the Delta, including Suisun Marsh and

part of the San Francisco Bay, as California's first National Heritage Area (Figure 7.7-1a) (^DPC 2019). The National Heritage Area designation further acknowledges the unique role of the Delta in California.

Historic Archaeology Property Types

Previous studies provide reasonable expectations of the range of relevant historic archaeological property types that may be found in the study area. These property types are classified here in terms of function. Intensive historic-era use of waterways within the study area coincides with the discovery of gold in 1848. The sudden influx of fortune seekers resulted in heavy use of waterways for transportation of individuals and supplies. To accommodate the surge, cities and towns were established along the rivers. Both small- and large-scale mining endeavors were carried out along the Feather, Sacramento, and American Rivers. Agricultural endeavors followed quickly, and overland transportation routes were developed that often paralleled the waterways. Historic archaeological resources are mostly related to these events. Six categories of historical archaeological property types have been identified within the study area: building foundations, refuse scatters/dumps, transportation-related features, water conveyance systems, historic-era isolated finds, and maritime/riverine resources.

Building Foundations

Building foundations typically are related to commercial or residential structures that have been demolished or burned down. Foundation materials can include stacked rock, wood, brick and mortar, and concrete. Associated structural remains such as plate glass, nails, and other hardware often are in the vicinity. Associated domestic refuse deposits are common, as well as subterranean wells and privy pits. Many examples of this site type are associated with farming and ranching.

Refuse Scatters/Dumps

Refuse scatters/dumps can range from a single dumping episode to an established community dump. Associated artifacts include glass bottles and jars, ceramics, metal cans, and a multitude of other domestic items. Many examples of this site type represent the remnants of labor camps and townsites.

Transportation-Related Features

Transportation-related features include roads, railroads, and landings for water vessels. Roads and railroad lines often were established on the crown of levees that parallel waterways. Public landings often were established for towns, but many were associated with private properties. Landings associated with private property typically were used for loading and unloading of materials and livestock associated with agricultural endeavors.

Water Conveyance Systems

Water conveyance systems consist of small-scale systems (e.g., ditches, canals, pump house foundations) and large-scale systems (e.g., levees, sloughs, weirs). Small-scale water conveyance systems typically are associated with irrigation for agricultural endeavors.

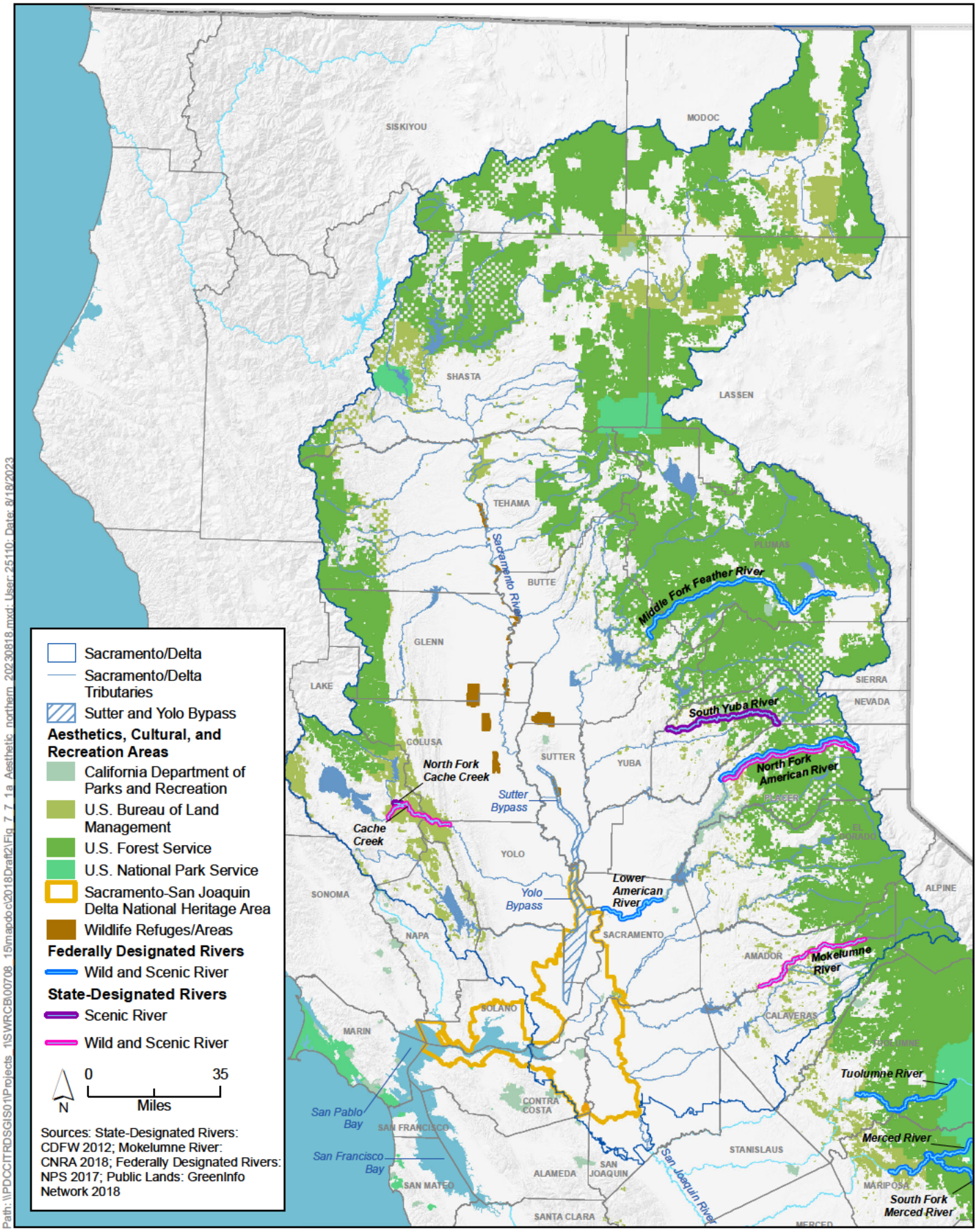

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Figure 7.7-1a
Aesthetics, Cultural, and Recreation Areas in the Study Area (northern)

Historic-Era Isolated Finds

Historic-era isolated finds are three or fewer artifacts that occur within an area greater than 30 meters from each other (Society for California Archaeology 2020a). Information potential usually is limited to location, material type, style, and function of the individual artifact.

Maritime/Riverine Resources

Maritime/riverine resources typically are associated with historic-era activities, although there is a small possibility of submerged prehistoric resources. Use of waterways for commercial, military, and recreational endeavors has been intensive since the 1840s, resulting in numerous maritime/riverine properties. Previous cultural resources studies have identified a few maritime/riverine property types in the study area. Maritime/riverine resources include the remains of landings, pilings, and modern and historic vessels.

Historic Built Environment Resources

Previous studies provide reasonable expectations of the range of relevant historic built environment resource property types that may be found in the study area. These property types are classified here by common types associated with significant historical trends. After the discovery of gold in the area in 1848, the increasing population in the latter half of the nineteenth century led to extensive construction and landscape alterations in the form of mines, agricultural settlements, towns, and cities. In addition to buildings, the transportation and industrial infrastructure associated with mining, commercial, agricultural, and residential developments into the twentieth century are representative of these historical trends. Seven categories of historic built environmental property types have been identified within the study area: Native American settlements and communities, early settlement and development, the Gold Rush period, railroad development and expansion, late nineteenth century settlement and development, early twentieth century settlement and development, and state water projects.

Native American Settlements and Communities

Significant built resources may be associated with Native American communities and may include Traditional Cultural Properties, which are significant for the role they play in a community's historically rooted beliefs, customs, and practices and may include natural resources or landscape elements (NPS 1992).

Early Settlement and Development

Built environment resources associated with the early European and Euroamerican settlements from the eighteenth century through the first half of the nineteenth century include ranchos, residential buildings, and associated ancillary buildings. Cultural landscapes associated with these periods of early development also may be present. As defined by the National Park Service, cultural landscapes encompass a “geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values” (Birnbaum 1994). Cultural landscapes of this period may include built resources and their associated lands and natural resources, such as water sources, used for agricultural activities or cattle ranching.

The Gold Rush Period

The Gold Rush period lasted from circa 1848 through the end of the nineteenth century and produced built resources that may be of historic or cultural significance. These include mines, mining infrastructure, homesteads or residences for prospectors, and mining camps and communities founded and supported by these mining activities. Significant built resources also may be associated with the locations of former Native American communities or newly founded settlements by displaced groups.

Railroad Development and Expansion

Mining operations and the growing population in California in the latter half of the nineteenth century were supported by the construction of multiple railroad lines throughout the state, including the Transcontinental Railroad, California and Oregon Railroad, and the many spur railroads that connected northern California to the rest of the state and country. Built environment resources associated with these developments include railroad tracks and their associated infrastructure, including stations, depots, freight houses, sidings, bridges, tunnels, and other buildings and structures. The railroad corridors also should be considered in association with their viewsheds—including mountains, forests, and rivers—as the scenic views provided by the natural surroundings may be character-defining features of the corridors. Railroads and railroad infrastructure also may be contributing features to historic districts, towns, or settlements that were established along the rails.

Late Nineteenth Century Settlement and Development

Built environmental resources of this era include water control systems like irrigation systems, canals, and levees constructed by farmers and the state government to control flooding. Power systems, such as hydropower plants and electric transmission systems and utilities, may be significant due to their early technological innovations or contribution to the growth of industries or communities.

Significant rural landscapes and built resources from this period may include agricultural complexes and their associated fields, farm structures, residences, and other natural features that contributed to the growth of the agricultural industry for products like wheat, wine, and fruit into the early twentieth century. Canneries, warehouses, packing facilities, and transportation routes, including railroads, that supported the growth of these industries may be significant individual or contributing resources during this and later periods.

Early Twentieth Century: Industrialization and Urbanization

Industrial agriculture was fueled by large-scale irrigation projects, such as canals, in the first half of the twentieth century, allowing crops such as rice to be introduced to the area. Agricultural complexes and their associated fields, flood control or irrigation weirs, canals, ditch systems, and other structures are examples of built resources that convey this expansion. Other associated built resources include rice milling plants, agricultural landscapes and canneries, and rural landscapes, as described above. Additionally, planned communities for farm workers constructed by the Rural Resettlement Administration or Farm Security Administration in the 1930s and into the 1960s to 1970s are examples of historic resources, rural historic districts, or historic designed landscapes. The features of these communities may include the buildings, utility systems, and landscaping elements designed by landscape architects.

Other built resources that represent the rapid industrialization of this period include the following examples: new railroads, such as the Northern Electric Railway Company; expanded and new roadways; road and railway bridges; factories; docks, marinas, and other transportation features along navigable waters; and utilities, such as electric or hydropower generation systems, sewer pipes, power lines, and water pipes.

State Water Projects

In the early twentieth century, California began a comprehensive flood control plan that expanded throughout the mid-twentieth century. The resulting work included flood control structures, like levees and canals, within numerous communities and along the Feather River. Other built resources associated with these efforts include pipelines, pumping plants, reservoirs, and hydropower facilities, from Lake Oroville, along the Feather River, and through the Delta.

7.7.2.3 Paleontological Resources

Geologic units with a high sensitivity (as described in Table 7.7-1) for paleontological resources occur throughout the study area.

The Sacramento River watershed encompasses most of the northern Central Valley (also known as the Sacramento Valley) and includes portions of the bordering Coast Ranges and Sierra Nevada. This area is in the Great Valley and Sierra Nevada geomorphic provinces (^CGS 2002). The geology of this area is described in Section 7.9, *Geology and Soils*. The Central Valley is rich in fossils as a result of its location between the Coast Ranges and Sierra Nevada—the thick alluvial and fluvial sediment that has been deposited in the valley reflects the erosion of these mountains. Examples of widespread geologic units in the Central Valley with a high sensitivity rating for paleontological resources include the Pleistocene Riverbank and Modesto Formations, which have yielded fossils of horse, ground sloths, coyote, rodents, mole, saber-toothed cat, mammoth, and camel (UCMP 2023a, 2023b).

The Delta eastside tributaries region spans the Great Valley and Sierra Nevada geomorphic provinces (^CGS 2002). Both these provinces contain surficial geologic units that record, for example, the life and environment of the Pleistocene epoch. Pleistocene cave fill in Calaveras County has yielded fossils of rodents, horse, rabbit, and ground sloth. In addition, a Pleistocene bear was recovered in Amador County (UCMP 2023a, 2023b). El Dorado County is well known for abundant fossils found in limestone cave localities, such as Hawver Cave and Cool Cave, in the Sierra Nevada foothills. The Coast Ranges also are rich in fossils because of the many sedimentary units that were bent and uplifted to form these ranges. Although the Sierra Nevada are formed by the uplift of granitic rock, which does not contain fossils, fossils have been recovered from sedimentary and volcanic rocks in the Coast Ranges, including an early Permian fish in Plumas County (UCMP 2023a, 2023b).

The Delta region is mainly in the Coast Ranges geomorphic province (^CGS 2002), and the potential for geologic units in this region to contain fossils varies widely. Units such as the Holocene intertidal deposits and other Holocene units generally are too young to contain fossils. In contrast, units such as the Pleistocene Montezuma Formation in southeastern Solano County preserve rich fossil assemblages, including camel, rabbit, otter, fish, and bird (UCMP 2023a, 2023b).

The San Francisco Bay Area (Bay Area) region is in the Coast Ranges geomorphic province (^CGS 2002) and represents a complex geologic history. Examples of geologic units with a high sensitivity rating for paleontological resources include the Merced, Purisima, and Monterey

Formations. Many of the fossils found in this region are of marine animals, including seals, whales, and fish. Other fossils include mammoth, mastodon, bison, horse, ground sloths, and birds (UCMP 2023a, 2023b).

The other geographic regions south of the Delta span several geomorphic provinces (e.g., Coast Ranges, Transverse Ranges, Peninsular Ranges Great Valley, and Mohave Desert geomorphic provinces) (^CGS 2002) and are rich in paleontological resources. A few examples of the many geologic units with a high sensitivity for paleontological resources include the Capistrano, Monterey, Palos Verdes Sand, Tulare, Round Mountain Silt, Ricardo, and Barstow Formations. These units have yielded thousands of fossils, including horse, pronghorn, seal, dire wolf and other canids, oreodont, sea cow, birds, reptiles, and a wide variety of fish. Well-known fossil locales include the Fairmead Landfill, Sharktooth Hill, and La Brea Tar Pits (UCMP 2023a, 2023b).

7.7.3 Regulatory Setting

The National Historic Preservation Act of 1966 (NHPA) (54 U.S.C., § 300101 et seq.), as amended, is the primary federal law governing the preservation of cultural and historic resources in the United States. The NHPA requires federal agencies to consider the effects of their undertakings on any historic property. The National Register of Historic Places (NRHP) is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources. The Archeological Resources Protection Act of 1979 (16 U.S.C., § 470aa) was enacted to protect archeological resources and sites that are located on public lands and Native American lands. The Archeological Resources Protection Act of 1979 governs the excavation and removal of archaeological resources and provides for enforcement to protect such sites. For activities on federal lands, the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C., § 3001 et seq.) provides for the repatriation of Native American cultural items and establishes procedures for the inadvertent discovery of Native American cultural items on federal or tribal lands.

CEQA includes special procedures for identifying, analyzing, and disclosing significant impacts on cultural resources, which include all resources listed in or formally determined eligible for listing in the NRHP, the California Register of Historical Resources (CRHR), or local registers. The Public Resources Code contains various provisions protecting historic, archeological, and paleontological sites. For example, section 5024.1 establishes the CRHR, which is to be used by state and local agencies to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change. Other provisions of the Public Resources Code protect resources on public lands. (See, e.g., Pub. Resources Code, §§ 5097–5097.7 [providing for protection of resources on state and public lands].)

The CRHR includes resources that are listed in or formally determined eligible for listing in the NRHP and some California State Landmarks and Points of Historical Interest. Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (Society for California Archaeology 2020b).

The California Historical Resources Information System (CHRIS) consists of the California Office of Historic Preservation (OHP), nine information centers, and the State Historical Resources Commission. OHP administers and coordinates CHRIS and presents proposed CHRIS policies to the

State Historical Resources Commission, which approves these policies in public meetings. The CHRIS Inventory includes the State Historic Resources Inventory maintained by OHP, as defined in Public Resources Code section 5020.1(p), and the larger number of resource records and research reports managed under contract by the information centers.

When human remains are discovered outside of a cemetery, the relevant county coroner determines whether an investigation of the cause of death is required. When the coroner determines that the remains are of prehistoric Native American origin, he or she contacts the Native American Heritage Commission. When the Native American Heritage Commission receives notification of a discovery of Native American human remains from a county coroner, it notifies those persons it believes to be most likely descended from the deceased Native American. The descendants may, with the permission of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American human remains and may recommend to the owner or the person responsible for the excavation work means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods (Pub. Resources Code, § 5097.98).

Many reservoirs are located within, or adjacent to, national, state, regional, or local parks that are used for recreation and other purposes (Figures 7.7-1a, 7.7-1b, and 7.7-1c). Public lands owned and operated by the U.S. Forest Service (USFS), National Park Service, and Bureau of Land Management (BLM) are subject long-term planning documents designed to guide future management actions, sometimes called *resource management plans*, to provide coordinated direction for the development and management of recreation lands, waters, and facilities. These plans serve as the basis for guiding resource management activities in a manner that maintains and enhances public and resource benefits, including cultural resources. The Federal Land Policy and Management Act (43 USCA § 1701 et seq.) and the National Forest Management Act (16 USCA § 1600 et seq.), both enacted in 1976, provide the statutory basis for BLM and USFS to identify and inventory resources on public lands and national forests. BLM prepares and implements land use plans, also known as resource management plans, and USFS prepares and implements the land and resource management plan, or forest plan. Plans typically provide for the inventory, evaluation, enhancement, and management of cultural resources to prevent loss of, or damage to cultural values; to integrate significant resources into multiple use management; to gain scientific knowledge and management data about them; and to interpret them for public benefit and appreciation.

Pursuant to the Reclamation Recreation Management Act of 1992, Title 28 (Pub. L. 102-575) and the Council on Environmental Quality Regulations (40 C.F.R. § 1500-08), the U.S. Bureau of Reclamation (Reclamation) is required to develop resource management plans and environmental impact statements for its major facilities. The Reclamation Recreation Management Act directs Reclamation to "provide for the development, use, conservation, enhancement, and management of resources on Reclamation lands" (Pub. L. 102-575, title 28 [2805(c)(1)(A)]). Management practices and principles established in a resource management plan, in accordance with federal laws, regulations, and policies, provide for the protection of fish, wildlife, and other natural resources; cultural resources; public health and safety; and applicable uses of Reclamation lands and water areas, public access, and outdoor recreation (Reclamation and State Parks 2012).

Many streams and reservoirs are operated for hydropower under the Federal Power Act (16 USCA § 791 et seq.) and licensed by the Federal Energy Regulatory Commission (FERC). Hydropower licenses contain terms and conditions related to public safety and recreation, operational reliability, dam safety, water and energy supply, and environmental and cultural resources. FERC typically requires as a license condition that the licensee develop and implement a Historic Properties

Management Plan (HPMP) or Cultural Resources Management Plan to meet the requirements of section 106 of the NHPA and to coordinate historic preservation in conjunction with other aspects of a project. An HPMP or Cultural Resources Management Plan identifies goals for the preservation of historic properties; establishes guidelines for routine maintenance and operation; and establishes procedures for consulting with state and tribal historic preservation officers, Native American tribes, historic preservation experts, and the interested public concerning effects on historic properties or contributing elements of a historic district.

State agencies, such as the California Department of Parks and Recreation (State Parks), also may participate in long-term planning on public lands surrounding streams and reservoirs. The mission of State Parks is to provide for the health, inspiration, and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation. In accordance with Public Resources Code, section 5002.2 and sections 21000 et seq., State Parks is required to prepare a general plan and environmental impact report for the lands that it manages prior to development of major facilities. Several reservoirs are associated with State Parks and its planning process.

For example, the Lake Oroville State Recreation Area (SRA) was created in 1961 along with other SRAs by the Davis-Dolwig Act, which was enacted to provide financing for SWP recreational facilities and fish and wildlife enhancement projects. Both State Parks and the California Department of Water Resources (DWR) developed a new Lake Oroville SRA general plan concurrently with the FERC relicensing process to help promote and coordinate interagency efforts to preserve and enhance recreational, natural, cultural, and educational values in the Lake Oroville area. The plan identifies specific guidelines to achieve the goal of protecting and preserving cultural resources, including continuing to: work with DWR through implementation of the HPMP; continue and expand the Site Steward Program and public education programs; ensure cultural resources specialists are consulted and that construction, development, or rehabilitation projects are undertaken according to the HPMP; work with DWR to protect important cultural resources as much as possible from adverse effects resulting from park visitor use, development of facilities, resource management programs, fluctuation of lake levels, and natural processes, such as erosion; and protect important cultural resources from adverse effects from excessive fuel loads and wildfires (State Parks 2004).

Another example is the Folsom Lake SRA that covers the area surrounding Folsom Lake and Lake Natoma. The joint Folsom Lake SRA General Plan/Resource Management Plan was first developed for the area in 1957 by Reclamation and subsequently has been updated and managed by State Parks through a long-term agency agreement. The Folsom Lake SRA General Plan/Resource Management Plan provides direction with goals and guidelines for future management and use of both Folsom Lake SRA and Folsom Powerhouse State Historic Park, including the coordination of federal and state regulations and responsibilities for the identification, evaluation, protection, and management of cultural resources within the SRA (Reclamation 2015).

7.7.4 Impact Analysis

The Bay-Delta Plan is a water quality control plan designed for the purpose of improving water quality conditions related to flow and water diversions in the Sacramento/Delta. Implementation of the proposed Plan amendments is expected to improve water quality conditions over a large geographic area, and particularly for fish and wildlife beneficial uses in the Delta. As such, cultural beneficial uses that are supported by healthy rivers and a functioning watershed are expected to

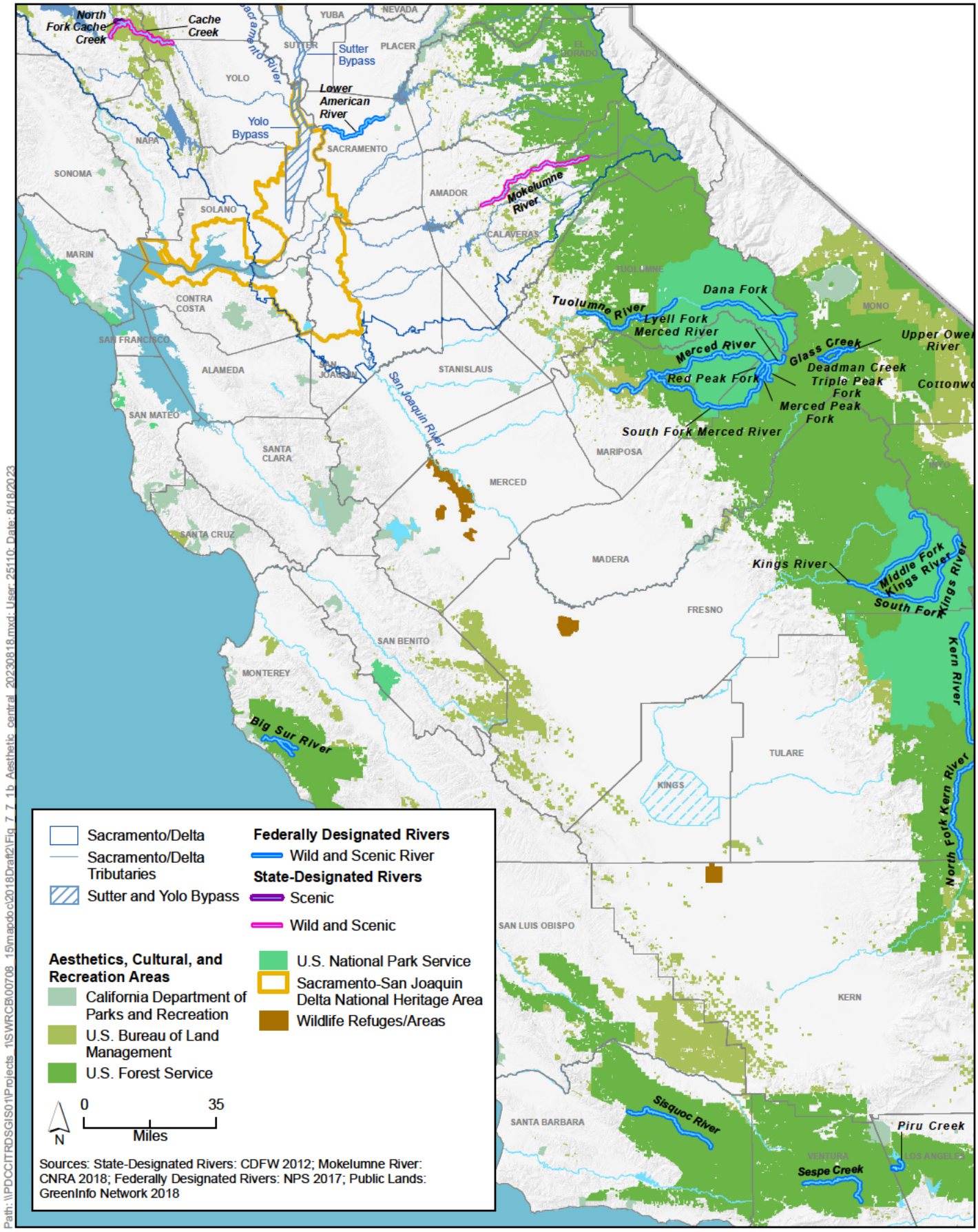

Figure 7.7-1b
Aesthetics, Cultural, and Recreation Areas in the Study Area (central)

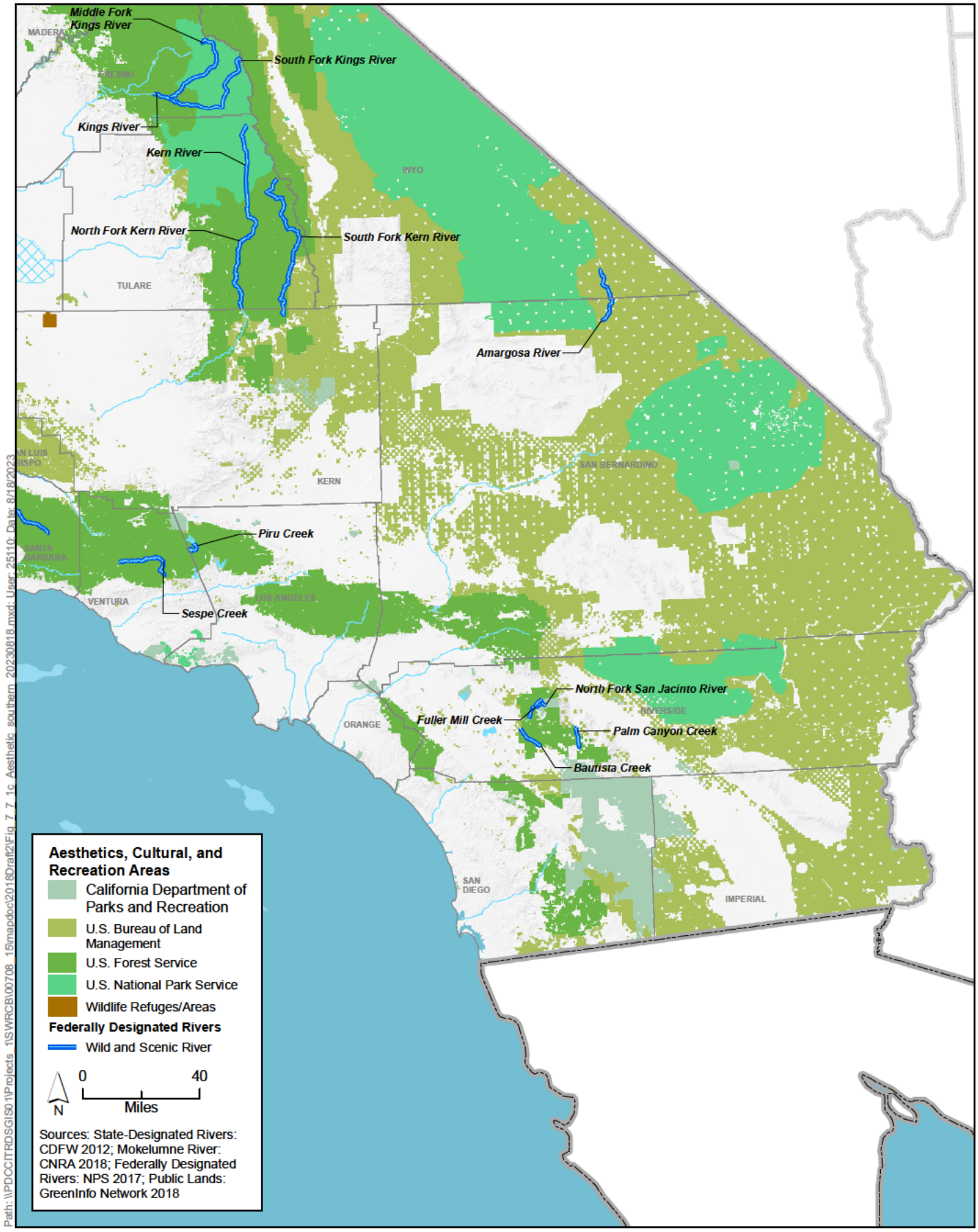

Figure 7.7-1c
Aesthetics, Cultural, and Recreation Areas in the Study Area (southern)

improve. However, actions associated with changes in hydrology and water supply also could have negative effects on cultural resources that are evaluated in this analysis. The analysis is focused on activities that could result in a potentially significant effect on cultural resources, including exposure of or damage to sensitive cultural resources, primarily from the changes in river flows or reservoir water elevations. Changes in hydrology could result in river flows or reservoir water level conditions that may expose known and previously undiscovered cultural resources and result in a substantial adverse impact on a historical or archaeological resource. These conditions also could result in discovery or potential disturbance of human remains.

Changes in water supply include reduced supply to municipal and agricultural uses. As discussed in Section 7.4, *Agriculture and Forest Resources*, reduced Sacramento/Delta supply for irrigation could result in changes to agricultural production or the types of agricultural uses, including taking some land permanently out of production and converting the land to other uses. Conversion of agricultural land to nonagricultural uses would occur on previously disturbed land. Further, the location and extent of agricultural land use conversion are speculative, as are the new uses to which the land would be converted; impacts on cultural resources from future project activities to clear land for new development is thus outside the scope of this analysis.

Changes in water supply for municipal and agricultural water uses could result in increased groundwater pumping and use of other water management actions, including groundwater storage and recovery, water recycling, water transfers, and water conservation using existing infrastructure. These actions would take place in already developed areas and would not result in substantial changes or effects on cultural resources because no new ground-disturbing activities would occur. There would be no impact. These actions are not evaluated further in this section.

Changes in hydrology and supply would not result in actions that require construction-related ground disturbance and, accordingly, would not result in conditions that would destroy unique paleontological resource sites or unique geologic features. There would be no impact, and this topic is not further evaluated in this section (Impact CUL-c).

Section 7.21, *Habitat Restoration and Other Ecosystem Projects*, and Section 7.22, *New or Modified Facilities,* describe and analyze potential impacts on cultural resources from actions that involve construction.

Impact CUL-a: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5

Impact CUL-b: Cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5

The analyses of historical and archaeological resources are closely related and therefore are addressed together under Impact CUL-a and Impact CUL-b.

Changes in Hydrology

Rivers/Streamflows

River flows under the proposed Plan amendments generally would remain within the historical range of flows observed (see Chapter 6, *Changes in Hydrology and Water Supply*). Inundation and exposure of historic or archaeological resources located within the Sacramento/Delta tributaries

would continue at rates similar to the baseline condition, with peak flows and higher flows during winter storms when reservoirs spill water and lower flows during late summer and fall when water may be diverted for irrigation. Sites with historic or archaeological resources along the Sacramento/Delta tributaries have been destroyed by past mining practices and developments in agriculture and irrigation or have been affected previously by the construction of dams and reservoirs or other development. At the same time, some sites remain intact and there is potential for previously unidentified sites to exist. Because river flows would remain within the historical range of flows, the change in flows would not be expected to increase the degree to which historic or archaeological resources would be substantially altered or adversely changed by scour or exposure compared with baseline conditions. This impact would be less than significant.

Flow increases could contribute to the waterways that define the sense of place in the Delta and contribute to the Delta's status as a National Heritage Area.

Reservoir Levels

Changes in reservoir levels could expose previously inundated cultural resources to increased wave action, erosion, and human activity (e.g., looting). Under baseline conditions, surface water elevations for reservoirs fluctuate throughout the year. Upper watershed reservoirs and rim reservoirs historically experience substantial changes in water elevation based on operational needs and hydrology. Most of the changes in reservoir elevations resulting from changes in hydrology would be within the historical ranges; however, elevations could be lower more frequently (see Section 6.3.2, *Reservoir Storage and Elevation*, for further discussion on changes to reservoir elevations).

Changes in hydrology would result in significant reductions in water surface levels at some reservoirs; consequently, there would be the potential for increased exposure and for damage to cultural resources, particularly during critical and dry water years. Significant historic or archeological resources that were previously submerged could be exposed and damaged by erosion or vandalism, causing a substantial adverse change in the significance of the resource. This impact would be potentially significant.

Implementation of Mitigation Measures MM-CUL-a,b: 1 through 3 will reduce or avoid impacts on historical and archeological impacts associated with changes in reservoir levels in the Sacramento/Delta. Mitigation Measure MM-CUL-a,b: 1 incorporates Mitigation Measures MM-AQUA-a,d: 1 for reservoir management. As discussed in Chapter 5, *Proposed Changes to the Bay-Delta Plan for the Sacramento/Delta*, the proposed Plan amendments would require reservoir operators in the Sacramento/Delta to develop and implement long-term strategies and annual operations plans for approval by the State Water Board to implement the cold water habitat objective. That process would reduce changes in reservoir levels and would consider other resources such as cultural resources. In addition, reservoirs may already be subject to resource management plans that contain cultural resource protection measures for previously recorded sites, as well as procedures to implement in the event of an unanticipated discovery, that could reduce potentially significant impacts to a less-than-significant level. Cultural mitigation measures are commonly employed on a variety of projects and, in many cases, reduce potentially significant impacts to less-than-significant levels. However, some uncertainty exists regarding the precise implementation measures for the cold water habitat objective. In limited instances, cultural impacts may result even with mitigation or where mitigation activities take time to implement effectively. Therefore, impacts on cultural resources from changes in reservoir levels remain potentially significant.

Depending on operational needs, reservoirs that receive Sacramento/Delta supply (export reservoirs) in the San Francisco Bay Area region and other regions south of the Delta may experience changes, including lower elevation levels. Because these reservoir elevation reductions may differ from baseline conditions, cultural resources could be affected. Therefore, changes in export reservoir levels may significantly alter or adversely change cultural resources, resulting in potentially significant impacts.

Export reservoirs receiving Sacramento/Delta supplies are not subject to the narrative cold water habitat objective and would not be required to develop and implement long-term strategies and annual plans for reservoir operations that would consider cultural resources. However, export reservoirs and streams below export reservoirs are subject to existing regulatory requirements, independent of the Bay-Delta Plan. Export reservoirs may already be subject to resource management plans that contain cultural resource protection measures for previously recorded sites, as well as procedures to implement in the event of an unanticipated discovery, that could reduce potentially significant impacts to a less-than-significant level. Implementation of Mitigation Measure MM-CUL-a,b: 1 through 3 will reduce or avoid cultural resources impacts at export reservoirs. Streams below export reservoirs may be subject to future changes, which could result from the issuance of new water right orders or decisions, FERC licenses, and other future regulatory requirements. In exercising its regulatory authorities, the State Water Board would consider cultural resources effects and ensure that impacts are avoided or reduced. However, unless and until the mitigation is implemented, any impacts from changes in reservoir storage levels on cultural resources in export reservoirs in other regions (San Joaquin Valley, Bay Area, Central Coast, Southern California) that receive Sacramento/Delta supply remain potentially significant.

Impact CUL-d: Disturb any human remains, including those interred outside of dedicated cemeteries

Changes in river flows would not significantly alter or adversely change the baseline conditions of human burials interred within or outside of dedicated cemeteries. This impact would be less than significant.

Changes in reservoir levels could result in more exposed barren land at reservoir edges when the water level is lowered. Exposure of previously inundated land may yield human burials, which could result in disturbance of the burial and impacts from human activity, such as looting. As discussed under Impact CUL-a and Impact CUL-b, water levels at some reservoirs could be substantially reduced. Substantial water level reductions below baseline levels could affect human remains or burials. This would be a potentially significant impact.

Implementation of Mitigation Measure MM-CUL-d: 1 requires implementation of or compliance with practices to protect cultural resources found on lands surrounding reservoirs in the event of an unanticipated discovery. These practices could reduce potential impacts to less-than–significant levels. However, unless and until the mitigation measures are fully implemented, the identified impacts remain potentially significant.

7.7.5 Mitigation Measures

MM-CUL-a,b: Mitigate impacts of project that could cause a substantial adverse change in the significance of a historical or archaeological resource

1. **Reservoir Management:** Implement Mitigation Measure MM-AQUA-a,d: 1 (Section 7.6.2, *Aquatic Biological Resources*) to reduce impacts of changes in reservoir levels and related impacts on cultural resources. Specifically, the long-term strategy and annual operation plans for Sacramento/Delta reservoirs (MM-AQUA-a,d: 1.i) will consider impacts on historical and archaeological resources and human remains from changes in reservoir levels and will include measures to avoid or reduce impacts on these resources. In addition, all reservoir owners and operators are subject to existing regulatory requirements that protect water quality in reservoirs and streams below reservoirs, including export reservoirs (MM-AQUA-a,d: 1.ii). In exercising its regulatory authorities, the State Water Board will consider cultural resources and ensure that any cultural resources impacts are avoided or reduced.
2. **Implement or Adhere to Cultural Resource Management Measures for Lands Surrounding Reservoirs**
    i. Implement any relevant general plan (private lands) or resource management plan (public lands), including provisions for inventory, evaluation, research, and interpretation of cultural resources. Plans typically contain site management measures, training for all operations and maintenance staff, and routine monitoring of known cultural resources.
    ii. Implement any relevant HPMP or Cultural Resources Management Plan to meet the requirements of section 106 of the NHPA, and to coordinate historic preservation in conjunction with other aspects of a project.
3. **Unanticipated Discoveries**
    i. Implement standard unanticipated discovery and treatment measures should any previously unknown cultural resources, including human remains, be discovered during continued operation of the reservoirs.
    ii. If human remains become exposed, follow procedures under Health and Safety Code, section 7050.5, and Public Resources Code, section 5097.9. If the human remains occur on lands owned and administered by a federal agency, the provisions of the Native American Graves Protection and Repatriation Act will apply. Compliance with state law for discoveries occurring on private or state lands requires notification of the county coroner so the coroner may determine whether an investigation regarding the cause of death is required. If the coroner determines that the remains are of early Native American origin, the coroner will notify the NAHC.

MM-CUL-d: Mitigate impacts of project that could disturb any human remains, including those interred outside of dedicated cemeteries

Implement Mitigation Measures MM-CUL-a,b to minimize the potential for disturbance of human remains that could exist in areas previously inundated at reservoirs.

7.7.6 References Cited

7.7.6.1 Common References

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^Delta Protection Commission (DPC). 2019. Press Release: President Signs Bill Establishing Sacramento-San Joaquin Delta National Heritage Area.

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