

## *17.0 Cultural Resources*

### *17.1 Introduction*

"Cultural resources" include physical resources and intangible cultural values pertaining to paleontology, prehistoric and historic archaeology, Native American ethnography, and history. This environmental assessment provides brief regional overviews of cultural resources, with more details on the "Area of Potential Effect" (APE) for the proposed ISDP, as well as the APEs for its various alternatives. The assessment is based upon information from various published and unpublished sources specifically identified below.

### *17.2 Environmental Setting/Affected Environment*

#### *17.2.1 Paleontological Resources*

Fossils may occur in various sedimentary deposits. The project vicinity includes unconsolidated Pleistocene and Holocene (recent) sediments, with both organic and mineral soils (Atwater 1982; Shlemon and Begg 1975). Vertebrate fossils occasionally are found in such settings. Spencer (1989) reviewed known finds in the Sacramento-San Joaquin Delta. Numerous fossils have been found around the Delta, but only five vertebrate fossil finds were noted for the Delta proper (West 1994). West checked records at the Museum of Paleontology, University of California, Berkeley. No new vertebrate finds had been recorded since Spencer's study. Delta sediments contain Holocene micro- and macrofossils of paleoecological interest, but sediments at proposed construction sites are too badly disturbed to be useful (West 1977, 1994:34). The Delta is generally of low sensitivity for vertebrate paleontology. Significant finds are possible, but unlikely.

#### *17.2.2 Archaeological Resources*

The Sacramento-San Joaquin Delta area has been intensively studied for over a hundred years. Chronological periods identified for Central California prehistory (Early, Middle, and Late) are defined primarily on distinctive funerary patterns and artifacts. Various regional cultures also have been identified (Heizer 1949; Gerow and Force 1968; Fredrickson 1974; Wallace 1978a; Elsasser 1978). In these regional cultures, changes are seen over time with increasing dietary dependence on fish and acorns.

Archaeological sites also include remains from historic period activities. Locations with standing or in-use structures only, or locations where historical activities are recorded but physical evidence is presently lacking, are discussed below.

Expectations regarding prehistoric archaeological sites in the project vicinity are defined by West and Scott (1990). All known prehistoric sites in the project vicinity are located on mineral soils (rather than organic soils of former tidal marshes); are along existing or former water channels or tidal wetlands; and are Late Period sites (generally easily identified mound sites). West and Scott

(1990) suggested additional survey in areas above five feet below sea level with mineral soils. Earlier sites on mineral soils may be buried under peat (Jones et al. 1980; Holson et al. 1993).

Systematic surveys and previously recorded sites are discussed below, grouped by proximity to project elements and alternatives. The information pertains to larger areas than the ISDP APE for two reasons. First, such information provides a context for understanding the nature of the expected resources within the APE. Second, the impact areas for certain project alternatives are only approximately defined so that more distant sites must be mentioned. The 1989 archaeological records search upon which West's (1994) report is based is supplemented here by record searches with the Northwest Information Center (NIC) and Central California Information Center (CCIC) in July 1994 and January 1995.

- *Vicinity of the proposed Old River Channel Dredging Area*

Several linear survey swaths approach the portion of Old River proposed for dredging (Bramlette et al. 1991). West (1994) inspected by water in 1988 and noted no historic remains. There are no prior systematic surveys on Victoria Island, where dredge spoil disposal is planned; West (1994) reports this area being intensively farmed in 1994, with primarily organic soils having no archaeological potential. Areas with mineral soils (about five acres) were surveyed with negative results. No known sites are within one mile. Vicinity sites include:

*CA-CCo-141.* Palm Tract near Mokelumne Aqueduct (>2 miles NW of the proposed dredging area); a prehistoric burial site with various artifacts, recorded in 1939 (Lillard, Heizer and Fenenga 1939).

*CA-CCo-145.* Byron Tract, along Indian Slough by St. Marys Bay (>1 mile W of the proposed dredging area); a prehistoric habitation site with a variety of artifacts, recorded in 1948.

*CA-CCo-148/H.* Orwood Tract, along Mokelumne Aqueduct (>2 miles NW of the proposed dredging area); a prehistoric burial/habitation site recorded by Wedel in 1935; includes late 19th century historic artifacts (Bramlette et al. 1991).

*CA-CCo-621/H.* Byron Tract (>1 mile W of the proposed dredging area); a scatter of prehistoric obsidian lithics and historic refuse, possibly redeposited (Bramlette et al. 1991).

*CA-CCo-650H.* Byron Tract (about 2 miles W of the proposed dredging area); a scatter of 20th century historic refuse (Romano 1990).

*Vicinity of the Proposed Northern Intake Structure at Clifton Court Forebay*

West (1994) reports the potential new intake area near Kings Island has been "completely modified" and no archaeological or historic properties are present. No known sites are within one mile.

- *Vicinity of the proposed Middle River Flow Control Structure*

There had been no prior systematic surveys in this area until the south bank was examined by West; the north bank was not accessible (1994). A temporary barrier is in place. West reports the entire vicinity to be highly disturbed by levee construction, rip-rap, and agricultural development (1994). No known sites are within one mile.

- *Vicinity of the proposed Grant Line Canal Flow Control Structure*

There had been no prior systematic surveys in this area. West (1994) reports the area is highly disturbed, with levees and rip-rap. No known sites are within one mile.

- *Vicinity of the proposed Old River Flow Control Structure*

Systematic surveys in this area include Archeo-Tec (1989, 1990, Baker and Shoup (1991), True et al. (1981), and West and Scott (1990). West (1991) surveyed the proposed flow control structure location and found nothing. A temporary control structure has been installed (West 1994). No known sites are within one mile. Vicinity sites include:

*CA-SJo-136.* prehistoric site south of Old River (>1.5 mile S of the proposed construction site); two chert projectile points collected by Barr in 1903; apparently not relocated since (Baker and Shoup 1991), though West (1994:31) reports artifacts found in 1983.

*CA-SJo-137.* a prehistoric site on Union Island, along Old River (>1 mile SE of the proposed construction site); a flange pipe and charmstone collected by Barr in 1898; not relocated since; West (1994:32) searched in 1990; it is believed the former mound has been leveled.

*CA-SJo-138.* on Union Island, near Old River (nearly 3 miles E of the proposed construction site); a prehistoric mound, recorded in 1898; not relocated (West and Scott 1990:16).

*CA-SJo-139.* on Union Island, along Old River (>2 miles E of the proposed construction site); a prehistoric mound, recorded in 1898; not relocated (West and Scott 1990:16).

*CA-SJo-229H.* located south of Old River (nearly 2 miles SE of the proposed construction site); the old townsite of Wicklund, occupied in the 1860s-1870s; a relatively thin scatter of glass and ceramics in 1991 (Baker and Shoup 1991).

*CA-SJo-231H.* located south of Old River (> 2 miles SE of the proposed construction site); a scatter of glass and ceramics, 1940s or earlier (Baker and Shoup 1991).

- *Vicinity of the proposed Old River Fish Control Structure*

Systematic surveys are reported by Napton (1988) and Wohlgemuth and Mears (1994). West (1994) reports the entire area modified by levees, agriculture, and temporary barrier installation. Access is along existing public and private roads. No known sites are within one mile. Vicinity sites include:

*CA-SJo-133.* Union Island, along Middle River (>2 miles W of the proposed construction site); a prehistoric mound, recorded in 1898; not relocated (West and Scott 1990).

*CA-SJo-134.* Union Island, along Middle River (>2 miles W of the proposed construction site); a prehistoric mound, recorded in 1898; not relocated (West and Scott 1990).

*CA-SJo-135.* Union Island, along Middle River (>2 miles W of the proposed construction site); a prehistoric mound, recorded in 1898; not relocated (West and Scott 1990).

*CA-SJo-255.* Stewart Tract (about 1 mile S of the proposed construction site); a sparse lithic scatter (Wohlgemuth and Mears 1994).

*CA-SJo-I-38.* Stewart Tract (about 1 mile SW of the proposed construction site); isolated igneous flake (Wohlgemuth and Mears 1994).

*CA-SJo-I-39.* Stewart Tract (about 1 mile SW of the proposed construction site); isolated chert flake (Wohlgemuth and Mears 1994).

- *Other Areas: South of Old River*

CA-SJo-5 is south of Paradise Cut (several miles from any proposed project element). Recorded in 1939, it is described as a "burial and occupation mound" that has been leveled.

CA-SJo-6 is along Old River near Tom Paine Slough (several miles from any proposed project element, roughly midway between the two control structures on Old River). It was a prehistoric burial site, now occupied by a dairy (West and Scott 1990:15).

- *National Register Evaluations*

None of the archaeological sites listed above are within one mile of any proposed project element, so they are clearly not within the proposed project APE; thus they have not been evaluated for eligibility to the National Register of Historic Places (NRHP). Twelve known archaeological sites are within one mile of components of the project alternatives and might require NRHP evaluation if one of those alternatives were selected for development. They are: CCo-143, CCo-144, CCo-653, SJo-89, SJo-133, SJo-134, SJo-135, SJo-137, SJo-138, SJo-138, SJo-139, SJo-222H, and SJo-232H. In addition, presently unknown archaeological sites in the vicinity of alternative project components may also require evaluation.

### 17.2.3 *Ethnographic Resources*

Ethnographic resources are physical resources, or intangible cultural values pertaining to physical resources, important to the maintenance of beliefs of a social group of people. Ethnographic resources may include natural or cultural resources, landscapes, or natural environmental features linked by a community or group of communities to traditional practices, values, beliefs, history and/or ethnic identity of that community or wider social group. Ethnographic resources are protected under state laws (Native American Heritage Act of 1976), federal laws (American Indian Religious Freedom Act of 1978, Native American Graves Protection Act of 1990), and federal regulations (see the National Park Service's Bulletin 38 regarding the place of ethnographic resources in compliance with Section 106 of the National Historic Preservation Act). In the present case, the primary ethnographic resources of concern are in relation to Native American people.

According to anthropologists, Native Americans in the South Delta area at historic contact were Penutian-speaking Northern Valley Yokuts people (Wallace 1978b). Settled along San Joaquin River and its tributaries, their territory extended from north of Calaveras River south to the eastward bend of the San Joaquin. Those in the south Delta proper were called Chulamni or Nochochomne. Semi-sedentary, they lived on low mounds or levees along major watercourses. Population estimates vary; Cook (1955) suggests 1,500 people in four or five settlements.

Contacted by Europeans during Spanish expeditions in 1806-1811 (Schenck 1926), Chulamni numbers were subsequently greatly reduced by missionization and European diseases. Secularization in 1822 improved little; malaria killed many in 1833. American influx after the 1849 gold rush further disrupted Yokuts society and culture. A few survivors signed treaties in 1850, but treaties were not honored. Some Northern Valley Yokuts descendants now live on the Tule River Reservation (Wallace 1978b); others may be scattered about San Joaquin Valley.

Miwokan/Utian-speaking Plains Miwok people lived primarily north of the project vicinity, with territory extending nearly to Sacramento. Anthropologists believe their territory stopped just north of the Calaveras River (Bennyhoff 1961; Levy 1978; Milliken 1994). This is disputed by Miwok people who now claim ancestral territory extended farther south; a definitive opinion is made difficult by early depopulation of the area.

Natural resource values of concern to Native American people occur within the project vicinity, despite long-term cultivation and development and the fact that people consulted do not live in close proximity to the project. The California Native American Heritage Commission (NAHC) indicated no knowledge of Yokuts Native Americans claiming affiliation with the project vicinity, but a number of Miwok people have expressed concern. NAHC identified people with whom to consult, and copies of West's archaeological survey report (1994) were sent to six individuals with a request for comments. Comments received from Miwok people living in Ione and Sacramento are reported by White (1995) and summarized here.

Miwok people are very much concerned about human remains (or associated artifacts) present at archaeological sites. They have been involved in monitoring construction at other recent projects, including the FERC-licensed PGT Pipeline project in Contra Costa County, and they believe: 1) many sites have produced human burials, and 2) many sites are deeply buried with no surface indications. They suggest buried sites are most often five to eight feet below the present-day ground surface.

Miwok people are also concerned with impacts on floral and faunal resources, particularly bird habitat and especially riparian woodland. Bird species of special concern are: Northern (Red-shafted) Flicker, Common Raven, Wild Turkey, Golden Eagle, Bald Eagle, and Red-tailed Hawk. They are also concerned about loss of wetlands, and native plants including wormwood (*Artemisia douglasiana*), black and green lichens on rocks, and nettles.

#### 17.2.4 Historic Resources

Historic resources may include either archaeological remains of historic period activities, or standing architectural remains; remains of historic activities which are archaeologically recorded are treated under section 17.2.2, above, while standing structures and remains known only from historic references are treated here. Vicinity historic period activities began with Spanish explorations in 1806; native populations were quickly drawn into missions. Spanish land grants began during the 1840s, and from this time forward, agriculture has dominated activities within the project vicinity. Little of the area remains undisturbed, due to diking, dredging, and other reclamation activities (Weir 1950; Thompson 1957; West 1977; Atwater and Belknap 1980). Dredged channels in the project vicinity include Grant Line Canal, West Canal, Victoria-North Canal, Woodward-North Victoria Canal, and a number of small cuts along Old River (West and Scott 1990).

Systematic survey for historic resources is available to the extent that the project vicinity was inventoried by West (1994). Various project alternatives would require additional inventory, if selected.

Potential historic sites in the project vicinity are related to navigation, commerce, and agriculture. It is expected there might be farmsteads, labor camps, landings for shipment of agricultural produce, unpaved roads, bridges, ferry crossings, pumping stations, siphons, canals, and drains. Owens (1991) presents a detailed list of sites, compiled from a variety of documentary sources, but not verified by survey. These are not entered on Central California Information Center master maps. Known historic sites within the project vicinity, potentially affected by various project alternatives, are as follows:

Old River Bridge. (bridge number 29-45) on State Route 4, built in 1915; determined NRHP eligible in 1985; eligible under criteria A (key link in an important highway) and C (distinctive example of a three-span rigid connection steel swing bridge).

Middle River Bridge. (bridge number 29-49) on State Route 4, built in 1915; determined NRHP eligible in 1985; eligible under criteria A (key link in an important highway) and C (distinctive example of a four-span rigid connection steel swing bridge).

Mohr's Landing. on Old River north of Bethany, established in the 1850s; a few structures remained into the 1940s (West and Scott 1990) but none remain now (West 1994); the site is well over a mile from the nearest proposed project element (Old River flow control structure).

### *17.2.5 Indian Trust Assets*

Indian trust assets (ITAs) are legal interests in assets held in trust by the federal government for Indian tribes or individual Indians. Assets can be real property, physical assets or intangible property rights. A characteristic of an ITA is that it can not be sold, leased or otherwise alienated without the U.S. government's approval. Examples of ITAs are land, including reservations and public domain allotments, minerals, water rights, hunting and fishing rights, other natural resources, money or claims. ITAs do not include things in which a tribe or individuals have no legal interest. For example, off-reservation sacred lands or archaeological sites in which a tribe has no legal property interest are not ITAs.

No Indian trust assets have been identified within the project area, and none are expected to be affected by the project.

## *17.3 Environmental Impacts/Consequences*

### *17.3.1 Introduction*

The potential environmental impacts or consequences of ISDP are discussed in the following. The APE for ISDP includes a new intake at Clifton Court Forebay, a dredging area on Old River between the north end of Clifton Court Forebay and the northwest corner of Victoria Island, two dredge spoil ponds on Victoria Island, and four permanent barriers. The potential impacts upon paleontological resources are discussed first, followed by archaeological, ethnographic, and historical resources.

### *17.3.2 Significance Criteria*

In accordance with the CEQ NEPA Regulations and the CEQA Guidelines, and for the purposes of this EIR/EIS, an impact would be considered significant if the project would adversely affect an important archaeological resource.

Appendix K of the CEQA Guidelines defines an "important paleontological, archaeological, ethnographic, or historic resource" as one which:

- "A. Is associated with an event or person of:
  - 1. Recognized significance in California or American history, or
  - 2. Recognized scientific importance in prehistory.
  
- B. Can provide information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions;

- C. Has a special or particular quality such as oldest, best example, largest or last surviving example of its kind;
- D. Is at least 100 years old and passes substantial stratigraphic integrity; or
- E. Involves important research questions that historical research has shown can be answered only with archaeological methods.”

Specifically, the CEQA Guidelines indicate that an impact would be considered significant if an action would disrupt or adversely affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group, or a paleontological site except as a part of a scientific study; have the potential to cause a physical change which would affect unique ethnic cultural values; or restrict existing religions or sacred uses within the potential impact area.

The importance of archaeological, historic, and ethnographic sites is also defined by the criteria under 36 CFR 60.4, for evaluating the eligibility of properties to the National Register of Historic Places. Significant properties are those that possess integrity, and:

- “(A) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) that are associated with the lives of persons significant in our past; or
- (C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinctions; or
- (D) that have yielded, or may be likely to yield, information important in prehistory or history.”

In addition, evaluating the importance of ethnographic resources is guided by National Register Bulletin 38. Important paleontological resources are those that can contribute to scientific knowledge.

### *17.3.3 Paleontological Resources*

Delta sediments contain Holocene micro- and macrofossils of potential interest, but sediments at proposed construction sites are too badly disturbed to be useful for such research. The Delta is generally considered to be of low sensitivity for vertebrate paleontology. Our review of the site conditions within the APE leads to a conclusion that it is unlikely significant vertebrate fossils would be found during the construction of ISDP. This is considered a potentially significant adverse impact.

#### 17.3.4 Archaeological Resources

A number of archaeological sites are known to have existed in the general project area. However, no sites have been identified in the vicinity of any proposed ISDP element. Accordingly, the construction and operation of ISDP would cause no known archaeological impact. The State Historic Preservation Officer (SHPO) has concurred with Bureau of Reclamation's request for a "no effect" determination (letter of September 14, 1994, Cheryl E. Widell to Frank J. Michny). Caution is warranted, as it was not possible to survey all potential impact areas at each project element site. Project element sites where complete archaeological survey was not possible are:

Northern and southern spoil pond sites. These former tidal marsh areas are well below sea level. They were not entirely surveyed because they were densely covered with crops and specific spoil areas had not been determined for Victoria Island at the time of reconnaissance (West 1994); and

Middle River control structure site. The unexamined north bank is rip-rapped, and the area is well below sea level. This area was not entirely surveyed, as access was denied to the north river bank. A temporary structure is already in place.

#### 17.3.5 Ethnographic Resources

Prehistoric human burials, or artifacts associated with burials, are of major concern to Miwok people. There is a degree of concern also for any archaeological site, regardless of whether it includes burials. Natural resources are also of concern. No archaeological sites with human remains are known to occur in the vicinity of any proposed ISDP project element. The preferred project will cause no known impacts to such ethnographic resources. Caution is warranted because buried sites with human remains could be present at certain project element sites. Impacts to such resources would be potentially significant.

There is likely to be some habitat loss at proposed ISDP project construction sites (see Chapter 10, Terrestrial Resources). Riparian woodland would generally not be affected by the project, but some riparian scrub (streamside willows and alders) would be affected. There may be some loss of wetlands and other areas with native plants, but regional effects of project-related water management is not yet understood. Lichens are not expected in the project area. There could be impacts to specific types of plants such as wormwood and nettles. These would be less-than-significant ethnographic impacts owing to the small scale of the potential disturbance.

There would probably be no loss of northern flicker habitat; wild turkeys and common ravens do not occur in the Delta (American crows do). Bald eagles occur infrequently in the area, and golden eagles occur in winter months only; red-tailed hawks are common. The most likely effect on raptors (eagles and hawks) would be from disturbance to nests and from electrocution by project-associated power lines. These would be less-than-significant ethnographic impacts owing to the small scale of the potential disturbance.

### *17.3.6 Historic Resources*

Three historic properties have been identified within the project area. These are: 1) Mohr's Landing, formerly on Old River north of Bethany over a mile from the nearest proposed project element, which no longer exists and hence cannot be affected by the project; 2) Old River Bridge (bridge number 29-45); and 3) Middle River Bridge (bridge number 29-49) which were both built in 1915, on State Route 4. These bridges have been determined eligible for the National Register of Historic Places. Old River and Middle River bridges might be crossed by trucks hauling construction material to several project element sites (especially the proposed Middle River Flow Control Structure).

Consultation with Susan Page of Caltrans (personal communication, July 1994) revealed that both bridges are rated "*full bonus purple*," meaning they can support 13-axle vehicles with no weight restriction. The proposed ISDP is expected to have no effect on these bridges.

In summary, the proposed ISDP as presently designed would have no effect on historic properties.

## *17.4 Mitigation Measures*

### *17.4.1 Introduction*

The following provides a discussion of the mitigation measures recommended for ISDP. The mitigation measures should include the general measure of implementing an Environmental Awareness Program (EAP), wherein construction personnel would be educated regarding known and potential environmental sensitivities connected with the project. The EAP would identify the specific steps to be taken, and the persons to be notified, in the event certain environmental sensitivities are encountered during construction. The EAP is discussed more specifically for various resource areas, in the following.

### *17.4.2 Paleontological Resources*

In light of the slight possibility that significant vertebrate fossil remains might be discovered during construction, the EAP should include information regarding the nature of vertebrate fossils and instructions regarding appropriate measures to take in event of discovery. The necessary discovery measures would include: 1) shutting down of construction activities in the immediate area of a find, without cost penalty to construction firm(s) involved; 2) notifying a professional paleontologist, either through the Museum of Paleontology (University of California, Berkeley), or by prior arrangement with qualified consultants; 3) continuing work cessation for a reasonable period of time to allow professional evaluation of finds; and 4) providing time and funding for professional recovery and analysis of significant paleontological finds.

### *17.4.3 Archaeological Resources*

Upon project approval, any areas not yet completely surveyed for cultural resources should be inventoried. These include the northern and southern spoil pond sites on Victoria Island (which should be sampled), and the proposed Middle River Control Structure site (the 0.34 acre storage area north of Middle River). Any sites found should be evaluated for NRHP eligibility in consultation with the SHPO; significant properties affected would require consultation with ACHP.

No known archaeological properties would be impacted by the proposed ISDP as presently designed. Due to the remote possibility that buried resources might be present, one element of the EAP should advise construction personnel of the nature of archaeological resources (both historic and prehistoric), and instruct them regarding appropriate measures to take in event of discovery (per federal regulations at 36 CFR 800.11). Necessary discovery measures would include: 1) shutting down of construction activities in the immediate area of a find, without cost penalty to construction firm(s) involved; 2) notifying a professional archaeologist; 3) continuing work cessation for a reasonable period of time to allow professional evaluation of finds, in consultation with the State Historic Preservation Officer; and 4) providing time and funding for professional recovery and analysis of significant archaeological finds.

### *17.4.4 Ethnographic Resources*

The EAP should include an element in which construction personnel are advised of the nature of human remains and associated objects, and instructed regarding appropriate measures to take in event of discovery of human remains.

If any prehistoric sites are discovered during construction, or during further inventory efforts, the Miwok people should be consulted during any archaeological testing of such sites. Discoveries of human remains and associated artifacts during construction would be handled according to provisions of the California Health and Safety Code, section 7052, and the California Public Resource Code, section 5097.99, i.e., construction activities in the immediate area of such finds would cease until the county coroner is notified, and, if remains are Native American, the Native American Heritage Commission is additionally notified in order that a "most likely descendant" might be identified. Insofar as none of the project facilities are located on federal or tribal land, discovery provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) do not apply. It should be emphasized that California statutes apply to any human remains, regardless of whether the archaeological site is severely disturbed.

Project power lines should be designed so eagles and hawks will not be electrocuted by the lines.

### *17.4.5 Historic Resources*

As presently designed, the ISDP would have no effect on historic resources, so mitigation measures are not necessary.

## 17.5 Comparative Evaluation of the Alternatives

### 17.5.1 Enlargement of Clifton Court Forebay, Construction of Two Intake Structures, Increased Export Capability, and Construction of Permanent Barriers

This alternative involves enlargement of Clifton Court Forebay, dredging of adjacent channels, increased export capability, and construction of permanent barriers. The APE for cultural resources would include the forebay enlargement area (portions of Clifton Court, Byron, and Victoria Island Tracts) and areas affected by dredging and barrier construction.

Paleontological Resources. It is unlikely, although possible, that significant vertebrate fossils could be found in the vicinity of these proposed facilities. Enlargement of Clifton Court Forebay (including portions of Clifton Court, Byron, and Victoria Island Tracts) would increase likelihood of impacts. Byron and Clifton Court Tracts have higher sensitivity than other areas associated with the proposed project (Spencer 1989; West 1994:34).

Archaeological Resources. There are no known sites in association with permanent barriers. One known historic archaeological site, SJo-232H, is very likely to be impacted by channel enlargement on Middle River between Woodward Island and Upper Jones Tract; there has been no systematic survey in this area, and presently unknown sites might also be affected. One prehistoric site, CCo-653, is within approximately 600 feet of the potential forebay expansion area on Byron Tract; two other prehistoric sites (CCo-143 and CCo-144) appear to be less than 1,000 feet from the expansion area. The three sites may be remnants of a single site (G. James West, personal communication, 1995). Major portions of Victoria Island, Byron Tract, and the southern part of Clifton Court Tract have not been systematically surveyed, and unknown sites might be affected.

Ethnographic Resources. No known archaeological sites are in association with permanent barriers. There has been no systematic survey in the area of channel enlargement on Middle River between Woodward Island and Upper Jones Tract, and presently unknown sites might be affected. Three prehistoric sites, CCo-653, CCo-143 and CCo-144, are less than 1,000 feet from the potential forebay expansion area on Byron Tract; CCo-653 produced at least one burial. Major portions of Victoria Island, Byron Tract, and the southern Clifton Court Tract have not been systematically surveyed and presently unknown sites might be affected as well. The known burial at CCo-653, and proximity of the Clifton Court Forebay expansion area to that site, makes Alternative 1 quite sensitive in terms of potential ethnographic impacts. Also, riparian vegetation and other natural habitat areas are likely to be destroyed in Clifton Court Forebay expansion areas and by Middle River channel enlargement.

Historic Resources. Plans for expansion of Clifton Court Forebay initially called for removal and replacement of Old River Bridge, and realignment of Highway 4 on its approach to Middle River Bridge. Insofar as those actions would have constituted adverse effects on National Register properties, DWR changed the Alternative 1 design such that Old River Bridge will not be removed, and the highway will not be realigned at Middle River Bridge.

Nonetheless, there is a possibility that development of levees and expansion of the Clifton Court Forebay in the immediate vicinity of the bridges could have an adverse effect on visual setting of the bridges. Whether or not there is an adverse effect could depend upon specific design criteria and the extent of environmental change visible from common vantage points involving the bridge. It seems probable there would be an adverse effect on the visual setting, insofar as levees would obstruct existing views from Highway 4 near the bridges; also, former agricultural lands visible from the bridges would be inundated by the expanded Clifton Court Forebay.

In addition to potential impacts to bridges, Owens (1991) lists camps and residences on Victoria Island, and a Chinese landing site and a private ferry on Byron Tract. Forebay expansion could impact several presently unrecorded historical sites.

- *Mitigation Measures*

Archaeological Resources. If this alternative is selected, a priority would be completion of archaeological survey. Areas requiring survey would include portions of Victoria Island, Byron Tract, and Clifton Court Tract involved in expansion of Clifton Court Forebay; Victoria Island could simply be sampled, once crop cover is absent. In addition, both shores of Middle River between Woodward Island and Upper Jones Tract would need to be surveyed. Any sites found would require NRHP evaluation; consultation with SHPO (and perhaps the Advisory Council on Historic Preservation, ACHP) would be needed.

No known sites are in association with permanent barriers. One known historic site at the northeast corner of Woodward Island, SJo-232H, would likely be impacted by channel enlargement on Middle River. This site would need NRHP evaluation, and, if significant, a treatment plan developed in consultation with SHPO and ACHP.

Precise boundaries of forebay expansion would need identification, and NRHP eligibility of (and potential effects on) prehistoric sites CCo-143, CCo-144, and CCo-653 (perhaps a single site) would require consultation with SHPO. Treatment plans, if necessary, would require consultation with ACHP.

It is remotely possible that buried resources might be present at Alternative 1 project element sites. If this alternative is selected, it should include an Environmental Awareness Program (EAP) with instruction of construction personnel regarding appropriate steps to be taken in event of discovery of resources. In addition, it would be prudent to conduct either archaeological monitoring of any deep excavation (e.g., in association with the forebay expansion), or extensive archaeological testing with a backhoe prior to construction.

Ethnographic Resources. If this alternative is selected, a first priority would be completion of archaeological survey and specific ethnographic consultation regarding findings.

No known sites are in association with permanent barriers. Along with archaeological evaluations as discussed above, sites CCo-143, CCo-144, and CCo-653 (perhaps a single site) would need to be considered in consultation with Miwok people.

Buried archaeological sites containing human remains might be associated with this alternative. If this alternative is selected, it should include an EAP with instruction of construction personnel regarding appropriate steps to be taken in event of discovery of human remains or artifacts which may have been associated with human remains. Any archaeological monitoring or testing should include consultation with the Miwok people. Also, better characterization and quantification of impacts to riparian vegetation and other natural habitat in Clifton Court Forebay expansion areas and along Middle River channel enlargement area would be needed, and Miwok people should be consulted in regard to such impacts. Project power lines should be designed to be raptor-friendly, i.e., so eagles and hawks would not be electrocuted by the lines.

Historic Resources. If this alternative is chosen, potential adverse effects on the visual setting of Old River and Middle River bridges would require careful assessment. This would involve development of both 1) verbal descriptions of views of and from the bridges, before and after expansion of Clifton Court Forebay, and 2) graphic presentations such as computer-enhanced photographs showing present and future appearance of the bridges and their surroundings. If, in consultation with SHPO and ACHP, it is determined that changes in visual setting constitute an adverse effect on one or both bridges, mitigation measures such as recordation to HABS/HAER standards (Historic American Building Survey/Historic American Engineering Record) would likely be required.

Selection of this alternative also would necessitate carrying out a survey of historical structures on those portions of Victoria Island, Byron Tract, and Clifton Court Tract affected by forebay expansion. A similar survey would be required for shores of Middle River between Woodward Island and Upper Jones Tract. This could be carried out in conjunction with archaeological survey; standing structures would also need to be assessed for NRHP eligibility, and SHPO (and perhaps ACHP) would need to be consulted regarding project effects and mitigation for any properties determined significant.

#### *17.5.2 Reduction of CVP/SWP Exports and Management or Reduction of Demand for SWP Water*

This alternative is a reduction of Central Valley Project/State Water Project (CVP/SWP) water exports combined with management/reduction of demand for water from SWP. The APE is difficult to identify; management/reduction of demand for SWP water includes an option of agricultural land retirement in the west side of San Joaquin Valley, and a long-range possibility that additional storage and conveyance facilities would be needed.

Paleontological Resources. Retirement of land on the west side of the San Joaquin Valley could indirectly impact vertebrate fossils, if retirement leads to development of land for residential or industrial purposes. Areas on Delta margins have higher sensitivity than areas associated with the proposed project (Spencer 1989; West 1994:34). Similarly, additional storage and conveyance facilities could have impacts on vertebrate fossils. In both cases, specific impact areas have not been identified, so it is impossible to quantify potential impacts from this alternative.

Archaeological Resources. Retirement of land on the west side of the San Joaquin Valley could indirectly impact sites, if retirement leads to development of land for residential or industrial purposes. Similarly, additional storage and conveyance facilities could have impacts on sites. Specific impact areas have not been identified so it is impossible to quantify potential impacts from this alternative.

Ethnographic Resources. Retirement of land on the west side of the San Joaquin Valley could indirectly impact cultural and natural resources of ethnographic concern if retirement results in development of land for residential or industrial purposes. Water conservation measures could reduce drain water, often used in wildlife refuges. Similarly, additional storage and conveyance facilities could have ethnographic impacts. Specific impact areas have not been identified, and it is impossible to quantify potential impacts from this alternative.

Historic Resources. Retirement of land on the west side of the San Joaquin Valley could indirectly impact on historical sites, if retirement results in abandonment of historic farms and/or development of land for residential or industrial purposes. Similarly, additional storage and conveyance facilities could have impacts on historical sites. Impact areas have not been identified so it is impossible to quantify potential impacts from this alternative.

- *Mitigation Measures*

Paleontological Resources. Options under this alternative would need better definition in order to develop appropriate mitigation measures. The EAP provisions outlined above might suffice for this alternative.

Archaeological Resources. Options under this alternative would need better definition in order to develop appropriate mitigation measures. Before developing mitigation measures, it would be necessary to carry out archaeological inventory, evaluation, and determination of effect on significant properties.

Ethnographic Resources. Options under this alternative would need better definition in order to develop appropriate mitigation measures. Before developing mitigation measures, it would be necessary to carry out archaeological inventory, and to consult with Miwok people regarding impacts on both cultural and natural resources affected by development options.

Historical Resources. Options under this alternative would need better definition in order to develop appropriate mitigation measures. Before developing mitigation measures, it would be necessary to carry out historical sites and buildings inventory, and to consult with SHPO (and perhaps ACHP) regarding NRHP eligibility of, and impacts to, historical properties.

### *17.5.3 Modification of CVP/SWP Exports, Consolidation of Agricultural Diversions, Extension of Existing Agricultural Diversions, and Increased Pumping at Banks Pumping Plant to 10,300 cfs*

- *Paleontological Resources*

It is unlikely, although possible, that significant vertebrate fossils could be found in the vicinity of Components 2 and 3 of this alternative. Construction of settling ponds on Union Island, the Stewart Tract and Fabian Tract, and construction of regulated reservoirs on Union Island, the Drexler Tract, Upper and Lower Roberts Island, the Stewart Tract, and El Pescadero have the slight possibility of unearthing fossils. Dredging might also increase chances for paleontological impacts. The sheer scale of excavation likely would increase sensitivity of this alternative. Dredging might also increase the chances for paleontological impacts.

- *Archaeological Resources*

Site SJo-133, SJo-134 and SJo-135 are located along Middle River; an isolated find (P-8 I-37) and sites SJo-138 and SJo-6 are located along Old River; and, SJo-5 is along Paradise Cut, all in areas potentially affected by dredging or spoils pipes. No sites are presently known in the immediate vicinity of proposed dredge settling ponds or regulated reservoirs. Two prehistoric lithic isolates (P-9 I-38 and P-10 I-39) are within the consolidation area for regulated reservoir #2, and perhaps within the boundaries of the settling pond on Stewart Tract; site SJo-255, a former burial mound, was located just northeast of the consolidation area for regulated reservoir #2. Caution is warranted as certain project element sites were not surveyed for potential impacts. Project sites only tentatively identified at this time, and with few exceptions not systematically surveyed at all, include the dredge settling ponds and regulated reservoirs (portions of the latter are also outside of the area covered by the archaeological records search, so there is a possibility that a few recorded sites are not discussed here).

- *Ethnographic Resources*

Sites SJo-133, SJo-134 and SJo-135 are located along Middle River, an isolated find (P-8 I-37) and sites SJo-138 and SJo-6 are located along Old River, and site SJo-5 is along Paradise Cut, all in areas potentially affected by dredging or spoils pipes. No sites are presently known in the vicinity of proposed dredge settling ponds or regulated reservoirs. Caution is warranted, however, as certain project element sites were not surveyed for potential impacts. This is particularly true for ethnographic sites, because buried human remains could be present at sites such as SJo-5 and SJo-6, even if there is no surface evidence of the sites at present.

There is likely to be some bird habitat loss at the alternative construction sites. Riparian woodland is generally not affected by the project, but some riparian scrub (Streamwide willows and alders) will be affected, perhaps especially by dredging along Middle River, Old River and Paradise Cut. There may be some loss of wetlands and other areas with native plants, but regional effects of project-related water management is not yet understood. Lichens are not expected in the project area. Impacts on specific types of plants such as wormwood and nettles would be difficult to assess.

There would probably be no loss of Northern Flicker habitat; Wild Turkeys and Common Ravens do not occur in the Delta (American Crows do). Bald Eagles occur infrequently in the area, and Golden Eagles occur in winter months only; Red-tailed Hawks are common. The most likely effect on raptors (eagles and hawks) would be from electrocution by project-associated transmission lines (but see mitigation below). For more information on floral and faunal impacts and mitigation, refer to Chapter 10.

- *Historic Resources*

Two historic properties have been identified within the vicinity of this alternative. Caution is warranted, however, as certain project element sites have not been surveyed for potential impacts.

Old River Bridge (bridge number 29-45) and Middle River Bridge (bridge number 29-49) were not built in 1915, on state Route 4. These bridges have been determined eligible for National register of Historic Places. Old River and middle River bridges might be crossed by trucks hauling construction material to several project element sites (especially regulated reservoir site #4 - Union Island A, #5 - Drexler Tract and #7 - Union Island C).

Consultation with Susan Page of Caltrans revealed that both bridges will support 13-axle vehicles with no weight restriction.

In summary, this alternative as designed will have no known effect on known historic properties.

- *Mitigation Measures*

Archaeological Resources. If this alternative is selected, a priority would be more precise definition of potential impact areas, followed by archaeological inventory. Extensive areas on Union Island, the Drexler Tract, Stewart Tract, Fabian Tract, El Pescadero and Upper and Middle Roberts Island likely would require survey. Any sites found would require NRHP evaluation; consultation with SHPO (and perhaps ACHP) would also be needed.

Sites SJo-133, SJo-134, and SJo-135 on Union Island, and sites SJo-5, SJo-6, and SJo-138 south of Old River and Paradise Cut, likely would need evaluation for integrity of potential remnants. If determined NRHP-eligible and subject to impact, treatment plans would need to be developed in consultation with SHPO and ACHP.

Buried resources might be present at the project element sites included in this alternative. If this alternative is selected, it should include an EAP with instruction of construction personnel regarding appropriate steps to be taken in event of discovery of archaeological resources. In addition, it would be prudent to conduct either archaeological monitoring of any deep excavation (e.g., for settling ponds or regulated reservoirs), or extensive archaeological testing with a backhoe prior to construction. Testing would be particularly pertinent in the vicinity of the six archaeological sites listed above.

Ethnographic Resources. If this alternative is selected, a priority would be more precise definition of potential impact areas, followed by archaeological inventory and ethnographic consultation.

Sites SJo-133, SJo-134, and SJo-135 on Union Island, and sites SJo-5, SJo-6, and SJo-138 would need to be evaluated for potential remnants; as would site SJo-255 if there is to be development in its vicinity; the mere presence of human remains, even if in archaeologically disturbed context, is sufficient to raise ethnographic concerns.

Buried sites containing human remains might be associated with this alternative. If this alternative is selected, it should include an EAP with instruction of construction personnel regarding appropriate steps to be taken in event of discovery of human remains or artifacts which may have been associated with human remains. Any archaeological monitoring or testing should include consultation with the Miwok people. Also, there should be better characterization and quantification of impacts to riparian vegetation and other natural habitat on Union Island, Fabian Tract, and Upper and Middle Roberts Island, and Miwok people should be consulted in regard to such impacts. Project power lines should be designed so eagles and hawks would not be electrocuted by the lines.

Historic Resources. If this alternative is selected, it would be necessary to carry out a survey of historical structures on Union Island, Fabian Tract, and Upper and Middle Roberts Island in areas potentially affected by construction of diversions. This could be carried out in conjunction with archaeological survey; standing structures would also need to be assessed for NRHP eligibility, and SHPO (and perhaps ACHP) would need to be consulted regarding project effects and mitigation for any properties determined to be significant.

#### *17.5.4 ISDP Project With an Additional Clifton Court Forebay Intake at Italian Slough*

This alternative would provide all of the proposed components of the ISDP project, plus a new intake at Italian Slough. Thus, the alternative would include two intakes, one at Italian Slough and one at the northeastern corner of Clifton Court Forebay. Consequently, the APE for this alternative would include the Italian Slough intake, as well as areas previously identified for the ISDP. Implementation of this alternative would result in all of the effects associated with the ISDP. In addition, the impacts discussed below would be associated with the proposed Italian Slough intake.

Selected areas on the west side of Clifton Court Forebay were surveyed for existing resources by West and Scott (1990), with negative results. The specific location of the potential Italian Slough intake has not been surveyed. It appears from the USGS map and project drawings that this area is substantially or completely modified, and sites would be unlikely close by. An associated rockfill storage area, however, may be undisturbed. Vicinity sites include:

*CA-CCo-130.* Byron Tract, near Italian Slough (slightly over 1 mile NNW of the potential Italian Slough intake); a prehistoric mound, recorded in 1949; not relocated despite intensive efforts (West and Scott 1990:14).

CA-CCo-143. Byron Tract, near Italian Slough (about 3/4 mile NW of the potential Italian Slough intake); a sparse prehistoric artifact scatter, impacted by agriculture (West and Scott 1990:15); a few artifacts found during recent examination (West 1994:31).

CA-CCo-144. Byron Tract, near Italian Slough (about 3/4 mile NW of the potential Italian Slough Intake); few data available; a prehistoric site recorded by Heizer in 1948, not relocated (West and Scott 1990:15).

CA-CCo-618H. Byron Tract (>2 miles NW of the potential Italian Slough Intake, and >2 miles W of the potential northern intake on Clifton Court Forebay); late 19th/20th century historic refuse (Romano 1990).

CA-CCo-653. Byron Tract, near Italian Slough close to sites CCo-143 and CCo-144 (about 3/4 mile NW of the potential Italian Slough Intake); a prehistoric site with surface lithic debitage, and at least one burial discovered during PGT Pipeline construction; possibly the same site as CCo-143 and CCo-144 (G. James West, personal communication, 1995).

Paleontological Resources. It is unlikely, although possible, that significant vertebrate fossils could be found in the vicinity of the proposed Italian Slough intake. Fossils could be found during construction of the Italian Slough intake, as this area has higher paleontological sensitivity than areas toward the center of the Delta (Spencer 1989; West 1994:34).

Archaeological Resources. No archaeological sites have been identified in the vicinity of the proposed Italian Slough intake. Thus, this alternative would cause no known archaeological impact. Potential impact areas from the Italian Slough intake have not been surveyed, however, and sites could be present there, particularly around a proposed rockfill storage area.

Ethnographic Resources. No archaeological sites of ethnographic value have been identified in the vicinity of the Italian Slough intake site. There is likely to be some bird habitat loss, some riparian scrub would be affected, and there may be some loss of wetlands and other areas with native plants. The proposed rockfill area would cause a loss of native vegetation. Specific impact areas from the Italian Slough intake have not been surveyed, but it is probable that impacts would differ little from those of ISDP.

Historic Resources. No historical sites other than the Old River and Middle River bridges have been identified in the vicinity of any elements of this alternative. It is expected that project traffic would not affect the bridges. This alternative would cause no impacts to known historical resources; however, potential impact areas from the Italian Slough intake have not been surveyed and historical properties could be affected by the facility.

- *Mitigation Measures*

Archaeological Resources. If this alternative is selected, any areas not yet completely surveyed for cultural resources should be inventoried. These include the northern and southern spoil pond sites on Victoria Island (sampling only), the proposed Middle River flow control structure site (the 10.8 acre storage area north of Middle River), and the impact areas associated with a new intake at Italian Slough. Any sites found would require NRHP evaluation; consultation with SHPO (and perhaps ACHP) would also be needed.

Buried resources might be present at the sites of the project element. If this alternative is selected, it should include an EAP with instruction of construction personnel regarding appropriate steps to be taken in event of discovery of archaeological resources. In addition, it would be prudent to conduct archaeological testing with a backhoe prior to construction on any terrestrial soils around the Italian Slough intake.

Ethnographic Resources. Any areas not yet completely surveyed for cultural resources should be inventoried, and Miwok people should be consulted in regard to any new findings.

Buried resources might be present at the project element sites. If this alternative is selected, it should include an EAP with instruction of construction personnel regarding appropriate steps to be taken in event of discovery of human remains or artifacts which may have been associated with human remains. Any archaeological monitoring or testing should include participation of a Miwok observer.

Project power lines should be designed so eagles and hawks would not be electrocuted by the lines.

Historic Resources. The portions of this alternative in common with the proposed ISDP would have no effect on historic resources, so mitigation measures are not necessary. The Italian Slough intake area, however, needs inventory for historical structures. If any are found, these would need to be assessed for NRHP eligibility, and SHPO (and perhaps ACHP) would need to be consulted regarding project effects and mitigation if a property were determined to be significant.

#### *17.5.5 ISDP Without the Northern Intake and With An Expanded Existing Intake*

This alternative would implement all of the proposed components of the ISDP project, except construction of a new intake at the northeastern corner of Clifton Court Forebay. Instead, the existing Clifton Court Forebay intake and West Canal would be expanded to accommodate the additional flow. The APE would include an area around the existing intake and areas previously identified for ISDP, except for the northern intake area. With the exception of the ISDP northern intake, implementation of this alternative would result in all of the effects associated with the ISDP, including impacts of the barriers and settling ponds on cultural resources in the project area. Additional impacts resulting from the proposed intake expansion are discussed below.

Paleontological Resources. It is unlikely, although possible, that significant vertebrate fossils could be found in the vicinity of the proposed facilities associated with this alternative. Fossils could be found during enlargement of the existing Clifton Court Forebay intake; this area has higher paleontological sensitivity than areas toward the center of the Delta (Spencer 1989; West 1994:34).

Archaeological Resources. As with the proposed project, no sites have been identified in the vicinity of any elements of this alternative. Thus, this alternative would cause no known archaeological impact. Potential impact areas adjacent to the existing Clifton Court Forebay intake have not been surveyed and resources could be present.

Ethnographic Resources. No archaeological sites of ethnographic value have been identified in the vicinity of any elements of this alternative. There is likely to be some bird habitat loss, some riparian scrub would be affected and there may be some loss of wetlands and other areas with native plants. Potential impact areas from enlargement of the existing Clifton Court Forebay intake have not been surveyed, but it is probable that impacts from this alternative would differ little from those of ISDP.

Historic Resources. No historical sites other than the Old River and Middle River bridges have been identified in the specific vicinity of any elements of this alternative. It is expected that project traffic would not affect the bridges. This alternative would cause no impacts to known historical resources. Potential impact areas from the Clifton Court Forebay intake have not been surveyed, however, and historical properties could be affected by that facility.

- *Mitigation Measures*

Archeological Resources. If this alternative is selected, any areas not yet completely surveyed for cultural resources should be inventoried. The additional sites to be surveyed would include the northern and southern spoil pond sites on Victoria Island (sampling only), the proposed Middle River control structure site (the 10.8 acre storage area north of Middle River), and impact areas associated with an expansion of the existing Clifton Court Forebay intake. Any sites found would require NRHP evaluation; consultation with SHPO (and perhaps ACHP) would also be needed.

Buried resources might be present at the project element sites. If this alternative is selected, it should include an EAP with instruction of construction personnel regarding appropriate steps to be taken in event of discovery of archeological resources. In addition, it would be prudent to conduct archaeological testing with a backhoe prior to construction on any previously undistributed terrestrial soils around Clifton Court Forebay intake.

Ethnographic Resources. Any areas not yet completely surveyed for cultural resources should be inventoried and Miwok people should be consulted in regard to any new findings.

Buried resources might be present at the project element sites. If this alternative is selected, it should include an EAP with instruction of construction personnel regarding appropriate steps to be taken in event of discovery of human remains of artifacts which may have been associated with human remains. Any archaeological monitoring or testing should include Native American (Miwok) consultation.

Project power lines should be designed so eagles and hawks would not be electrocuted by the lines.

Historic Resources. Those portions of this alternative in common with the proposed ISDP would have no effect on historic resources, so mitigation measures are not necessary. The expansion area for the Clifton Court intake, however, needs inventory for historical structures. If any are found, these would need to be assessed for NRHP eligibility and SHPO (and perhaps ACHP) would need to be consulted regarding project effects and mitigation if a property were determined to be significant.

#### *17.5.6 No Action (Maintain Existing Conditions)*

This alternative is described as "No Action (maintain existing conditions)." No APE has been identified, nor are potential cultural resource impacts identified. This alternative would maintain the existing environmental conditions. ISDP would not be constructed. No project-related ground-disturbing construction would occur with this alternative. Accordingly, there would be no adverse impacts upon paleontological resources, archaeological resources, ethnographic resources, or historic resources.

#### *17.5.7 No Action (Maintain Conditions as they will Exist in the Future)*

This alternative would not include the construction and operation of ISDP, leading to future water shortages. No project-related ground-disturbing construction would occur with this alternative. Accordingly, there would be no adverse impacts upon paleontological resources, archaeological resources, ethnographic resources, or historic resources.