FINAL

SACRAMENTO-SAN JOAQUIN DELTA CULTURAL RESOURCES RESEARCH DESIGN AND CONTEXT STATEMENT

PREPARED FOR:

California Department of
Water Resources
901 P Street, Suite 411b
Sacramento, CA 95814
Contact: Katherine Marquez
916.651.7011

PREPARED BY:

ICF
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Susan Lassell
916.231.7612

PEER REVIEW CONDUCTED BY:

Horizon Water and Environment, LLC
555 Capitol Mall, Suite 800
Sacramento, CA 95814
Contact: Janis Offermann
916.553.4923

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Acronyms and Abbreviations

BNSF	Burlington Northern Santa Fe
California Register	California Register of Historical Resources
CVP	Central Valley Project
Delta	Sacramento–San Joaquin Delta
CHRIS	California Historical Resources Inventory System
DPC	Delta Protection Commission
DWR	California Department of Water Resources
EIR/S	Environmental Impact Report/Environmental Impact Statement
HASR	Historic Architecture Survey Report
National Register	National Register of Historic Places
NHA	National Heritage Area
NHPA	National Historic Preservation Act
NPS	National Park Service
OFT	Optimal Foraging Theory
OHP	California Office of Historic Preservation
RD&CS	Research Design and Context Statement
SR	State Route
study area	RD&CS study area
SWP	State Water Project
TCPs	traditional cultural properties
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation

Chapter 1
Introduction

1.1 Purpose

The purpose of this Research Design and Context Statement (RD&CS) is to establish a consistent cultural and historical framework with which to evaluate cultural resources in future assessments.

The RD&CS covers topics such as:

- Describing the cultural resources anticipated for identification and evaluation during the course of Sacramento–San Joaquin Delta (Delta) cultural resources studies.
- Providing the Delta's significant historical themes and research topics that contextualize its resources.
- Establishing aspects of integrity that must be present for specific property types to be eligible for inclusion in the National Register of Historic Places (National Register) or the California Register of Historical Resources (California Register).
- Explaining how the RD&CS serves as a baseline against which continued assessments and future syntheses may be prepared.

1.2 Study Area

The RD&CS studies a portion of the Sacramento-San Joaquin Delta in the vicinity of the Sacramento and Stockton/Tracy metropolitan regions, between the San Francisco Bay Area and the western Sierra Nevada. The study area is defined as a 45-mile long and 1-mile wide path through the heart of the Delta, from the vicinity of Hood at the north to the vicinity of Byron at the south (see Figure 1-1). This study area includes numerous Delta islands and rural Delta communities such as Bouldin Island, McCormack Tract, and Walnut Grove.

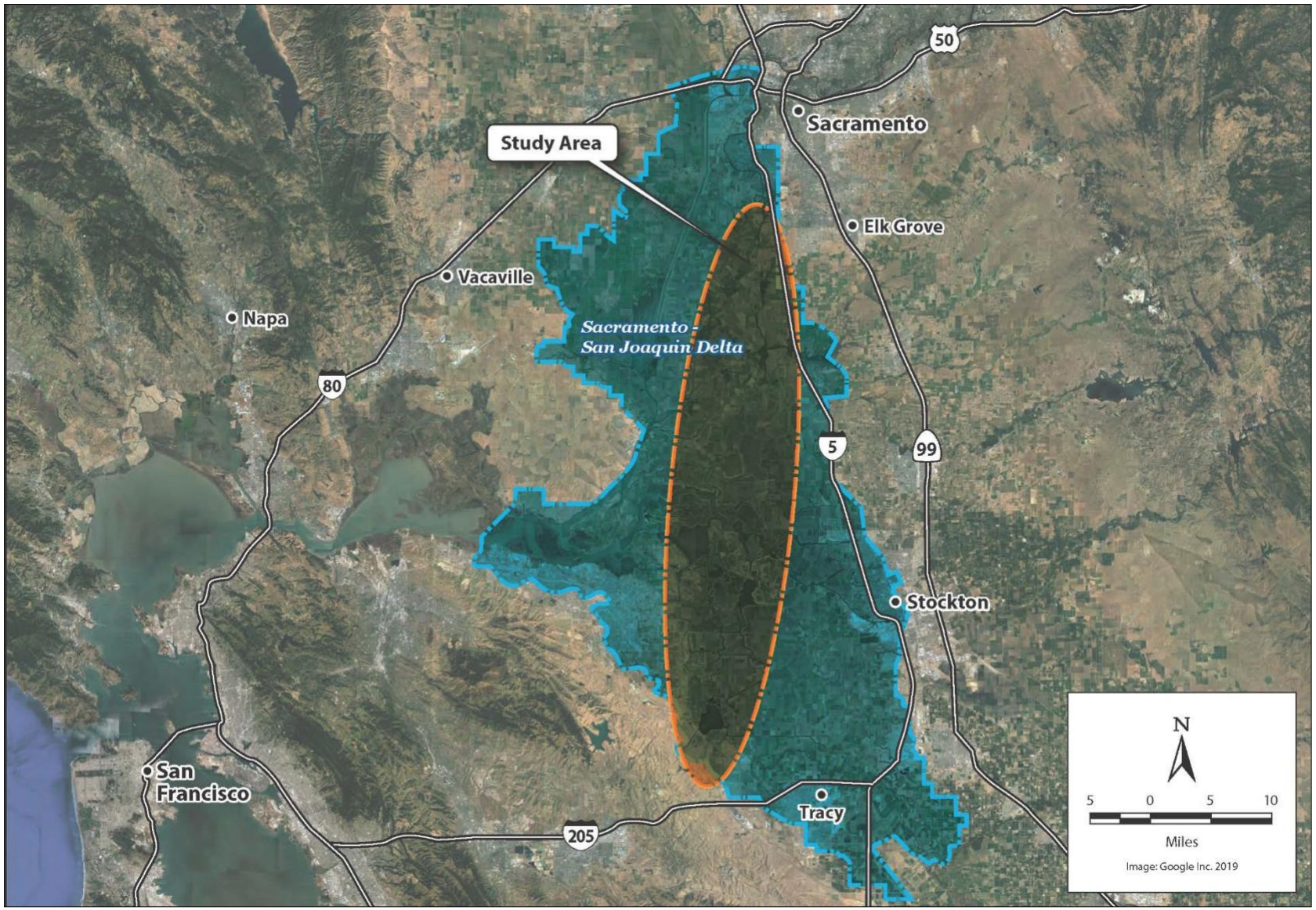

Figure 1-1. Regional Location

1.3 RD&CS Format and Content

1.3.1 Basic Concepts—Chapter 2

This chapter introduces the reader to the concepts that are the basis of National Register and California Register cultural resources evaluations, and that are developed specifically for Delta studies in subsequent sections. Chapter 2 covers topics such as:

- Defining general resource type categories in the RD&CS study area (study area), and identifying examples of known historic properties in the study area for each of the categories.
- Summarizing the National Register and California Register criteria for resource evaluations.
- Explaining the role of buried archaeological resource sensitivity studies in cultural resources identification and evaluation.

1.3.2 Historic Context and Narrative Themes—Chapter 3

The purpose of this chapter is to introduce the significant historical themes that may be applied to cultural resources evaluation in the study area. This chapter covers significant chronologies, historical developments, biographies, architectural trends and research design themes that support the evaluation of the historical significance of archaeological, built environment, traditional, and district and landscape resource types. This chapter also identifies the property types (both typical and underrepresented) associated with each theme, examples of known properties of each type, as well as data gaps in information about the themes or property types.

1.3.3 Resource Evaluation—Chapter 4

The purpose of this chapter is to inform the reader about the registration criteria for evaluating cultural resources under all four of the National Register and California Register significance criteria, and the integrity requirements that must be considered for different resource types.

1.3.4 Conclusions—Chapter 5

The conclusions chapter explains how the document is intended to be used for ongoing project support. This chapter covers topics such as:

- Development of identification and evaluation standards for underrepresented property types.
- Future syntheses of the baseline cultural resources knowledge with new information that future projects will collect during cultural resources studies.
- Development of a comprehensive representation of the Delta's history and historical significance.

1.3.5 References—Chapter 6

The references chapter presents full bibliographic information for all materials consulted in the preparation of the RD&CS. The chapter covers a range of available sources of information, such as:

- Work conducted previously for projects in the Delta.
- California Historical Resources Inventory System (CHRIS) record searches.
- Standard texts and databases for cultural resources information.
- Works cited in the RD&CS.
- Other collections of information that exist and are known to be relevant to the Delta's history.

Chapter 2
Basic Concepts

This chapter defines the known property types, introduces the general resource evaluation criteria, and explains the role of buried site sensitivity modeling relative to the study area. These basic concepts will be used by future investigators to transition from simple recordation of cultural and historical resources during fieldwork to the application of the evaluation framework presented in Chapter 3, *Historic Context and Narrative Themes*, and Chapter 4, *Resource Evaluation*.

2.1 General Property Types

Historic properties are cultural and historical resources that have been recommended or determined eligible for listing in the National Register or California Register, or that have been listed. Understanding the distinctions between property types helps the investigator determine which registration criteria to apply for the evaluation of National Register or California Register eligibility. Evaluating a barn as an individual built resource is very different from evaluating it as a component of a rural historic landscape, and evaluating a prehistoric fish camp for its archaeological data potential may be very different from evaluating it as part of a traditional property type. This section identifies the study area's property types, why they have the potential to be important, and to what extent we find them in the Delta.

Cultural resources in the study area can be generally characterized as archaeological (either early Native American or post-contact), built environment, historic districts and landscapes, and traditional properties. Property sub-types associated with each of these categories are defined and briefly discussed under separate headings in this section. Each property type includes a description of the type, a discussion or table of known archaeological resources and historic properties representing the type, and navigation to potentially applicable registration criteria found in Chapter 4.

2.1.1 Early Native American Archaeological Property Types

An *archaeological resource* is four or more discrete artifacts clustered within an area of diameter no greater than 10 meters (approximately 33 feet). An artifact is any item more than 50 years of age that was created, altered, or moved as a result of human activity. Archaeological resources may also consist of, or contain, archaeological features which are comprised of multiple contexts, either artifacts or stratigraphy, that are the physical remnants of non-portable human activity.

The visibility and density of artifacts and features in a given archaeological resource is a function of the activity that formed the resource, the frequency and duration of use, and whether the contents of the resource preserve through time. Archaeological resources can be formed by use during a single event, such as the dumping of cans or creation of a temporary hunting camp, or through continual use, as would be the case with a prehistoric village. Sites occupied over tens or hundreds of years are likely to have thick depositions of *midden soils*—soils enriched in organic material through human occupation. If multiple occupations have occurred serially at a given site, this may be visible in the stratigraphic profile of the site, with the older periods of occupation positioned lower than more recent occupation.

Archaeological resources that share similar, important characteristics related to activities performed on site are referred to by their *property types*. For this RD&CS, archaeological property types have been broadly categorized into groups based on their cultural and temporal associations. Archaeological property types that have the potential to be present in the study area, as identified by comparative research and previous investigations, are discussed in the following sections.

Archaeological resources are not unbiased reflections of past activity. An archaeological site's contents reflect the human activities that result in the discard of physical items, and the physical items that preserve over time. Differential preservation, disturbance by natural or human activity, and recordation bias may all result in a skewed perception of the human activities that formed a given resource. Archaeological resources only reflect a specific range of human activities—those that leave physical remains on the landscape that are preserved over time—and other methods, such as historic and ethnographic research, are required to produce a more comprehensive view of the past.

Changes to an archaeological resource can be identified by their depositional context, or stratigraphic correlation. Archaeological materials may occur in a primary depositional context, in which artifacts are retained in the same context in which they were deposited at the time of use or discard, or in a secondary depositional context, in which post-deposition activity, such as modern or historical disturbance, has altered the placement of artifacts. This distinction is important, as resources within a primary depositional context are a direct reflection of intentional human activity. Resources within a secondary depositional context are likely to have had any contextual relationships between artifacts and features disturbed. In general, this disturbance means that archaeological resources within a secondary depositional context lack sufficient integrity to provide detailed and meaningful information about past human activities. Exceptions might include individual artifacts within a disturbed context that possess exceptional data potential.

2.1.1.1 Native American Archaeological Properties

Native American properties may encompass a range of property types, including traditional cultural properties (TCPs), tribal cultural resources (TCRs), cultural landscapes, and archaeological resources. This section specifically considers Native American archaeological properties. For the purposes of this RD&CS, Native American archaeological properties encompass two categories of archaeological resources: those formed prior to European contact or before around AD 1500 (hereafter referred to as *early Native American properties*) and those formed after European contact (hereafter referred to as *post-contact archaeological properties*).

As summarized later in this RD&CS, the early Native American archaeological properties anticipated for the study area are divided into four functional types—resource collection and processing, habitation, ceremonial, and multi-use. Each of these functional types may include multiple types and assemblages of artifacts associated with specific human activities. Table 2-1 summarizes functional property types, examples of activities typically associated with them, and the artifacts and features typically associated with these activities. The examples presented in Table 2-1 are summarized in greater detail below the table and represent the anticipated range of property types and early Native American activities in the study area.

Table 2-1. Early Native American Property Types

Property Type	Activity Type	Constituents
Resource Collection and Processing	Milling	Bowl mortars, milling slabs, pestles, handstones, flaked stone, plant remnants
	Lithic Quarry	Lithic cores, greater proportion of core reduction debitage relative to flake reduction debitage
	Animal Butchery	Flaked stone, animal remains, broken shells
Habitation	Seasonal Occupation Site	Dietary remains representing a single season, ground and flaked stone
	Village Site	Dietary remains reflecting multiple seasons, ground and flaked stone, midden soils, housepits, human burials
Ceremonial	Isolated Human Burials	Human burials, grave goods
	Ceremonial	Clay figures, charmstones, shell ornaments, ritual objects
Multi-Use	Multi-Use	Any combination of the above constituents, potentially separated by stratigraphic context

Resource Collection and Processing

Resource collection and processing sites are formed by the deposition of artifacts over the course of collecting and processing food and raw materials. These resources may be small and diffuse in instances where a given location was used for a single activity that deposited artifacts (e.g., a brief pause in transit to sharpen a tool) or may be large and clearly visible where a given location was repeatedly used for a large-scale resource collection and processing activity (e.g., a traditionally used fish camp).

Resource procurement sites are more likely to contain a more restricted range of artifact types. These sites are likely to be associated with lithic scatters and animal remains. Faunal remains may show signs of field processing or butchering. These sites may be located outside of areas preferred for human habitation, or in areas with periodically restricted access, such as seasonally flooded wetlands.

Bedrock mortars, while common in much of the rest of California, do not occur within the Delta due to the lack of bedrock outcrops within the area. Other plant processing technologies such as bowl mortars or hopper mortars may occur within resource procurement or occupation sites.

A relative lack of toolstone within the Delta led to the development of baked clay artifacts as a substitute. Baked clay artifacts commonly found in the archaeological record include “spool” or “spindle” shaped fired clay implements. These may be found in either occupation sites or resource procurement sites. Examples of resource collection and processing sites in the study area are listed in Table 2-2.

Table 2-2. Resource Collection and Processing Sites

Primary Number	Trinomial	County	Detail
P-34-000330	CA-SAC-1165	SAC	Artifact scatter
P-34-000330	CA-SAC-1569	SAC	Artifact scatter
P-34-000330	CA-SAC-357	SAC	Artifact scatter
P-34-000074	CA-SAC-47	SAC	Artifact scatter
P-34-000330	CA-SAC-761	SAC	Artifact scatter
P-07-000085	CA-CCO-143	CCO	Refuse Scatter
P-34-000336	CA-SAC-309	SAC	Baked Clay

Habitation

Habitation sites are areas that contained one or more dwelling places and associated areas for domestic tasks, and may have been used on a temporary, seasonal basis, or may have been utilized perennially as a permanent village site. Village sites within the Delta are often located on raised earthen mounds close to tributaries (Meyer and Rosenthal 2008: 69). These mounds are usually situated on natural high spots relative to their surroundings; deposition of organically enriched soils due to long term human occupation leads to increasingly prominent mounds over time. These mounds are often conspicuous on the landscape due to their prominence, and greasy dark-grey midden soils.

Midden soils and mounds reflect occupation of a site over an extended period of time, and are typically associated with habitation sites. These habitation sites are likely to be located relatively close to a perennial source of water, and are likely to contain a heterogeneous assemblage of artifacts and features. This may include dietary remains, such as shell, bone, or burned plant materials, stone tools and waste materials from the production of stone tools, structural remains such as house floors, pits, hearths, and human burials. Examples of habitation sites are listed in Table 2-3.

Table 2-3. Habitation Sites

Primary Number	Trinomial	County	Detail
P-34-000048	CA-SAC-21	SAC	Midden/Mound
P-34-000052	CA-SAC-25	SAC	Midden/Mound
P-34-000128	CA-SAC-1367	SAC	Midden/Mound
P-34-000128	CA-SAC-155	SAC	Midden/Mound
P-34-000276	CA-SAC-249	SAC	Midden/Mound
P-34-000128	CA-SAC-559	SAC	Midden/Mound
P-34-000083	CA-SAC-56	SAC	Midden/Mound
P-34-000086	CA-SAC-59	SAC	Midden/Mound
P-34-000087	CA-SAC-60	SAC	Midden/Mound
P-34-000088	CA-SAC-61	SAC	Midden/Mound
P-34-000128	CA-SAC-963	SAC	Midden/Mound
P-07-000070	CA-CCO-128	CCO	Midden/Mound
P-07-000072	CA-CCO-130	CCO	Midden/Mound

Primary Number	Trinomial	County	Detail
P-07-000413	CA-CCO-653	CCO	Midden/Mound
P-07-000721	CA-CCO-368	CCO	Midden/Mound
P-07-002650	CA-CCO-767	CCO	Midden/Mound
P-34-000025	CA-SAC-025	SAC	Midden/Mound
P-34-000083	CA-SAC-056	SAC	Midden/Mound
P-34-000086	CA-SAC-059	SAC	Midden/Mound
P-34-000089	CA-SAC-062	SAC	Midden/Mound
P-34-000215	CA-SAC-188	SAC	Midden/Mound
P-34-000355	CA-SAC-328	SAC	Midden/Mound
P-34-000422	CA-SAC-395	SAC	Midden/Mound
P-39-000204	CA-SJO-068	SJO	Midden/Mound
P-39-000247	CA-SJO-115	SJO	Mound
P-39-000260	CA-SJO-142	SJO	Midden/Mound
P-39-000263	CA-SJO-145	SJO	Midden/Mound

The Delta's largest habitation sites, also known as mound sites, are among the earliest studied by California archaeologists. As a result, several of these sites, such as the Windmiller Site (CA-Sac-107) and the Hollister Site (CA-Sac-21), are the basis of California's archaeological chronology and cultural-historical framework. The framework has been augmented through the 20th and 21st centuries, at the regional level, with new information from the archaeological record and ethnohistorical studies. The Delta's mound sites have also developed historical significance beyond archaeological data potential as properties associated with important researchers and early archaeological research.

Research chronologies for Delta mound sites provide both information about the archaeological properties as well as aid to finding field notes, reports and collections that have likely traveled to various repositories over the last century. For instance, the Hollister Site was originally recorded as S-66 during pioneering Delta archaeological work that pre-dated the modern OHP state trinomial and primary numbering systems (Schenke and Dawson 1926). The site was excavated by Sacramento Junior College (Lillard 1939) during an era of low employment opportunities, and was supported by students and Civilian Conservation Corps personnel. Lillard, Heizer and Fenenga produced a number of reports in the 1930s and 1940s that included Sac-20 data analysis (Heizer and Fenenga 1939; Lillard et al 1939). Richard Beardsley identified Sac-21 (a.k.a. S-66) as the Hollister site in 1954 as part of his discussion of temporal relationships of archaeological components, which in turn informed his early cultural framework for central California (Beardsley 1954). Sacramento State University Professor Jerald Johnson led a Delta survey in the early 1970s, and described the previously recorded location of Sac-21 as possibly related to the ethnographic-era village site Chupumne; Johnson was the first to note that the Delta's mound site locations were increasingly difficult to verify due to extensive leveling and plowing throughout the agricultural region (Johnson 1974). Johnson also appears to have manually edited the original 1934 inventory record with data from his work, without attributing this fact. In 1977, Greg Greenway and William Soule inventoried a portion of the Delta, and concluded that Sac-21 was "completely destroyed" (Greenway and Soule 1977:14). In 1982, Kielusiak analyzed baked clay artifacts and other cultural constituents at Delta sites, including the Hollister Site. In addition to improving archaeological description for baked clay artifacts, her analysis concurred with earlier findings that the site

represented a single, long-term occupation (Kelusiak 1982). Her thesis work included radiocarbon study of burial remains from the site, conducted at the University of California Riverside (Taylor 1982). In 2003, Pacific Legacy reported that the site was mostly levelled, but that the great size and depth of the originally recorded mound suggested that subsurface materials may still be present (Pacific Legacy 2003:26). The Pacific Legacy report remains the most comprehensive recent documentation for California's mound sites. The Society for California Archaeology's "Chronology and Cultural Units" continues to maintain that the Hollister Site is the type site for the Hollister Aspect, a Late Horizon/Emergent period representation of the Augustine Pattern associated with the ethnolinguistic Plains Miwok people (Society for California Archaeology 2019). This example of a complex archaeological research history is common to the Delta mound sites.

Ceremonial Sites

Ceremonial sites are sites in which ideological or religious ritual was practiced. Ceremonial sites may contain ritual objects such as charmstones, pendants, ochre, baked clay figures, and other sacred or ceremonial objects, and may contain human burials. Ceremonial sites may occur independently of other site types, or may occur within an occupation site. No ceremonial sites, within occupation sites or occurring independently, have been identified within the study area.

Multi-Use

Multi-use sites consist of any combination of the above site types. The use of a site may have changed over time, such as a site that was used as a temporary camp for processing game early in the archaeological record, but large-scale, perennial use as a village site late in the archaeological record. Such a site would be multi-use, with its different uses reflected in the site stratigraphy. Sites recorded as habitation sites may be multi-use sites. There are no known multi-use sites recorded in the study area.

Sites of Unknown Use

The prehistoric sites listed in Table 2-4 were submitted to the CHRIS with recordation forms that were largely blank. While they are recorded as being prehistoric in age, their use is unclear. These sites may be resource collection/processing sites, habitation sites, ceremonial sites, or multi-use sites.

Table 2-4. Sites of Unknown Use

Primary Number	Trinomial	County	Detail
P-07-000086	CA-CCO-144	CCO	Blank site record
P-39-000261	CA-SJO-143	SJO	Blank site record
P-39-000262	CA-SJO-144	SJO	Blank site record
P-39-000264	CA-SJO-146	SJO	Blank site record

2.1.2 Post-Contact Archaeological Property Types

A post-contact archaeological property, for the purposes of this study, is defined as an archaeological site that was formed after initial contact with Europeans, which occurred from approximately AD 1800–1900 in the Delta. Post-contact archaeological sites can encompass a wide range of resources and elements, classified here in terms of their function. Previous studies in the

vicinity of the study area indicate use for water- and land-based transportation of people and supplies, agricultural pursuits, and city and town development.

From what we know about the historical use of the area, it is assumed that seven post-contact archaeological property types have the potential to be present in the study area—architectural, infrastructure, landscaping, maritime and riverine, refuse, water conveyance systems, and post-contact Native American archaeological properties. These property types are summarized in Table 2-5, which lists the artifacts and features that may be found associated with each property type. The property types are also described under separate headings in this section.

Table 2-5. Post-Contact Archaeological Property Types

Property Type	Features—Characteristics
Architectural	**Foundations**—Brick alignments, concrete slabs, and footings or pilings. **Builder's Trenches and Walls**—Concrete, brick, or wood; in situ or collapsed. **Decking/Planking**—Wood boards, in situ or collapsed. **Building Remains**—Siding, framing, and other structural components; in situ or collapsed. **Floors**—Concrete, wood, or tile.
Infrastructure	**Utility Lines**—Alignments of sewer pipes, power lines, waterlines, pipes, or trenches; or pits/postholes associated with installation of these types of utilities.
	Transportation Routes—Roads, trails, railroad grades/tracks, bridges, vehicle parking or storage areas.
Agriculture and Ranching	**Cultivation and Livestock**—Fallow fields, livestock watering and feeding holes or troughs, planting beds, and planting holes. **Defining Spaces**—Berms, fencing, corrals, and pathway alignments.
Maritime and Riverine Properties	**Shipwrecked Vessels**—Abandoned and discarded boats, barges, and ferries. **Docking Elements**—Docks, landings, piers, pilings, and dolphins.
Refuse	**Contents of Hollow-Filled Features (pits, privies, and/or wells)**—Discrete and bounded stratigraphic layers representing chronological sequence of events that occurred at the site. **Sheet Refuse**—Thin layer of refuse that may have accumulated over time, versus large discrete layers of refuse representing several events. **Dumps**—Concentrated refuse that may represent a single refuse event or several events. Chronological sequence of several events may be represented horizontally rather than vertically. **Massive Intentional Fill**—Industrial and structural debris, possibly combined with sediments, municipal refuse dumps and unofficial community dump sites.
Reclamation and Water Conveyance	**Water Conveyance**—Irrigation ditches and canals (earthen, concrete/lined), check-dams, weirs, floodgates, and pumps. **Water Containment**—Levees, and dams (rock, concrete, wooden).
Post-contact Native American archaeological properties	**Archaeological Sites** – These sites are consistent with the subtypes of Native American Archaeological properties as described in Table 2-1, but may contain European materials, trade goods, or technologies

2.1.2.1 Architectural

Architectural property types include features such as the remains of once-standing structures or buildings representative of residences, domestic outbuildings, commercial (e.g., retail, offices, services), industrial, social (e.g., temple, theater, community organizations), and religious structures. Specific characteristics of such architectural property types may include foundations, walls, floors, pads, piers, footings, "robber trenches" (where footings once lay), or any other extant architectural elements. Structural remains from previously standing buildings and outbuildings may be present, although structural remains are often not determined significant unless the architectural details are unique, are not well documented in the archival record, or represent the work of a master.

Within the study area, previously standing commercial and residential structures would have been located in towns and rural settings. In towns, these structures are likely to reflect the communities' shipping and agricultural roles, and could include several buildings. In rural settings, residences and commercial buildings associated with rural farms and agricultural uses could be present including main residences, workers camps, or larger ancillary agricultural buildings such as barns.

Fourteen archaeological sites were previously recorded that contain foundations or structural remains are in the study area. Many of these sites, such as Bacon Island Camp 1, were found eligible for listing in the National Register/California Register as contributing elements to the Bacon Island Rural Historic District.

2.1.2.2 Infrastructure and Transportation-Related Features

Examples of this property type include private and municipal utilities and transportation routes. Additional examples include private and municipal service systems, such as sewer pipes, power lines, water pipes, and water or irrigation ditches and canals. Infrastructure can also include above-ground and subsurface remains of roads, railways, trails and pathways, drainage structures, and other engineered structures or spaces. Within the study area, roads and railroad lines were often established on the crown of levees that parallel waterways. The archaeological remains of these features may be considered significant if they are in situ and can assist with spatial analysis and the understanding of these feature types in relation to other property types and assemblages in the study area.

Within the study area, infrastructure or transportation archaeological resources are expected to primarily consist of roads and railroads. These resources were constructed at two different times with large-scale transportation systems beginning with the introduction of the railroad system in the 1860s, and the inland road network established later when trucking capabilities were used to support the agricultural industry. Archaeological remains of these transportation systems could consist of raised or partially eroded railroad grade segments, ties, rails, and spikes, partial road grades and removed or graded road alignments, broken asphalt or discarded road base. Archaeological remains of bridges may include concrete and wood footings or partial segments of wood or metal. These footings and partial bridge segments may be found protruding from bodies of water or along banks of watercourses.

The remains of the old Sacramento Southern Railway (later the Southern Pacific), which include the grade and segments of track, are present between West Sacramento and the area north of Walnut Grove, within the study area. Portions of the Walnut Grove Branch Line's abandoned grade between Freeport and Walnut Grove are visible archaeological resources (see Department of Parks and Recreation 523-series forms for CA-SAC-1092). The resource has been recommended eligible for the

National Register for its association with Delta's transportation history as well as its design and construction by Wilhelm Hood (see Table 2-15).

Other National Register–eligible transportation properties within the study area (Old River Bridge, Bacon Island Railroad Bridge, Woodward Island Railroad Bridge) are currently in use according to their original function and do not appear to have any archaeological elements.

Table 2-6. Sample List of National Register Eligible Infrastructure and Transportation Properties

Resource Name	City	County	Year	National Register Criteria
Walnut Grove Branch Railroad, Sacramento Southern Railroad	Walnut Grove	SAC	1908–1912	**A**: Delta transportation development **C**: Wilhem Hood, architect and builder

2.1.2.3 Agriculture

Examples of this property type include abandoned and fallow fields that were previously leveled, berms or earthen remnants of previous fence alignments, corral remnants, and rows of mounds where trees were previously planted. Evidence of previous agricultural use also includes previously standing structural remains, foundations, and infrastructure as mentioned in the architectural and infrastructure property types. Other archaeological remains of agricultural use may consist of private gardens with evidence of planting trenches and beds, pathways, and fencing.

Within the study area, agricultural archaeological resources are expected to consist of previously cultivated fields, the remains of fence alignments tree windbreaks, and associated outbuilding structural remains. Prior to reclamation of the Delta islands, which allowed large expanses of land to be cultivated, only a few small-scale farms and ranches had been established in the area.

One National Register–eligible agriculture district, with archaeological features, has been previously recorded (PAR 1993) in the study area—the Bacon Island Rural Historic District. The Bacon Island Rural Historic District recorded 10 labor camps and a bridge tender's residence as the primary resources on the island. These labor camps included surface refuse scatters associated with the remains and domestic material left over from those residences. The district also included the island's levees and ditches as historical resources integral to the spatial organization of the potential historic district.

2.1.2.4 Maritime and Riverine Properties

Use of the waterways in the study area for commercial, military, and recreational endeavors has been intensive since the 1840s, resulting in the potential to encounter numerous maritime/riverine properties in the study area. Archaeological examples of this property type include the remains of landings, pilings, and historic vessels, described in the following subsections.

Landings

This property type includes wooden structures used for docking vessels to load and unload people, livestock, and materials. Public landings were often established for towns, but many were associated with private properties. Landings associated with private property were typically used for loading and unloading materials associated with agricultural endeavors. As overland transportation became

more common, use of the waterways declined and landings fell into disrepair, often resulting in their collapse into the water. A few notable landings identified in historic documentation and maps include Blake's Landing, New Hope Landing, and Bouldin Landing. All of these landings have since been destroyed or removed due to alterations in landscape such as levee construction and agricultural expansion. Remains of landings identified in areas along the Sacramento River north of the study area consist of rows of posts driven into the river bottom, sometimes protruding above the water in times of low river levels. These landings no longer contain platforms and are difficult to identify from a distance. No National Register–eligible landings have been previously recorded in the study area.

Pilings

This property type was often associated with landings or structures built along the riverfront. Pilings are wood or concrete poles driven into the river bottom to support the associated, lifted structure, but they were also sometimes used individually for the mooring of vessels. Many pilings in the study area have fallen into disrepair and sunk, although some are intact and being used for mooring. No National Register–eligible pilings have been previously recorded in the study area.

Vessels

A wide range of submerged vessels dating from the 1840s to the present may be located in the study area. The earliest vessel types included small and large sailing vessels and barges, typically with wooden hulls and metal hardware. These vessels were usually associated with commercial endeavors because recreational boating was not common until the 1930s. Wooden barges in the study area were typically "dumb" barges (i.e., no built-in means of propulsion) and were used for transporting produce while tethered to a wind- or steam-powered vessel. Steel hulls became more prominent after the 1860s and are typically steamboats, barges, fishing vessels, or military vessels. Modern vessels are most often recreational and are made of fiberglass and wood or steel composite. Several historical vessels were identified in the study areas during prior remote sensing investigations (Panamerican 2010), and it appears that one vessel, the Clarksburg Ferry, was found eligible for the National Register (U.S. Army Corps of Engineers 2010).

2.1.2.5 Refuse Deposits

Previous archaeological excavations and comparative research help define diagnostic attributes of intact refuse deposits. Based on a review of research conducted for refuse deposits, it is clear that refuse deposits generally have considerably more data potential when they are associated with a specific household, neighborhood, community, or ethnic/socioeconomic group, compared to deposits with broader associations. As the number of groups associated with a given refuse deposit increases, the potential for collecting and associating data with any specific group that may have deposited the refuse decreases.

Refuse disposal sites contain some unique challenges for assessing integrity because the waste has been removed from its initial point of use and deposited with refuse from other households or businesses (Sullivan and Griffith 2005: 27). As a result, the contextual relationship among and between items has already been diminished once they become part of a refuse deposit (Sullivan and Griffith 2005: 27).

In light of these considerations, recognition of locally deposited intact refuse deposits in an otherwise heavily disturbed and filled environment is imperative for providing meaningful

archaeological analysis and addressing research questions. Table 2-7 summarizes the predicted refuse deposits by age, depositional event, composition, and structure. Further development of the thresholds for registration for refuse deposits will be required by future studies.

Table 2-7. Attributes of Anticipated Refuse Deposits

Cultural Activity	Composition	Structure
Refuse dumps	An informal, possibly community-based refuse disposal site typically formed by individuals or households who communally deposited their refuse. Dumps are typically uncovered areas and can consist of waste piles or open dumps. Typically, little effort is put into reducing visual and odor impacts at dump sites (Sullivan and Griffith 2005: 15, 19).	Stratified or mixed
Sheet refuse	Artifacts (refuse) discarded and accumulated over a period of time.	Stratified
Refuse pits or privies	Hollow-filled features that have been used for the deposition of refuse.	Stratified
Massive intentional fill	Industrial and structural debris, possibly combined with sediments, municipal refuse dumps, and unofficial community dump sites.	Mixed

No individual National Register–eligible refuse deposits have been previously recorded in the study area. Refuse deposits that could be contributing elements may be present within the National Register–eligible historic districts of Bacon Island, Locke, and Walnut Grove, but none were identified in the corresponding district records. The four types of refuse deposits potentially located in the study area are refuse dumps, sheet refuse, refuse pits or privies, and massive intentional fill, and these resources and their characteristics are discussed in more detail in the following sections.

Refuse Dumps

Refuse dumps are composed of secondary refuse and include either waste piles or open dumps. Refuse dumps tend to contain large- to medium-sized items, in contrast to the small items that typically comprise sheet refuse deposits. Waste piles tend to be surface deposits that represent a single use or a brief time period. These deposits can be near where the refuse was originally generated or placed at greater distances away. Waste piles are more often associated with an individual or a household, in contrast to open dumps that tend to be informal community-based refuse disposal sites. Open dumps are likely to include several piles of refuse. Typically, these dumps are used for a longer span of time and are characterized by a larger accumulation of materials compared to waste piles (Sullivan and Griffith 2005: 19).

Both waste piles and open dumps can be stratified because of accumulation over time. If deposits are disturbed by sorting, salvage, animals, or other post-depositional factors, refuse dump deposits will become mixed.

To accommodate larger quantities of refuse before the institution of municipally managed disposal, urban residents often created informal communal areas in which to place their refuse. These communal disposal sites, or dumps, are typical in urban areas and can be found as diffuse or concentrated piles, in pits excavated for the purpose of refuse disposal, or in natural landscape

features such as ravines or ponds. Due to their communal nature, dumps cannot usually be associated with a specific individual, household, business, or activity. However, communal dumps may have the potential to address questions related to site development, broad patterns of consumer behavior such as differential time lag of commercial product disposal (Van Wonner 1991), and general disposal practices of different refuse types in the area. Dumps, whether as sheet refuse or deep deposits, can exhibit considerable horizontal and vertical stratification because they may be used over several months, years, or generations by community residents. As such, they may provide insight into local demographic change, urban development, and the history of waste disposal (Praetzellis 1994).

Sheet Refuse

Sheet refuse is a low-density scatter of artifacts that can be made up of primary or secondary refuse. Sheet refuse deposits are recognizable because they are typically in direct proximity or association with a property boundary, contain multiple episodes of deposition documenting long-term use, are dispersed across a small area, and primarily consist of small items (Sullivan and Griffith 2005: 25). Over time, as refuse accumulates and is not removed, stratified deposits can be created. Through various formation processes, such as repurposing or recycling deposited materials, scavenging by animals, and changes in land use, mixed deposits can be created (Schiffer 1987: 27–143).

When the source of sheet refuse is a residence or a commercial building in an urban area, the refuse scatter will be in close physical proximity to the structure and will primarily contain small items. According to Sullivan and Griffith (2005: 35), larger items and accumulated trash from a property were likely transported to another, more distant location.

Refuse Pits and Privies

Refuse pits and refuse associated with privies are typically in direct proximity to the place where the refuse was generated, within a property boundary. Refuse pits can be intentionally excavated for refuse disposal purposes, or pits may have been created for other purposes—only later being used for depositing refuse. Refuse pits and privies are characterized by concentrated refuse deposits located within confined subsurface features (e.g., pits and privy vaults) and consist primarily of small domestic and personal items. Refuse pits and privies represent multiple episodes of use over an extended time period (Sullivan and Griffith 2005: 25); refuse pits tend to be shallower in depth than privies and may represent single or multiple discard events.

Privies often served as disposal areas for small trash items while they were in regular use. When no longer needed, privies were opportunistic receptacles for large-scale household cleanup just prior to their abandonment. Artifacts found in privies are usually well preserved and located within stratigraphic deposits. Privies are often deeper than refuse pits to minimize odors due to perceptions about proper sanitation (Stottman 2000: 39–40).

Hollow features such as wells, privies, and cisterns often became refuse disposal locations during the use of nearby buildings and during site cleaning or abandonment episodes. These features are often filled with refuse over a short duration by the occupants of a property, and therefore, potentially reflect the activities of a specific household or occupational group more directly than communal dumps (Anthropological Studies Center 2007). However, hollow features must be interpreted at two levels: first, that of the architectural or infrastructural feature that was originally excavated, and second, that of the refuse deposits placed within the feature after it no longer served its original purpose.

Massive Intentional Fill

Massive intentional fill may include a mixture of sediments, debris, or concentrations of materials associated with domestic, commercial, or industrial activities. Massive intentional fill is deposited during a single event; however, it is possible that discrete lenses of debris may be visible in a stratigraphic profile. Subsequently, the characteristics of massive intentional fill should include substantial deposits that span a large area and may be deep, have likely been compacted or leveled, and contain mixed deposits of domestic, commercial, or industrial debris.

Fill materials were brought into the study area at various times throughout its historic-period occupation to raise low areas and level the ground surface in anticipation of development or redevelopment. Although the resulting landscape itself represents the changing urban environment through time, cultural materials found within this fill lack clear contextual associations and are seldom likely to yield important information beyond the terminus post quem dating of fill event(s). (*Terminus post quem* is a historical archaeological dating technique that designates the date after which an artifact-filled feature was deposited, as identified by the earliest possible manufacture date of the most recent artifact contained therein.) The artifacts within the fill may include evidence of all activities mentioned above as well as re-deposited early Native American artifacts.

2.1.2.6 Water Conveyance Systems

Examples of this archaeological property type include the remains of both small-scale systems: ditches, canals, and pump house foundations; and large-scale systems: levees, sloughs, aqueducts, gates, and weirs. Small-scale water conveyance systems are typically associated with irrigation for agricultural endeavors. Remains of these systems can be categorized as built landscapes, but also as archaeological sites if these features are no longer in use or partially/wholly destroyed.

Throughout the Delta, water conveyance systems were developed to facilitate agricultural land uses on islands, as well as to channelize and drain several sloughs, rivers, and waterways. As such, in the study area, water conveyance archaeological resources are expected to primarily consist of ditches and levees. The archaeological remains of water conveyance systems by themselves may not be individually significant if they do not retain integrity. However, the remains of water conveyance features may be considered contributing elements to larger historic districts and cultural landscapes. See Section 2.1.4, *Historic Districts and Cultural Landscapes,* for more information on these resource types.

No National Register–eligible water conveyance archaeological resources have been previously recorded in the study area.

2.1.2.7 Post-Contact Native American Archaeological Properties

These archaeological properties are largely similar to those described in Section 2.1.1, consisting of habitation, resource procurement and processing, ceremonial, and multi-use sites. These, however, may contain materials, technologies, or trade goods of European or Euroamerican origins, or objects or evidence of lifeways which display European or Euroamerican influence.

2.1.3 Built Environment Property Types

The study area's built environment includes buildings, structures, and objects that are historically significant as built resources or as contributors to the historic districts, landscapes, and traditional properties that represent the Delta's history. This section outlines built environment property types and subtypes known to be located in the study area.

The Delta's built environment reflects both sparse development in the nineteenth and early twentieth centuries, and the agricultural economy that has dominated the area from the nineteenth century through more recent decades. While buildings are the most common built property type known in the Delta, there are also a moderate number of bridges and water conveyance infrastructure within the study area that illustrate equally important components of the Delta's historical development.

2.1.3.1 Residential Buildings

Residential buildings constructed in the nineteenth century are scattered throughout the region. These residences exhibit Anglo-American, Asian-American, and vernacular styles. Numerous residences in the Delta reflect adaptation to local conditions such as seasonal flooding, as well as the adherence to design and structural forms consistent with particular architectural styles.

Many architectural styles fall into the nineteenth-century picturesque movement, including the Greek revival, Italianate, and Folk Victorian styles. These homes are found on farms, smaller ranchettes, and in small towns throughout the study area. They also span a wide socioeconomic range, from modest vernacular cottages in the smaller towns to grand beaux arts mansions on the pioneering farms and ranches. The urban homes are generally built in the same styles as the rural homes, and are typically cottages on small residential parcels that may also include a garage, fences or walls, and landscaping. Homes on farms and ranches may be contributors to rural historic landscapes, the evaluation of which involves consideration of the property as a whole, including residences as well as other ancillary buildings, structures, circulation systems, and boundary demarcations (see Section 2.1.4, *Historic Districts and Cultural Landscapes*).

Residential buildings in the Delta constructed during the twentieth century include Craftsman-style bungalows, and Foursquare, Colonial Revival, Spanish Colonial Revival, Minimal Traditional, or Ranch-style residences. These buildings were mainly constructed during the first half of the twentieth century in both urban and rural settings. The grand period revival farm and ranch mansions from the 1910s and 1920s represent some of the more striking property types. Rural homes also typically exist within a cluster of farmstead buildings such as barns, packing sheds, equipment sheds, and tank houses. House boats and floating cabins exist along several of the major sloughs in the study area. It is not uncommon to see dilapidated homes (at times reclaimed by the Delta's waterways), sheds, and general agricultural infrastructure in a variety of massing and scale. Table 2-8 lists examples of this property type that have been recognized as eligible for or listed in the National Register.

Table 2-8. Sample List of National Register Listed and Eligible Residential Properties

Resource Name	City	County	Year	National Register Criteria
Rosebud Ranch	Clarksburg	YOL	1877	**C**: Italianate style and Nathanial Goodell, master architect

Resource Name	City	County	Year	National Register Criteria
Edward Bunnell House	Clarksburg	YOL	1910	**A**: early reclamation and agriculture **B**: Edward Bunnell, Delta pioneer **C**: Classical revival/Queen Anne styles
Hugaboom House	Clarksburg	YOL	1873	**A**: early Delta settlement **B**: Cornelius Hugaboom, Delta pioneer
8870 River Road	Clarksburg	YOL	1880	**A**: Delta reclamation and agriculture **B**: Ralph Moore, Reclamation District 744 director
9521 River Road	Clarksburg	YOL	1903	**A**: early Delta agricultural development **B**: Catherine Mosher, Delta agriculturalist
George B. Green House	Courtland	SAC	1876	**A**: early Delta agricultural development **B**: Josiah Greene, early levee builder and dairy farmer **C**: Greek revival style

2.1.3.2 Commercial Buildings

Commercial buildings in the study area include a range of compositional types representing a variety of economic activities. Commercial buildings include stores, banks, agricultural vendors, and office buildings, and are typically one-part commercial block buildings with moderately decorative facades and stepped parapets. Commercial buildings, with rare exceptions, exist in the small towns as well as the larger communities. Twentieth-century commercial buildings in the rural Delta occur almost exclusively in the small towns, including Clarksburg, Hood, Locke, and Walnut Grove. Although generally small in scale (reflecting the modest scale of commercial activity), these buildings mimic the design of commerce in bigger cities. As noted with the residential buildings, many of these building types serve mixed commercial and residential uses. The few nonurban commercial buildings in the region comprise marina or other waterfront service buildings, such as stores and restaurants. Table 2-9 lists examples of the commercial property type that have been recognized as eligible for or listed in the National Register.

Table 2-9. National Register Listed and Eligible Commercial Properties

Resource Name	City	County	Year	National Register/California Register Criteria
Imperial Theater	Walnut Grove	SAC	1918	**C/3**: Neo-Classical style
Lawlor and Cosby General Merchandise	Clarksburg	YOL	c1920	**A/1**: local economic development **C/3**: Mission-revival style
Husick Hardware	Clarksburg	YOL	c1920	**A/1**: local economic development

2.1.3.3 Industrial Properties

A number of buildings in the study area represent the Delta's rich and long-standing agricultural industry. The majority of these properties are representative of the types of facilities developed in the Delta during the early-to-mid-twentieth century for storing and processing locally grown

produce. In the long history of agricultural enterprise in and around the Delta, the construction of packing houses, for example, with cold storage capabilities was fairly common. Sources report that by the turn of the nineteenth century 6,000 acres of reclaimed Delta lands were planted with asparagus, which was packed straight from the fields. This technique introduced a demand for canneries, with several outfits leading the way, including the Hickmott Asparagus Canning Company with a complex on Bouldin Island, and the Golden State Asparagus Company with its property on Andrus Island.

Though on the whole these buildings are utilitarian in architectural style, each varies moderately in massing, scale, and design materials. These architectural themes and features are visible in the oversized wall openings and steel corrugated siding of the Southern Pacific Wharf building in Hood. Pronounced features are also revealed in the decorative patterned brick coursing and the six-over-six single-hung, nine-pane fixed wood windows located on the expansive Amalgamated Sugar Company complex in Clarksburg. One of the more notable architectural features found in the study area can be seen on the California Fruit Canners' Vorden Asparagus Cannery building in Courtland. The exterior cladding throughout this cannery building that fronts River Road is made of unfinished, hollow-clay tile set similar to English bond brickwork with alternating horizontal rows of stretchers and headers. Table 2-10 lists examples of the industrial property type that have been recognized as eligible for or listed in the National Register.

Table 2-10. National Register Listed and Eligible Industrial Properties

Resource Name	City	County	Year	National Register Criteria
Noah Adams Lumber Company	Clarksburg	YOL	c1920	**A**: early economic development
Amalgamated Sugar Company	Clarksburg	YOL	1934–1935	**A**: economic development **C:** vernacular industrial architecture
Vorden Cannery	Courtland	SAC	1900	**A**: Delta asparagus canning industry

2.1.3.4 Agricultural Properties

The agricultural heritage of the Delta is perhaps the most enduring historical theme in the study area. Several property types in the study area are associated with agriculture. Agricultural properties may comprise individual ranchettes, large orchards and pastures, labor camps, and processing facilities. Agricultural complexes typically consist of a primary residence and—in the case of larger complexes—one or more secondary residences, as well as assemblages of barns and predominantly utilitarian buildings and structures with specific animal-husbandry, crop-production, or equipment-maintenance functions. Agricultural complexes also typically include landscape components such as orchards, pastures, or crop fields.

Agricultural buildings and structures in the study area include residences, barns, tank houses, sheds and outbuildings, grain silos and elevators, culling chutes, corrals, fences, and irrigation or drainage ditches. Many of the built environment's agricultural resources date to the first half of the twentieth century and reflect a broad range of architectural styles, from period revival mansions to vernacular barns, tank houses, and weathered storage sheds. Of these architectural types, the most prominent agricultural structure found in the study area is the gable-roofed barn. These barns share similar characteristics, including moderately steep gables, tall sidewalls, rectangular massing, and post-and-

beam construction. Table 2-11 lists examples of the agricultural property type that have been recognized as eligible for or listed in the National Register.

Table 2-11. National Register Listed and Eligible Agricultural Properties

Resource Name	City	County	Year	National Register
8700 Neugeburger Road	Stockton	SJO	1910	**C**: western feeder barn type
Terminous Culling Chute	Terminous	SJO	1927	**A**: Delta agricultural developments **C**: Industrial style **D**: Industrial archaeology

2.1.3.5 Water Control Systems

The Delta's landscape is built and maintained by reclamation and flood control management systems, and both regional and local irrigation systems have supported historical development of its communities and agricultural traditions. Reclamation and flood management systems are the infrastructures that maintain the Delta's current landscape by stabilizing and defining the region's islands and waterways, and include facilities that prevent saltwater intrusion into the Delta's freshwaters. Irrigation systems are the infrastructure that convey water from the region's sources to its areas of use, and these include components of the Central Valley Project (CVP) and State Water Project (SWP) as well as minor interior canals and diversion structures designed to irrigate specific properties on the area's numerous islands. While reclamation and flood management systems literally shape the geographic landscape, irrigation systems are a key component of how those lands are used.

Reclamation and Flood Management Infrastructure

The greatest factors advancing settlement in the Delta were land reclamation and the introduction of flood management systems, which transformed the vast marshland into levee-encircled islands. Many features and structures introduced into the landscape as part of this development remain extant. Compared to many built resources in the region, reclamation and flood management structures have had minimal consideration as historical resources.

Typical structures associated with reclamation and flood management include levees, canals, and land-side irrigation and water conveyance infrastructure such as ditches, pump houses, and other structures that support reclamation of and agriculture on reclaimed uplands. These structures range in sophistication from shoestring levees built in the nineteenth century, which required frequent repair and reconstruction, to the canals built by the U.S. Bureau of Reclamation (USBR) and the California Department of Water Resources (DWR), which are among the largest and most highly engineered water conveyance structures in the nation.

Diversion structures include weirs of either steel or wood, such as those found at the fish protective facility at the Clifton Court Forebay. Other structures are pumping facilities of varying sizes that are used to move water from where it is in excess to where it is needed. These range from the massive plants at Banks and Tracy Pumping Plants, to the mid-sized Middle River Pumping Plant, and to the single pumps that line the levees throughout the study area. Conduits such as canals, flumes, tunnels, and pipelines used to convey water are found throughout the study area. They range from simple dirt-lined ditches found on virtually every agricultural parcel to the three pipelines that make

up the massive Mokelumne Aqueduct. Smaller pipelines with siphons, penstocks, gates, valves or other distribution and regulation structures are found throughout the study area.

The Sacramento River levees in the study area have been documented (Caltrans and JRP 2008) but appear not to have been evaluated for National Register or California Register eligibility.

Irrigation Infrastructure

Irrigation systems include many of the same water conveyance infrastructure that support reclamation and flood control, such as ditches, pump houses, and other structure. These buildings, structures, and objects range in sophistication from minor ditches that supported small residential farms, to the canals built by USBR, DWR and others. Conduits such as canals, flumes, tunnels, and pipelines used to convey water are found throughout the study area. They range from simple dirt-lined ditches found on virtually every agricultural parcel to the three pipelines that make up the massive Mokelumne Aqueduct. Smaller pipelines with siphons, penstocks, gates, valves or other distribution and regulation structures are found throughout the study area. Table 2-12 provides an example of an irrigation infrastructure property type that has been recognized as eligible for or listed in the National Register.

Table 2-12. National Register Listed and Eligible Water Control Systems Properties

Resource Name	City	County	Year	National Register
Delta-Mendota Canal	Tracy	SJO	1946–1952	A: Water Development/Central Valley Project

2.1.3.6 Institutional Buildings

The Delta's communities and industries are in part represented by civic centers such as Hood, Courtland, Clarksville, Locke, and Walnut Grove. Rural civic centers such as those found in the Delta are often reflected in institutions such as schools, courthouses, libraries, and parks.

Few features and structures were introduced into the landscape as part of nineteenth-century civic development, and it is unclear how many of this small population remain extant. Spanish revival and Mission revival, common civic architectural styles in the early twentieth century, appear to be represented in the study area. Table 2-13 provides an example of an institutional property type that has been recognized as eligible for or listed in the National Register.

Table 2-13. National Register Listed and Eligible Civic Properties

Resource Name	City	County	Year	National Register
Beaver Union Elementary School	Walnut Grove	SAC	1920	**A**: Community development **C**: Spanish Colonial revival style

2.1.3.7 Utilities and Transmission Structures

The Delta's communities and industries that are supported by energy infrastructures that traverse the network of Delta islands and supply each island's interior as suited for its unique landscape and use. Residential, civic, and industrial centers frequently have utilities management and distribution

stations, whereas less-developed areas commonly only have transmission lines. Utilities and transmission infrastructure have not been well represented in resources identification and evaluation in previous cultural resources studies. Table 2-14 lists examples of the public utility property type that have been recognized as eligible for or listed in the National Register.

Table 2-14. National Register Listed and Eligible Public Utilities Properties

Resource Name	City	County	Year	National Register Criteria
East Contra Costa Irrigation District Electrical Substation	Byron	CCO	1914	**A**: Delta water and power development **C**: minimalist Neo-Classical revival style
12525 West Walnut Road electrical power substation	Thornton	SJO	1911	**A**: Delta water and power development **C**: Classical revival style

2.1.3.8 Transportation Systems

One of the direct results of settlement was the development and improvement of the transportation infrastructure in the Delta. During the late nineteenth and early twentieth century, several railroads were constructed through the region, roads were improved, and bridges were constructed to ensure efficient delivery of produce grown in the Delta region to major markets.

Railroads

Railroads were important in the creation and economic success of many Delta towns. They played a critical role in the region's agricultural economy. Railroad systems that continue to run through the study area include the Southern Pacific Railroad line between Tracy and Antioch and the Burlington Northern Santa Fe (BNSF; formerly the Atchison, Topeka, and Santa Fe) line between Stockton and Antioch. Portions of the grade for the old Oakland, Antioch and Eastern Railway line (later the Sacramento Northern) can be observed in the northern study area.

Roads

During the second half of the nineteenth century, early roads in the Delta were built over old trails that ran along the tops of river levees. Early-twentieth-century trends saw macadam and asphalt roads increasingly constructed on the tops of levees. Today the Delta is traversed by numerous road alignments 45 years of age or older, many of which still run atop levees. As resources requiring periodic maintenance and alteration, these roads have been occasionally subject to widening, course changes, resurfacing, and installation of railing.

Bridges

Bridges have been an important element in the transportation network of the Delta since the nineteenth century. Because these bridges often cross navigable waterways, their builders frequently employed moveable designs providing for accommodation of river-boat traffic. As a consequence of the need to maintain river navigation in the midst of railroad development, growing automobile use, and multiplying roads across the Delta, the region became home to the majority of all movable-span bridges in California. Present in the study area are single- and double-leaf bascule

bridges, steel swing bridges, and steel vertical lift bridges, some of which have been determined eligible for the National Register (see Section 3.3.7, *Transportation Development*).

Water Transportation Infrastructure

The oldest means of transporting goods, people, and other objects across Delta waterways are ferries. Ferries were also built to carry automobile traffic over navigable waters. Most of these ferries were simple cable ferries, capable of carrying only a small number of vehicles at a time. In the San Joaquin County portion of the Delta, for example, as many as 16 ferries operated at one time. Several ferries are still in service in the study area, including the Woodward Island Ferry and the Cache Slough Real McCoy ferry. Features associated with the Woodward Island Ferry, for example, include a ferry tender's house, ramps formed of wood boards with steel bracing on wood piles, and a ferry boat consisting of a steel hull, deck, safety gates, and a shed-roofed cabin that courses between ramps via a steel cable driven by a diesel-engine-powered cast-iron pulley.

As a destination for recreational boating and fishing, the Delta is home to numerous marinas. Marinas are located in the study area at the Roberts Island Resort, the Sea Horse Marina, Landing 63, and the Paradise Point Marina. These resources consist of buildings, ramps, stairways, and boat slips subject to frequent alteration due to maintenance needs. Table 2-15 lists examples of the transportation property type that have been recognized as eligible for or listed in the National Register.

Table 2-15. Sample List of National Register Listed and Eligible Transportation Systems Properties

Resource Name	City	County	Year	National Register Criteria
Bacon Island Railroad Bridge	Woodward Island	SJO	1929	**A**: Delta transportation development **C:** Abt-type bascule design (one of six in the U.S.)
Middle River Road Bridge	Stockton	SJO	1915	**A:** Delta transportation development
Three-Mile Slough Bridge		SAC	1949	**A:** Delta transportation development **C:** Movable steel truss type
Walnut Grove Branch Railroad, Sacramento Southern Railroad	Walnut Grove	SAC	1908–1912	**A**: Delta transportation development **C**: Wilhem Hood, architect and builder

2.1.4 Historic Districts and Cultural Landscapes

Historic districts and cultural landscapes may comprise collections of resources such as archaeological habitation sites, historical commercial buildings and streetscapes, ethnographic fishing areas, agricultural complexes, and other places that have traditional importance. Although the historic district documentation technically remains the basis for a variety of district and landscape types, the district and landscape concepts are distinct and may describe different property types. Sections 2.1.4.1, *Historic Districts*, and 2.1.4.2, *Cultural Landscapes*, discuss these categories.

2.1.4.1 Historic Districts

The National Park Service (NPS) defines *historic district* as a resource possessing "a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (National Park Service 1997: 5).

Examples of National Register–listed historic districts include the Locke and Walnut Grove townsites. These historic districts both contain clusters of built environment resources that are connected by similar themes of Asian-American settlement and architecture in the Delta, and they each reflect a wide range of functional building types dating from the late nineteenth century to early twentieth century. These historic districts may also be traditional properties that represent cultural traditions (see Section 2.1.5, *Traditional Property Types*).

Historic districts are not limited to urban settings. South River Road, in the vicinity of Clarksburg, has a series of late-nineteenth-century and early-twentieth-century grand rural homes associated with the Delta's agricultural history, and collectively these buildings could be considered a district. Also identified on South River Road are a series of Delta-style homes built between 1855 and 1875. These modest vernacular buildings are associated with early Portuguese settlers and comprise what is known in the region as the Lisbon District. Additionally, the components of the SWP's infrastructure have been described as a historic district, but evaluation as a district has not been completed to date. Table 2-16 lists examples of historic districts in the study area that have been recognized as eligible for or listed in the National Register.

Table 2-16. Sample List of National Register Listed and Eligible Historic Districts

Resource Name	City	County	Year	National Register Eligibility
Locke Historic District National Historic Landmark	Locke	SAC	1915–1940	**A:** Asian ethnic heritage **C:** Architecture
Walnut Grove Japanese/American Historic District	Walnut Grove	SAC	1915–1942	**A:** Asian ethnic heritage **C:** Architecture
Bacon Island Rural Historic District	Stockton	SJO	1913–1942	**A:** Asian ethnic heritage **B:** George Shima **C:** Architecture **D**: Japanese material culture
Grand Island/ Reclamation District 3 Rural Historic District	Walnut Grove	SAC	1850–1900	**A**: Delta reclamation
Delta Field Division of the State Water Project	Byron	SJO	1963–1969	**A**: State Water Project **C:** Engineering

2.1.4.2 Cultural Landscapes

The NPS defines a *cultural landscape* as "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: 1). Cultural landscape is an umbrella term for historic landscape types including historic designed landscapes, historic sites, historic vernacular landscapes and ethnographic landscapes. Evaluation and documentation of cultural landscapes is not as established as that of built or architectural resources, including historic districts, and is typically underrepresented in identification and inventory efforts. Cultural landscapes may be eligible for listing in the California Register or National Register as designed landscapes, historic sites, or historic districts. Cultural landscapes are sometimes distinct from individual built resources in that they often incorporate natural resources or systems as integral components. Additionally, cultural landscapes often change over time, which means that their integrity is not always easily defined. As such, a cultural landscape may derive its significance *because* of its evolution of use rather than in spite of it.

For the purposes of technical documentation, cultural landscapes are often classified by the following characteristics:

- Natural Systems and Features
- Spatial Organization
- Land Use
- Cultural Traditions
- Cluster Arrangements
- Circulation
- Topography
- Vegetation

- Buildings and Structures
- Views and Vistas
- Constructed Water Features
- Small-Scale Features
- Archaeological Sites

The presence of some or all of these characteristics aid in understanding a landscape's cultural value (National Park Service n.d.). It is not necessary for a cultural landscape to contain all of these characteristics; the presence of certain characteristics can help categorize the landscape. The NPS definitions of the main cultural landscape categories are outlined in the following sections, though it is important to note that they are not mutually exclusive and often overlap with one another.

Historic Designed Landscape

This type of landscape may be described as a design or work of art and be considered significant as:

- a conscious design and layout either by a master gardener, landscape architect, architect, or horticulturalist that adheres to a design principle
- a conscious design and layout by an owner or other amateur according to a recognized style or tradition and that illustrates a high aesthetic value
- associated with a historically significant person, trend, or movement in landscape gardening or architecture
- associated with a significant relationship to the theory or practice of landscape architecture

The most recognized examples of historic designed landscapes include parks and private estates or gardens. Parkways, campuses, and cemeteries may also fall under this landscape type. Designed landscapes are intentional and easily recognizable.

Historic Site

An historic site can be a landscape that is significant for its association with a historic event, activity, or person. The NPS provides battlefields and former U.S. Presidents' house properties as good examples of historic sites. Other examples may include sites associated with events that marked important moments in the civil rights or women's suffrage movements, memorials or monuments dedicated to important persons in our shared history, or the site where a significant invention occurred. This type of cultural landscape can be difficult to immediately identify because it is often associated with events in history and requires some advance knowledge before it can be understood as a landscape. Onsite interpretation is often an important component of historic sites.

Historic Vernacular Landscape

A vernacular landscape has typically been shaped over time through use. Vernacular landscapes are multilayered and can be significant for multiple associations. They reflect large cultural or social patterns in human behavior, from an individual level up to that of an entire community. This property type may be described as a landscape:

- whose use, construction, or physical layout reflects endemic traditions, customs, beliefs, or values

- in which the expression of cultural values, social behavior, and individual actions over time is manifested in physical features and materials and their interrelationships, including patterns of spatial organization, land use, circulation, vegetation, structures, and objects
- in which the physical, biological, and cultural features reflect the customs and everyday lives of people

Examples of vernacular landscapes include historic settlements or communities, land trusts or reservations, industrial sites such as a mill town or a system of canals, farmsteads, and historic roadways. In many cases, vernacular landscapes include elements that are also designed or recognized as a historic site.

Rural Historic Landscapes

A rural historic landscape property is a sub-type of the historic vernacular landscape type that may be common in the Delta region. According to *National Register Bulletin 30* (National Park Service 1999a), a rural historic landscape is:

> a geographical area that historically has been used by people, or shaped or modified by human activity, occupancy, or intervention, and that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features. Rural landscapes commonly reflect the day-to-day occupational activities of people engaged in traditional work such as mining, fishing, and various types of agriculture. Often, they have developed and evolved in response to both the forces of nature and the pragmatic need to make a living.

While small rural landscapes that have no buildings or structures are sometimes classified as sites for the purposes of technical evaluation and documentation (e.g., an orchard), most rural landscapes have extensive acreage and contain a number of buildings, structures, or features and are often classified as historic districts. However, according to the NPS, "large acreage and a proportionately small number of buildings and structures differentiate rural historic landscapes from other kinds of historic properties" (National Parks Service 1999: 2).

Rural historic landscape types may be described as:

- Industrial
- Agricultural
- Recreation
- Water Conveyance and Flood Management
- Transportation
- Utilities and Transmission

Many of these types are common in the Delta. Rural historic landscapes, especially those composed of a variety of land uses, may incorporate more than one of the types.

Rural historic landscapes can include constituent elements of all the various property types from the historic era (National Park Service 1999a: 24). Such landscapes have been identified and evaluated in the Delta. The most notable example is Bacon Island; the entire island has been determined to be a National Register–eligible rural historic district. Although large-scale agriculture is clearly still the predominant industry and way of life in the Delta, the social, ethnic, technological, and economic context has changed dramatically since the early twentieth century, and few such complexes retaining a high degree of historical integrity have been recorded in the Delta. This could mean that

few such landscapes remain intact, that they have been overlooked as an important resource type, or simply that previous investigations were unfamiliar with the more recent guidance for documenting and evaluating this property type.

Ethnographic Landscape

The NPS defines an ethnographic landscape as containing a variety of natural and/or cultural resources that are defined as heritage resources by a contemporary ethnic group (Page et al. 2009: 6-4). Sometimes ethnographic landscapes include archaeological sites or the potential for archaeological discovery. Examples include communities such as at the Martin Luther King, Jr. National Historical Site in Atlanta, the Timbisha Shoshone community at Death Valley, and massive geological structures like Devils Tower National Monument in Wyoming. The components that make up an ethnographic landscape may include characteristic plant or animal life, and the presence of cultural traditions such as hunting, gathering, or religious ceremonies. A common challenge in identifying ethnographic landscapes is that their significance is not fully understood or recognized beyond the associated community that places ethnographic value on those landscapes, and they may require a more holistic approach involving non-traditional forms of outreach, investigation, and documentation.

2.1.5 Traditional Property Types

Traditional properties are a category of cultural resources associated with historical traditions. The term *traditional* may be defined as "those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice." *Traditional cultural significance* may be defined as "significance derived from the role a property plays in a community's historically rooted beliefs, customs, and practices" (National Park Service 1998: 1) The cultural importance of traditional properties is most appropriately defined by the people who identify with the traditions.

Traditional property types may include archaeological, built environment, and multi-component resources such as historic districts and landscapes, but they also may be resources that are not embodied by any of these types. The Traditional Cultural Properties (TCP) and Tribal Cultural Resources (TCR) categories are the most commonly applied categories for identification and evaluation of traditional properties. The federal government has provided guidance for identification and evaluation of TCPs relative to Section 106 of the National Historic Preservation Act (NHPA). See Section 2.1.5.1, *Traditional Cultural Properties*. Similarly, the State of California has provided guidance on TCRs in relation to the California Assembly Bill 52 CEQA amendment. See Section 2.1.5.2, *Tribal Cultural Resources.*

Traditional properties may not always be well defined by firm boundaries or clearly articulated character-defining features, in part because such resources are considered very personal to the groups who ascribe significance to them, and such details are not always suitable for sharing outside the group. The NPS has listed to the National Register traditional cultural landscape properties and Native American cultural landscape properties, including the Nantucket Sound Cultural Landscape (a TCP), which has no precise historic property boundary attributed to it (National Park Service 2010).

2.1.5.1 Traditional Cultural Properties

A TCP is a property that is eligible under National Register Criteria A, B, C, or D, and "eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (National Park Service 1998: 1).

The NPS's *National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties* emphasizes Native American properties in its guidance; however, Americans of every ethnicity, national origin, or other cultural association can ascribe significance to properties of traditional cultural value (National Park Service 1998: 3).

No TCPs have been identified in the study area. Further investigation of the Delta's historical traditions may reveal that properties associated with historical events, persons, architectures and/or data potential also have traditional significance. For example, traditions and associated communities identified in the *National Heritage Area Feasibility Study* (Delta Protection Commission 2012) may provide important information on this topic.

2.1.5.2 Tribal Cultural Resources

California's Public Resources Code section 21074 defines a TCR as a geographically-defined resource with cultural value to a California Native American tribe and that also meets one of the following criteria:

- Is listed or eligible for listing in the California Register of Historical Resources.
- Is listed or eligible for listing in a local register of historical resources as defined in Public Resources Code section 5020. l(k).
- Is a historical resources determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1.

No TCRs have been identified in the study area. Future Delta studies and further investigation of the Delta's Native American traditions may identify such resources, and may reveal that known resources associated with historical events, persons, architectures and/or data potential also have traditional significance.

2.2 Evaluation Criteria and Standard Guidance

This section introduces the National Register and California Register criteria for evaluating cultural resources, and the standard guidance for specific property types.

2.2.1 National Register and California Register Criteria

National Register and California Register criteria for evaluation are applied to cultural resources relative to the significant thematic, geographical, and chronological parameters identified in a historic context statement (see Chapter 3). National Register and California Register eligibility are found by applying the criteria for evaluation for each of these two programs. The following

associative criteria are applied to identify the significant historical themes that resources may represent.

- *National Register Criterion A/California Register Criterion 1* is applied to assess a resource's association with trends or events that have made a significant contribution to the broad patterns of history.
- *National Register Criterion B/California Register Criterion 2* is applied to assess a resource's association with the lives of persons significant in our past.
- *National Register Criterion C/California Register Criterion 3* is applied to assess a resource's association with the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction.
- *National Register Criterion D/California Register Criterion 4* is applied to assess how a resource has yielded, or may be likely to yield, information important in history.

Additional criteria considerations are applied to religious properties, built resources that have been moved from their original locations, birthplaces and graves of individuals, cemeteries, reconstructed buildings, commemorative properties, and properties that have achieved historical significance within the past 50 years.

Both the National Register and California Register cultural resources evaluation processes include assessments of the following aspects of integrity.

- *Location* is the place where the historic property was constructed or the place where the historic event occurred.
- *Design* is the combination of elements that create the form, plan, space, structure, and style of a property.
- *Setting* is the physical environment of a historic property.
- *Materials* are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- *Workmanship* is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- *Feeling* is a property's expression of the aesthetic or historic sense of a particular period of time.
- *Association* is the direct link between an important historic event or person and a historic property.

Registration criteria may be developed to assess integrity specific to a resource type, its category of significance, and its comparative representation in listed National Register historic properties and California Register historical resources (see Chapter 4).

National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation

National Register Bulletin 15 provides the foundational technical guidance for evaluating common National Register property types. The guidance covers basic definitions of historic properties categories (building, structure, site, object, and district), how historic contexts should be developed and applied during resource evaluation, how to identify the historical significance of a property

(using criteria A, B, C, and D), discussion of special considerations for certain types of properties, and how to evaluate the historical integrity (location, design, setting, materials, workmanship, feeling, association) of a significant property (National Park Service 1997). All other National Register Bulletins build upon the fundamental guidance in National Register Bulletin 15, whether they are about historic landscapes (National Register Bulletins 10 and 30), historic archaeological resources (National Register Bulletin 36), TCPs (National Register Bulletin 38), shipwrecks (National Register Bulletin 20), or other property types.

2.2.2 Historic Districts and Landscapes Guidance

As discussed in Section 2.1.4, *Historic Districts and Cultural Landscapes*, cultural resources may be historically significant as collections of individual resource types related to a theme, geographic location, or landscape. According to federal guidelines "an historic district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development" (National Park Service 2002).

Federal guidance and its application have evolved rapidly in recent years, and numerous property types have been brought to the forefront as landscapes or specific district types. This section describes the current baseline of guidance and support for describing and evaluating these distinct properties.

2.2.2.1 Historic District Guidance

NPS guidance and standards for contextualizing and evaluating historic districts are included in National Register Bulletin 15. Other bulletins address the unique considerations for particular types of districts, such as historic residential suburbs (unnumbered National Register Bulletin), historic battlefields (National Register Bulletin 40), or historic landscapes, discussed in the next section.

2.2.2.2 Cultural Landscapes Guidance

Several NPS publications provide a framework for the evaluation of historical significance and a nuanced approach to historic integrity of cultural landscapes. NPS guidance and standards for the survey and evaluation of cultural landscapes are included in following publications.

National Register Bulletin 18: How to Evaluate and Nominate Designed Historic Landscapes. This bulletin provides technical guidance on comprehensive planning, survey of cultural resources, and registration in the National Register as applicable to designed historic landscapes (National Park Service 1999b).

National Register Bulletin 30: Guidelines for Evaluating and Documenting Rural Historic Landscapes. This bulletin provides technical guidance for agencies and individuals in the successful preparation of nominations to the National Register and requests for determinations of eligibility for historic sites or districts known as rural historic landscapes (National Park Service 1999a).

Preservation Brief 36: Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes. The preservation brief provides guidance on the protection of cultural landscapes. Its contents can be useful in determining appropriate treatment considerations (National Park Service 1996).

The Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The *Guidelines for the Treatment of Cultural Landscapes* illustrates how treatment options described in the *Secretary of the Interior's Standards for the Treatment of Historic Properties*—preservation, rehabilitation, restoration, and reconstruction—can be applied to the unique qualities of cultural landscapes. In addition to providing guidance regarding treatment options, the guidelines provide commentary about the nuances of evaluating cultural landscapes in terms of change and continuity, relative significance in history, integrity and existing physical condition, geographical context, use, archaeological resources, natural systems, management and maintenance, interpretation, accessibility considerations, health and safety considerations, environmental protection requirements, and energy efficiency (National Park Service 1996).

A Guide to Cultural Landscape Reports: Contents, Process, and Techniques. The *Guide to Cultural Landscape Reports* establishes the model for Cultural Landscape Report development, which includes site history, existing conditions, analysis, evaluation, treatment, and record of treatment. This resource offers particularly relevant guidance on crafting methodology, identifying landscape characteristics, documenting existing conditions, establishing a statement of significance, and assessing historic integrity (Page et al. 1998).

National Park Service Cultural Landscapes Inventory Professional Procedures Guide. The *Cultural Landscapes Inventory Procedures Guide* offers instruction crafted for comprehensive inventory of cultural landscapes within the NPS system. It provides robust guidance on organization of survey data, writing statements of significance, evaluating integrity, and defining landscape characteristics. The information in this resource is transferable to cultural landscapes beyond NPS boundaries and applicable to the Delta region (Page et al. 2009).

2.2.3 Traditional Properties Guidance

NPS guidance and standards for contextualizing and evaluating traditional properties, and California Office of Historic Preservation (OHP) support for identifying traditional properties, are included in the following publications.

National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties. This bulletin provides technical guidance on understanding traditional cultural values and defining cultural significance, determining eligibility, and documentation topics such as confidentiality and boundary identification (Parker and King 1998).

Five Views: An Ethnic Historic Site Survey for California. *Five Views* provides contextual histories that have been prepared by scholars who identify with a range of ethnic histories in California. The contexts support identification of properties that may be associated with significant historical traditions, and particularly those that may be identified as sites, buildings, objects, and districts (California Office of Historic Preservation 1988).

Latinos in Twentieth Century California: National Register of Historic Places Context Statement. *Latinos in Twentieth Century California* provides contextual history that have been prepared by scholars who identify with Latino heritage in California. The context supports identification of properties that may be associated with significant historical traditions, and particularly those that may be identified as sites, buildings, objects, and districts (California Office of Historic Preservation 2015).

2.3 Buried Archaeological Resource Sensitivity

This section presents guidance for assessing geotechnical and geoarchaeological data collection and analysis for future cultural resources assessment in the Delta. The methods and reporting requirements for buried archaeological resources sensitivity studies would be determined based on the scope of the future projects.

The purpose of this section is to more precisely define the nature of buried archaeological resource sensitivity, recognize data gaps, and propose standard approaches to appropriately address data gaps. *Buried archaeological resource sensitivity* is defined as the potential for a given area to contain a buried archaeological resource. This definition is related to, but different from, general archaeological sensitivity, which considers the potential for a given area to contain an archaeological resource regardless of whether it is buried or surface-exposed.

2.3.1 Analytical Framework

This section considers landscape age and depositional context to assess where project-related ground disturbance has the potential to encounter buried archaeological resources. These factors are linked because the age and environment in which a landscape is formed has direct bearing on when it becomes accessible for human use, how humans interact with it once it becomes accessible, and how the material remains of these activities are preserved. This section uses landforms—geologic units with shared geomorphic origin—as the unit of analysis, and considers the timing of the formation of the various landform types that occur in the study area vicinity. Landforms tend to be useful analytical units for archaeological sensitivity analyses because each type has a unique set of physical attributes and can be recognized and contrasted at the macroscopic scale. The age and depositional environment of a landform can also provide insight into whether archaeological resources are likely to be present on or buried within it.

To determine the range of potential geologic landform types within the study area, a review of the local geology and landscape history is necessary. A detailed summary of the geologic context of the study area falls outside of the scope of this context statement. Instead, the following briefly summarizes the geologic forces whose physical legacies contributed to the current topography of the study area, and provides greater detail for those geologic forces that have directly affected the morphology of the current landscape and its likelihood to contain buried archaeological resources.

The study area is located at the interface between the Sacramento (north) and San Joaquin (south) Valleys within the Great Valley geomorphic province, on the Sacramento and San Joaquin River Delta. This province is characterized by a 50-mile (east to west) by 400-mile (north to south) topographic depression or basin (California Geological Survey 2002), and formed as a result of tectonic pressures along the Pacific and North American plate starting in the Cretaceous period (145 to 66 million years ago). Over time, this basin infilled with marine sediments, as well as sediments transported downslope from the Sierra Nevada and their foothills. By the early Pleistocene epoch (starting at around 2.1 million years ago), the basin was cut off from the Pacific Ocean. Thereafter, a series of lakes formed across the Great Valley, some of which drained into the Pacific Ocean through the present-day location of Carquinez Strait (Bartow 1991). The drainage of these lakes, as well as meltwater from large alpine glaciers in the Sierra Nevada, resulted in the formation of a series of large alluvial fans in the Great Valley and within the study area (Atwater 1982). As a result of the large volumes of water trapped in continental glaciers during the late Pleistocene epoch, global sea

levels were significantly lower than at present, extending as much as 125 meters below their current levels during the last glacial maximum (between 17,000 and 21,000 years ago). As glacial ice receded, global sea levels began to rise rapidly, but tailed-off during the middle to late Holocene as sea levels approached their present elevation (Atwater et al. 1979; Fleming et al. 1998), which resulted in the infilling of the present-day location of the Delta with seawater through the Carquinez Strait (Atwater 1982).

The geomorphology of the study area vicinity reflects the complex interplay between sea level change as a result of periodic oscillations in the volume of continental glacial ice and periodic changes in stream erosion and sedimentation as a result of oscillations in the volume of alpine glacial ice in the Sierra Nevada. These oscillations are not synchronous, and their timing relative to each other affects whether the Delta undergoes periods of erosion or aggradation (or upward growth). For example, during periods when there are large volumes of continental and alpine glacial ice (i.e., low sea levels and large rivers), like the end of the Pleistocene epoch, the Delta undergoes a period of erosion and down cutting (or incision). Conversely, during periods when continental and alpine glacial ice volumes are low (i.e., high sea levels and small rivers), like the middle to late Holocene, the Delta undergoes a period of aggradation—infilling with fine sediments and organic materials (Atwater 1982).

For much of the period for which there is scientific consensus regarding human occupation of North America, which includes the Pleistocene-to-Holocene transition (around 15,000 years ago to around 12,000 years ago) and the Holocene epoch (around 12,000 years ago to the present) the Delta has been in a period of aggradation. This has resulted in widespread estuarine and alluvial deposition of as much as 60 feet of silts, sands, and organics across the study area (Atwater 1982).

For the purpose of this study, the landforms in the study area are divided into two groups based on their age relative to the period for which there is scientific consensus regarding human occupation of North America. The first, Pleistocene or older, are landforms that would have formed prior to human occupation of North America and would therefore have limited sensitivity for containing buried archaeological resources. The second, Holocene-aged, are landforms that would have formed during the period in which humans have occupied North America. Depending on the specific conditions in which the landforms from this period were formed, they may have increased sensitivity for containing or overlaying buried archaeological resources. The two groups of forms, the landform types that they encompass, the timing of their formation, accessibility, and archaeological sensitivity are presented in Table 2-17. Additional discussion about each of the anticipated landform types is provided after the table.

Table 2-17. Anticipated Landform Types, Age, Accessibility, Buried Resource Sensitivity, and Possible Resource Types in the Study Area

Landform Group	Landform Type	Age	Accessibility	Buried Resource Sensitivity	Possible Resource Types
Pleistocene or Older	Alluvial Fan	Pleistocene	Frequently accessible	Limited	Habitation, Resource Collection, Resource Processing
Holocene-aged	Floodplain	Middle to late Holocene	Frequently accessible	High	Habitation, Resource Collection, Resource Processing
	Stream Channel and Levee Splay	Middle to late Holocene	Frequently inaccessible	Limited, but may bury older landforms	Resource Collection
	Tidal Marshes	Middle to late Holocene	Frequently inaccessible	Limited, but may bury older landforms	Resource Collection
	Alluvial Fan	Early to middle Holocene	Frequently accessible	High	Habitation, Resource Collection, Resource Processing

2.3.1.1 Pleistocene-Aged or Older Landforms

Pleistocene-aged or older landforms were formed prior to the period for which there is scientific consensus relating to the earliest human occupation of North America. As a result, these landforms have limited potential to contain buried archaeological resources, but may contain archaeological resources on their surfaces. Within the study area, Pleistocene-aged or older landforms are anticipated to consist of alluvial fans comprised of fine to coarse sediments, and formed during the Pleistocene epoch. These fans appear to have formed during two distinct periods, resulting in the identification of two separate formations—the lower member of the Modesto formation (younger) and Riverbank formation (older) (Atwater 1982).

2.3.1.2 Holocene-Aged Landforms

Holocene-aged landforms have the potential to form over archaeological resources, and may have the potential to contain archaeological resources if the conditions in which they form are conducive to human occupation (for example, a floodplain as opposed to a stream channel). Nearly all of the Holocene-aged landforms in the study area represent components of a larger geomorphic system—a delta (Shipman 2008). Importantly, the Sacramento and San Joaquin River Delta differs from most other coastal plain deltas in that it aggrades (grows upward), but does not appear to noticeably prograde (grow outward or seaward)—a trait consistent with other inland deltas (Atwater and Belknap 1980).

Deltas form where sediments accumulate faster than can be reworked as a stream flows into a standing body of water, like lacustrine or coastal environments (Waters 1992), or back up behind a

geographic constriction point (Atwater and Belknap 1980). Commonly, deltas are divided into three zones—the delta plain, delta front, and prodelta (Reading and Collinson 1996). Of these, only the delta plain is typically exposed above the water level, and the landform types associated with this plain are described in greater detail below. The delta front forms as suspended and saltating sediments transported along distributary channels are deposited seaward of the delta plain as water velocity decreases. As a result, delta fronts tend to accrete both laterally and vertically over time. Sediments deposited along the delta front tend to be coarser than those deposited on the delta plain and prodelta. The prodelta forms at the outermost edge of the delta as the last remaining suspended sediments are deposited along the delta front, resulting in gradual vertical accretion (Reading and Collinson 1996).

Landforms commonly associated with the delta plain include tidal marshes, channels, and floodplains. The following subsections are detailed summaries of each of these landform types.

2.3.1.3 Tidal Marshes

Much of the study area is located at low enough elevations that they would be subject to daily intertidal oscillation if not for the presence of a levee system. Prior to the construction of this levee system beginning in the mid-nineteenth century, large portions of the study area would have been subject to daily low-energy tidal inundation. This resulted in the formation of extensive tidal marshes, which were both documented as being widespread in the study area during the historic era (Atwater et al. 1979) and are reflected in the geological record by the presence of widespread peat deposits (Atwater and Belknap 1980; Atwater 1982). The presence of peat is only possible in instances where frequent or permanent inundation occurs, resulting in the anaerobic conditions necessary for the preservation of peat.

Historical maps reveal that tidal marshes were widespread in the study area prior to historic landscape modification. The conditions in which they form reduce their potential to contain archaeological deposits because although intertidal marshes can be rich in floral and faunal resources, they are regularly inundated and cannot be used for habitation or resource processing activities that require long periods of time. As a result of the intermittent to limited ground surface accessibility for these landforms, it is anticipated that any evidence of human use of the landscape would be limited to resource collection, which would result in limited archaeological evidence. However, in areas where upland landforms intersect with intertidal landforms, it is possible that upland surfaces that have been buried by intertidal landforms as a result of sea level rise could be encountered if subsurface ground disturbance is deep enough.

2.3.1.4 Channel

The study area was and is dissected by numerous stream channels. A channel is defined as the space within which a body of flowing water is confined (Waters 1992). Within an active stream channel, sediment may accrete, forming sand and gravel bars. Although the range of sediment sizes in stream channels are a function of the size and composition of source sediments, distance from sediment source, and stream gradient, the coarsest sediments in a fluvial system should be located within a stream channel and in areas that were previously inhabited by a stream channel. Within the study area, channel deposits are anticipated to primarily consist of medium to coarse sands. Channel deposits are unlikely to contain archaeological deposits in primary depositional context or features because they are frequently, if not permanently, inundated and in a state of perpetual erosion and

deposition (Waters 1992; Gladfelter 2001). Therefore, no resources are anticipated to be encountered within channel deposits. However, in areas where relict upland landforms have been deeply buried through deposition and sea level rise, it is possible that channel deposits could bury more deeply buried archaeological resources.

2.3.1.5 Floodplain

Portions of the study area contain floodplains, which are defined as broad and flat terrestrial landforms located adjacent to streams. When water discharge volume exceeds the cross-sectional area of a channel, or where a natural levee fails, overbank flooding may occur. This process carries sediments suspended in the floodwaters onto the areas adjacent to the stream and deposits them. Over time, this process results in floodplain aggradation (Waters 1992; Collinson 1996). Floodplain formation can also be supplemented with sediments that wash down valley and canyon walls onto the floodplain. Floodplains are typically composed of massive to laminated fine sands (Collinson 1996), and have the potential to contain archaeological resources in primary depositional context because the velocity of the overbank flooding is commonly not great enough to disturb associations between and within archaeological resources. Since overbank flooding tends to occur seasonally, floodplains are suitable for temporary habitation, resource collection, and resource processing. If overbank flooding occurs with regularity, it has the potential to deeply bury archaeological resources.

2.3.1.6 Alluvial Fan

The study area may contain buried and surface-exposed alluvial fans associated with the upper member of the Modesto formation, which formed between 9,000 and 14,000 years ago (Atwater and Belknap 1980; Marchand and Allwardt 1981). Alluvial fans form where flowing water emerges from a laterally confined area, resulting in flow expansion and a related reduction of flow depth and velocity. As flow velocity decreases, suspended and saltating sediments settle out. Over time, this process results in the formation of a cone- or fan-shaped landform. Alluvial fans are typically divided into two classes: gravity flow fans and fluvial fans. Gravity flow fans are generally small to medium in size, receive intermittent to rare flow, and occur along basin margins and in arid environments. Fluvial fans are generally medium to large in size and receive flow through permanent to intermittent channelized streams, and occur in humid environments (Collinson 1996). These differences precipitate key differences in how sediments are deposited on each alluvial fan class over time. In the study area vicinity, the upper member of the Modesto formation tends to be comprised of medium to fine sands (Atwater 1982). Since only the channelized portions of alluvial fans are inundated except for rare instances where high flow events may result in overbank flooding, these landforms are suitable for habitation, resource collection, and resource processing. If overbank flooding occurs with regularity, it has the potential to deeply bury archaeological resources.

2.3.2 Desktop-Based Buried Archaeological Resource Sensitivity Analyses

The study area was subject to a desktop-based geoarchaeological sensitivity analysis that relied on soils data to determine landform age within the study area and attributed the following categories of archaeological sensitivity based on landform age and depositional context (Table 2-18).

Table 2-18. Buried Archaeological Resource Sensitivity Categories used for the Project EIR/S

Category	Landform
Low	Early Holocene Fans and Floodplains; Pre-Pleistocene through Latest Pleistocene Hillslopes, Fans and Floodplains; Peat and Muck
Moderate	Middle Holocene Fans and Floodplains
High	Late Holocene Fans and Floodplains
Very High	Latest Holocene Fans and Floodplains

Much of the study area has low buried archaeological resource sensitivity. However, this is primarily because much of the study area contains Holocene-aged soils defined as having low probability to contain buried archaeological resources (i.e., peat and muck). As indicated in the analytical framework presented above, while it is true that peat and muck form in conditions that are not conducive to human occupation, they do retain the potential to bury older landforms and in doing so, could have buried archaeological resources that were previously exposed at the ground surface.

A revised analysis was performed to better account for the potential for Holocene-aged landforms that are not conducive to human occupation (i.e., channels and intertidal marshes) to bury older landforms that would have been conducive to human occupation. For this analysis, the categories presented in Table 2-19 and the geologic landform age data developed by Knudson (et al. 2000) were used. This analysis revealed that the vast majority of the study area is located on landforms that retain a high degree of sensitivity for containing buried archaeological resources. Table 2-20 presents the proportion of the study area located within each buried archaeological resource sensitivity category and Figure 2-1 depicts how these categories are distributed across a portion of the study area.

Table 2-19. Revised Buried Archaeological Resource Sensitivity Categories

Category	Landform
Low	Pleistocene-aged or older landforms
Moderate	Early Holocene Landforms
High	Middle to Late Holocene Landforms

Table 2-20. Proportion of the Study Area Located Within Each Buried Archaeological Resource Sensitivity Category

Category	Proportion of Study Area
Low	23.2 %
Moderate	9.9 %
High	64.9 %

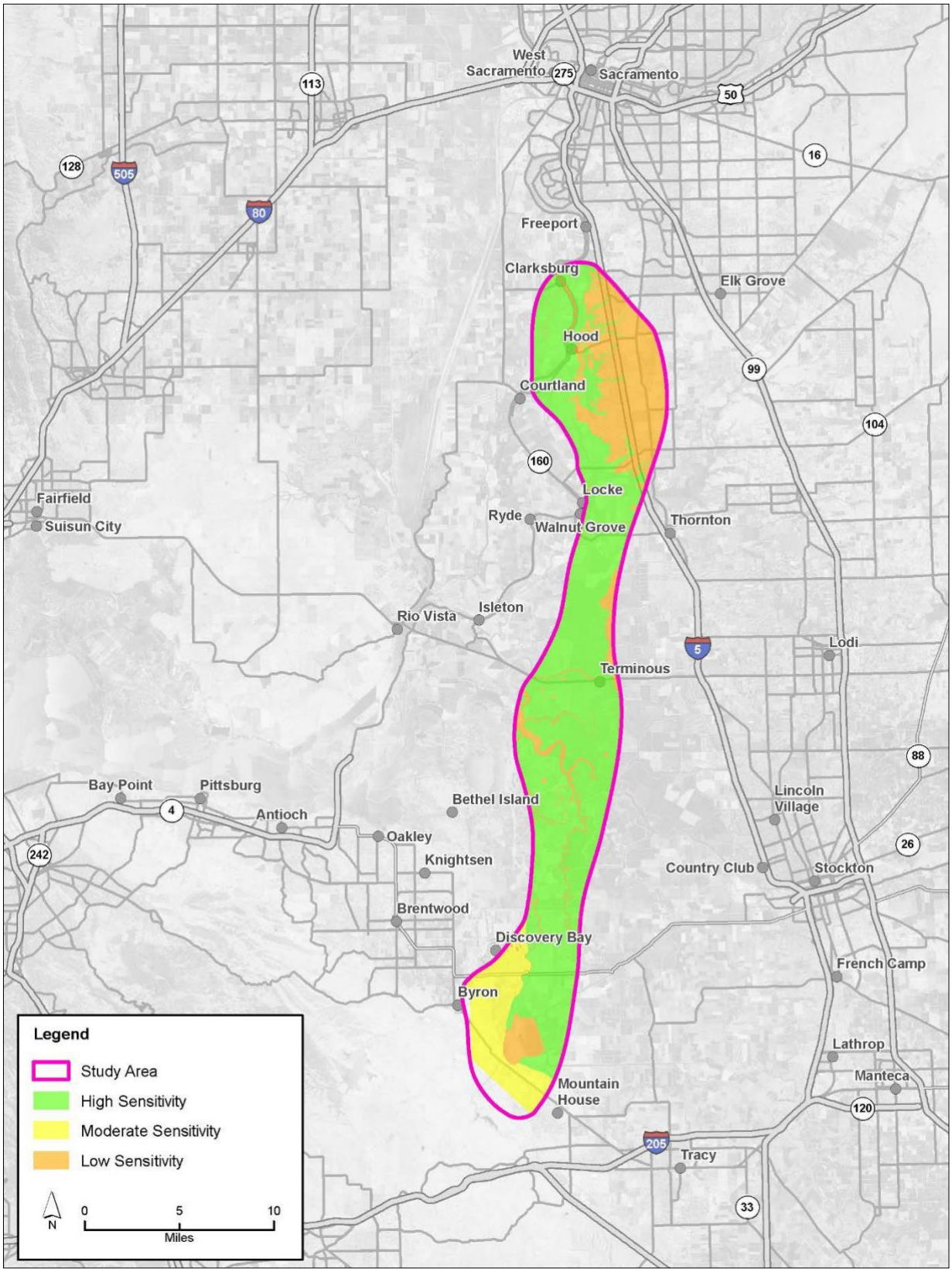

Figure 2-1. Buried Sensitivity Map

While nearly the entire study area appears to be located on landforms that retain either a moderate or high degree of sensitivity for buried archaeological resources, this does not reflect the full range of dimensions that need to be considered to understand buried archaeological resource sensitivity. Specifically, the information available for this analysis was insufficient to determine the vertical dimensions of geologic units. This consideration is important because some landform types, such as channels and intertidal marshes, have limited sensitivity to contain archaeological resources, but rather retain the potential to bury older landforms that contain archaeological resources. To more precisely define buried archaeological resource sensitivity in a way that can assist with risk-based decision-making, additional data that describes vertical geologic data within the study area may be needed.

2.3.3 Proposed Approaches for Supplemental Geoarchaeological Studies

Additional information relating to the vertical dimensions of geologic landforms is needed to define the potential for encountering buried archaeological resources in the study area. Therefore, in those instances where future project-related ground-disturbing activities would encounter buried landforms or surfaces that have elevated potential to contain buried archaeological resources, further studies may be needed to more precisely delineate these landforms and surfaces. The following nested approach is proposed for collecting the necessary supplemental data.

1. **Collect and Synthesize Previous Geotechnical and Geoarchaeological Boring Data.** Collect boring logs and fence diagrams from previously conducted geotechnical and geoarchaeological investigations across the study area. Using this information and the analytical framework presented in Section 2.3.1, *Analytical Framework*, develop a series of north-to-south and east-to-west fence diagrams (i.e., geologic cross-section diagrams) that depict the vertical dimensions of landforms and surfaces with varying degrees of buried archaeological resource sensitivity. Overlay the fence diagrams with the depths of project-related ground-disturbing activities.

2. **Perform Additional Geoarchaeological Borings in Locations with Limited Coverage.** In those instances where gaps in the current geotechnical and geoarchaeological data are such that it is unclear whether a given project-related ground-disturbing activity has the potential to encounter a landform or surface with buried archaeological resource sensitivity, perform targeted geoarchaeological investigations using methods that can adequately access the depth in question and that will yield sufficient sedimentary and stratigraphic data to determine landform type and age. The specific investigation methodology will be developed by DWR or in conjunction with their designee in coordination with consulting parties.

3. **Perform Project Activity–Specific Geoarchaeological Investigations.** In those instances where a given project-related ground-disturbing activity would encounter a landform or surface with buried archaeological resource sensitivity, perform additional investigations as needed to precisely define the topography and dimensions of the landform or surface in question and to assess whether the risk of encountering a buried archaeological resource is sufficient to warrant supplemental studies or archaeological monitoring. The need for, and nature of, additional studies or archaeological monitoring will be developed by DWR or in conjunction with their designee in coordination with consulting parties.

Chapter 3
Historic Context and Narrative Themes

This chapter describes historical contexts and themes that address the Delta's history, including archaeological research questions. For each contextual theme, known property types in the study area that were introduced in Section 2.1, *General Property Types*, are identified in association with that theme.

The context and themes demonstrate current knowledge about the Delta, and also help to identify data gaps in the current body of knowledge. The information presented in this chapter also covers topics that have been used to develop registration criteria for discussion in Chapter 4, *Resource Evaluation*.

3.1 Early Native American Context and Themes

3.1.1 Early Native American Chronology

This section briefly summarizes how several key attributes of early Native American lifeways appear to have changed over time, based on the available information in the archaeological record and ethnographic literature. These attributes include technology, mobility and settlement, resource use, and social organization/ideology. The purpose of this summary is to identify the key research trends and data gaps so as to establish important research themes for early Native American archaeological resources. The attributes, research trends, and research themes presented in this section are academic constructs and may not reflect the most important issues for contemporary Native American tribes.

There is no single cultural-historical framework that accommodates the entire prehistoric record of the Central Valley. Moratto's (1984) well-regarded synthesis of Central Valley archaeology was based on works from Bennyhoff and Fredrickson (Elsasser 1978; Fredrickson 1973, 1974). The comparative frameworks established by Bennyhoff and Fredrickson (1994) incorporated a wide range of local and regional traditions but have not been systematically applied outside of the Sacramento Valley. For this reason, the following discussion uses a simple classification based on the three basic periods proposed by Fredrickson: the Paleo-Indian, Archaic, and Emergent (Fredrickson 1973, 1974). The Archaic period has been further divided into the Lower, Middle, and Upper Archaic based on newer radiocarbon dates, adjusted with modern calibration curves (Rosenthal et al. 2007: 150).

3.1.1.1 Paleo-Indian

The earliest accepted evidence of human occupation in the Central Valley during the Paleo-Indian period (11,550–8500 BC) comes from the discovery of basally thinned and fluted projectile points at three separate locations in the southern portion of the basin (Rosenthal et al. 2007: 151). Archaeological deposits associated with these ancient landforms either have been destroyed or lie buried beneath more recent alluvial deposits (Rosenthal et al. 2007: 151).

3.1.1.2 Lower Archaic

As with the Paleo-Indian period, the Lower Archaic period (8000–5550 BC) is characterized by mostly isolated finds, including stemmed points, chipped stone crescents, and early concave base points. Typical examples of these artifact types have been found on the ancient shore of Tulare Lake (Wallace and Riddell 1991).

3.1.1.3 Middle Archaic

The beginning of the Middle Archaic (5550–550 BC) brought significant climate changes to the Central Valley: warmer, drier conditions; the development of the Delta as sea levels rose; and the stabilization of fans and floodplains around 5550 BC calibrated (written as cal BC or cal AD; calibration is used to convert the laboratory determination of carbon-dated materials to calendar years) (Rosenthal et al. 2007: 152). Around 2300 BC, saltwater from the San Francisco Bay first reached what are now the mouths of the San Joaquin and Sacramento Rivers near Browns Island. This new, brackish tidal marsh would slowly develop into the Sacramento–San Joaquin Delta (Meyer and Rosenthal 2008: 61).

Around this time, there appeared to be two distinct settlement-subsistence adaptations operating in central California—one centering on the foothills and the other on the valley floor (Fredrickson 1994: 102–103; Rosenthal and McGuire 2004: 161–163). Late Middle Archaic sites appear to be increasingly sedentary, as indicated by refined and specialized tool assemblages and features, a wide range of non-utilitarian artifacts, abundant trade objects, and plant and animal remains indicative of year-round occupation (Moratto 1984; Ragir 1972; Schulz 1970, 1981; White 2003a, 2003b). Settlement-subsistence patterns of the Middle Archaic within the Delta appear similar to subsistence patterns in the rest of the Sacramento-San Joaquin Valley, but show a greater reliance on aquatic resources—specialized fishing gear appears within Delta assemblages during this period.

The Windmiller pattern first appeared during the Middle Archaic. A pattern is a widely distributed, shared suite of adaptations, technologies, and ceremonial and economic behaviors (Moratto 1984: 201). Dietary patterns within Windmiller sites reflect an emphasis on gathered plant resources, with large quantities of mortar fragments appearing within Windmiller sites (Moratto 1984: 201). Faunal assemblages from Windmiller sites are more diverse in composition. Notably, Delta Windmiller sites show a greater reliance on elk relative to deer (Meyer and Rosenthal 2008: 63, 72). Notable and identifiable mortuary practices associated with Windmiller sites include westerly oriented, ventrally extended burials, and the association of red ochre with burials. Moratto also notes that Windmiller pattern burials within the Delta occur both in isolation and in large cemeteries (Moratto 1984: 203). An important Windmiller pattern site, the Blossom Mound (SJO-68), is located within the Delta. Dating to approximately 3050 BC, the Blossom Mound represents the earliest known Windmiller pattern site, and one of the earliest known occupation sites within the Delta (Meyer and Rosenthal 2008: 61).

3.1.1.4 Upper Archaic

The Upper Archaic (550 BC–AD 1100) is characterized by another change in climate conditions—this time to a cooler, wetter, and more stable climate. These changes resulted in renewed fan and floodplain deposition and soil formation in the Central Valley (Rosenthal et al. 2007: 156). New technologies were developed during this period, including new types of bone tools and bone implements and widespread manufactured goods such as *Haliotis* ornaments and ceremonial blades

(Bennyhoff and Fredrickson 1994,; Fredrickson 1974, Moratto 1984). The Berkeley Pattern (Fredrickson 1973, 1974) typically contains large quantities of habitation debris and features (such as fire-cracked rock heaps, shallow hearths, house floors, and flexed burials) that reflected long-term residential occupation.

This period is associated with the development of large, populous villages within the Sacramento Valley. In the Delta, similar but smaller "mound-villages" and small hamlets began to appear in greater numbers along tributaries of the Sacramento and San Joaquin Rivers (Meyer and Rosenthal 2008: 69).

3.1.1.5 Emergent

The archaeological record for the Emergent/Historic period (post-AD 1100) is more substantial and comprehensive than those of earlier periods in the Central Valley, and the artifact assemblages are the most diverse (Bennyhoff 1977; Fredrickson 1974; Kowta 1988; Sundahl 1982, 1992). The Emergent period, which enjoyed a relatively stable climate as opposed to the earlier periods, is associated with the use of the bow and arrow over the dart and atlatl (Bennyhoff and Fredrickson1994).

The bow and arrow appears to have arrived in the Delta fairly late in time relative to its introduction to the rest of California, perhaps no earlier than 1210 AD (Meyer and Rosenthal 2008: 71). This is in contrast to other regions of California, where the bow and arrow appears as early as 450 AD (Bettinger 2015: 42). The introduction of the bow to the Delta is marked by the appearance of the "Stockton Serrated Point," an independently developed style of projectile point that is unique to the Delta (Meyer and Rosenthal 2008: 71).

Other characteristics of this period include a regionally variable economy, changes in manufacturing residues at Emergent period sites, and the decentralization of shell bead production (Rosenthal et al. 2007: 159). The Emergent period matches behavior typically associated with ethnographic populations.

3.1.2 Depositional Context and Resource Identification Processes

This section considers how post-depositional processes and methodological factors have affected the preservation and visibility of the archaeological record in the study area, and how these factors could affect archaeological interpretation of early Native American lifeways. The purpose of this section is to identify potential non-cultural patterns in the archaeological record and to better understand where there are data gaps in the record.

3.1.2.1 Geomorphology and Landscape Age

Much of the study area is located on the Sacramento-San Joaquin Delta, a large depositional landform that has continued to grow vertically (i.e., aggrade) during the period for which there is scientific consensus of human occupation of North America (Meltzer 2004, Erlandson 2007, Braje et al. 2017) as sea levels have risen during the Holocene epoch (Atwater 1982). Although the thickness of the sediments deposited during this period vary across the study area, previous geological investigations have revealed Holocene-aged estuarine deposits to depths of up to 60 feet below the current ground surface in the vicinity of Jersey Island within the study area (Atwater 1982). As a

result, on the Delta, it is likely that only archaeological resources formed during the late Holocene epoch (i.e., most recently) would be accessible and visible using standard archaeological survey methods, such as pedestrian survey and hand-excavated test units. Considering the local depositional context prior to the nineteenth and twentieth centuries—a semi- to permanently inundated estuary—any visible early Native American resources are likely to be related to aquatic resource collection, if they have any physical signature at all.

Overall, the timing and nature of landscape change in the study area is likely to result in a bias towards the identification of younger and resource-focused archaeological resources because of their visibility and accessibility. Older resources, located on landforms that may not reflect the current environmental conditions, are not likely to be readily visible or accessible, but have the potential to be present below the ground surface at the interface between the Holocene-aged estuarine deposits and the underlying Pleistocene- to Holocene-aged terrestrial deposits that were buried as the Sacramento Delta aggraded during the Holocene epoch.

3.1.2.2 Resource Type and Visibility

The ability to perceive (i.e., visibility) archaeological resources depends on the nature of the physical material–depositing activities that forms the resource, and the frequency and/or duration of use for these activities in a given area. These factors affect three key attributes—the visibility of the individual items that comprise the resource, the extent to which the items that comprise the resource are dispersed, and the size of the resource (Elder et al. 2016). Considering that much of the study area is located within a region that was subject to tidal and periodic overbank inundation (Atwater et al. 1979), and that this has been the case within the study area for much of the Holocene epoch (Atwater 1982), the range of early Native American archaeological resource types within the study area are anticipated to be limited to intermittently used resource collection and processing resources. Such resources tend to be small in size and their constituents can include items that either preserve poorly or are not readily recognizable as being cultural in origin (i.e., plants and plant remains). Therefore, it is considered likely that while there is archaeological and ethnographic evidence of early Native American land use of the study area vicinity, the archaeological record for the region is unlikely to reflect the full range or intensity of early Native American land use.

3.1.2.3 Summary

Based on the considerations described in the preceding subsections, it is anticipated that the post-depositional and methodological factors that affect archaeological resource visibility and preservation in the study area are likely to have resulted in an overrepresentation of late Holocene-aged early Native American archaeological resources, and that the archaeological record is unlikely to reflect the full range of early Native American land use in the region. With this information in mind, the research themes identified in Section 3.1.3, *Early Native American Archaeological Research Themes*, explicitly consider both known early Native American resource types in the region and those that are inaccessible with standard archaeological methods but have the potential to be encountered during project-related ground-disturbing activities.

3.1.3 Early Native American Archaeological Research Themes

Beyond reconstruction of cultural chronology, archaeological study of a region or group is generally driven by various research themes. These themes offer a framework within which to understand and contextualize human behaviors. The choice of a given research theme in archaeology is usually

driven by methodology or philosophy and by the suitability of extant material culture for addressing that theme. Broadly, approaches to the archaeological record fall into one of two categories—empirical, scientific approaches to the archaeological record that are focused on culture process, or post-modern, relativistic, humanities-aligned approaches. The research themes presented here fall generally within the former category, with data-forward, scientific approaches being generally more appropriate for the analysis of archaeological sites within existing legal frameworks of cultural resource protection.

3.1.3.1 Technology

The archaeological record is well suited for the study of changes in technology through prehistory. Stone tools preserve particularly well within an archaeological context, and changes in stone tool technology reflect and, it can be argued, drove changes in mobility and settlement, resource use, and social organization. Changes in complexity of stone tool assemblages and changes in technology are of interest, such as the shift from the atlatl (spear-thrower) to the bow and arrow.

The transition to the use of the bow and arrow over the atlatl from the Upper Archaic (550 BC–AD 1100) to the Emergent (post-AD 1100) represents a significant technological shift, allowing for efficient hunting of significantly smaller game. The exact timing of the introduction of the bow and arrow to California and to various regions of California is of academic interest, and any Delta sites that date between 50 and 1500 AD may be of value in understanding the spread of this technology. Evidence suggests the bow was introduced in the Delta very late in time relative to the rest of California, around 1210 AD. Arrow points within the Delta that predate this period would be of archaeological interest, as would any geographic-chronological pattern of point distribution that might indicate from where bow and arrow technology was introduced and spread.

Late Middle Archaic assemblages are notable for the elaboration of tool assemblages and the appearance of non-utilitarian stone artifacts within assemblages. Sites from within the Middle Archaic that show this development in its nascency may be of interest.

Sites from the Paleo-Indian period (11,550–8500 BC) and Lower Archaic (8000–5550 BC) are extremely rare within the Delta. Clovis points—large, fluted, lanceolate dart points—are one of the earliest technologies observed in the Americas. They are vanishingly rare within California, with most examples having been discovered at Tulare Lake, approximately 200 miles southeast of the study area (Moratto 1984:81–82). Given that the Delta did not develop until approximately 4250 BC, any technology from these periods, even occurring in isolation, would be notable. Considering the environmental differences of the region in these periods, these sites or artifacts may represent a pattern of use that is far different than later patterns of exploitation of the Delta.

Research Questions

1. Are exotic raw materials and tools represented in the archaeological resource? What is the origin of these items? Are there changes in source or material choice over time in the production of stone tools?
2. What is the timing of the introduction of bow and arrow technology to the Delta, and/or are there factors which might have delayed the introduction of this technology to the region?
3. Are there regional patterns in the spatial distribution of particular types of technologies?

Data Requirements

- Flaked stone projectile points with functionally and chronologically diagnostic artifact and features.
- Debitage that is identifiable based on ratios of trace elements in chemical composition through XRF (X-ray Fluorescence analysis)
- Well-researched comparative examples of other prehistoric archaeological resources from the study area vicinity.

3.1.3.2 Mobility and Settlement

Differences in mobility and settlement have been a primary area of interest in the historic study of hunter-gatherer groups. California Native American groups in general, and Delta groups in particular, did not practice agriculture in the prehistoric era, making these research frameworks suitable for the study of prehistoric Native American groups of the region. A number of frameworks have been created by which to explain or understand the differences between mobile or sedentary hunter-gatherer groups, including Binford's Forager-Collector model and Bettinger's Traveler-Processor model (Binford 1980; Bettinger 1991).

There are two general patterns of mobility—residential mobility, in which a group picks up camp and moves to resources; and logistical mobility, in which a group camps somewhat centrally and conducts logistical forays for resources. Residentially mobile groups are considered more mobile than logistically mobile groups, and within those subcategories given groups may be more mobile or sedentary than others.

To some extent, prehistoric changes in mobility in the Delta can be understood through the lens of these models of mobility, with sites prior to the Late Middle Archaic indicating a significantly higher level of residential mobility. Increasing sedentism through the Upper Archaic was likely both driving and driven by increasing population sizes within the Delta. The value of sites from the Lower Archaic and Paleo-Indian period in understanding mobility prior to large population increases in the Delta, coupled with the rarity of these sites, makes them of significant interest in the study of mobility and settlement.

It may also be informative to compare and contrast known Middle Archaic Windmiller pattern sites within the Delta, such as the Blossom Mound, with more abundant Upper Archaic Berkeley Pattern sites. Changes from the Middle to Upper Archaic may elucidate factors which made a more sedentary pattern of habitation more desirable later in time.

Authors such as Bettinger (2015) have argued that the introduction of the bow and arrow to California significantly reduced the size of political units, and by extension, settlement size, by allowing for individual hunting of smaller game. Comparing Delta habitation sites of the Emergent period against those of the Middle Archaic may serve to test Bettinger's hypothesis.

Research Questions

1. What is the nature of the evidence for seasonal or permanent or semi-permanent residential features that would suggest villages? (e. g. permanent structures, storage, midden deposits, etc.)
2. What items represent settlement practices? Are changes in the settlement practices observable in the archaeological record?

3. How do the landforms fit within the regional settlement pattern? What resources were locally available for exploitation? Was the area suitable for long term habitation or short term resource exploitation use?
4. Do the archaeological resources of the region support the established settlement pattern? (e.g. seasonal use of wetlands, less residential mobility through time)

Data Requirements

To address the research questions described above, the following data types are needed:

- Archaeological resources with functionally and chronologically diagnostic artifact and features, including floral and faunal remains.
- Information relating to landform age, type, and how the landform changed during the period of prehistoric use.
- Well-researched comparative examples of other prehistoric archaeological resources from the study area vicinity.

3.1.3.3 Resource Use

Changes in resource use relate to, but are separate from, prehistoric changes in mobility and settlement. Some of the same models through which changes in mobility of Delta groups can be understood can also be used to understand shifts in their use of resources.

Bettinger's Traveler-Processor model considers not only the mobility of hunter-gatherer groups, but also the diversity of resources a given group exploits. Travelers tend to focus on a narrow band of nutritionally dense resources, while processors focus on a broad spectrum of lower-ranked resources. More broadly, this model and many studies of resource use integrate with the broad umbrella of Optimal Foraging Theory (OFT). OFT posits that as encounter rates of high-ranked resources decrease due to population pressures, overhunting, etc., a given group must introduce lower-ranked resources into their diet to maintain the same rates of return, becoming more like processors and less like travelers.

This pattern appears to be reflected within the archaeological record. Archaeological sites show increasing emphasis on gathered plant resources late in time, culminating in the intensive use of acorn in the Emergent period. For example, the large darts of the Paleo-Indian period, which have traditionally been argued to be a part of a tool assemblage focused on the hunting of large game such as mammoth, contrast with specialized plant processing technologies found late in time, such as hopper mortars.

Again, Lower Archaic and Paleo-Indian sites are an important but missing piece of the puzzle in understanding resource use within the Delta. Patterns of resource use within these sites, where population pressures were lower, could be contrasted against patterns of resource use within Middle Archaic sites, where population pressures were higher.

Bettinger provides a compelling case for the cascading effect of bow-and-arrow technology on nearly all aspects of prehistoric California lifeways. Assuming that Bettinger's hypothesis is correct, contrasting pre-bow and arrow Middle Archaic sites against post-bow and arrow Emergent sites should show significant differences in terms of hunted and gathered resources represented and the ratios in which they are represented.

Research Questions

1. What are the subsistence patterns represented by the archaeological deposits (e.g. emphasis of terrestrial mammals vs waterfowl in diet)?
2. Can changes in diet be observed in floral, faunal, and human remains? What do these changes reflect in terms of resource intensification and depression?
3. If human remains are present, what does the analysis of carbon and nitrogen in human bone collagen tell us about the health and diet of prehistoric individuals?

Data Requirements

- Archaeological resources with functionally and chronologically diagnostic artifact and features, including floral and faunal remains.
- Human remains with preserved and recoverable bone collagen.
- Well-researched comparative examples of other prehistoric archaeological resources from the study area vicinity.

3.1.3.4 Social Organization/Ideology

Social organization and ideology are rather difficult to address directly through the archaeological record, but may be reflected in the size and organization of habitation sites. Apparent changes in ideology and ritual may be observable through changes in ritual practice, such as funerary practice, but it is not possible to ascribe deeper meaning to these symbolic changes from an objective, scientific perspective.

Changes in mobility and population drove the formation of larger settlements in the Delta beginning in the Middle Archaic. Bettinger argues that the introduction of the bow and arrow in California did much to destabilize this pattern. In *Orderly Anarchy* he argues that bow and arrow technology allowed for the development of private property, as the pursuit of smaller game became more efficient and group hunting and meat sharing became less frequent or unnecessary (Bettinger 2015). He hypothesizes that this reduced the size of the political unit within California to the family level.

Bettinger's hypothesis may assume that habitation size would decrease from the Middle Archaic to Emergent. Contrasting the size and use of habitation sites from these periods would be a useful avenue of research.

The Delta is notable for early, influential cultural sequencing based on its mortuary practice. Lillard, Heizer, and Fenenga proposed the Delta Sequence, which separated Delta prehistory into three periods (the Early, Transitional, and Late periods) based largely on burial practice. Burials from the Early period are fully extended, westerly facing, and associated with *haliotis* and *olivella* ornaments; burials from the Transitional period are tightly flexed, and associated with ochre and imperforate charmstones; and burials from the Late period are largely flexed with some cremations and pre-interment burning of grave goods (Moratto 1984: 180). Bridging the gap of this chronology with that of the more subsistence-focused chronology presented earlier in this chapter is of interest. It is possible that there is not a 1:1 relationship between changes in subsistence and changes in ideology or belief (as understood by proxy through changes in burial practice).

Research Questions

1. Are exotic raw materials, tools/items or trade goods represented in the archaeological resource? What is the origin of these items?
2. Is there a pattern in the way that burial goods are distributed by age, sex, or class?
3. Are there regional patterns in the spatial distribution of particular types of trade goods?

Data Requirements

- Archaeological resources with functionally and chronologically diagnostic artifact and features; including personal, ceremonial, and trade items.
- Human remains with associated burial goods.
- Well-researched comparative examples of other prehistoric archaeological resources from the study area vicinity.

3.2 Transition Context

Early Native American history, which is exclusively concerned with the early history and heritage of California's native tribes and their ancestors, transitions to an era of rapid colonization by nonnative people from Europe, Asia, and Africa. The archaeological record and the ethnohistorical documents derived from this transitional period provide a brief glimpse of the Delta's Native American people, culture, and settlements at the time of "Contact".

Written records from this period augment Early Native American history's archaeological record (see Section 3.1, *Early Native American Context and Themes*), and complement subsequent nineteenth- and twentieth-century Native American histories (see Section 3.3, *Historical Context and Themes*). As nineteenth-century scholars of natural history and anthropology arrived in California, descriptions of such cultural elements as languages, technologies, social and political systems, settlements, and religions were written, collected, and occasionally published. These ethnographic documents range from data notebooks, to composed narratives, to comparative studies of California's native history and culture (see Section 3.3.1, *Introduction*).

Colonization had a devastating impact on native Californians and their homes and settlements, social relationships and organizations, technologies, religious and economic systems, and access to and use of natural resources. Native American people who lived during the early colonization period and its significant cultural impacts may be seen as historically significant, such as individuals who pioneered economic, political, and social adaptations, and continued traditions or established new ones. Similarly, village sites from this transitional era may similarly be regarded as historically significant.

3.3 Historical Context and Themes

This section summarizes the significant themes that describe the post-contact historical setting of the study area. This information will be used to identify the relevant research themes and periods of significance for archaeological, built environment, historic district, cultural landscape, and traditional resources evaluations.

3.3.1 Introduction

The Delta is a region that has been heavily modified by flood management and agricultural activities since the mid-nineteenth century. Today the Delta's islands, canals, river channels, and general topography bear little resemblance to the Delta environment inhabited by Native Americans prior to the arrival of nonnative explorers in the early 1800s. This review of the historic-era setting of the Delta region is presented and interpreted according to the most prominent themes of its development, including the early phases of exploration and settlement, subsequent land reclamation and agricultural development (including the mobilization of labor for such development), large-scale flood control and water management, transportation, and recreation. A number of urban centers took shape within the region and the study area, such as West Sacramento and Stockton, alongside the Delta's more rural community hubs at Hood, Locke, Walnut Grove, Rio Vista, and Clarksburg.

The historic context and themes presented in this section are primarily derived from background information was gathered from the following sources.

- California State Library, Sacramento
- Sacramento Public Library, Sacramento
- Shields Library at the University of California, Davis
- Internet Archive (online)
- University of California Regional Oral History Office's California Water Resources Oral History Series (online)
- California Digital Newspaper Project (online)
- JSTOR (online)

3.3.2 Native American Ethnographic Themes

During the historic era, at least four Native American linguistic groups inhabited portions of the study area. These groups are the southern Patwin, Plains Miwok, Northern Valley Yokuts, and Nisenan.

Ethnographic boundaries, though often presented in cultural resource documents as a matter of fact, have long been a matter of debate and disagreement between academics and ethnographic informants. Cultural or territorial boundaries are not static, and have not been consistent throughout the course of prehistory.

This is true of the Sacramento Valley and the Delta, where missionization was highly disruptive to the Plains Miwok in the 18th and 19th centuries. This disruption and instability resulted in very poorly defined boundaries between the Plains Miwok and their neighbors in the Delta. A number of known villages within the Delta are of unknown or disputed cultural affiliation. Presented below as an example are several alternative ethnographic maps of Plains Miwok peoples developed between 1891 and 1933. Also presented below is Bennyhoff's 1977 ethnographic map of the Plains Miwok. While also likely imperfect in its description of mutable prehistoric ethnographic boundaries, Bennyhoff's map represents a more balanced synthesis of archaeological and ethnographic data.

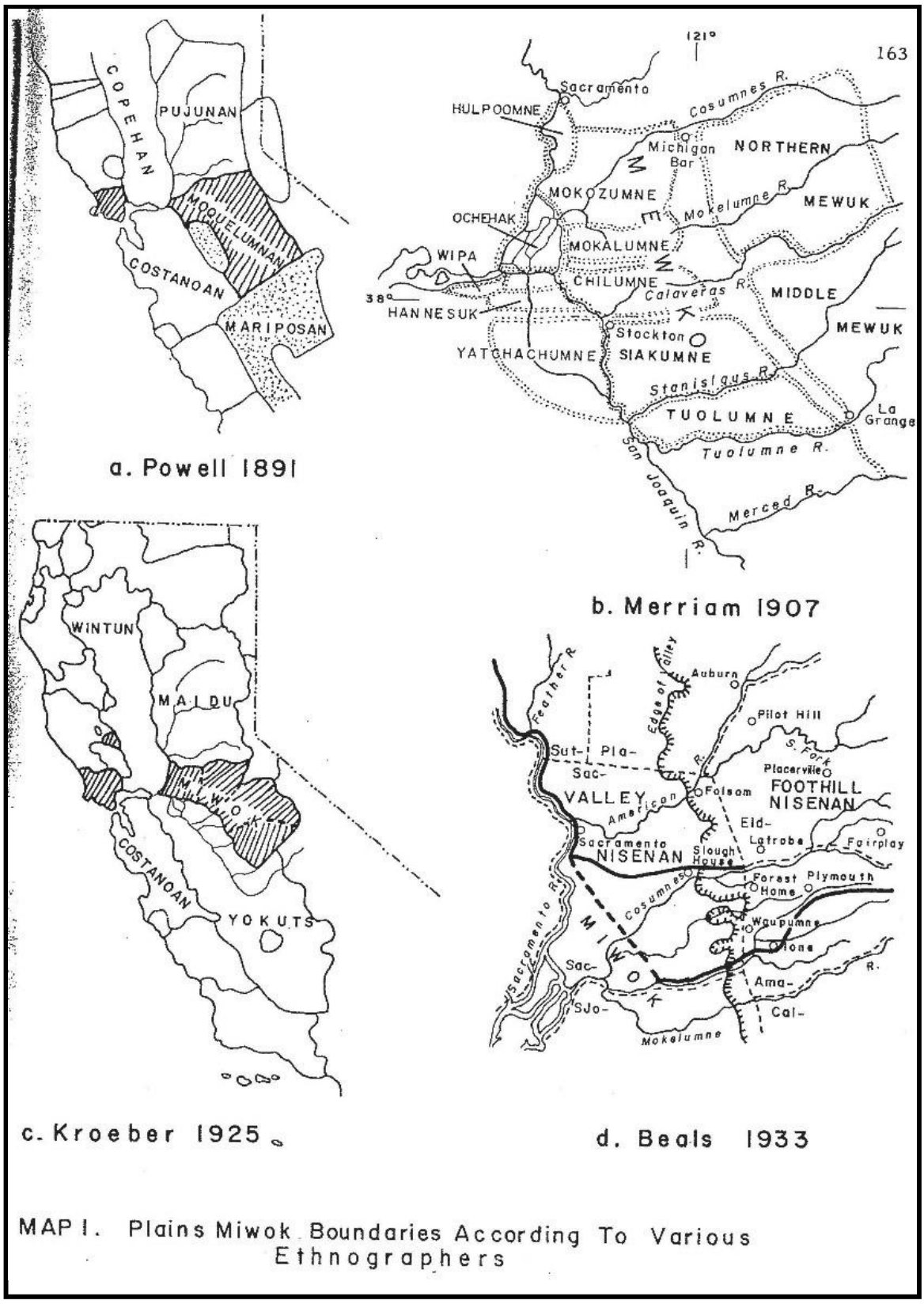

Figure 3-1. Alternative Ethnographic Boundaries from Bennyhoff 1977

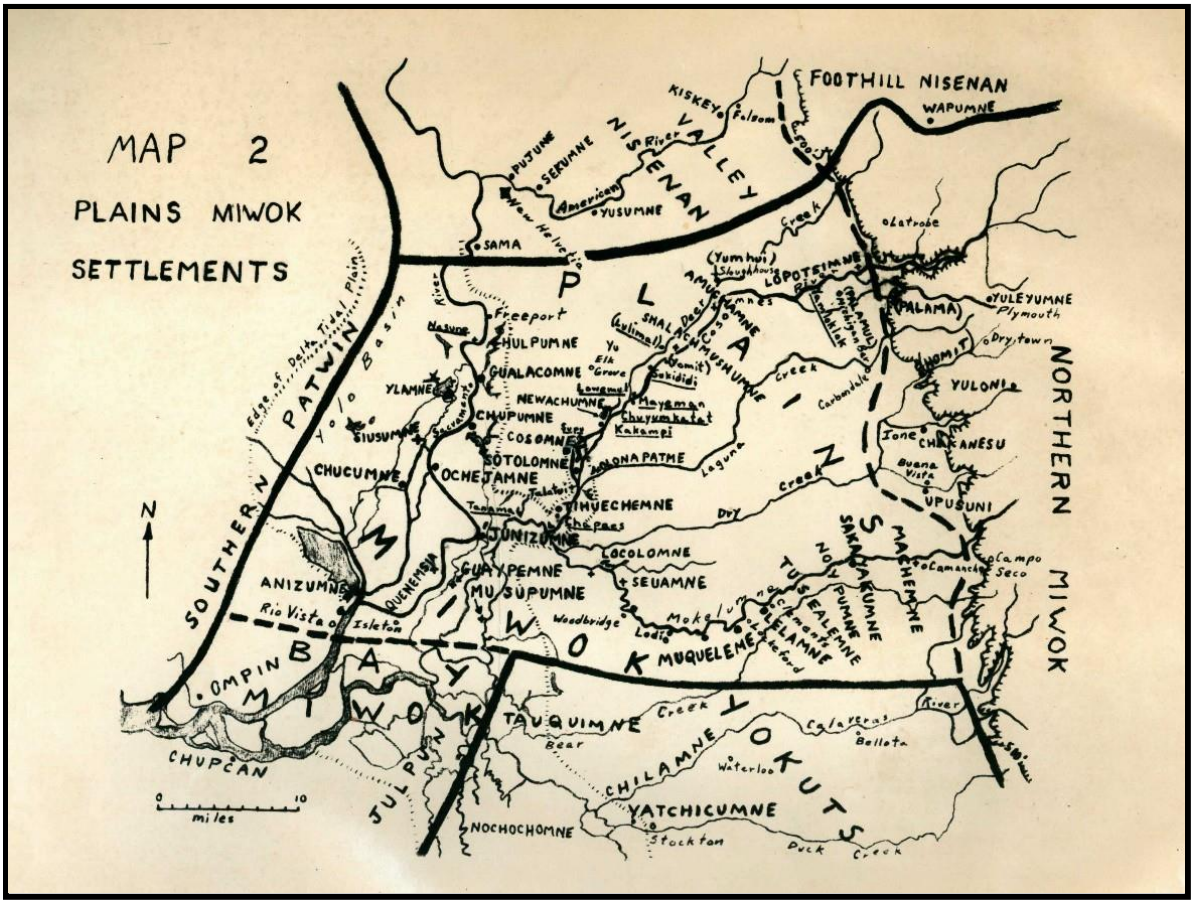

Figure 3-2. Synthesized Ethnographic Boundaries from Bennyhoff 1977

3.3.2.1 Southern Patwin

The southern Patwin were a series of linguistically and culturally related tribelets that occupied a portion of the lower Sacramento Valley west of the Sacramento River and north of Suisun Bay. They resided adjacent to the study area and probably used lands within its boundaries. These groups had no common name, but spoke dialects of a single, historically related language that extended southward to the Delta. Patwin tribelets maintained their own autonomy and sense of territoriality, and typically consisted of one primary and several satellite villages. Villages were located along waterways, often near the junction with another major topographic feature, such as foothills or another waterway. The ethnographically documented villages nearest to the study area were Aguasto and Tolenas, both situated immediately north of San Pablo Bay to the west-northwest (Kroeber 1925, 1932).

The largest Patwin political unit was the tribelet. Each tribelet had a discrete territory as well as autonomy relative to other social units. While a common language unified these social units, tribelets each had subtle cultural differences relative to one another. Within the tribelet were several political and social distinctions, including a chief who oversaw village activities; this position was passed through inheritance from father to son (Johnson 1978: 354).

Patwin villages contained four main types of permanent structures: the dwelling or family house; the ceremonial dance house, which was usually built at a short distance to the north or south end of

a village; the sudatory (sweathouse), which was positioned at either the east or the west of the dance house; and the menstrual hut, which was placed on the edge of the village, farthest from the dance house. All of these were earth-covered, semi-subterranean structures with either an elliptical or circular shape (Johnson 1978: 357–358).

The principal subsistence activities of the Patwin were the gathering of wild plants, hunting, and fishing. Along with the acorn, the primary staple, the Patwin gathered buckeye, pine nuts, berries, wild grapes, and other plants. Each village had its own location for these food sources, and the village chief oversaw the procurement of food for the village (Johnson 1978: 355).

Population estimates for Patwin groups, from pre-contact until 1833, are more than 15,000 (Kroeber 1932; Cook 1955). The Patwin were in contact with the Spanish missions by the late eighteenth century, and some of the Patwin's earliest historic records are found among mission registers of baptisms, marriage, and deaths of Native American neophytes. Mission San Jose, established in 1797, along with Mission Dolores, actively proselytized Patwin from their southern villages, and Mission Sonoma, built in 1823, also baptized neophytes. The missions were secularized by the Mexican government in 1832–1836, and afterward, many tribal territories were divided into Mexican land grants (Johnson 1978: 351).

The United States' conquest of California (1846–1848) was followed by a massive influx of settlers from the United States and numerous other nations into Patwin territory. To facilitate the development of ranching, agriculture, mining, and civic development, the Patwin were usually moved to reservations. However, some Patwin assimilated themselves, at least partially, into white culture by working as ranch laborers (Johnson 1978: 351). Today, some Patwin descendants live on the Colusa, Cortina, and Rumsey Rancherias, although many of the people living on these rancherias are of general Wintun descent.

3.3.2.2 Plains Miwok

The eastern Miwok, and more specifically the Plains Miwok, inhabited the lower reaches of the Mokelumne and Cosumnes Rivers, and the banks of the Sacramento River from Rio Vista to Freeport (Levy 1978: 398).

Although the Plains Miwok shared a common language and cultural background, they comprised several separate, politically independent nations, or tribelets (the primary political unit). The tribelet represented an independent, sovereign nation that defined and defended a territory. The tribelet chief, usually a hereditary position, served as the voice of legal and political authority in the tribelet (Levy 1978: 410).

The eastern Miwok village comprised various structures. For houses, conical structures of bark were used in the mountains, and conical structures of tule matting were used in the lower elevations of the central Sierra. Semi-subterranean, earth-covered dwellings served as winter homes. Also within the Miwok settlement were assembly houses, sweathouses, acorn granaries, menstrual huts, and conical grinding huts over bedrock mortars (Levy 1978: 408–409).

The Spanish mission system forcibly assimilated many Plains Miwok circa 1811 to 1836 (Bennyhoff 1977). With the arrival of trappers, gold miners, and other settlers to California, the Miwok suffered exposure to introduced diseases. While some hostilities occurred between the Sierra Miwok and miners, other Miwok groups became involved in agricultural operations on the newly developing large land grants. After California was annexed by the United States, some Miwok were displaced to

Central Valley locations, yet many remained on the rancherias established in the Sierra Nevada foothills. During the late nineteenth and early twentieth centuries, the Miwok living on the foothill rancherias adapted to new lifestyles, such as seasonal wage labor on ranches and farms, to augment subsistence through hunting and gathering (Levy 1978: 400–401). Since the early twentieth century, many persons of Miwok descent survive and maintain strong communities and action-oriented organizations (see also Bennyhoff 1977).

3.3.2.3 Northern Valley Yokuts

The Northern Valley Yokuts were the historical occupants of the central and northern San Joaquin Valley. Yokuts is a term applied to a large and diverse number of people inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Northern Valley Yokuts' territory extended from near where the San Joaquin River makes a big bend northward to a line midway between the Calaveras and Mokelumne Rivers (Wallace 1978: 462).

For the Northern Valley Yokuts, the San Joaquin River and its main tributaries served as a lifeline to the valley, and their villages congregated around these main water sources. They gained much of their livelihood through fishing (in particular, salmon fishing) and varied their diet with waterfowl and the harvesting of wild plant food, such as acorns, tule root, and seeds (Wallace 1978: 464).

Most settlements, or at least the principal ones, were built atop low mounds, on or near the banks of large watercourses, for protection against spring flooding (Schenck 1926: 132; Schenck and Dawson 1929: 308; Cook 1960: 242, 259, 285). Settlements were stable and occupied over multiple generations. However, flooding posed the primary threat to a fully stationary existence, and the local rivers, swollen from melting Sierra Nevada snows and heavy rains, periodically overflowed their banks and drove the villagers to even higher ground (Wallace 1978: 466).

A headman guided each tribe, and village populations averaged around 300 people. Family houses were round or oval, with a cone-shaped pole frame sunk into the ground and covered with tule mats. Each village also had a community lodge for dances and community functions, as well as a sweathouse (Wallace 1978: 465).

The Northern Valley Yokuts suffered great population decline and cultural breakdown when they were drawn into the mission system. Following the mission period, Northern Valley Yokuts continued to clash with the white settlers, and, as a result, many villages were burned. The population decline continued through the early American period, as the rich soils of the Delta and valley attracted former miners and other settlers to farming. As they filled up the district, the remaining Yokuts were driven off their hunting and food-gathering lands (Wallace 1978: 468–469). As with the Miwok and the Nisenan, however, tribal population surged in the latter decades of the twentieth century, along with a renewed interest in traditional Yokuts culture.

3.3.2.4 Nisenan Maidu

According to Kroeber (1932), the west side of the Sacramento River is within or near the southern limits of the Nisenan. Several ethnographic Nisenan villages have been documented along the western bank of the river (Heizer and Hester 1970). Along with Maidu and Konkow, the languages of the Nisenan people's northern neighbors, the Nisenan language forms the Maiduan language family of the Penutian linguistic stock (Shipley 1978: 83).

Wilson and Towne (1978) defined three main subgroups within the Nisenan tribe: Northern Hill Nisenan, Southern Hill Nisenan, and Valley Nisenan. The Valley Nisenan resided adjacent to the northernmost extent of the study area prior to nonnative colonization.

Valley Nisenan located their permanent settlements along the riverbanks on elevated natural levees near an adequate food and water supply, in fairly open terrain, with southern exposure preferred (Beals 1933: 363). Villages ranged from tribelets of small extended families consisting of 15 to 25 individuals to larger communities with more than 100 people (Kroeber 1925).

Village sizes ranged from 3 houses up to 40 or 50. Houses were domed structures covered with earth and tule or grass. Brush shelters were used in the summer and at temporary camps during food-gathering rounds (Kroeber 1925: 407–408). Larger villages often had semi-subterranean dance houses, which were covered in earth and tule or brush and had a central smoke hole at the top. Other common village structures were the sweathouse, used for curing and purification, and the granary, used for storing acorns (Wilson and Towne 1978: 388–389).

The smallest Nisenan social and political unit was the family. Each extended family was represented by a family leader, who was called to council by a headman. The headman of the dominant village in a cluster of villages (tribelet) had the authority to call upon the aid of surrounding villages in social and political situations. The headman also served as village adviser, directed special festivities, arbitrated disputes, and acted as an official host (Wilson and Towne 1978: 393, Beals 1933: 360).

Early Nisenan contact with Europeans appears to have been limited to the southern reaches of their territory, beginning in the early 1800s. Unlike the Valley Nisenan, the groups in the foothills remained relatively unaffected by the European presence until the discovery of gold at Coloma in 1848. In the years following the gold discovery, Nisenan territory was overrun by settlers. Gold seekers and the settlements that sprang up to support them led to the death or displacement of many Nisenan. Survivors worked as wage laborers and domestic help and lived on the edges of foothill towns. Despite severe depredations, descendants of the Nisenan still live in the northern Central Valley and maintain their cultural identity (Wilson and Towne 1978: 396–397).

3.3.2.5 Associated Historic Properties

Archaeological properties which represent this period and theme would include any archaeological sites with components from the Post-contact period. These would include habitation, resource procurement, and ceremonial sites that date to this period, either through archaeometric dating, or through the presence of European technologies and objects. Sites from this period most closely reflect the ethnographic landscape as it is understood from 20th century ethnographic informants. Sites from earlier in prehistory are less likely to represent this period and theme due to historical conflict, change, innovation, and movement.

No built environment, district or landscape, or traditional properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. Properties associated with this theme would likely be very rare due to the physical changes that have occurred to the Delta landscape, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

3.3.3 Delta Exploration

The earliest recorded European explorations of the Delta occurred in the San Francisco Bay region in 1772. Led by Captain Pedro Fages, an overland expedition from the Spanish mission at Monterey skirted the eastern shores of present-day San Francisco and San Pablo Bays, went east to Suisun Bay, then ventured south toward Mt. Diablo before reaching the mouth of a large stream or river that Fages named the San Francisco San Joaquin (Thompson 1957: 88–90). Beyond the mouth of the river stretched the vast expanse of twisting waterways and tule reeds that comprised the southern Delta.

The Spanish endeavored to establish and maintain sovereignty in their northwestern-most North American colony by creating numerous Catholic missions in California's coastal zone. Through the 1810s, the Spanish continued to establish new missions and assess the economic potential of the region, with presidios functioning as the central military outposts and the missions—each of which retained a small guard of soldiers—serving as the institutions for assimilating Native American "neophytes" (converts) into both the Catholic religion and European modes of economic production. In 1813, Francisco Soto led the first major expedition intended to recapture Native American neophytes who had fled east of the San Joaquin and into the uncharted Delta to punish those who harbored the fugitives. Soto's expedition set the stage for similar punitive Delta expeditions over the next decade that gradually increased Spanish familiarity with the region. Nevertheless, the number of Spanish explorers and colonists remained small, and they were preoccupied with consolidating their hold on the immediate San Francisco Bay area. They had little opportunity for systematic exploration of the interior (Sandos 2004: 1–13, 99–103; Thompson 1957: 94–98).

By the end of the 1700s, as Indians developed a taste for European livestock, the rising numbers of escaping neophytes coincided with a rising rate of attrition on mission stock. Horse and cattle thieves frequently passed through the Delta on their way to safer ground east of the San Joaquin. Overland and waterborne expeditions in the early nineteenth century attempted to further subdue the Indians in the Delta, as well as chart the waterways and scout for potential mission sites. After 1813, however, exploration of the Delta diminished as a goal as the Spanish and subsequent Mexican incursions became increasingly militarized to subdue, capture, and punish Indian resisters to their rule. Native resistance reached its peak in the 1820s, and with Mexican success in suppressing it, by the end of the 1820s there was virtually no sedentary Indian settlement in the Delta (Thompson 1957: 96–100).

3.3.3.1 Associated Historic Properties

No archaeological properties that represent this post-contact period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. Archaeological properties from this era would likely be very rare. Any archaeological indications of habitation or use may have been destroyed due to intensive landscape modifications from reclamation and agricultural development in the mid-to-late nineteenth century. Archaeological properties that could be identified during the exploration period could be submerged vessels; however, historical documentation of the Delta region does not identify any shipwrecks in this area. These considerations may have exceptional weight in the evaluation and treatment of such resources.

No built environment properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. Built properties associated with this theme would likely be very rare, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

No district and landscape properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. District and landscape properties associated with this theme would likely be very rare, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

No traditional properties that represent this period or theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.4 The Trapping Era through the Gold Rush

California's remoteness from the centers of Spanish colonization made it a tempting target for traders from the United States and Europe. Only a few ships per year arrived in the first two decades of the 1800s but they enriched the material comforts of the colonists. After Mexico's independence from Spain, American newcomers began to enter California in increasing numbers.

Anglo-American trappers associated with the Hudson's Bay Company played an important role in the exploration of the region. The first American trapper-explorer in the region was Jedediah Smith, who traveled north from San Gabriel across the Tehachapis and into the San Joaquin Valley in 1827. In addition to introducing American fur trapping to the San Joaquin Valley, the Smith party's return trip to Utah was also the first American crossing of the Sierra Nevada. According to historian Robert Glass Cleland, "[Smith] had traversed the first of the great continental routes to California, made known the valleys of the San Joaquin and Sacramento to the American trappers, and through them to American settlers" (Rolle 1963: 146–148). During his second trip into California in 1828, Smith was harassed by territorial officials and eventually made his way to Vancouver via Oregon, where most of his party was killed in an Indian attack. That same year, a trapping party led by Alexander Roderick McLeod ventured into the Sacramento Valley and traveled as far south as Stockton, confirming Smith's reports of abundant beaver in the region (Thompson 1957: 101–102).

The trapping era lasted until the early 1840s. Trappers introduced diseases such as malaria in the Delta that took a heavy toll on the region's Native American population. During the mid-1840s, with beaver populations declining after years of intensive hunting, the Hudson's Bay Company ceased its California operations, marking the end of extensive trapping in the Delta region. However, partly as a consequence of fur trappers' reports of California's abundant natural resources upon their return east, Americans would continue to enter California (Owens 1991: 15, Thompson 1957: 101–109).

After the conclusion of the Mexican War of Independence (1810–1821), which made Alta California a territory of Mexico, society became increasingly secular as liberal Enlightenment ideas filtered into Mexican California. Mexico granted territorial governors the right to distribute grants of land beginning in 1828 and in 1833 California began to secularize the missions—a gradual process that ended the Catholic Church's domination of mission lands by distributing a share of them to Indian converts. Former mission Indians frequently had their land swindled from them. Mexican government officials distributed large land grants to their friends, family members, and political

allies (Rolle 1963: 126–129, 153). Although land grants were technically available only to Mexican citizens born in Alta California, Mexican governors also granted large tracts to politically connected non-Mexicans. A total of 813 grants were awarded throughout California between approximately 1824 and 1846. Of that total, 346 were awarded to non-Mexican citizens (Beck and Haase 1974: 24).

Several land grants were located in the northeastern, eastern, and southern portions of the Delta or just beyond it. Partially situated along the Sacramento River was New Helvetia, the grant that John A. Sutter received in 1841. Well southeast of New Helvetia, at the Delta's northeastern corner, lay Rancho Sanjon de los Moquelemnes, granted to Anastacio Chabolla in 1844. Further south, the roughly 49,000-acre Rancho Campo de los Franceses was granted to Guillermo Gulnac in 1844, who soon sold the ranch to American Charles M. Weber. At the southeast corner of the Delta lay the Pescadero grants. Valentin Higuera and Rafael Feliz acquired the southern Pescadero grant and Antonio M. Pico acquired the northern grant. By the outbreak of the Mexican–American War, the Delta had only a few Euroamerican settlers consisting of a bachelor at one site and a family at another. The bachelor, a Dutchman named John L. Zwart, lived along the west bank of the Sacramento River on an unconfirmed land grant south of Sutter's landing, where he farmed potatoes and fished for salmon. The other settlers, a family headed by William Clements, lived much further south. (Owens 1991: 15–17, Thompson 1957: 112–123).

Despite the difficulties of travel, and resistance from Mexican landowners and the Mexican government, Americans began to arrive in California in increasing numbers during the 1840s, attracted by accounts of the rich farmland and pastures. The flood of American immigrants gradually eroded Mexican control over much of California. By the time gold was discovered at the site of Sutter's Mill in Coloma and elsewhere in the Sierra Nevada foothills in 1848, the United States and Mexico had been at war for nearly 2 years and Mexican governance of much of Alta California had essentially been ceded to American interests in all but name. Ending the Mexican–American War (1846–1848) and formally delivering California to the United States, the Treaty of Guadalupe Hidalgo was signed 9 days after the gold discovery. Congress granted California statehood 2 years later, on September 9, 1850 (Rolle 1963: 204, 208; Thompson 1957: 122–132).

Many of the Mexican land-grant titles proved tenuous as the United States took over California. Not until the ratification of the Land Act of 1851 was a commission established to adjudicate title disputes. In all, the commission approved 553 claims totaling approximately 8,850,000 acres. Of those 553 finalized grant holdings, the vast majority have since been broken up and sold piecemeal over the past 150 years. None of the grants established in the study area endured as distinct holdings (Beck and Haase 1974: 28–30; Thompson 1957: 112–122.)

During the first years of the Gold Rush and into the 1850s, unprecedented numbers of people traveled through the Delta in sailboats and steamboats en route to the Sierra mines via Sacramento, Stockton, and river landings further east. Many would-be miners initially lured to California by tales of easy riches in the goldfields quickly realized that it was often much harder to find gold than they had been led to believe. As a result, many simply returned to the occupations they knew best, usually agriculture in one form or another. While some newcomers farmed at a subsistence level, others realized that providing food or other supplies to the mines could be highly lucrative. During the Gold Rush the vegetable and meat markets boomed throughout the Central California interior. Centers of trade among the farmers, ranchers, and the mines soon developed along the Sacramento River. The town of Sacramento initially served as a major gateway to the foothill goldfields, shipping supplies to the miners and serving as a jumping-off point for hopeful prospectors from around the world (Thompson 1957: 133–146).

Most of the Delta, however, remained only sparsely settled during this period. In the northern Delta, settlement remained limited to the higher ground on each side of the Sacramento River's natural levees. To the south, as geographer John Thompson has explained, "few attractive residence sites appeared except near the Delta apex and on those mainland fringes that has deep water access, firm ground, and timber. As with the Sacramento banks, the southern sites were near focal centers of trade and travel: Stockton, French Camp, and the San Joaquin [ferry] crossing." Settlers generally stayed away from the Delta's western and southern margins, which lacked good water supplies, and they stayed away from the central and southern islands, which did not have the elevation or tree cover found along the banks of the Sacramento (Thompson 1957: 140). More widespread settlement and agricultural development of the Delta awaited the land reclamation efforts initially launched in the late 1850s and 1860s.

3.3.4.1 Associated Historic Properties

No archaeological properties that represent this post-contact period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

Archaeological properties from this era would likely be very rare due to the low numbers of settlers along the Delta during this era. Archaeological remains would be sparse due to the nomadic nature of trappers during this period. In addition, any archaeological indications of habitation or use may have been destroyed due to intensive landscape modifications from reclamation and agricultural development in the mid-to-late nineteenth century. Possible archaeological remains, if discovered, could consist of submerged vessels that formerly traveled the Delta's waterways, or foundations or building ruins of stage stops or landings constructed of local materials. Artifacts consisting of isolated domestic refuse deposits and evidence of temporary campsites, farming implements, and trails or unimproved roadways. These considerations may have exceptional weight in the evaluation and treatment of such resources that would otherwise be considered not eligible.

No built environment properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. Built properties associated with this theme would likely be very rare, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

No district and landscape properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. District and landscape properties associated with this theme would likely be very rare, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

No traditional properties that represent this historical period or theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.5 Delta Reclamation

To nineteenth-century Americans, the 750,000 acres of wetland in the Delta were at best an inconvenience and at worst a source of disease and possibly death. On his initial trip into the Sacramento River Valley, John Sutter and his crew took nearly 10 days to wend their way from San Francisco Bay through the islands and sloughs to find the mouth of the Sacramento River, and until 1880 most people assumed that marshy soils like those found in the Delta were precisely the type that exuded malaria, a disease that troubled Californians at least through the 1910s (Hurtado 2006: 60–61). Ultimately, however, it was the desire to develop Delta lands that spurred the draining and levee construction that began during the last third of the nineteenth century and continues to today (Garone 2011: 110–111).

Reclamation of the Delta from its natural state and converting it to agricultural uses began in the 1850s. In 1850, Congress passed the Arkansas Act, just weeks after granting California statehood. Also known as the Swamp Land Act, it gave states all public lands that were swamp and overflowed as long as the states used funds from their sale to drain and reclaim the land for agriculture. By necessity, reclamation included not only draining swamps and marshes, but constructing dikes and levees, and redirecting the flow of water through conveyance systems to ensure the water went where it was needed the most. California passed on the opportunity for grand public works projects to accomplish the task and instead, in 1855, empowered county officials to handle the problem. Counties officials were directed to hire surveyors who would determine whether land qualified as swamp and overflow, and then conduct sales through the State Land Office. In 1858, to prevent wealthy speculators from gaining monopoly control, the Democrat-controlled legislature modified the law to limit individual sales to 320 acres (at $1 per acre), and then raised the limit to 640 acres the next year (Igler 2001: 93, Kelley 1989: 34–43).

With miners providing a lucrative market for agricultural products, farmers occupying the lower Sacramento River took advantage of the rich Delta soils and access to the river for irrigation and transportation to markets. Workable land, however, proved scarce amid the tule-covered marshlands and peaty soils comprising most of the Delta. Settlements in the Delta were initially situated on alluvial soils near naturally formed levees along the major river sources. These early settlers called themselves “rim landers” and created so-called shoestring levees atop the natural levees along the Sacramento, Mokelumne, and Calaveras Rivers to withstand the highest tidal rises. One exception was a larger artificial levee built by Chinese, Indian, and Hawaiian laborers—marking an important precedent for future use of low-paid ethnic-minority workers to construct levees—at the north end of Grand Island, where large-scale levee construction was pioneered in the early 1850s (Paul 1973: 19–20; Thompson 1957: 140–144, 210–212; Street 2004: 117).

Wealthy landowners on the northern Delta near the Sacramento River began to enclose islands and large portions of islands in levees. In 1861, the California State Legislature created the State Board of Swamp Land Commissioners, which was empowered to authorize the formation of reclamation districts among groups of smaller landholders. The board established 32 districts in the Delta and Central Valley that attempted to enclose large areas with levees. Districts undertook major levee construction projects to reclaim large portions of land at Grand Island in the northern Delta, the area east of Roberts Island in the southeastern Delta, and at Sherman Island in the peatlands of the central Delta.

Crops and grazing herds were flourishing on reclaimed Delta lands, which remained limited to about approximately 10,000 to 15,000 acres under the commission. By the late 1860s the owners of

Sherman Island, the Tide Lands Reclamation Company, claimed that they had built 47 miles of levee complete with flood gates. Capitalized at $12,000,000, they made no pretense of adhering to acreage limits but rather compared their efforts to those of Menes, an ancient King of Egypt. The company's goal was to subdivide the reclaimed land and sell it in 20–40-acre parcels for up to $75 per acre—providing a significant return on their $1 purchase price and $6 to $25 investment in levee building (Paterson et al. 1978: 12). However, early reclamation districts formed under the commission were often undermined by lack of cooperation among the landowners and financial problems stemming from the rising costs of levee repairs (Lund et al. 2007: 20; Thompson 1957: 187–198, 212–218; Thompson 2006: 48–52).

Several developments in the 1860s encouraged private reclamation efforts, which, in conjunction with technological advances and recruitment of a growing force of Chinese laborers, helped quicken the pace of levee construction and land reclamation in the Delta. In 1866, the State legislature terminated the State Board of Swamp Land Commissioners and transferred its duties regarding reclamation districts to individual counties. Many counties offered incentives to landowners for reclaiming agriculturally unproductive land, but these actions resulted in little change in the amount of land reclaimed. In 1868, however, the legislature unanimously passed the Green Act, which eliminated the 640-acre limit on individual land holdings. Individuals could buy as much swampland as they could afford; title would be conferred once county officials determined that the land had actually been reclaimed. The Green Act also allowed for the creation of reclamation districts that included a single property, opening the way for speculative reclamation by large, often absentee landowners. Over the next half century, over 300,000 acres of Delta wetlands would be reclaimed privately, and by the early twentieth century, the 340,000 acres of Delta wetlands present in 1850 would be reduced to 18,000 acres.

Between 1868 and the end of the century, Delta reclamation was conducted by capitalists who gambled part of their fortunes on swamplands, and many of them lost a great deal of money. Two large firms formed in the 1860s. The Tide Land Reclamation Company, directed by George Roberts, and the Glasgow-California Land and Reclamation Company, directed and owned predominantly by Morton Fischer, would dominate reclamation in the Delta into the latter decades of the nineteenth century (Garone 2011: 113; Lund et al. 2007: 20; Owens 1991: 19; Thompson 1957: 198–202, 225; Paterson et al. 1978: 19–20).

George Roberts' first and most successful venture was the reclamation of Twitchell Island, the site of profitable wheat harvests, other crops, and sizeable livestock herds by the early 1870s. In all, Roberts accumulated 250,000 acres of Delta land by acquiring swampland claims from $0.50 to $3.00 per acre plus fees. To finance part of these purchases, he relied on the backing of Oakland and San Francisco businessmen who invested in his company. The total value of the capitalization was set at $12 million and consisted of 120,000 acres of property located in the Yolo Basin; the back swamps south of Courtland, Grand, Brannan, Twitchell, Andrus, Tyler, Staten, Roberts, and Union Islands; and land in the east-central Delta. Later, some of the lands were transferred to other individuals who established their own reclamation companies. For example, in 1875, after making some levee improvements, Roberts transferred Union Island, Grand Island, and Yolo Basin properties to Thomas Hanford Williams, and transferred Roberts Island to J.P. Whitney (Thompson 1957: 225–232; Thompson 2006: 54–58).

Whether undertaken by districts that hired contractors or speculative companies, most reclamation projects followed similar sequences. Delta reclamation began with the damming of sloughs with sediment or peat to drain tracts. These dams usually incorporated culverts or tide gates. To

construct the levees, material was generally drawn from borrow trenches on the rivers sides of sediment levees and the island sides of peat levees. At first laborers performed the excavation with shovels and wheelbarrows, except where firm natural levees allowed for horses and plows, scrapers and ditchers; over time, steam and hydraulic dredges came into use. Efforts to strengthen natural levees in upriver areas involved amassing additional soil. In the peat areas, laborers cut peat blocks, sun dried them, built parallel walls out of the blocks, and then filled the center with sand and other material. Carpenters built bulkheads and culverts into the levee systems. Once enclosed and drained, a new island's tule would be burned, plowed, and planted. The peat levees constructed in the early 1870s were typically 4 to 6 feet high, 8 to 20 feet at the toes, and 3 to 6 feet across the crowns. These levees were broadened over time (Chu 1970: 24; Thompson 1982: 8–17).

The workforce employed to construct levees and perform other land reclamation labor reflected the racial hierarchies of California society in the 1870s. Chinese workers performed the hard unskilled labor. Skilled American and European-immigrant workers on levee, dam, and canal projects primarily served as equipment operators and carpenters. Despite relatively high salaries of $30–35 per month offered by Roberts's Tide Land Reclamation Company and other contractors during the 1870s, workforce turnover remained high. Skilled laborers tended to leave for opportunities in the mines in the Sierra Nevada foothills or to rent farmland and employ Chinese labor to help grow local crops (Thompson 1957: 261).

Reclamation introduced Chinese immigrants to the Delta. Although a few farmers employed Chinese laborers to construct levees on the Sacramento River in the 1850s, contractors and land reclamation companies turned to mass employment of Chinese labor beginning in the late 1860s, after the Chinese had been driven from the gold mines and railroad construction work began to decline with completion of the Transcontinental Railroad. Most Chinese labor gangs were recruited for reclamation work from Chinatown boarding houses in Sacramento, Stockton, and San Francisco. Using just shovels and wheelbarrows, 200 Chinese laborers built 49 miles of levee during the initial reclamation of Sherman Island, completed in 1869. That year, Roberts's Tide Land Reclamation Company contracted at least 250 Chinese workers to levee Twitchell Island. By 1876, over 1,000 Chinese laborers were engaged in construction of a new levee and dam system at Union Island. Chinese immigrants also farmed the lands created by reclamation as tenants or laborers. Chinese immigrants and their descendants would maintain a presence in Delta Chinatowns into the twentieth century (Chan 1984; Chu 1970: 24; Thompson 2006: 48–49, 54).

Over the course of the 1870s, technological advancements in levee construction gradually reduced the need for low-wage Chinese laborers. By the early 1870s, levee builders began to make use of dredges that functioned as floating steam shovels to transport alluvium and clay, but as Thompson explains, these "had too little reach with their long-handled single scoop to discharge directly onto a levee stability, as occurred at Bacon Island in 1873. The alternative was to dump into scows that laborers or an endless belt conveyor unloaded onto levees" (Thompson 2006: 43). Hydraulic dredges, wheel dredges, and peat excavating machines were also employed in levee construction. First used in levee construction as early as 1879, clamshell dredges significantly improved reclamation efforts over the next several decades, allowing builders to amass levees with greater thickness and height while reducing the need for human labor (Garone 2011: 155; Thompson 1957: 266–272; Thompson 2006: 48, 55, 65). Clamshell dredges consisted of a "barge with a long boom and large bucket that opened like a huge clamshell to drop down into the soft river bottom, clamp shut, lift, and swing out over the levee where its contents were released and packed down. Because it removed land for the river side of the levee, it had the effect of both deepening the channels and

increasing their size, as well as cutting the cost of levee construction by more than half" (see Figure 3-3) (Lokke and Simmons 1980: 229).

Figure 3-3. Clamshell Dredge. Image courtesy of Maven's Notebook, 2017.

The rise of the clamshell dredge occurred at an opportune moment, speeding repair of the numerous levees that proved inadequate in the changing Delta environment. The floors of the islands formed by levees built in the peaty portions of the Delta would often sink several feet, and levees comprised of peat would frequently settle, forming large cracks that proved difficult to strengthen with peat fill. In addition to difficulties related to substandard materials and inadequate engineering, the early years of levee construction in the Delta were disorganized. Higher levees on one tract would lead to flooding on a neighboring tract with lower levees. Some islands required permanent maintenance crews. Levees continued to fail, and repeated inundations caused some reclaimed islands or portions of islands to be abandoned (Thompson 2006: 50, 54, 57–58, 60, 63). At the same time, tailings from hydraulic mining in the Sierra Nevada gradually traveled downstream, where they raised and choked riverbeds. The downstream effects of hydraulic mining increased flooding, which in turn increased levee failure. Although hydraulic mining was outlawed by the mid-1880s, its effects continued to be felt in the Delta for decades. Into the twentieth century, subsidence continued to lower the floors of Delta islands, causing groundwater seepage onto the floors and making it more difficult for land to be recovered after floods. Simultaneously, increasing upstream irrigation draws from the rivers feeding the Delta also caused saltwater intrusion deeper and deeper into the Delta (Garone 2011: 111, 116–117; Lund et al. 2007: 22–24).

The environmental consequences of Delta reclamation, Sierra mining, and increasing upstream irrigation did not, however, result in an abandonment of Delta agriculture. Clamshell dredges provided for the construction of larger and better engineered levees. By 1900, "some new levees were on the order of 100 to 125 feet at the base, up to 20 feet across the crown, and at least 5 feet

above the estimated high-water level." Modern pumps also helped drain subsiding island floors (Thompson 2006: 66 quoted, 51, 5; Thompson 1957: 277–280). Nevertheless, flooding and levee failure continued. Delta landowners exerted growing political pressure for state and federal action to protect and facilitate the Delta's agricultural economy. The result was a combination of flood control efforts, transportation development, and water development and policy that further transformed the Delta during the first half of the twentieth century, which are discussed in the following sections.

3.3.5.1 Bouldin Island Reclamation

As each island has a unique reclamation history, the RD&CS provides the following information for one island in the study area in order to demonstrate the kind of information readily available to support identification and evaluation of individual islands within a reclamation context. Paterson et al (1978) is a thorough research report for many of the islands in the study area, and remains one of the most comprehensive resources for this topic.

Reclamation District 22 was established in 1861 following state mandates associated with enforcement of the federal Swamp Lands Act. The district included the tidal marshlands and decomposed tule reed soils of the Mokelumne River from which Bouldin Island would be built. Bouldin Island was first leveed in 1871 by Steven, Baker & Company with an investment of $65,000. These early, insubstantial "shoestring" levees were manually constructed using available peat soils, a method that was too frail and permeable to substantially withstand tides and seasonal floods (Paterson et al. 1978: 15–16).

In 1879, the Pacific Distillery Company, a San Francisco enterprise owned by Henry Voorman, George Oulton and the Shultz brothers, invested over $250,000 in rebuilding the levees. The company began using a mechanical dredger which excavated below the peat soils and extracted clay muds for its levee materials. By 1886, the company was operating a sharecropper industry at Bouldin Island that supplied San Francisco's potato market (Paterson et al. 1978: 16). As such, Bouldin Island is distinct for being one of only a handful of successful nineteenth-century levee efforts alongside Andrus, Tyler and Staten Islands (Paterson et al. 1978: 20).

In the early twentieth century, Bouldin Island fell into the jurisdiction of the new Reclamation District 756, which was formed in 1904 following a heavy seasonal flood year. Bouldin Island's levees were breached and portions of the island regularly flooded between 1906 and 1916. District 756 reorganized in 1918. The current reclamation levee configuration was completed between 1916 and 1918 by California Delta Farms, in which George Shima was a primary shareholder (Paterson et al. 1978: 23b).

3.3.5.2 Associated Historic Properties

No archaeological properties that represent this post-contact period and theme have been identified previously in the study area. This may indicate that resources associated with this significant theme are not present, or that additional identification efforts are appropriate. Although National Register–eligible reclamation districts are present in the study area such as Grand Island/ Reclamation District 3 Rural Historic District and the Netherlands District and Associated Reclamation District 999 Rural Historic District, documentation of these districts was based upon the intact built environment features present during recording. The archaeological components of these districts have not been identified in the records and are underrepresented.

Underrepresented archaeological sites and artifacts associated with Delta reclamation may include construction equipment, building materials, and domestic refuse as evidence of habitation. Machinery and tools used to construct these levees may include fragments of shovels, wheelbarrows, picks, horse-drawn plows, scrapers, ditchers, and abandoned or buried hydraulic clamshell dredges. Building materials indicative of the reclamation theme may include early steam-powered and electric pumps and segments of abandoned or buried levees. Archaeological evidence of laborers may be present through domestic refuse and habitation remains. Such archaeological properties may consist of temporary foundations made of stone or other local materials, hearths and other temporary residential features. Domestic refuse may consist of liquor bottles, sanitary cans, glassware, dishware, hygiene products, and clothing items such as buttons. The majority of the laborers were Chinese and cultural domestic items such as opium pipes, rice bowls, soy sauce jars, and teacups may be present. Because archaeological evidence during this period is so rare, consideration may have exceptional weight in the evaluation and treatment of such resources that would otherwise be considered not eligible.

Built environment properties that represent this historical period and theme are located in the study area. Built properties associated with the earliest period of this theme would likely be rarer than later twentieth-century properties, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

Districts and landscape properties that represent this period and theme are located in the study area. Districts and landscape properties associated with the earliest period of this theme would likely be rarer than later twentieth-century properties, and this consideration may have exceptional weight in the evaluation and treatment of such resources. The Grand Island/Reclamation District 3 Rural Historic District in Walnut Grove and the Netherlands District and associated Reclamation District 999 are eligible for National Register and California Register listing for their historical significance associated with this theme. Additionally, the system of islands in the Delta resulting from the construction of levees and dams requires further consideration as a vernacular cultural landscape. Landscapes associated with this theme are likely to be large in scale and related to the early infrastructure construction efforts and reclamation districting. Few districts and landscape properties have been previously identified in the study area, which may indicate that additional identification efforts are appropriate because this era had a large impact on the formation of the current Delta environment.

No traditional properties that represent this historical period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.6 Delta Agriculture

Land reclamation was driven by the agricultural promise in the region's natural advantages, which included the fertile, nitrogen-rich soils of drained and burned tule marshes, an abundance of water, and a marine climate that dramatically contrasted with the majority of the Central Valley, particularly in the summer months. At first, agricultural activity took place mainly on higher lands near natural levees and rises along the Sacramento River, where farmers raised potatoes, onions, and beans, among other crops, and where fruit orchards—especially pears—flourished in the nineteenth century. Early farmers also grazed cattle and sheep. By 1852 the banks of the San Joaquin River were entirely occupied by small-scale farming operations as well (Lokke and Simmons 1980: 223–224; Thompson 1957: 139–144).

From the 1860s through the 1880s, land reclamation spread agriculture from alluvium lands upstream along the major rivers into the peat lands of the central Delta. Growers in the northern and southern Delta frequently planted islands of recently burned and plowed tule in grains, especially wheat, California's most widely cultivated and profitable agricultural product during most of the late nineteenth century. Commercial farmers also planted potatoes, beans, clover, and alfalfa. During the winter, crop residues and persistent wetland areas served as grazing lands. In 1875 and 1876, for example, 19,000 sheep grazed on Sherman Island. The Miller & Lux ranching operation frequently sent cattle and sheep herds to the Delta islands for winter grazing. Soon farmers began to diversify by undertaking fruit and dairy production. By 1877, farmers on Sherman Island had begun experiments with grapes, berries, and row crops. With water access to a growing urban market in San Francisco, Delta agriculture boomed. By 1883, large tonnages of vegetables were being shipped to San Francisco in steamers that allowed Delta vegetables and fruit to be sold a day after they were harvested (Rawls and Bean 2003: 201–202; Angermeier 1970; Thompson 1957: 309–312; Thompson 2006: 52, 56, 61–63).

Delta agriculture bore no resemblance to the eighteenth- and nineteenth-century American ideal of the land-owning independent yeoman farmer. The reclamation companies and landowner groups responsible for the creation of the Delta's agricultural islands resisted land subdivision. Early on, the failure of reclamation efforts and districts formed by small independent land-owning farmers—usually due to lack of cooperation—led to the corporatization of Delta agriculture. Reclamation companies, investor groups, and large absentee owners turned to renters, lessees, sharecroppers, and farm managers to perform the agricultural work that made the investment of land reclamation and levee maintenance extremely profitable in terms of agricultural output over time (Azuma 1994: 17–20; Thompson 1957: 300–302).

Many of the large land holdings were divided into agricultural "camps" with a resident superintendent overseeing the cultivation of a particular crop (Dillingham 1911: 330). Patterns of agricultural production in the Delta reflected ethnic specialization developed over time. American-born Delta farmers tended to be engaged in grain, orchard, and livestock husbandry as lessees, farm managers, and in a few cases, independent farmers. Over time, Euroamerican farmers increasingly lived in high-ground houses, away from the lowland field camps and bunkhouses occupied by different segregated groups of transient ethnic laborers. Euroamerican lessees sometimes subleased to ethnic Chinese or Japanese entrepreneurs, who then arranged to have members of their ethnic communities work the land. Chinese, Italian, and Portuguese tenant farmers often specialized in garden or truck farming. Chinese agricultural laborers also became associated with row crops, especially nineteenth-century potato cultivation. Arriving in the Delta mainly during the early twentieth century, Japanese farmers frequently engaged in potato and asparagus production. One Japanese potato producer, George Shima, developed virgin peats to produce a light-skinned potato that he marketed in trademarked red bags. Eventually controlling much of the local crop, Shima earned himself the title Potato King. Japanese entrepreneur Hotta Kamajirō built a highly successful asparagus growing and shipping operation. These men were the exception. Most Japanese farmers remained lessees, sub-lessees, or employees due to discriminatory laws that barred them from land ownership. Beginning in the 1920s, Filipino and Mexican workers were also incorporated into the Delta agricultural system as day laborers (Azuma 1994: 14–20; Miller 1955: 180–182; Thompson 1957: 305–306, 309–310, 335).

Shima and Kamajirō were part of a gradual transition from garden to field agriculture that accelerated in the early twentieth century. In addition to earlier established large-scale field crops such as potatoes, beans, and onions, farmers added asparagus, celery, tomatoes, and sugar beets.

Sometimes planted across entire islands, potatoes remained one of the Delta's premiere crops until out-of-state competition led to the crop's decline in the Delta during the 1930s. After 1900, barley replaced wheat and became the most widely planted Delta crop by 1916. That year, 120,000 acres were planted in barley east of the Old River and the Mokelumne North Fork. Dairying also expanded in the San Joaquin portion of the Delta, and Bartlett pear orchards became a mainstay along the banks of the Sacramento River in the northern Delta. Farmers also grew alfalfa for the livery trade or to feed cattle and sheep (Thompson 1957: 312–314, 331, 335).

Technological advances in the first decades of the twentieth century also increased Delta agricultural production and gave rise to modern industrial farming after World War I. The late-nineteenth-century mechanical harvesters informed the development of increasingly efficient tractors powered by steam and then internal combustion engines. "Caterpillar" tractors became commonplace in the Delta, particularly among the large land companies. Although large acreages continued to be reclaimed, a good deal of island land was improved through the introduction of electric pumps. Replacing less efficient and less powerful steam- and horse-powered devices, electric pumps came into use by 1905 and provided for drainage of persistent wetlands and subsidence areas waterlogged by irrigation runoff. A network of transmission and distribution lines constructed mainly from 1911 to 1915 crossed the Delta and made the use of electric pumps commonplace. Also during these years, the sale of field crops by consignment to wholesale markets or shippers gave way to canneries and wholesale produce houses with product standards and field buyers. In the fields, contract day labor began to replace gangs of sharecroppers. Fertilizer came into increasing use at this time as well (Thompson 1957: 281, 296–298, 312, 314).

From the 1920s through the 1950s, additional technological changes such as increased mechanization and fertilizer use, improved seeds, portable sprinkler systems, pesticides, and weed killers continued to increase production. Grain—mainly barley—and asparagus were the chief crops during these decades, occupying 25–35 percent and 17–21 percent of Delta acreage, respectively. The next most widely planted crops were corn (9–15 percent) and alfalfa (6–10 percent). Asparagus production gradually shifted from the Sacramento Delta to the San Joaquin Delta, where 62,300 acres of asparagus were planted in older organic soil in 1945. By 1952, 95 percent of the Delta's asparagus crop (75,800 acres) was planted in the San Joaquin districts. This represented nearly half of the asparagus grown nationally (Thompson 1957: 315–318, 343–344).

Fish canneries were another critical part of the Delta agricultural economy. Long before the land was reclaimed for farming, commercial fishing had taken root in the Delta. Hubert Howe Bancroft wrote that commercial fishing along the Delta began no later than 1850 when a colony of Italian immigrants started using nets to catch salmon. By the 1870s the Delta was one of the most productive salmon fisheries in the world with annual catches nearing 10 million pounds. Local canneries handled most of the catch by 1860 (Armentrout-Ma 1981: 149). The first cannery in the state was built in San Francisco in 1857 and the first Pacific Coast salmon cannery started in 1864 across the river from Sacramento at Broderick in Yolo County. Only European settlers fished for salmon in the Delta—they threatened harm to any Chinese that did so—but Chinese settlers were allowed to fish for virtually any other fish in the area including sturgeon, shad, and smelt (Armentrout-Ma 1981: 149–150). Chinese workers, however, provided critical labor for the numerous canneries in the Delta (Chan 1986: 335–338).

In 1870, the State Legislature created the California Fish Commission with a mandate to restore and preserve the state's fisheries. By the first decades of the twentieth century overharvesting of fish had become an obvious problem. In some seasons, fishing was so productive that canneries could

not keep up with processing. Barge loads were dumped and carcasses used to feed hogs. In 1951, the state prohibited net fishing in the Delta, bringing salmon canning in the area to a virtual halt (Skinner 1962: 32).

3.3.6.1 Associated Historic Properties

Archaeological properties that represent this post-contact period and theme are located in the study area. The resources listed in Table 3-1 are associated with farm labor camps within the Bacon Island Historic District, which is one of the oldest large-scale farming operations on the Delta.

Table 3-1. Archaeological Resources within the Delta Agricultural Theme

P-Number	Trinomial	Detail
P-39-000325	CA-SJO-000211H	Bacon Island Camp 1
P-39-000326	CA-SJO-000212H	Bacon Island Camp 2
P-39-000327	CA-SJO-000213H	Bacon Island Camp 3
P-39-000328	CA-SJO-000214H	Bacon Island Camp 4
P-39-000329	CA-SJO-000215H	Bacon Island Camp 5
P-39-000337	CA-SJO-000223H	Bacon Island Camp 6
P-39-000330	CA-SJO-000216H	Bacon Island Camp 8
P-39-000331	CA-SJO-000217H	Bacon Island Camp 9
P-39-000332	CA-SJO-000218H	Bacon Island Camp 10
P-39-000333	CA-SJO-000219H	Bacon Island Camp 10 ½
P-39-000334	CA-SJO-000220H	Bacon Island Camp 11
P-39-000335	CA-SJO-000221H	Bacon Island Bridge Tender's house
P-39-000336	CA-SJO-000222H	Bacon Island Camp 12

These camps, constructed in 1915, housed Japanese, East Indian, and Mexican farm laborers who worked the lands of Bacon Island (PAR 1993). These camps (and bridge tender's house) have been identified as contributing elements to the Bacon Island Rural Historic District. Archaeological elements of the camps consisted of a large numer of artifacts reflecting the personal and domestic use of the camps, building and residential foundations/pads, structural materials, and pier remnants.

The majority of properties in the study area were used for agricultural production as early as the late nineteenth century. These other properties in the study area may contain significant archaeological resources associated with early agricultural use of the Delta, and are therefore underrepresented in the archaeological record. Archaeological properties associated with agriculture in the Delta may include a variety of agricultural equipment and farming implements and evidence of early (circa mid-to-late nineteenth century) labor camps and associated domestic artifacts. Although the archaeological refuse scatters have been mentioned as part of the Bacon Island District, in-depth data-recovery and analysis was never performed for these archaeological components and could provide information needed to answer key research questions regarding the agricultural lifeways and technology in the Delta.

Built environment properties that represent this period and theme are located in the study area. Built properties associated with the earliest period of this theme would likely be rarer than later

twentieth-century properties, and this consideration may have exceptional weight in the evaluation and treatment of such resources. Currently, built resources contribute to the Bacon Island Historic District, which represents this historical theme.

Districts and landscape properties that represent this period and theme are located in the study area. District and landscape properties associated with the earliest period of this theme would likely be rarer than later twentieth-century properties, and this consideration may have exceptional weight in the evaluation and treatment of such resources. Currently, the Bacon Island Historic District and the Netherlands District and associated Reclamation District 999 represent this historical theme but may require further evaluation as rural landscapes. Furthermore, given the evolving but longstanding role of agriculture in shaping the Delta, it is likely there are additional extant vernacular cultural landscapes within the study area that have not yet been identified or studied.

No traditional properties that represent this historical period and themes have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that they are underrepresented and therefore additional identification efforts are appropriate.

3.3.7 Transportation Development

Until reclamation of Delta lands began, most traffic in the Delta was by water and the few trails that complemented the water traffic. Only after the start of the twentieth century, with the introduction of the automobile, did roads begin to dominate traffic in the Delta.

Early roads evolved from trails and were serviced by wagons that hauled freight back and forth between the farms and the small towns that began to crop up behind the levees being constructed to block flood waters and dry out tule swamps (Thompson 1980: 147).

Railroads also played an important role in the development of agriculture, especially after the beginning of the twentieth century. The earliest surviving railroad built through the study area was the Southern Pacific line completed in 1878. Still in use for freight transport, the line extended northwest from Tracy to Antioch and occasioned the establishment of towns such as Byron and Brentwood. The San Joaquin Railroad was completed between Stockton and Antioch by 1897 and then purchased by Atchison, Topeka, & Santa Fe within a few years. Two currently operating bascule bridges, the Bacon Island Railroad Bridge and the Woodward Island Railroad Bridge, were constructed during the years 1928 and 1929 to carry this line across the Middle and Old Rivers respectively (Bridgehunter.com 2012a, 2012b; Daggett 1922: 334; Hulanski 1917: 287–291; Thompson 1959: 410–411).

The rise of asparagus as the leading Delta crop in the early twentieth century prompted construction of several branch lines into the Delta. In 1906 and 1909 the Sacramento Southern Railway completed a line from Sacramento to Walnut Grove via Freeport and Hood, which became a formal part of the Southern Pacific Railroad in 1912. The Southern Pacific subsequently built an additional line from Walnut Grove to Isleton 1929. That same year, the Oakland, Antioch and Eastern Railway (later the Sacramento Northern) built a freight line between Reclamation District 999 and West Sacramento. All of these railroads were constructed in the study area. Only the former Santa Fe line (now BNSF) and Southern Pacific line between Tracy and Antioch remain in use. Remnant track and grades of the other lines can be observed from the central to northern Delta (Melvin and Flores 2007: 1; Robertson 1998: 197; Thompson 1957: 410–411; Thompson 1980: 163).

Until the construction of year-round roads after 1920, most Delta farms were only accessible by steam launches. Originating primarily in Antioch, Stockton, and Sacramento, they plied the waterways on set schedules dropping off workers and supplies and transporting harvested crops (Thompson 1980: 145–147).

After 1900, county and state investment nurtured bridge construction, which in turn enabled the development of year-round roads serving Delta residents and visitors. During the first decade of the twentieth century, the construction of steel draw-and-swing bridges across Georgiana Slough, both the North and South Forks of the Mokelumne River, and the Sacramento River below the head of Grand Island, provided for road connections from Walnut Grove and Brannan, Andrus, and Grand Islands to the population centers of Sacramento and Stockton. In 1905 and 1906 San Joaquin County also constructed two steel swing bridges, which were later moved to Bacon Island in 1950 (Bridgehunter.com 2012c and 2012d; Thompson 1980: 151–154, 163).

During the 1910s and early 1920s, additional bridge construction and road development connected the era's increasing automobile traffic from the earlier established roads to new routes. In 1915, for example, the American Bridge Company built the Middle River Bridge, a steel, Pratt-truss swing bridge. That same year the American Bridge Company completed the Old River Bridge, a steel Howe truss through bridge with Pratt truss approach spans, approximately 4 miles west of the Middle River Bridge. Facilitating development of the southern Delta's Borden Highway, or State Route (SR) 4, between Stockton and Contra Costa County, these two National Register–eligible bridges are some of the oldest operating steel swing bridges in California (Blow 1920: 226; Bridgehunter.com 2012e; California Department of Transportation 1979). By 1922, the completion of River Road (SR 160) through the northern Delta allowed motorists to travel from Stockton and Sacramento across the northern Delta to Vallejo. Constructed in 1926 to replace a major ferry crossing, the Antioch Bridge (since replaced) provided for completion of the Victory Highway route, which crossed the Delta to connect Sacramento and the East Bay via Antioch. This route was improved in 1949 with construction of the Three Mile Slough Bridge between Sherman and Brannan Islands. Designed by the State of California and constructed by Judson Pacific Murphy, this steel-frame vertical lift bridge has been determined eligible for the National Register (Blow 1920: 226; California Department of Transportation 1990: 116–117; 2012: 48; Lortie 2003; Thompson 1980: 151–154, 163).

Between 1927 and 1940, two majestic paddle-wheel steamboats connected Sacramento with San Francisco. The Delta King and the Delta Queen offered daily non-stop travel. Although the trip was popular, the owners had financial challenges from the start as the rise of the automobile made the paddle-wheelers anachronistic from their launch (Garvey 1999: 35).

3.3.7.1 Associated Historic Properties

No historical archaeological properties that represent this post-contact period and theme have been identified previously in the study area. Road and railroad segments have been recorded in the study area; however, no portions of those properties would be considered archaeological in nature. The National Register–eligible transportation properties within the study area (Old River Bridge, Bacon Island Railroad Bridge, Woodward Island Railroad Bridge, and the Walnut Grove Branch Railroad, Sacramento Southern Railroad) are currently in use according to their original function and do not have any archaeological elements.

Early transportation archaeological properties constructed prior to land reclamation efforts in the Delta would likely be very rare due to the low numbers of settlers or inland travelers during this

time. There is the possibility that undocumented transportation archaeological properties constructed after the initiation of land reclamation (mid-nineteenth century) are present in the study area. Possible archaeological resources, if discovered, could consist of trails, unimproved and deteriorated road segments, railroad grades and materials, and bridge footings or destroyed bridge segments.

Built environment properties that represent this historical period and theme are located in the study area. These properties include the Woodford Island Bridge and the Walnut Grove spur line of the Southern Pacific Railroad. Built properties associated with the earliest period of this theme would likely be rarer than later twentieth-century properties, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

No districts and landscape properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. District and landscape properties associated with the earliest period of this theme would likely be rarer than later twentieth-century resources, and this consideration may have exceptional weight in the evaluation and treatment of such resources. District and landscape properties associated with this theme would likely include water conveyance systems, railroads systems, and roadways and their associated infrastructures such as South River Road in the vicinity of Clarksburg.

No traditional properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.8 Community Development

The Delta's communities developed in the nineteenth century as water transportation hubs and leveed island communities. As levee engineering improved around the turn of the twentieth century, terrestrial roadways and railways were built that strengthened already well-established ties between the Delta's island communities and the Central Valley's larger cities such as Sacramento and Stockton.

Smaller community hubs developed throughout the Delta, supporting and facilitating travel, transport, and communication along the waterways and developing levee roads (California Department of Transportation 2010: 21–22, 24). Townsites such as Clarksburg, Hood, Walnut Grove, Rio Vista, and Byron became community centers for farm workers and other Delta residents. These centers often housed the headquarters of regional land management companies such as the Netherlands Farm Company and its successor, the Holland Land Company (Tyler 2005: 2). This towns are further discussed in the following subsection.

Despite anti-immigrant—and in particular anti-Asian—laws in California, Chinese and Japanese communities arose at Walnut Grove, Locke, and at agricultural hubs such as Bacon and Bouldin Islands. Chinese immigrants were a primary workforce in building nineteenth century railroads and levees, and often settled on leveed islands to farm (Paterson et al 1978). The 1913 Alien Land Act limited agricultural land purchases to citizens or aliens eligible to citizenship, limiting the alien Japanese, who were ineligible to citizenship, to 3-year renewable leases. Euroamerican landowners and Japanese-American farmers quickly found ways around the law; instead of bringing an end to the growth in Japanese farms, the numbers actually increased in the 6 years after the law's passage. This topic is further discussed in the following subsection.

3.3.8.1 Delta Cities and Towns

Stockton

Founded by German Immigrant Charles M. Weber in 1847, the early Stockton settlement was advantageously located on the south side of the Stockton Channel, a deep water slough extending east from the San Joaquin River. The first steamboat from San Francisco landed at Stockton in 1849, and the following year, the town of 1,000 residents became the seat of San Joaquin County. Stockton's economy prospered first of as a mining supply center and later as port for wheat shipment. Over the course of the late nineteenth century, Stockton also became a center of shipbuilding, milling, packing, and manufacture of steam engines, foundry products, farm tools, and farm tractors. Many Delta agricultural laborers resided primarily in Stockton. Located approximately 7 miles west of the Stockton embarcadero is Holt, a small enclave established as a freight-car loading point along the Atchison, Topeka, and Santa Fe Railroad line completed in 1899. Holt was named for brothers Benjamin and Frank Holt, who founded Stockton's Holt Manufacturing Company (Kyle 2002: 370–371; Thompson 1957: 411, 416, 425; Tinkham 1923: 339–340).

Clarksburg

Clarksburg was established in 1850 in the far northeast Delta along the Sacramento River. The town later took its name from Christopher Clark, who arrived there in 1856, the same year the settlement constructed its first schoolhouse. Commercial fishing provided the base of Clarksburg's early economy. In 1858, Joseph Souza Nevis purchased 186 acres in the northern part of the Clarksburg area, which became a center of commercial fishing. Nevis's holdings developed into a major Portuguese settlement, which gave rise to the Lisbon District. Clarksburg got its first post office in 1876. In 1874 and 1877, respectively, the Merritt District (commonly known as Merritt Island) and the Lisbon Districts were organized into reclamation districts. The Merritt District was named after the settler and 1846 Bear Flag Revolt leader, Ezekiel Merritt. In addition to commercial fishing, the Azorean Portuguese residents of the Lisbon District engaged in truck farming and dairying. Catastrophic floods in 1907 and 1909 were followed by major new reclamation efforts around Clarksburg by the Netherlands Farm Company, which subsequently began selling and renting small 20-acre farms on its newly reclaimed properties. By the 1910s, Clarksburg was one of the few small towns within Yolo County that had not gone dry in response to the temperance movement's campaigns for alcohol prohibition. The town, however, did not become a center of vice (Gregory 1913: 158; California Department of Transportation 2010: 79–80; Thompson 1957: 431).

The area to the west of Clarksburg remained marshy, undeveloped tule land until after the creation of the State Reclamation Board in 1911 and the related authorization of several special reclamation districts by the legislature. The Progressive Era Reclamation Board ushered into existence the huge Yolo Bypass project and helped promote the federal-state levee construction partnership, making it more practical and profitable to farm some of the lowland areas of Yolo County. Also in 1911, Isaac B. Parsons of the Bank of Hayward laid the foundation for a farm colony on the west bank of the Sacramento River surrounding the settlement of Clarksburg, then little more than a river landing. Parsons started buying land on behalf of a group who would later form the Netherlands Farm Company. Meanwhile, in 1913 they formed Reclamation District 999, in the wake of the passage of new reclamation laws (Tyler 2005: 2; Paterson 1978: 26–28; Meloy 2004: 84, 129).

The Netherlands Farm Company ultimately owned as much as 80 percent of the land in the district until financial difficulties forced it to reorganize in 1916. The resulting Holland Land Company had

seven board members including president Jesse V. Mendenhall, T.A. Allan, Walter J. Seaborn, M.E. Addis, T.T. C. Gregory, and J. P. O'Connor (Tyler 2005: 2).

The Holland Land Company reclaimed the bulk of the marshy tule lands of the Holland District within 2 years, using huge clamshell dredges. It then began marketing crops to demonstrate the land's capabilities to prospective buyers. To pre-screened individuals—often with links to the University of California's farm school at Davis—the company sold and leased parcels of 20 acres and more. The selected few not only met the educational standards, but also the Progressive Era standards for race and citizenship. The 1910s and early 1920s saw an era of anti-Japanese agitation in California, a social movement that had its origins at the turn of the century among organized working class San Franciscans. As increasing numbers of Japanese took up farming along the Sacramento River and in the Delta, both as tenants and as farm owners, non-Japanese middle-class urban and rural Central Valley residents challenged the legitimacy of Japanese leases and deeds, and claimed that the Japanese were conspiring to take control of California farmlands. The Alien Land Act of 1913 was one response to this, as were calls for the state to intervene to help white farmers compete against the Japanese. The 1913 act limited agricultural land purchases to citizens or aliens eligible to citizenship, limiting the alien Japanese, who were ineligible to citizenship, to 3-year renewable leases. Euroamerican land owners and Japanese farmers quickly found ways around the law; instead of bringing an end to the growth in Japanese farms, the numbers actually increased in the 6 years after the law's passage (Meloy 2004: 106–149).

Calls for government intervention increased as private development efforts failed to ensure farms remained in the hands of native-born whites. As efforts failed to attract more white settlement, the calls by white supremacists for a solution to the Japanese problem increased. Senator James D. Phelan led the charge from Washington, DC while State Senator James Inman of Sacramento and Sacramento Bee publisher Valentine Stuart McClatchy led a signature drive to qualify an initiative on the November 1920 ballot. The 1920 Alien Land Law further restricted the practices employed to circumvent the Alien Land Act (Tyler 2005: 2; Paterson 1978: 26–27).

The Holland Land Company also sold land for town sites in Clarksburg (conceived as a model town) and commercial lots. In the early 1920s, the American Crystal Sugar Company built a sugar beet refinery north of Clarksburg (Tyler 2005: 2). Though the company had its headquarters at Clarksburg, for the most part, it seems, these were absentee owners. Mendenhall and Seaborn both originally hailed from Berkeley, where they had served subsequent terms as town (later city) clerk between 1906 and 1910. Mendenhall would later take up residence in Stockton while Seaborn would help found the California-Delta Potato Growers Association in San Francisco (Pacific Rural Press 1906; 1910).

The Holland Land Company had high hopes for success. It built numerous levees, canals, roads, bridges, and buildings on its land and planted alfalfa, corn, sugar beets, asparagus, and truck crops. In the middle of the 1920s the company still owned more than 50,000 acres in Yolo and Solano counties. Nevertheless, it was apparently unable to attract the type of settlers they had originally sought and therefore leased land to Japanese tenants. The company dissolved in 1942, when it finished selling land. Responsibility for levee maintenance then fell to Reclamation District 999, which still operates in the area (Tyler 2005: 2; Meloy 2004: 129).

Hood and Courtland

Also located on the Sacramento River, the towns of Hood and Courtland were respectively established approximately 3.5 and 6.5 miles south of Clarksburg. Their early development was

driven by fruit production and other agricultural activity on Merritt, Randall, Grand, and Sutter Islands, and on land east of the Sacramento River's natural levees. Initially known as Richland, Hood was established in 1860 as a river landing with a warehouse and schoolhouse serving nearby agricultural producers. The community was also served by a Methodist-Episcopal Church. Courtland was founded in 1867, when a post office was moved there from Onisbo across Steamboat Slough. Encompassing wharves, a hotel, and stores, Courtland experienced continued growth after 1900. Unlike other Delta landing settlements, Courtland sent its fruits and vegetables to other towns for canning or other processing. Eschewing industry, Courtland remained a residential settlement and agricultural shipping center with a wharf and a commercial district serving area farmers. Courtland and Richland would remain well known for pear production into the twentieth century (Bohakel 1979: 33–34; California Department of Transportation 2010: : 79; Reed 1923: 120, 407; Thompson 1957: 359, 428–429).

The entire town of Hood is located in the study area. In 1909, the Southern Pacific Company (the overarching company best known for its railroad holdings) named the small shipping enclave for William Hood, a Southern Pacific engineer who planned a rail spur from the landing to Franklin Junction on the Sacramento Southern Railroad, initially built from West Sacramento south to Walnut Grove in 1909, and subsequently extended to Isleton. As a complement to its rail spur to Hood, the Southern Pacific erected a wharf on the Sacramento River. The structure continues to stand today. The Southern Pacific chose the site for its relatively high elevation and safety from seasonal floods as much as for its location outside the jurisdiction of the nearby Richland Reclamation District. The latter factor would allow the Southern Pacific greater independence and protect it from costly district assessments. The wharf and spur made Hood a favored packing and shipping site for pear farmers in the Courtland area (Hecteman 2009: 63; Hutchinson 1999: 4–5).

The Southern Pacific partnered with Madison P. Barnes to develop a residential community adjacent to the new shipping facilities. A prominent Sacramento businessman and civic leader, Barnes is credited with founding the real estate development firm Hood Improvement Company in 1909 and creating the first plat for the community in September of that year. Early promotional efforts tied the development—fancifully dubbed "a New Netherlands"—to Southern Pacific's Netherlands Route, a steamboat passenger line between Sacramento and San Francisco by way of the Sacramento River and other Delta waterways. On his wife Adella's insistence, William Barnes commissioned the 1914 construction of a 21-room Netherlands Hotel (no longer extant). Barnes' efforts were poorly timed, however, and Hood's residential growth remained limited for several decades. Around the Southern Pacific wharf, however, several growers' associations and companies established warehouses, packinghouses, and cold storage facilities during the early-to-mid twentieth century (Bohakel 1979: 34; Hecteman 2009: 64; Hutchinson 1999: 4).

Walnut Grove

Located at the junction of Tyler and Georgiana Sloughs along the old Sacramento River channel, nearly 7 miles southeast of Courtland, Walnut Grove was founded in 1851 by John W. Sharp. It received its first post office within 5 years of its founding and enjoyed thriving commerce from its advantageous location and its surrounding agricultural production. Its location near the Tyler and Georgiana sloughs provided access to the Mokelumne and the San Joaquin rivers and trails along those rivers' natural levees. Walnut Grove grew slowly at first, but by the late 1870s it had a hotel, schoolhouse, meeting hall, sheltered wharf, and warehouses. The construction of bridges, including a cantilevered bridge across the river in 1913, and the creation of ferry services around the town facilitated increasing stage and wagon traffic during the last decades of the nineteenth and early

twentieth century. As with other communities in the Delta, asparagus production boosted the Walnut Grove economy in the twentieth century, leading to geographic expansion of the town that crossed the river. The town's commercial center developed on the east side of the river and consisted of commercial buildings, a hotel, bank, theater, warehouses, packing sheds, and a residential "shanty" town. By the second quarter of the twentieth century, a respectable residential district known as "asparagus row" took shape west of the river, where a railroad depot, warehouses, and packing sheds were also constructed (California Department of Transportation 2010: 79; Reed 1923: 121; Thompson 1957: 427–428).

Chinese immigrant workers maintained a significant presence in the Delta throughout the latter nineteenth century and the first half of the twentieth century. Chinese immigrants initially performed dam- and levee-construction labor and then became tenant farmers, making major contributions to the growing late-nineteenth-century Delta economy. Comprised mainly of male immigrants and subjected to systematic discrimination that led to the Chinese Exclusion Act of 1882, the Chinese population in the Delta initially lived in segregated camps formed of wood-frame residences built to two stories in anticipation of floods. Over time, residentially segregated Chinatowns comprised of two-story wood-frame buildings took shape in Walnut Grove, Isleton, Courtland, and Rio Vista. Although Chinese migration out of the Delta outstripped in-migration during the 1890s, that trend reversed after the San Francisco earthquake of 1906 and during the asparagus growing and canning boom of the early twentieth century. Whereas Courtland and Rio Vista had permanent populations of Chinese settlers who specialized in fruit or potato production, Chinese communities in Walnut Grove and Isleton consisted of a small, high-status population of merchants and bosses who lived there permanently, and a large transient male population of agricultural workers. Vice flourished in the opium dens, brothels, and gambling halls of the latter Chinatowns, and served as a linchpin of the labor system designed to keep low-wage workers in constant debt to bosses (Charleton 1990: 22–23; Chu 1970: 26, 28–30; California Department of Transportation 2010: 78–79).

After fire burned Walnut Grove's Chinatown in 1915, members of the community's ethnic Changshan population approached landowner George Locke seeking to relocate onto his property. Separating themselves from Walnut Grove's ethnic Sze Yap, and legally prohibited from buying land under the California Alien Land Act of 1913, the Changshan group leased 9 acres within a half mile north of Walnut Grove and established a new Chinatown that became known as Locke. The town was laid out by Chinese architects who created an unusual mix of traditional Chinese building patterns and Delta vernacular architecture in the two-story buildings overhanging Locke's 12-foot-wide main street. Locke initially served transient Chinese workers who labored in the asparagus fields, canneries, and nearby Southern Pacific Railroad packing sheds. The town quickly earned a reputation for vice. Opium dens and gambling establishments nestled in buildings behind respectable businesses were soon joined by prohibition-era speakeasies that attracted Euroamerican patrons. The town's population of 600 often ballooned to 1,500 on weekends. Despite the end of prohibition, the decline of Delta asparagus production, the Great Depression in the 1930s, and eventual Chinese migration out of the Delta, Locke endured (Charleton 1990: 23–25; Kyle 2002: 314–315).

In the early twentieth century, Japanese immigrants and their Nisei offspring, followed by a new and largely male population of Filipino immigrants, settled and worked in the Delta in increasing numbers. Leasing Delta lands, George Shima grew rich growing potatoes and built an agricultural operation that included steamboats, barges, and tugboats that shipped his crop to San Francisco. Beginning in 1903, Hotta Kamajirō capitalized on an exceptional land lease and a favorable contract

with the California Fruit Growers Association to build another Japanese agricultural empire around asparagus production. Limited by the alien land laws barring Japanese land ownership, the overwhelming majority of Delta Japanese farmed under exploitive leases or tenancy that allowed Euroamerican landowners to extract a great deal of profit from Japanese agricultural enterprise. Later, many Japanese growers worked farms as "foremen" employed by white owners. These farmers established new ethnic enclaves in Delta towns such as Walnut Grove and Isleton. After the national immigration restrictions of the 1920s terminated Japanese immigration but allowed Filipinos to enter the United States as colonized American nationals, Japanese tenant farmers and foremen profited by employing a growing population of itinerant low-paid Filipino agricultural laborers in the Central Valley and the Delta. Indeed, the Delta grew more and more ethnically diverse over the course of the late nineteenth and early twentieth century (Azuma 1994: 14–29; Azuma 1998: 168–169, 177–178; California Department of Transportation 2010: 78–79; Miller 1995: 180–182).

Rio Vista and Isleton

Rio Vista, located approximately 11 miles southwest of Walnut Grove and now the largest community in the northern Delta, was founded by members of the Brazos del Rio ("Arms of the River") community that flooded in 1861. Displaced Brazos del Rio residents established the new town on the ranch lands of Joseph Bruning adjacent to the Montezuma Hills. Rio Vista became a major wheat producer with water piped into the fields from the river, as well as an important shipping center serving nearby farmers. Between 1868 and 1878 the population within a 10-mile radius of Rio Vista grew from 200 to 1,500. The town continued to grow in the twentieth century as a shipping and agricultural processing center. By the turn of the century, its northeastern wharf was occupied by J.H. Gardiner's grain warehouses and the California Transportation Company, the latter of which was formed in 1875 to ship produce to San Francisco markets. The Sullivan and Larsen lumberyard occupied the southeastern wharf. Cannery operations began in Rio Vista in 1904. Rio Vista's Main Street stretched northwest from the river, which was spanned in 1918 by a bridge connecting the town to Brannan Island on the east side of the river. By the mid-twentieth century Rio Vista had a population of 2,500 and had become the site of a farm equipment manufacturing factory, a packing house, a dredge depot, a storage deport for mothballed ships, and businesses provisioning sports fishermen (California Department of Transportation 2010: 77–78; Thompson 1957: 418–421).

Situated approximately 4 miles east of Rio Vista on Andrus Island, Isleton was founded in 1874 by Dr. Josiah Pool as an agricultural service town and shipment landing. After farming a portion of Andrus Island beginning in 1855, Pool subsequently purchased an additional 535 acres from the Tide Land Reclamation Company, and then combined his land with a brother's and two neighbors' land to form the Isleton District (Reclamation District 215) in 1875. By 1878, the bustling town had a city hall, a water company, a warehouse, a hotel, a grange hall, two saloons, a blacksmith's shop, several stores, and a commercial ferry that ran to Grand Island and Rio Vista. The California Sugar Manufacturing Company also planted nearby sugar beet crops and established a mill and feed lot north of Isleton. Devastating floods wiped out the sugar beet operations in 1878. After the levees were restored, agriculture once again flourished around Isleton. During the twentieth century, Isleton became a center of asparagus and other vegetable canning, including the Libby, McNeil & Libby operations. The town's population grew to 2,090 in 1930, but began to decline thereafter (California Department of Transportation 2010: 79; Thompson 1957: 429–430; Thompson 2006: 63–65).

Byron and Knightsen

The two historic towns nearest the southwestern portion of the study area are Byron and Knightsen, both located in far eastern Contra Costa County. Byron was established along the Southern Pacific Railroad line in 1878. The Fish & Blum warehouse and the home of F. Wilkening were also built at that time. Wheat farming occupied most of Byron's early settlers. By the late 1910s, the town had 500 residents, four churches, and a school. Water from the Byron-Bethany Irrigation District (1915–1916) had also boosted the towns agricultural output of almonds, walnuts, alfalfa and dairy products. Several miles outside of town, the mineral springs and mud holes that became known as Byron Hot Springs were first developed into a health resort in 1868 that remained a local attraction into the 1930s. During World War II, the federal government interned high-ranking prisoners of war from Germany and Japan at the site. Knightsen was founded along the Santa Fe Railroad line 7 miles north of Byron in 1899. The town's agricultural activity featured celery, dairy, and silkworm production. By World War I Knightsen consisted of residences, a store, blacksmith shop, garage, and a saloon (Kyle 2002: 68; Hulanski 1917: 404–405, 426–428).

3.3.8.2 Delta Islands

The Delta's landscape comprises dozens of islands, each with its own unique history of construction, ownership, and use. Although the cities and towns described in Section 3.3.8.1 are important to the Delta's historical socioeconomic development, the Delta's islands form the majority of its landscape and hold numerous rural neighborhoods, communities, and townsites. Each island in the study area has at least one river landing or developed marina that serves as a socioeconomic hub for the island's commerce, industry, transportation, and recreation. Several of the islands in the study area are associated with the region's earliest levee engineering or agricultural achievements, and some are associated with important historic figures such as George Shima. Numerous Delta island communities remain extant while many others have passed into the archaeological record.

As noted earlier in Section 3.3.5, Paterson et al. (1978) is a thorough research report for many of the islands in the study area, and remains one of the most comprehensive resources for developing community histories for individual islands.

3.3.8.3 Associated Historic Properties

Archaeological properties that represent this post-contact period and theme, including elements that contribute to the Bacon Island Historic District, have been identified previously in the study area. Several intact structures located within the Delta towns, such as the Locke and Walnut Grove townsites, have been recorded, evaluated, and found eligible for the National Register; however, these eligibility determinations were focused on the built environment components. Few archaeological sites within these towns have been recorded and none have been found individually eligible. Upon further investigations, eligible archaeological properties contributing to this historical theme of community development may be discovered and provide information important to this theme. Archaeological resources representing this theme may include structural remains; domestic, industrial, civic, and social market artifacts; and buried or non-functioning infrastructure.

Built environment properties that represent this period and theme are located in the study area. Most of these properties are residences associated with the early community development of Hood, Locke, and Walnut Grove. Built properties associated with the earliest period of this theme would

likely be rarer than later twentieth-century properties, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

District and landscape properties that represent this period and theme are located in the study area, including the Locke and Walnut Grove townsites. District and landscape properties associated with the earliest period of this theme would likely be rarer than later twentieth-century resources, and this consideration may have exceptional weight in the evaluation and treatment of such resources. District and landscape properties associated with this theme may be represented by agricultural settlements and/or community resources associated with cultural groups and their heritage. Additional districts and landscape properties may be represented by those towns that were planned by or built around companies such as the Holland Land Company or the Southern Pacific Company.

No traditional properties that represent this historical period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.9 Water Management

Water management in California has been important to the development of the state throughout its history, from the earliest efforts to the twentieth-century implementation of the CVP and SWP. Irrigation had often been a haphazard affair in California and, with rights to much of the state's water in the hands of a few large landowners, the distribution of water seemed to defy the Jeffersonian vision of small-scale farms fostering democratic values. Following a year of drought, the California legislature in 1887 passed the Wright Act, named for a Modesto assemblyman Charles C. Wright, legalizing the creation of local irrigation districts. Farmers could appeal to their county boards for permission to create quasi-governmental organizations with the power to hold elections, tax residents living within district boundaries, issue bonds, acquire water rights, and construct conveyance systems. However, at the start of the twentieth century, irrigation, like the reclamation districts sanctioned decades before, were failing to deliver on their promise to increase economic growth and reverse the trend of urbanization that afflicted the state. In 1902, the federal government passed Newland's Reclamation Act, intended to reinvigorate efforts to spread family farms throughout the arid west (Kelley 1989: 252).

Dry-farmed wheat had been the dominant agricultural product in California for the last quarter of the nineteenth century, but by the turn of the century irrigated row crops and orchards had begun to demonstrate the possibilities of more diversified agriculture. More widespread transportation networks, the refrigerated railcar, and the subdivision of several large estates suggested that with more rational distribution of water, the state's agricultural potential was unlimited (Mowry 1951: 152; Kelley 1989: 288–291; Pisani 2002: 255).

By the end of the first decade of the twentieth century, landowners had constructed 1,000 miles of levees, creating 60 large agricultural islands in the Delta. In spite of millions of dollars invested in levees, Delta reclamation districts faced the continued threat of flooding. Nearly every winter, rains soaked the peat-laden lands, and each spring runoff from Sierra snowpack raised river levels. Reclamation districts built drainage systems with drainage canals and powerful pumps to siphon excess water from their fields. When fields were planted, they reversed their pumps to pour water back onto them to irrigate crops. The system required constant supervision and levee maintenance. As the rivers had proved highly unpredictable and uncontrollable, reclamation districts kept

shifting, raising, and widening their levees. However, districts could not predict the flow of the rivers and as the number of upstream users increased, the quantity and quality of water coursing into the Delta may have been less a random force of nature than an outcome of an intense competition for water. As a result, despite the enormous investment by the reclamation districts, the quantity and quality of water was no more predictable and possibly even less controllable.

At the beginning of the century, California began growing at unprecedented rates. Its population nearly quadrupled between 1900 and 1930 and California was becoming increasingly industrialized, fueled by the discovery of oil, the increasingly widespread availability of electrical power, and the availability of water. The farmers on these islands put heavy demands on the Delta's water supply at a time when oil and sugar refineries located in and near the Delta, and farms and cities located throughout Northern and Central California were demanding a greater share of Sacramento and San Joaquin River water supplies (Rice et al. 1996: 579–581).

Since the 1870s, Californians had tried to develop a coordinated plan for flood control in the Sacramento Valley. Increased water diversions upstream from the Sacramento River exacerbated navigation problems caused by years of excess runoff from mountain streams, and increased the likelihood of damaging floods, such as occurred in 1902 and 1909. These two problems led to the creation of a new state-run Reclamation Board in 1912. Governor Hiram Johnson sent a delegation to Washington, DC in 1912 to plead with Congress for funds to dredge the Sacramento River of debris accumulated from hydraulic mining and the construction of levees that removed an important outlet for river sediment. After several years of lobbying, the federal government bought into the project in 1917 with the passage of the first national flood control project. The resulting 1917 Flood Control Act provided $5,600,000 in federal funds for nearly 200 miles of levees, several hundred miles of bypass channels, and ultimately the rerouting of floodwaters of the Sacramento, Yuba, and American rivers. The construction of levees required the aid of the large dredges that had been used in the Delta (California Department of Public Works 1931: 31; Rice et al. 1996: 579; Garone 2011: 93–95).

This unprecedented federal participation in California's river health came at a time when upstream diversions from waterways draining into the Delta were increasing dramatically, with serious consequences for the Delta. In addition to diversions for Central Valley towns and irrigation, the urban Bay Area was planning or building extensive systems to capture and deliver Sierra Nevada water that had always flowed into the Delta. By 1917, construction had already begun on the Hetch Hetchy project, which would eventually transport Tuolumne River water to San Francisco. By the early 1920s, the East Bay Municipal Utility District was also planning a system that would deliver Mokelumne River water to Oakland, Berkeley, and other urban areas of the East Bay through the Mokelumne Aqueduct, built across the Delta during the late 1920s. Long before these systems were completed, serious drought combined with upstream diversion and increasing rice cultivation to create a crisis of saltwater intrusion into the Delta that threatened the agricultural economy and municipal water supplies. In 1920, the city of Antioch in the western Delta, with the backing of 97 Delta landowners, challenged water diversions by upper Sacramento River farmers, especially rice growers. The California Supreme Court ultimately decided against Antioch and Delta farmers but the case started serious discussions among engineers about saltwater barriers and additional freshwater storage facilities. (Elkind 1994; Pisani 1984: 384–385; Righter 2005: 55–56, 186–187, 136–166).

Since the end of the nineteenth century farmers had been replacing windmills with steam, gasoline, and increasingly with electric centrifugal pumps (Williams 1997: 73). By the middle of the 1920s it

was clear that groundwater was being drafted at rates much faster than the environment was capable of restoring it. At the same time groundwater depletion was increasing, drought conditions contributed to dropping water levels in the Delta, allowing for saltwater intrusion as far inland as Courtland, less than 20 miles southwest of Sacramento (Kahrl 1979: 49).

By World War I, it was clear to California officials that the state needed centralized water planning. In the 1880s, the California State Engineer circulated a proposal for a state water project that linked a series of canals to develop the Central Valley's agricultural potential. The idea was dismissed as too ambitious at the time, but the creation of several large water projects under the aegis of USBR, such as the Salt River Project in Arizona, built between 1905 and 1911 and later named the Roosevelt Dam, spurred renewed consideration of the possibilities for a statewide water system. After World War I, the idea gained new impetus as concern grew for the future livelihoods of returning veterans. Promoters of farmlands for veterans insisted that the state institution could guarantee a reasonable chance of success (Hundley 2001: 211). Nevertheless, many still viewed such projects as overly ambitious, unaffordable, and unnecessary (Kahrl 1979: 46; Cooper 1968: 50–52).

The 1919 work of Robert B. Marshall, a geographer with the U.S. Geological Survey, formed the basis for California's 1930 State Water Plan. The Marshall Plan envisioned a series of canals and locks carrying Klamath and Sacramento River waters south toward the Sacramento, San Joaquin, and Santa Clara valleys while multiple dams would intercept the flow of virtually every stream in the state and store the captured floodwater in reservoirs that would ensure that none of the state's most precious resource would escape unused to the ocean (San Francisco Chronicle 1919; Los Angeles Times 1919).

In 1921, the State Water Commission was folded into the Division of Water Rights of the State Department of Public Works. In the 1920s, the division undertook several ambitious studies of water supplies under the direction of Edward Hyatt. Hyatt had worked with the State Water Commission since 1916, became a deputy then chief of that division, and was then named the State Engineer of California in 1927. In 1928, the state's voters approved a constitutional amendment that limited the holders of riparian water rights to reasonable use of their water. By 1930, after decades of remarkable demographic and economic change, water planners were keen to "meet the continuance of this remarkable growth" (California Department of Public Works 1931: 21).

The state faced a two-fold problem. The first problem was the conservation and utilization of the state's water resources. However, water resources were unequally distributed, both geographically and seasonally. Any solution, therefore, would involve new storage facilities and conveyance conduits to store water where it was surplus and then transport it to where demand was greatest. The state's second water problem involved flood control. In part, solutions to these problems could be found in combination. For example, storage reservoirs could address both conservation and flood control. However, the construction of works of "such great magnitude and of such far reaching scope" required the "coordination and unification of the interests of not only the entire state, but the federal government as well" (California Department of Public Works 1931: 23).

Because the act provided for the sale of public power to finance it, several utilities challenged the act in a referendum. Though the voters rejected the utilities' challenge, the state's depressed financial condition meant that it was unable to sell bonds to finance the project without an infusion of federal money (Kahrl 1979: 47–49; Burke 1982: 96–98).

USBR ultimately took responsibility for the CVP at the behest of Congress. The project included dams and power facilities at Friant in the southern Sierra Nevada and at Kennett in Northern California, a mining town flooded with the creation of Shasta Lake when Shasta Dam was being constructed. The CVP also included a power transmission line between Shasta and Antioch, to power pumping plants that would divert Sacramento River water southward through a series of canals linking with the Delta-Mendota Canal, which was designed to replace water diverted from the San Joaquin River by canals coursing south from the Friant Dam. With the 4.5 million acre-feet of Sacramento River water impounded behind the Shasta Dam, USBR promised to provide flood control, improve river navigation, provide electrical power to farms and industries, and to provide recreational opportunities (U.S. Bureau of Reclamation 1938). While USBR promised to control salinity and to provide irrigation water for the Delta, Congress did not specifically call for Delta protection (Kahrl 1979: 47). Most of the CVP was completed by the early 1950s, including more than 500 miles of canals and 20 dams and reservoirs (Hundley 2001: 257–258).

The State of California, therefore, entered the war era virtually self-sufficient in both water and power. However, the CVP was meant primarily to address current needs. California's population had continued to grow through the Great Depression, and as World War II increased demand for California's products, the economy began to grow as well. Population growth accelerated through the war years and continued into the 1950s and 1960s. Californians promoted additional population growth even as they discovered the state was no longer capable of maintaining self-sufficiency (Williams 1997: 280–282).

In 1945, the State Legislature created the Water Resources Control Board to investigate the state's water resources and plan for California's future water needs. The study was published in 1951, at about the same time that studies were released by USBR and the state engineer, Arthur D. Edmonston. In 1957, DWR released the California Water Plan, based on Edmonston's plans. Published as Bulletin No. 3, it suggested a comprehensive plan to meet the future needs of the state (Kahrl 1979: 51). DWR said the state's economy had suffered from the "maldistribution" of California's water resources. "The bulk of the waters of the State do not occur where they are needed and are not naturally available when they are needed," Bulletin No. 3 said (California Department of Water Resources 1957: 11). The Feather River Project, as the SWP was then known, called for the construction of a large multi-purpose dam northeast of the Sacramento Valley town of Oroville, a reservoir to impound Feather River water, and a power plant. The plan promised to augment flows to the Delta during dry years, called for state-funded canals to carry the water south into the San Joaquin Valley, and additional canals to carry water from the Delta to Santa Clara and Alameda counties (Kahrl 1979: 51) Edmonston, who had designed many of the features of the CVP, also proposed specially designed pumps to lift water out of the Delta and into the San Luis Reservoir from where it would be pumped into a huge aqueduct that would carry it through the San Joaquin Valley, watering dry areas of the valley before custom pumps lifted it over the Tehachapi Mountains into Southern California. The legislature approved Edmonston's plan and demonstrated the importance of water to the state by creating an agency with water management responsibilities at the department level. Nevertheless, the voters had the final say in 1960 when they approved the project's financing (California Department of Water Resources 1974: 7; Cooper 1968: 201–204; Rarick 2005: 205–228; Kahrl 1979: 51).

The 1957 California Water Plan called the Delta the "hub" of the California Aqueduct System, bringing together the surplus waters "developed by the Klamath, Trinity, Eel River, and Sacramento Divisions, and lifting these waters into major conduits for conveyance southward and westward." It also said that "ultimate transfer of water developed in the Sacramento River basin would be

accomplished by construction of an isolated canal and control structures." People in the San Francisco Bay and Delta areas generally supported the CVP, but their opposition to the State Water Plan reflected the fact that the CVP had lowered the quality of Delta water. The State Legislature passed the Burns-Porter Act in June of 1959 calling for a November 1960 referendum for an initial $1.75 billion bond. But the legislature also passed a compromise measure providing protections and guarantees to Delta interests. Burns-Porter guaranteed water contracts made with the state; the 1959 Delta Protection Act established legal geographic boundaries and provided guarantees of quality and supply for the Delta (California Department of Water Resources 1957: 185–186; Rice et al. 1996: 586; Garone 2011: 335–336).

As work began on the two primary features of the SWP, the 735-foot-high, mile-wide dam at Oroville and the 444-mile California Aqueduct, discussions continued over how to effectively move water through the Delta. One leading water official was convinced that the peripheral canal was "a facility that wasn't needed for some time" and put it onto a list of facilities to be deferred (Gianelli 1985: 44). A committee formed in 1961 comprised of more than 30 federal, state, and local agencies spent nearly 3 years trying to resolve conflicting opinions. The committee released a report in 1964 that revised a 1940s USBR proposal for a 50-mile Delta Cross Channel to divert water from the Sacramento River to the pumping plant south of the Delta. The new proposal called for a 43-mile-long canal between 360 and 535 feet wide and 30 feet deep, beginning south of Sacramento at the town of Hood and ending at the Clifton Court Forebay. On the way it would be siphoned under Mokelumne, San Joaquin, and Old rivers (Price 1965: 291–292).

Efforts to fund and build the canal occurred in an era of growing environmental concern and debate. In 1964, Congress passed the Wilderness Preservation Act; the following year it passed Water Quality, Noise Control, and Solid Waste Disposal Acts; and in 1968 it passed the Wild and Scenic Rivers Act. California's 1967 legislature banned certain types of detergent additives and the 1969 legislature came within a few votes of banning Dichlorodiphenyltrichloroethane (DDT) from certain agricultural products. In 1970, President Richard Nixon signed the National Environmental Policy Act. Nevertheless, the State Water Project split members of the environmental community (Graff and Yardas 1994: 8–10).

Critics argued that the problems ran much deeper than mere salt intrusion: the Delta had become a dumping ground for agricultural runoff that threatened its fish and wildlife. Sacramento River water was necessary to flush the Delta. If that water was diverted before it arrived to flush out the Delta, the ecological balance of the entire system could be destroyed. One critic warned that the scheme to bypass the Delta threatened "to eliminate one of the most valuable estuaries in the world: the San Francisco Bay system" (Rice et al. 1996: 591).

Supporters made the opposite assertion. They said that the canal was necessary for the health of the Delta. The CVP was then pumping water directly out of the southern end of the Delta, often at rates that exceeded the ability of upstream supplies to replenish it. Furthermore, Sacramento River water was not responsible for maintaining the freshness of Bay Area water. DWR director William R. Gianelli told a congressional committee that the Delta was cleansed almost entirely by "tidal action" (Los Angeles Times 1970).

For its start the SWP relied on the most expensive bond issue in state history. Contrary to optimistic projections, bonds became difficult to market. Lawmakers had to seek voter permission to increase interest rates. Furthermore, underestimation of the project's true costs merged with 1960s inflationary pressures to push the overall package's price tag to nearly $3 billion. The peripheral

canal, first brought before Congress in 1966 for funding, failed to gain congressional support again in 1970 (Los Angeles Times 1970).

Throughout the 1970s, court challenges and budget constraints kept the canal from completion in spite of increasing pressure from supporters to see it constructed (Gianelli 1985: 46–48). In 1980, the California Legislature finally gathered the required votes and Governor Jerry Brown signed the bill. Opponents of the bill rallied, however, and within 3 months had gathered enough signatures to qualify for a statewide referendum. Ultimately, voters rejected the canal in a June 1982 vote.

Even with its defeat, canal plans never fully disappeared; many involved in water delivery still supported a peripheral canal. An extreme drought between 1987 and 1993 proved to many the necessity of additional means of delivering water from the north to the south. At the same time, the water deliveries to Southern California had not reached levels promised when the SWP was initially approved. Then, in the early 1990s, the U.S. Environmental Protection Agency said that the state was not providing enough freshwater to the Delta to support its fish and wildlife. Three years of planning followed with the formation in 1994 of the Bay-Delta Accord to settle many of the longstanding disputes that had held up several water projects. That resulted in the CALFED Bay-Delta program that included state and federal agencies, as well as other stakeholders including water agencies, environmental groups, and farmers. A 1997 statewide proposition authorized additional funding for water projects in the state, including funding for additional studies of the Delta. In 2006, the Bay Delta Conservation Plan was begun, funded by water contractors, mostly from south of the Delta (Starr 2004: 513; Leavenworth 2012).

3.3.9.1 Associated Historic Properties

No archaeological properties that represent this post-contact period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. Archaeological properties from this theme and era of early reclamation and water conveyance might not be present if they have been destroyed or replaced with updated delivery systems.

Possible archaeological resources for this theme, if discovered, could consist of resources related to the construction of these features, and both small-scale abandoned water conveyance systems such as ditches, canals, and pump house foundations, and large-scale systems such as non-functioning or destroyed levees, sloughs, aqueducts, and weirs.

Built environment properties that represent this post-contact period and theme are located in the study area. The Delta-Mendota Canal, a component of the CVP, was determined eligible for listing in the National Register. Built properties associated with the earliest period of this theme would likely be rarer than later twentieth-century resources, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

District and landscape properties that represent this post-contact period and theme are located in the study area. These include the Netherlands Historic District and the Lisbon Historic District, both historical reclamation districts that are also associated with water management. District and landscape properties associated with the earliest period of this theme would likely be rarer than later twentieth-century resources, and this consideration may have exceptional weight in the evaluation and treatment of such resources. District and landscape properties associated with this theme may also include large-scale water control and conveyance systems and their related features, such as levees, dams, and canals.

No traditional properties that represent this historical period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.10 Recreation

Wild game and abundant fisheries have attracted people to the Delta for millennia. Trappers such as Jedediah Strong Smith and trapping companies such as the Hudson Bay Company began exploiting these resources in the early nineteenth century. By 1850, market hunting and commercial fishing began to dominate the marshes and helped fuel a fast-developing conservation movement. By the end of the century, conservation efforts had reshaped the Delta's hunting from market to non-sale game and from commercial fishing to sport and recreation. In addition, land investors reclaimed swampland faster than it could be put to productive agricultural uses, opening large areas for alternative uses, including sport recreation. By the first decades of the twentieth century the Delta was a haven for sportsmen.

During the second half of the nineteenth century and the first quarter of the twentieth century, Americans, especially those in the West, developed a more sophisticated understanding of nature and the natural world as not only an economic resource but a spiritual and aesthetic one as well. The Conservation Movement, as it has become known, emphasized the threat industrialism posed to natural resources and in California, the voices of conservationists merged with the voices of anti-monopolists to demand a more equitable distribution of the state's animate as well as inanimate natural resources.

In 1870, the state created the Board of Fish Commissioners, and in 1878 it expanded the commission's authority to include game as well. Overhunting of several species, including deer, quail, and elk, led to outright bans on their sale. Courts repeatedly agreed with the conservationists who asserted that fish and wildlife belonged to the people of the state. In 1905, the state put a limit on the number of trout an individual could take in a single day and in 1917, the state prohibited the sale of ducks and geese. Furthermore, the popularity of sport fishing among elites led to disputes between commercial fishing operators and local communities. State and federal fish and game officials sided with fishing for sport because adjacent communities stood to gain more from sportsmen than from commercial operators. Sport fishing's popularity grew along with such innovations as the attachment of a gasoline-powered motor to personal watercraft.

As reclamation spread to even the most remote areas of the Delta, boosters increasingly portrayed the Delta's landscape as familiar and romantic, not as unusual and forbidding. Just as boosters in Sacramento portrayed their river as "America's Nile," Delta boosters suggested that "California's Netherlands," with its dykes, levees, river traffic, and agricultural productivity, combined ancient agricultural traditions with progressive American ingenuity. In the process they helped make the Delta a destination for recreation and leisure activities.

By the 1920s, with the construction of year-round roads and bridges, hotels and campsites, it had become a destination for the recreational driver, the car camper, and the sightseer. The Delta's transportation infrastructure benefited from the rapid adoption of the automobile, as automobile owners demanded more and better roads, and hotels such as the Ryde Hotel, built on River Road in 1927, catered to their many needs and desires (Pacific Rural Press 1911; Sausalito News 1910). In the post–World War II era, the widespread development of tract housing bypassed the Delta, primarily due to land ownership patterns, limited transportation options, and increased restrictions

on residential developments in the Delta. At the same time, those factors increased demand for recreational opportunities.

In the late nineteenth century, the Delta was the site of regular sailboat races (Tinkham 1923: 322). Sailing and yachting were popular throughout the Bay Area, where even people of rather limited means could enjoy the sport. By the middle of the twentieth century, power boats outnumbered sailing vessels. After World War II, the Delta became a popular destination for family boating, houseboat and party boat rentals. More recently, with the restoration of wetlands, the Delta's perimeter has become a haven for bird watchers (California Department of Water Resources 1995; Schell 1979: 196; Gardner 1964: 8–19; Young 1969: 1; Steienstra 2012: 289; Thompson 1959: 58: Garone 2011).

3.3.10.1 Hunting and Duck Clubs

Hunting clubs formed on private lands in the Sacramento–San Joaquin Valley in the nineteenth century for subsistence or recreation purposes. Some clubs were termed gun-and-cattle clubs, and were the seasonal focus of cattle ranchers on their reclaimed grazing lands. Others were termed duck clubs and were formed by farmers whose mid- to late-nineteenth century wheat crops attracted seasonal waterfowl to the extent that the crops were often damaged and occasionally decimated. As such, changes in agricultural land uses were generally followed by changes in club types. Both types of clubs are found throughout the Central Valley, on both naturally existing and reclaimed lands, and numerous of them can claim nineteenth century origins.

The Delta is part of the Pacific Flyway, a network of seasonal flightpaths for longitudinal migration by ducks, geese, and other migratory fowl. The Central Valley and its Delta wetlands serve as a hub for all of the coastal, central, and eastern California routes that individual species use (Kortright 1943: 52–53). Historic records indicate that the mid-nineteenth century practice of planting large tracts of wheat may have attracted an even larger number of waterfowl than existed previously. Prior to regulation, common commercial hunting practices included employing double-barreled shotguns to eliminate hundreds of migrating waterfowl per hour and shipping the game to high-demand urban markets like Sacramento and San Francisco (Garone 2011: 103).

During the 1870s, wheat farmers were outspoken about their disdain for migratory waterfowl and their inclination to devour wheat crops. "Gooseherders" were stationed in wheat fields during the migration season and sprayed the flocks with shot as a deterrent. Occasionally, these employees were provided cabins and expected to fire shot all day and flash acetylene torches all night to prevent crop destruction. Hugh Glenn, the Central Valley's largest wheat farmer, employed between 20 and 40 gooseherders each year (Garone 2011: 102).

In 1894, *Forest and Stream* magazine published an editorial by influential conservationist George Bird Grinnell that asked, "Why should we not adopt as a plank in the sportsman's platform a declaration to this end – *that the sale of game should be forbidden at all seasons?*" (Grinnell and Reynolds 1894: 89). The article has been cited as a significant turning point in the era's conservation efforts, as "the culmination of the nineteenth-century efforts of upper class sportsmen to protect wildlife populations by circumscribing acceptable methods of hunting came to fruition as the twentieth century dawned, once those efforts coalesced with the support of a growing and increasingly sophisticated scientific community and the enhanced authority of state fish and game commission" (Garone 2011:104).

Late nineteenth and early twentieth century state and federal regulations imposed restrictions on the number of fish, game, and waterfowl that a hunter could take within a day or a season, which slowly diminished popular large-scale market-hunting strategies. California mandated waterfowl restrictions in 1901, and these first efforts included bag limits and closed seasons. The Flint-Cary Act was passed in 1911 and prohibited the sale of game, making distinct the philosophical division between sportsmen and market hunters in terms of natural resources uses. The Flint-Cary Act was overturned in 1914 through pressure from wealthy hoteliers in San Francisco and Sacramento whose profits depended on market hunting, but this was the last legislative victory for the commercial game hunters (Garone 2011:103–104). As hunting restrictions rebounded and increased, private hunting club prestige and exclusiveness increased too. By the end of the twentieth century, club fees ranging from $2000 to $10,000 for shared hunting rights in the Delta during mandated hunting seasons were common.

Duck hunting properties are characterized by water control systems, hunting blinds, and clubhouses. Leveed canals, gauges, and weirs allow croplands to be seasonally inundated for attracting waterfowl and other animals. In this manner, the Delta's agricultural infrastructure has developed alongside its hunting interests. Some water districts, such as the Grasslands Water District in the southern San Joaquin Valley, formed in the early twentieth century and continue to operate for the sole purpose of supplying water to private farms, ranches, and duck clubs, with seasonal inundations on duck club lands a chartered priority. Duck hunting properties also contain hunting blinds, ranging from permanent wooden structures to temporary reed constructions. Developed duck hunting properties contain clubhouses, and large or particularly wealthy clubs contain multiple residential and social camp buildings. The buildings rarely conform to any architectural style and are usually simple square plans with low, single-story massing and a front-gabled roof. The buildings resemble ancillary farm structures, and may occasionally have been converted from farm uses. Immediately following the 1906 San Francisco Earthquake, hundreds of shed-like earthquake shacks were hauled to the Central Valley to serve as base camps for market hunters (Brookshear 2013).

3.3.10.2 Associated Historic Properties

No archaeological properties that represent this post-contact period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. Early recreational archaeological properties prior to Delta reclamation would be rare to currently exist due to the drastic alterations in the marsh landscape. These sites could consist of temporary campsites and hunting blinds, transportable domestic refuse (sanitary cans and bottles), discharged ammunition, faunal remains (butchered or burned bone), and abandoned transportation vessels such as boats.

No built environment properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate. Built properties associated with the earliest period of this theme would likely be rarer than later twentieth-century resources, and this consideration may have exceptional weight in the evaluation and treatment of such resources.

No district and landscape properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme

are not present, or that additional identification efforts are appropriate. District and landscape properties associated with the earliest period of this theme would likely be rarer than later twentieth-century resources, and this consideration may have exceptional weight in the evaluation and treatment of such resources. The overlap of early environmental conservation efforts with this theme may play into future landscape evaluation.

No traditional properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.11 Biographies

Biographical themes include both individuals who are recognized as significant contributors to the Delta's history and master architects whose significance likely transcends Delta history. The following biographies are represented by known listed historic properties.

3.3.11.1 Nathanial Goodell

Nathanial Dudley Goodell was a master architect and builder whose career in the Sacramento region is represented by several listed properties including Hood's Rosebud Ranch and Sacramento's Albert Gallatin Mansion (now known as the Governor's Mansion) and Heilbron House. A complete catalog of his local works is extensive, and he is credited with nearly all of the extant mansard-style roofs in Sacramento. His works are characterized by high style and ornate detail, as well as a singular reliance on wooden materials.

Goodell's early works such as the Belchertown City Hall are found in Massachusetts where he studied architecture and apprenticed as a carpenter. He arrived in Sacramento circa 1860, and established his office in the basement of Pioneer Hall at J and 7th Streets. He served as director of the Society of California Pioneers from 1878 to 1898. His first local work was the Wachhorst Jewelry Store built in 1863, and the 1860s saw his architectures reflecting colonial styles from his native New England. Between 1870 and 1890 he designed the Sacramento Grammar School, the County Hospital, the Armory Hall, the residence of Mrs. Crocker, and the Masonic Hall in Woodland. He also redesigned the mansions of Stanford, the Hale Brothers, Huntington and Hopkins, and Johnston's residence in Hood. During this period, Goodell's work reflected the Italianate style elements that were popular with the up-and-coming merchant class.

3.3.11.2 Alex Brown

Alexander Brown II arrived in Walnut Grove in 1879 and remained the most significant individual in the town's development until his death in 1923. Brown was instrumental in developing the agricultural industry in the Delta through his practices of lending money to immigrant agriculturalists and entrepreneurs, planning and building housing for agricultural workers, and building local institutions to ensure Walnut Grove's function as a central Delta community. He established elements of the town's commerce system, including banking, shipping, and utilities networks as well as agricultural operations and both residential and commercial neighborhood planning. Brown was an agent of Wells Fargo and Company, and in 1883 began using bank drafts to eliminate the costly handling of gold coins from the Delta's agricultural businessmen and workers to San Francisco and China. The Bank of Alex Brown was founded in Walnut Grove by Brown's son John in 1916.

According to the National Register listing of the Walnut Grove Historic District, Brown is recognized as a staunch supporter of immigrant agriculturalists, regardless of national origin, and thus Brown contributed to the establishment of the area's historical multi-ethnic identity that remains today. Brown's business record indicates that he was non-discriminatory in his residential and commercial lending practices to immigrants from numerous national backgrounds, including Chinese, Japanese, and Portuguese. Furthermore, during World War II Japanese interment operations, Brown's family and descendants used the Brown family's properties to store the possessions of interred local families and helped manage the property assets of those families during their absence.

Three portions of the Walnut Grove town site are listed in the National Register, including the Chinese- and Japanese-American districts, and the commercial district that Brown built between 1879 and 1923 that includes commercial storefronts, a row of residences known as Brown's Alley, and the Craftsman-style residence that Brown built for his son.

3.3.11.3 Wayne Thiebaud

Wayne Thiebaud is an American artist and California native whose career is mainly represented by his colloquial paintings of confections and everyday objects that influenced the twentieth-century Pop Art genre, and numerous paintings of California's Delta region and urban San Francisco landscapes. His tile mosaic "Water World" that clads the Sacramento Municipal Utility District's headquarters building is described as a contributing element in that building's National Register listing (Encyclopedia Britannica 2018; Sacramento Municipal Utility District 2018; Roland 2010).

Born in 1920, Thiebaud enlisted in the Army Air Corps in 1941 and was stationed at Mather Airfield in Sacramento. The military reassigned him to its First Motion Picture Unit near Los Angeles, where future U.S. President Ronald Reagan oversaw Thiebaud's work in a war film production studio. After World War II, Thiebaud worked for Universal Studios designing movie posters, and Rexall Drugs designing advertisements. He received a Master of Arts degree at Sacramento State College, and held his first solo exhibit "Influences of a Young Painter" at Sacramento's E. B. Crocker Museum in 1951 (New York Times 2010; Sactown 2010: 1–2). He briefly taught at Sacramento Junior College in the 1950s, followed by a 30-year professorship at the University of California, Davis (California Museum 2018).

During the 1990s, Thiebaud focused on Delta landscape paintings while residing at the Rosebud House in Hood, a National Register–listed residential property that is currently recognized solely for its architectural design elements (California Museum 2018; Boghosian 1979). His Delta landscapes, such as "River Intersection", are characterized by thick, bright paints that illustrate its rivers, its levees, and its farms in map-like imagery (New York Times 2010). Transcripts from the Smithsonian Archives fleetingly record his recollection of this period.

> I did lots of river pictures, lots of river landscapes, going out directly and painting. Then we owned a home down below Sacramento, near the delta, for about three and a half years, a big old dilapidated mansion that we bought—which was a kind of a horror when we bought it—and fixed it up. But it was in the middle of pear orchards, and the river was right in front of the house. Did lots of series of those then (Thiebaud 2001: 19).

A later interview conducted at the Crocker Museum recounts Thiebaud's paintings that were on view and their connection with the Delta.

> They represent a new direction in his work begun about 15 years ago and inspired by an almost forgotten corner of nearby countryside. South of Sacramento and a turn of the Interstate is an old state road that can take a person back in time, like an episode of the "Twilight Zone," to a California that existed long before the turn of the 21st century. As the road winds along a levee, high above the Sacramento River delta, the banks are dotted

> with funky fishing stations and bait and tackle shops; houseboats are moored to creaky docks; orchards and farm fields spread out like counterpanes on either side of the silvery water. Thiebaud comes here to sketch, then returns to his studio to paint.
>
> With wildly shifting perspectives and geometric patterns created by sharp curves and hard edges, the delta paintings recall his vertiginous San Francisco cityscapes. They look like aerial views—there's barely any sky or horizon line—but there are multiple vantage points. In *Brown River* (2002), some fields are painted in traditional perspective while others tilt up precariously, like a view from a roller coaster. Thiebaud sometimes paints patches of fields in unexpected hues—candy pink or baby blue—with tiny stands of trees and toy-like farmhouses along their edges (McGuigan 2011: 3–4).

Thiebaud received the National Medal for the Arts in 1994, and an honorary Doctor of Fine Arts from the California State University at Sacramento. His works are held by the Smithsonian, the DeYoung, the Crocker, and the California Museums, as well as numerous other collections in the U.S., England, Italy, and Australia (Thiebaud 2001; Sac State News 2003; McGuigan 2011; DeYoung Museum 2018; California Museum 2018).

3.3.11.4 George Shima

George Shima was a Japanese-American agriculturalist known for his significant contributions to the Delta's reclamation and agricultural developments during an era of severe legal restrictions on Asian immigrants. Called the "Potato King," Shima's work pioneered and then dominated California's potato market. Shima owned 3,000 acres of Delta potato farms, controlled an additional 5,000 acres of farmlands, and presided over 85 percent of California's potato crop. Shima was the nation's first Japanese-American millionaire, with over $15 million in assets (San Bernardino Daily 1926). He served as president and spokesman for the Japanese American Association, which supported Japanese immigrants to the U.S. and diplomatic relations with Japan (PAR 1993: 85–86). The Bacon Island Historic District was evaluated as eligible for listing in the National Register in 1993, and is an example of Shima's historic work as represented by the property's reclaimed and cultivated landscape along with its work camp buildings and associated archaeological deposits (PAR 1993).

George Shima arrived in the California Delta region in the 1880s and worked as a farm laborer on Mokelumne River lands. By the 1890s, he began leasing Delta lands and, by 1906, he had pioneered and established the Delta's potato farming industry. In 1907, it was reported that George Shima was "probably the potato king of the world" (Pacific Rural Press 1907). It was similarly reported that "George Shima, a Japanese of San Francisco, bears the title of potato king, so many acres of the land being under his control" (Sacramento Union 1908).

> Spuds have their Napoleons and kings, all the same as cattle, politics and finance. The potato king of the San Joaquin is George Shima, a Japanese man, who twelve years ago was a common laborer. Now his fortune is estimated at $150,000, and he has 6000 acres of potatoes this year, which escaped the floods, and he expects to get $2 a sack for them this winter. He and his partner, M. Naka, have just secured a lease on the Sargent Canal farm of 3,200 acres for years at an annual rental of $15,500 (Pacific Rural Press 1906).

In addition to the Sargent property on New Hope Tract, Shima leased 2,500 acres on Rindge Tract, 1,200 acres on Jones Tract, 800 acres on Levy Tract, and 600 acres on Orwood Tract (San Francisco Call 1907; 1909a). Shima began farming potatoes at Bouldin Island circa 1918, following repairs of that island's levees (Mariposa Gazette 1918). By 1920, Shima was leasing almost 3,000 acres on Manville Island and over 5,000 acres on Bouldin Island from the Empire Navigation Company (Sacramento Union 1920). Shima's industry relied heavily on barge transportation through the Delta's channels (San Francisco Call 1910). He employed drainage ditches and water pumps to remove stagnant water from his cultivated lands, and then replenished the lands with fresh Delta

water via the same equipment (San Francisco Call 1910). His modest residence in the Delta was located near Stockton (Figure 3-4).

Shima was politically and socially active in Japanese-American cultural and economic ventures. In August 1907, Shima hosted a Japanese minister of foreign affairs K. Ishii, and escorted him through the Delta's farms by river vessel and train (Los Angeles Herald 1907). He founded the Stockton Potato Festival in 1908, which promoted his potato industry and featured notable guests from both Japan and the U.S. The festival was also a Japanese-American socio-cultural event, featuring a lavish banquet, Japanese athletics, and heritage displays such as a broadsword duel (San Francisco Call 1909b).

Figure 3-4. George Shima's Ranch House on his Delta Properties near Stockton. Image courtesy of the Bancroft Library, University of California at Berkeley.

Los Angeles and San Bernardino regional newspapers carried headlines reading "Potato Crop Cornered by Jap" (San Bernardino Daily Sun 1912; Los Angeles Herald 1912). San Diego columnists suggested their readers should grow potatoes, asserting that "a Japanese has cornered the supply this year as in other years and is reaping enormous profits from his monopoly" and asked "don't you think it about time to turn a trick on this wily Japanese who is making half a million dollars a year (San Bernadino Daily Sun 1912)." Southern California columnists also presented Shima's pioneering efforts in Delta reclamation and cultivation as Shima having "bought outright or taken options on nearly every bit of potato-producing land in the state, and it is said that his operations have been extended into Portland, where the potato is produced on a large scale (Los Angeles Herald 1912)."

Despite their social and financial status, Shima and his family were met initially with racist resentment and epithets by their affluent Berkeley neighbors (San Francisco Call 1909c). For instance, in response to news that Shima had purchased a mansion on College Avenue at Parker Street, financier J. H. Harville stated:

> Roosevelt is to blame for this, for if he had not interfered with the enactment of the laws of our state we would have soon had laws which would shut the Japanese out and prevent them from owning property. Their residence in one of the best section of town would then by no means be tolerated (San Francisco Call 1909c).

Due to national and state laws that excluded Asian immigrants from owning property, Shima began purchasing property in his children's names, a practice that was disputed by anti-Asian parties. Disputers asserted that exclusion laws also denied Shima rights to lease or use his Delta lands, and these claims were put to rest by the U.S. Supreme Court during President Roosevelt's administration (San Bernardino Daily 1926). In the decades following his death, his asset records revealed that he owned controlling stock in the Delta's land management companies such as Empire Navigation Company, which owned Manville and Bouldin Islands (Santa Cruz Sentinel 1938).

In 1926, George Shima suffered a stroke in Los Angeles. He died in Hollywood, California on March 27, 1926, and was cremated following funeral services held in Los Angeles (Santa Cruz News 1926a; 1926b).

3.3.11.5 Associated Historic Properties

No archaeological properties that represent this historical theme have been identified previously in the study area. This may indicate that properties associated with a significant biographical theme are not present, or that additional identification efforts are appropriate.

Built environment properties that represent individuals who are significant in the Delta's history are located in the study area. Built properties associated with historically significant individuals represent the person's significant contributions to history. For instance, the commercial storefront of an early businessman may best convey the significance of that businessman's contributions to Delta history. The rarity of properties representing a significant individual should be considered, and may have exceptional weight in the evaluation and treatment of such resources. Known historic properties in the study area that are significant because of their association with individuals include the Rosebud Ranch, which was designed and built by master architect Nathanial Goodell and was the residence of artist Wayne Thiebaud, and the buildings on Bacon Island that are associated with the historical significance of prominent agriculturalist George Shima.

Districts and landscape properties that represent individuals who are significant in the Delta's history are located in the study area. District and landscape properties associated with historically significant individuals represent the person's significant contributions to history. For instance, the agricultural lands and distribution facilities of Japanese-American farmers may best convey the significance of that farmer's contributions to Delta history. The rarity of properties representing a significant individual should be considered, and may have exceptional weight in the evaluation and treatment of such resources. Currently, contributing elements of the Bacon Island Historic District are associated with the historical significance of prominent agriculturalist George Shima.

No traditional properties that represent this period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.12 Architectures

Architectural styles found in the Delta include traditional styles imported from the eastern United States with American settlers, the revival styles that manifested in California, and the Delta vernacular style that is endemic to the region. These architectural styles are represented by known historic properties as well as unevaluated historical resources.

3.3.12.1 Spanish Colonial (Period of Significance 1600 to 1850 or 1900)

The Spanish Colonial style originated in the United States along Spain's southwestern corridor of colonies extending from Saint Augustine, Florida through Texas, New Mexico, Arizona, and both Southern and Central California. The architecture is characterized as simple plans of adobe construction. Circa 1830, trade with the United States brought economic changes that influenced the architectures of colonial outposts, ranging from trends toward greater massing to the adoption of wood timber construction. With the advent of the railroads circa 1880, wood timber almost entirely replaced adobe in colonial-styled architectures.

Original examples of these architectures are exceedingly rare due to deterioration and overzealous renovation. Restoration efforts for many Spanish Colonial residences in the United States were actually renovations in the Spanish Revival style of the early twentieth century, and therefore may contain elements of older as well as more recent architectures that each represents different historical stylistic trends and developments.

The Spanish Colonial style is characterized by McAllister as a single-story building with a low-pitched or flat roof, thick masonry walls, multiple entrances and few small, unglazed windows. One principal substyle is distinguished by pitched roofed buildings with steep, thatched side-gables or low, half-cylinder tiled shed or side-gables, and the more rare flat roofed buildings with tar-coated shed style caps. A second major substyle emphasizes the use of heavy timbers and parapeted walls that support heavy, flat earthen roofs and drainage structures (McAllister 2014: 188–192).

3.3.12.2 Italianate (Period of Significance 1840 to 1885)

The Italianate style originated in England during the Picturesque movement's rejection of formal classical styles in favor of informal and sometimes rambling design elements. The style in the United States flourished in rapidly developing Midwestern cities and San Francisco.

The Italianate style is characterized as a two- or three-story building with a low-pitched roof, tall narrow windows, and commonly a square cupola tower. Italianate buildings are very rarely single story. The low-pitched roof has moderate to wide overhangs at its eaves, with decorative bracketing. The windows, particularly above the ground floor, may have inverted U-shaped arches. Principal substyles are distinguished by simple rectangular plans with hipped roofs and occasionally cupolas and gabled front entrances, compound L- and U-shaped plans (Italian Villas) with or without cupolas and occasionally with towers, simple plans with detailed, front-gabled roofs that are common to urban lots, and townhouses with flat or very low-pitched roofs and deep, bracketed eaves that are distinguished from other townhouse styles of the era by Italianate details on the front-facing façade (McAllister 2014: 282–286).

3.3.12.3 Craftsman (Period of Significance 1901 to 1930)

The Craftsman style originated during the Arts and Crafts movement, and is best represented in Pasadena with the work of the Greene brothers and in Berkeley with the work of Bernard Baybeck and his student Julia Morgan. Gustav Stickley, an interior designer, helped popularize the style through his magazine *The Craftsman* which included Craftsman-style house plans and images of the interior of his own home in Syracuse (United Crafts 1903; National Park Service 2017). The Craftsman style emphasized the use of natural, hand-wrought materials which, along with form, served as architectural décor. The style is referred to commonly in relation to the contemporary Prairie Style, which emphasized adaptation to local environments over handcrafted materials.

The Craftsman style is characterized by single- or one-and-one-half-story buildings with low-pitched gabled roof and exposed eaves, emphasized beams and braces that may be structural or decorative, and gabled porches supported by tapered square columns. Craftsman buildings occasionally have two stories. Principal substyles are distinguished by a front-gabled roof with a porch under the gable or under a separate gable and occasionally with dormer windows, or a cross-gabled roof where the front porch forms the cross gable, or a side-gabled roof that covers the porch, occasionally with a break in slope, or a hipped roof that lacks exposed eaves and covers the front porch (McAllister 2014: 566–568).

3.3.12.4 Mediterranean Style (Period of Significance 1915 to 1935)

The New Traditional Mediterranean style, also known as the Tuscan style, is based in twentieth-century Spanish Revival styles (McAllister 2014: 521–534) and rural Italian elements (McAllister 2014: 283–302). The style is commonly found in the southwestern United States, particularly cities that embraced Spanish Colonial imagery in its new architectures circa 1920 to 1930. It is differentiated from the Mission style that closely preceded it by both its application to residential rather than civic buildings and the composition of its architectural elements.

The Spanish Revival roots of this style mean it borrows from the full span of Spanish architectural history, and may include Moorish, Gothic, Byzantine, and Renaissance influences. Nevertheless, the Mediterranean style may be characterized by a low-pitched roof with minimal eave and red tile cladding, walls clad in stucco and extending uninterrupted to the gable on each elevation, and a prominent arch at the door or window of the primary, asymmetrical façade. The roof cladding may be numerous versions of half-cylinders or S-shaped red tiles, and doorways are dramatized by heavy wooden features or tile, plaster or structural accents. Similarly, a principal window will usually have a notable arch, decorative glazing, iron grills and balustrades.

Principal substyles are distinguished by a side-gabled roof over a multi-story, compound plan commonly with side-gabled low wings, or a cross-gabled roof on an L-shaped plan with a prominent front-gabled front façade, or a combined hipped-and-gabled roof over a rambling plan, or a hipped roof over a two-story simple plan, or a flat roof with parapets over a one- or two-story simple plan (McAllister 2014: 520–522).

3.3.12.5 “Delta” or “River” adaptation (1850 to present)

One example of conformity within architectural design can be seen in what are commonly referred to as *river homes* or *Delta homes*. These two-story buildings were often built within feet of river levees and below the river’s waterline. Some of the finest examples in the Delta are located in the study area along River Road, the meandering SR 160 atop the Sacramento River levee. The second stories of these homes frequently extend beyond the height of the levee, and in the event of a flood, it is customary for the occupant to open all doors and windows on the ground floor, and retreat to the dry, second floor (ICF 2012). This architectural adaptation is found in floodplain environments throughout the United States, and is an adaptation underlying other conventional styles and vernacular designs.

3.3.12.6 Associated Historic Properties

No archaeological properties that represent this historical period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

Built environment properties that represent historically significant architectural styles are located in the study area. Built properties associated with historically significant architectures represent all or many of the characteristics of the architectural style that convey the style's significance. The rarity of properties representing a significant architectural style should be considered, and may have exceptional weight in the evaluation and treatment of such resources. Furthermore, continued identification and evaluation of architectural properties may have the potential to contribute to architectural history, including delineating the Delta's regional expression of architectural elements, material compositions, and periods of significance that characterize each style.

Residential properties are the most common built environment property type in the study area. Known properties associated with architectural themes include the Italianate-style Rosebud Ranch, the Mediterranean-style Amos Pylman House, the Georgian-style George B. Green House, the Foursquare-style residences at 38320 and 36542 South River Road, and the Delta-style residences at 37383 Country Road in Walnut Grove, 40418 South River Road in Clarksburg, 3245 Byer Road in Byer, and 10776 2nd Street in Hood.

Districts and landscape properties that represent this period and theme are located in the study area. The townsites of Locke and Walnut Grove, as well as the agricultural industries at Bacon Island, have been determined eligible for listing in the National Register. The townsite of Locke is also a National Historic Landmark due in part to the significant historical architectural styles represented in its commercial and residential buildings. The early company towns and the collection of vernacular resources along River Road may also represent historic districts or landscapes associated with this theme.

No traditional properties that represent this historical period and theme have been identified previously in the study area. This may indicate that properties associated with this significant theme are not present, or that additional identification efforts are appropriate.

3.3.13 National Heritage Area Themes

A National Heritage Area (NHA) is a federal designation enacted by Congress that recognizes the national geographic, economic, natural, and cultural importance of a region. The NHA program is unrelated to the National Register, Section 106 of the NHPA, and the National Environmental Policy Act. However, the goals and content of NHAs have the potential to bring new historical themes and narratives to identification, evaluation, and treatment of cultural resources.

The Delta Protection Commission

Under California's Delta Reform Act, the Delta Protection Commission (DPC) was established to represent the interests of the Delta inhabitants' economic, ecological, and cultural interests. According to DPC's government website (Delta Protection Commission 2018):

> "The Delta Reform Act emphasizes that: "the basic goals of the state for the Delta are the following: (a) Achieve the two coequal goals of providing a more reliable water supply for California and protecting, restoring, and

> enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place." (Resources Code § 29702)
>
> This recognizes that the Delta, in addition to being California's water hub and a fragile and crucially important ecosystem, is also a PLACE – a place for people, homes and businesses, and a place filled with human history, cultural richness and diversity."

DPC has launched several programs to meet its goals, including forming the Delta Narratives Project research team and developing the recently-adopted Sacramento-San Joaquin Delta NHA.

Delta Narratives

In a 2015 report prepared for the DPC, the California State University Sacramento Center for California Studies described its Delta Narratives Project Team's suggested strategies for preserving the Delta's historical and cultural heritage. The team adopted former State Historian Kevin Starr's argument that "California is the site of a particularly intense pursuit of the American Dream" (Center for California Studies 2015: 4) and prepared four scholarly essays that examine how this theme is manifested in the Delta (Garone 2015; Swagerty and Smith 2015; Helzer 2015; Camfield 2015). The team recognized that many important Delta histories may be underrepresented.

Sacramento–San Joaquin Delta National Heritage Area

In 2012, DPC's Sacramento–San Joaquin Delta NHA feasibility study was approved by the NPS and submitted to Congress. On February 12, 2019, Congress approved the Natural Resources Management Act (S. 47) which includes adopting the Sacramento-San Joaquin Delta NHA; the legislation is pending White House approval. The NHA elaborates on identified themes of national importance that characterize the Delta's landscape, economy, and culture. Representation of these themes includes historic resources that contribute to the Delta's heritage for preservation planning purposes, e.g. heritage tourism, adaptive reuse projects, and interpretive projects (Delta Protection Commission 2012: 37). The Sacramento–San Joaquin Delta NHA recognizes known archaeological, built environment and historic district resources that contribute to the Delta's heritage, as well as museums that house information about the past and cultural centers that support current traditions.

Five heritage themes are part of the Sacramento–San Joaquin Delta NHA, and these are currently expressed in the following terms.

- "At the heart of California lies America's inland delta," characterizing how the Delta is a central feature of California's geography and the nation's largest West Coast estuary.
- "Conversion of the Delta from marshland to farmland was one of the largest reclamation projects in the United States," recognizing the historically significant undertaking at the national level.
- "Multi-cultural contributions and experiences have shaped the Delta's rural landscape," recognizing the Delta's diverse ethnic histories as well as the specific historic communities that reflect that diversity.
- "The Delta, California's cornucopia, is amongst the most fertile agricultural regions in the world," identifying national and international agricultural significance.
- "The Delta lies at the center of California's water resource challenges," contextualizing both the place and its most vital natural resource.

As a comparative example, the adopted Mississippi Delta NHA emphasizes heritage themes such as the "River and the Land," which characterizes the landscape's use by all humans who have lived there; "the Blues," which recognizes the birthplace of a significant American music tradition; "Moving Toward Freedom," which contextualizes the Mississippi Delta's role in the nation's human rights history through the eras of slavery and civil rights; "A Wellspring of Creativity," which catalogues the writers and other artists who have captured the Mississippi Delta in their works; and finally, "Diverse Communities," which acknowledges the waves of immigrant populations that are the foundation of the region's history. These Mississippi Delta NHA themes are comparable to Sacramento–San Joaquin Delta NHA heritage themes, and each draws in some part from its extant cultural resources. For instance, "the Blues" theme calls out cultural resources that contribute to that theme across the landscape, and builds a comprehensive program of preservation and interpretation for those resources.

No archaeological, built environment, district or landscape, or traditional properties that represent the themes of the NHA have been identified previously in the study area. The NHA themes are relevant for consideration by future projects because they represent cultural and historical values identified by the Delta's inhabitants, and have a high potential for representing the Delta's local history and historical traditions that have not been previously studied.

3.3.14 Post-Contact Archaeological Research Themes

The study area has the potential to contain a variety of undiscovered resources, which, as previously discussed, could be associated with the early Delta exploration (1772–1848), reclamation, and agricultural development and expansion (1848–1950), and establishment of Delta communities and towns (1850–1913). Due to the broad range of activities that could have occurred in the study area, the archaeological deposits could reflect a variety of social groups, ranging from the individual residential unit (e.g., individual, family) or the collective, immediate community (e.g., neighborhood, agricultural camp). The following research themes were identified for the study area to address this wide range of possibilities, and will be further refined as needed, based on the results of investigations.

3.3.14.1 Consumer Behavior

The growth of the capitalist economy, specifically facilitated by the Industrial Revolution, affected the global and national market economy, labor, social structure, and trade networks throughout the country. Industrialization in the United States brought increasing amounts and varieties of consumer goods to much of the population. Urban residents were flooded with mail-order catalogs, newspaper advertisements, and magazines with advertisements for foodstuffs, patent medicines, and personal goods. The focus on consumption can be seen as an outgrowth of the Industrial Revolution, along with the labor movement that brought workers more income in the form of cash and more time to spend it.

Although newly purchased goods often served subsistence functions, they also served non-subsistence functions by acting as symbols that conveyed information about their owners. Symbols were given mass public recognition by retailers through their catalogs and department stores, which became the source of influence about how one should dress, furnish a home, and spend leisure time.

The material record reflects how people were influenced by fashion and mass-marketing as well as how they prioritized cost, quality, popularity, and efficiency in their consumer choices. In addition,

even though certain goods represented cultural strategies for living and success in certain ethnic or economic neighborhoods, individual variance or deviance from established ethnic, community, and gender-specific values can be identified in private households or similar residential groups.

Consumer behavior also became a mechanism for the lower classes to assert affiliation and moral equivalency to the elite upper class. Material culture became a symbol of increased status and social and economic achievement (Shackel 1993).

Consumer behaviors of the early twentieth century were transformed by marketing and advertisements geared toward convincing the consumer that abundance and the possession of material goods was the key to improving happiness. Corporations created false needs in consumers and ultimately began to manipulate fears and desires and to elevate superficiality over substance (Peiss 1998).

Between 1890 and 1910, corporations targeted mass production, distribution, marketing, and advertising to transform the local patterns of buying and selling goods in urban and rural areas throughout the United States, and thus to create a culture of consumption that would increase corporate profits (Horowitz 1985). Specific materials mass marketed in the early twentieth century included clothing, cosmetics, furniture, food products, pharmaceuticals, and household goods (e.g., tableware, stemware, and food storage and preparation tools).

Research Questions

- Did the quantity of goods and supplies flowing into the Delta region from the U.S. and abroad increase over time as the area became more established or did it decline as more local industries were developed to serve these needs?
- Did lower-class residents attempt to mirror middle- and upper-class elites within the community in terms of material culture and social status?
- How was the community influenced by the corporate marketing strategy of the early twentieth century? Was there a shift in purchasing/consuming nationally mass-produced items?
- Was cost, tradition, quality, fashion, or efficiency the prime influence on consumer choices of the community during the nineteenth century? How did this change in the twentieth century?
- Did world events such as World War I and World War II impact the supply, demands, and booms and busts of goods and services coming from the Delta?

Data Requirements

Specific types of data are required to address a given research question. Presenting these data requirements before excavation guides the assessment of archaeological features identified during excavation. Both historical and archaeological data are required to address some of the research questions.

Historical Data

To address the questions of consumer behavior in the study area, especially in terms of differences between classes, it will be necessary to identify the occupants of specific lots through time. Only in this way can questions of differential access to or uses of consumer goods by the inhabitants be addressed.

Sources to identify individual resident consumers include census records, tax assessor's records, and city directories. Some of these resources, such as census records, could also help to further define the individual residents by providing information about ethnicity, place of birth, socioeconomic status, and household structure. To identify the businesses that were consumers, many of the same sources would be consulted with a few additions, including historical maps (e.g., town plats, Kroll Map Company maps, Sanborn Fire Insurance maps [Sanborn maps], engineering maps), census records, local product catalogs, tax assessor's records, and newspaper articles providing information about business names, figures for the amount of money invested in the companies, and the businesses' public image, whether created by them or by outside journalists. If available, oral histories and diaries will be particularly helpful for understanding the authors' perceptions of and practices of consumer behavior responsible for the products purchased and then discarded in the area.

In addition, a variety of archival resources will be used to identify what products were available to the residents and businesses of the study area. Sources such as historical maps (e.g., town plats, Kroll Map Company maps, Sanborn maps, engineering maps), census records, local product catalogs, city directories, tax assessor's records, and newspaper articles will be used to determine what businesses were located in the vicinity of the site. Other sources, such as printed advertisements and mail order catalogs, will provide information about the products available to the wider population at local stores and markets as well as those that could be delivered to their doorstep. These sources would also help to develop a general understanding of broader patterns in consumer behavior so that potential outliers, such as one individual with an affinity for a specific product or type of product, is not mistakenly interpreted to represent a population's preferences or trends.

Archaeological Data

Archaeological concentrations from discrete contexts (intact hollow-filled features and sheet refuse) containing a sufficient quantity and variety of artifacts are needed to address research questions specific to consumerism. Features should contain well-stratified, temporally diagnostic deposits to assist researchers in documenting and understanding change over time. Features should retain integrity and have identifiable associations.

Artifacts reflective of changes in consumer patterns in the early twentieth century would need to be readily identifiable and datable. A large quantity and variety of domestic and personal items may provide the most information for documenting consumer choices. Specifically, discrete depositional layers containing dense concentrations of mass-produced food and beverage containers, toiletries, other household materials will indicate participation into the mass consumption revolution that occurred in the late nineteenth and early twentieth century.

3.3.14.2 Spatial Organization

The study of spatial organization of an archaeological site allows researchers to understand the basic layout and structure of the site, laying the groundwork for meaningful interpretation of the lives of site occupants. Research has the potential to determine how the residents of Delta towns and camps defined and used space while adhering to traditional practices or adopting western models, or in response to constraints such as access to utilities, services, or transportation routes. Spatial organization can also reflect differences in status.

According to Allen, social boundaries can be marked by material symbols, including the nature and placement of buildings (Allen et al. 2002). For example, buildings located at the Woolen Mills

Chinatown in San Jose, California, had brick facades and were designed to present a "public front" to and for the Chinese community. The study of the layout of the Woolen Mills site reflects a balance of traditional Chinese organization along with local Euroamerican traditions to suit the needs of the local population.

Research Questions

- Was the layout of the towns in the Delta intentionally planned and, if so, what does it say about social relations within the community and with the broader culture?
- How does the spatial organization of the community compare to others in the region?
- Can organizational differences in the community be related to ethnic, technological, or economic distinctions?
- Is there evidence that the spatial organization changed over time through improvements of utilities, abandonment of structures, or changes in landscapes?
- Are there indications of gender-distinctive uses of space?
- To what extent did geomorphologic conditions influence the establishment, success, or failure of the community?

Data Requirements

Historical Data

As discussed above with regard to spatial organization, considerable effort will be directed to illuminate the layout of the community to provide associations between any identified archaeological deposits and specific occupants or businesses. Historical maps (e.g., town plats, Kroll Map Company maps, Sanborn maps, engineering maps) will likely prove to be the most useful source for this information. Also, there are historic photos, oral histories, and secondary resources available at the Huntington Library in San Marino, California that could provide additional information. Together, these sources will provide a baseline of spatial layout information, which additional primary research may support, refute, or clarify. Photographs, census, and tax assessor's records will be reviewed to augment this information towards the goal of addressing questions regarding spatial organization.

Archaeological Data

Archaeological concentrations from discrete contexts (hollow-filled features and sheet refuse) representing a sufficient quantity and variety of artifacts are needed to address research questions about spatial organization.

Intact structural remains (foundations, outlines of features), refuse features (sheet refuse, hollow-filled features), and landscape features (fence lines, natural and cultural modification to the land) will help reconstruct the spatial organization of the community. Features should retain integrity, be temporally discrete, and have identifiable associations. Artifacts attributable to a specific activity (e.g., cooking, agriculture) will guide researchers in the interpretation of the spatial organization of the site.

3.3.14.3 Urban Geography

Archaeological resources can help us understand characteristics of the natural environment as well as landscape modifications made during the historic period. They can aid in understanding beginnings of urban planning and infrastructure, such as electrical and telecommunications, water supply and storage, trash and sewage disposal, flood protection, fire protection, and drainage. Features related to water supply and waste disposal can incorporate public and individual private adaptations to basic needs in urban areas, and are often linked to social and political status in neighborhoods (Bell 1987: 57). In general, historic ground surfaces were periodically filled over to cover up the debris left by fires, surface refuse and accumulated debris, and to eliminate miasmas (Praetzellis and Praetzellis 1990).

Archaeology is often the only method of examining the responses of individual residents to legal norms established by the city. For example, in many cities "earth closets" (i.e., privies dug directly into the ground) were outlawed in the 1880s and historical records document many sewer hook-ups at this time. Archaeological evidence, however, demonstrates that some urban households and neighborhoods continued to use earth privies well into the twentieth century (Costello 1999). Similar examples of ad hoc drainage, fire protection, and refuse disposal have been discovered archaeologically (Costello et al. 2002).

Research Questions

- How did residents respond to city public health and safety ordinances?
- Did residents keep prohibited livestock, engage in unlawful activities, and build or use facilities that did not "meet code"?
- How do the archaeological infrastructure remains relate to the municipal ordinances regarding improvements to the infrastructure?
- Did residents connect to town and regional electrical or telecommunication systems? Is there evidence of changes in electrical or telecommunication advancements or supply?
- Did residents connect to town sewer and water systems? Did residents devise their own solutions to sewer and refuse disposal?
- Was the design of the infrastructure current with industry standards? Was the area up to date with new sanitation standards developed as a result of contemporary germ theory and public health information?
- Is there evidence of expedient construction techniques using whatever materials were readily at hand?

Data Requirements

Historical Data

A variety of archival resources will be used to identify how the area developed or was envisioned to have developed. Sources such as historical maps (e.g., town plats, Kroll Map Company maps, Sanborn maps, engineering maps) and newspaper articles will be used to determine how the area was spatially planned and developed, including changes in access to utilities, street orientations, and built structures. Newspaper articles, oral histories, diaries, public works documents, and code enforcement records will also assist in determining popular and political pressures on this

development and any final determinations or directions they took, including details regarding the amount and types of materials used. Conclusions from this information will be checked against both specific historical resources, such as historical photos depicting the area, and the archaeological record to identify any disparities.

Archaeological Data

Remains of infrastructure, including sewer, water, and power lines in relation to structural remains will help to document and understand the urban geography of the area. Stratigraphic evidence of modifications to the landscape will assist with reconstructing the geography of the site.

3.3.14.4 Trade Markets and Networks

The increased access to national markets resulting from Northern California's connection to transcontinental railroad lines had a tangible influence on the development of the Delta and the daily lives of its inhabitants. The influence of this connectivity would have been expressed in material culture and refuse disposal practices, as well as the area's urban development. The majority of artifacts recovered from early twentieth-century sites in the western United States were mass produced in the eastern United States and transported to the West for resale. However, due to the large numbers of Chinese and Japanese workers in the Delta, it is expected that many goods were also brought from China and Japan. The origin of manufacture and distribution of these artifact types may allow researchers to examine the impact of the emerging global economy on the Delta region through analysis of trade networks and market access.

Emerging Markets

Globalization of the economic, cultural, and political spheres in the late-nineteenth century and early twentieth century had a direct impact on communities and individuals nationwide. During this period, local economies and goods were largely replaced by mass-produced materials, often transported hundreds and even thousands of miles from an emerging manufacturing core in the eastern United States. By the end of the nineteenth century, the majority of households in the United States had access to the national market regardless of economic status or geographic location. Once an efficient route of transportation was established from the manufacturing core to a periphery, consumers had almost unlimited access to a variety of manufactured goods. Mail order catalogs, such as Sears & Roebuck and Montgomery Ward, allowed people to order manufactured goods that would then be delivered via the transportation networks.

Access to the national market changed the daily lives of many Americans and ultimately affected the formation, maintenance, and operation of households, businesses, and even larger community networks and systems. After the completion of the Transcontinental Railroad and regional railroads throughout the United States in the late nineteenth century, there was a substantial shift from local and regional-based economies, strongly dependent on agricultural production, to a national economy more heavily focused on the consumption of manufactured goods.

The majority of the manufacturing capacity in the United States during this time period was located in what was referred to as the "American Manufacturing Belt," located in the eastern United States between the Great Lakes and New England (Pred 1970). Archaeological studies (Adams et al. 2001; Riordan and Adams 1985) of commodity flow from and national market access to this manufacturing core have relied heavily on the model developed by Pred (1970). Pred developed a geographical model to study the way a national economy produced and distributed manufactured

goods. A community's access to manufactured goods can be placed into three categories based on accessibility to markets via land and sea transportation: High Access, Intermediate Access, or Low Access Areas (Pred 1970: 280). This geographical model was later adapted for use with archaeological data by Riordan and Adams (1985).

Riordan and Adams (1985: 5–6) noted the complexity in trying to analyze market access. The type of commodity and the nature of existing transportation networks are important factors in determining whether an area has ready access. In Pred's classification of market access, the Delta at the turn of the twentieth century may have been classified as a Low Access Area, given the great distance between Northern California and the American Manufacturing Belt. However, at the close of the nineteenth century, as nearby Sacramento and Stockton gained increased connectivity to the emerging national market through the Transcontinental Railroad, its market access was in the midst of rapid change. Prior to the completion of the Transcontinental Railroad, these areas had access to mass-produced goods from national and international manufacturing cores via shipping and overland routes. Yet, it is likely that regional manufacturing and the local economy provided a greater variety and less-expensive alternatives for consumers in the region.

Northern California became increasingly connected to the global economy as it urbanized in the second half of the nineteenth century. For this reason, the emerging conflict between rival global cores played out in the material culture of the area. For much of the nineteenth century, Great Britain was the core nation of the world system. As the century closed, British core status was challenged and eventually eclipsed by the United States. Evidence of this conflict is found in advertisements of goods that were marketed and sold in the region in the late nineteenth century. Prior to 1900, British ceramics dominated the market and American ceramics were considered inferior (Sutton and Arkush 2002: 200). According to the Sears Roebuck & Co. Catalogue in 1897, "American made crockery is well known to be inferior to the English and French manufacture" (Sears Roebuck and Company 1968). By the turn of the twentieth century, reliance on the British ceramic industry had declined in American markets and was being replaced by the American ceramic industry, primarily the Ohio Valley potteries. By 1902, the Sears Roebuck & Co. Catalogue highlighted the virtues of American-made ceramics (Sears Roebuck and Company 1969; Sutton and Arkush 2002: 200). The shift from British ceramics to American-manufactured ceramics was directly tied to the American Manufacturing Belt that was able to flood the American market with mass-produced goods.

Emerging Networks

The concept of a "central place" can be used to understand economic, social, and political networks within a community, as well as in larger cities that may have had a more active role in broader economic, cultural, and political systems.

In his work on trade networks in Silcott, Adams (1976: 1) used the term "central place" specifically to describe a locality to which "people are oriented for social, economic, and political reasons." People and places are entwined in economic networks, eventually linking the individual consumer to national and international markets via complex transportation networks, distribution centers, and manufacturing locations. Adams' study of trade networks and interaction spheres in Silcott identified six different trade networks, several of which he was able to document archaeologically. These trade networks included what Adams (1976: 104) defined as "local," "local-commercial," "area-commercial," "regional," "national," and "international" networks, terms that may be applied to the Delta's historical networks as well.

From the late nineteenth century, the Delta and surrounding region supplied vast amounts of produce that was shipped nationally. Nearby Sacramento, Stockton, and San Francisco had local and regional trade networks to facilitate the transportation of raw materials to the core manufacturing areas in the eastern United States as well as the distribution of mass-produced goods and services to the more remote areas of the region and beyond. As a "central place" in Northern California, Sacramento was a center of cultural and economic exchange for the region, and served as a central place for more rural areas in California. This relationship between local and regional communities and larger networks is critical to recognizing and understanding globalization in the material culture of urban archaeological sites. The interactions between these places can be studied in terms of commodity flow, access to national and international markets, and the relationship between these emerging networks and urbanization.

Connecting these emerging markets in the Delta region in the late nineteenth century and early twentieth century to central places provides information about how communities of varying scale influenced one another and interacted with national and international markets. Late-nineteenth-century and early-twentieth-century archaeological resources located in the study area have the potential to provide information on how the region interacted with local, national, and international markets. Analysis of specific stratigraphic events in relation to diagnostic artifacts and archival research may be able to document how the cultural landscape was influenced by the emerging global economy and increasing access to new consumer trends, products, and technologies. Documenting the archaeological expression of the growing role of the region as a central place on the household and neighborhood level may prove valuable for comparisons with similar deposits from other urban and rural areas.

Research Questions

Transnationalism refers to any processes that extend beyond state boundaries, including economic, political and sociocultural networks. Because transnationalism folds in many areas of study such as economy, identity, consumerism, and material culture, many of the questions presented within the other research themes also address issues of transnationalism.

- How reliant were consumers on local or regional versus national or international produced goods?
- Are there patterns in what goods were purchased from the local or regional market versus the national or international market? Are these patterns reflective of a distinction between perishable and non-perishable items? How does emerging food preservation technology change subsistence patterns?
- Can Japanese and Chinese ceramic artifacts indicate which regions the Japanese and Chinese inhabitants came from, or are the ceramics mass produced by large manufacturers?
- Does the presence of British ceramics indicate a continued reliance on an international market, or does it suggest that these ceramics were purchased from an earlier time period when British ceramics were popular?

Data Requirements

Historical/Archival Data

As with many of the other research questions, establishing clear associations between features and the occupants of the study area will be critical to addressing questions of transnationalism. Potential archival sources could include census records, tax assessor's records, and city directories to identify differences in populations and ethnicities. Business records (general stores and shops) and railroad and shipping records would provide information regarding the import and export of goods and materials in the communities. Efforts will also include archival research to identify what products were available to the residents and businesses of the study area, as described previously.

Archaeological Data

Archaeological concentrations from discrete contexts (hollow-filled features and sheet refuse) containing a sufficient quantity and variety of artifacts are needed to address research questions specific to transnationalism. Features should contain well-stratified temporally diagnostic deposits to assist researchers in documenting and understanding change over time. Features should retain integrity, and have identifiable associations.

Artifacts reflective of ethnic identities and origins, and items that are not attributable to a specific ethnicity but can be readily identifiable as to place of origin and function will help researchers understand transnationalism. A feature that can be specifically associated (through historical research) with a particular individual and/or family will assist us with better defining "households" within the study area. A comparison between the archaeological materials and inferences from the archival research may provide valuable insight on the outside perception of identity.

3.3.14.5 Gender and Family

According to Voss, historical archaeology offers valuable insights into questions regarding gender because written records are often biased in their representations of men and women (Voss 2006). The archaeological record is critical for understanding the history of gender roles and relationships from a different perspective than the written record.

Archaeological studies in New York City by Diana Wall were designed to test the notion that the division of home and workspace in the late nineteenth century were caused by economic changes tied to capitalism, and that women were passive "victims" in this event. Wall focused her investigation on the organization and service of family meals. Her research discovered that by the mid-nineteenth century, the family meal was not only focused on food, but also the dishes on which the meals were served. According to Wall, the dishes became symbols in the increasingly elaborate and ritualized mealtime. Wall concluded that this change in meal organization and service occurred prior to the economic changes of the late nineteenth century and argued that women must be regarded as active agents in the redefinition of gender (Wall 1994).

Voss argues that gender studies in archaeology should include women, men, children, and the elderly. Gender identities, roles, and ideologies vary across cultural groups over time and also intersect in powerful ways with race, ethnicity, and class (Voss 2006). The spatial organization, architecture, material culture, and foodways within the study area can be better interpreted by understanding the role of gender within the local community.

Research Questions

- How did the status of women change over time as women became increasingly involved in women's movements?
- What percentage of the women associated with the archaeological resource participated in the work force? How did this change over time?
- What were the perceptions of femininity/women's roles versus masculinity and men's roles in the study area?
- How did residents manifest age or gender roles (traditional or not)?
- How is the teaching of values (family, social, political, moral, religious) reflected in children's artifacts?
- Is there evidence that people were educating their children?
- Is there evidence of female head of households or female-involved businesses?

Data Requirements

Historical Data

As with many of the other research questions, establishing clear associations between features and the occupants of the archaeological resource will be critical to addressing questions of gender and family. Potential archival sources could include census records, tax assessor's records, city directories, local historical societies, newspapers, and photographs. A review of oral histories and other personal accounts may also be fruitful.

Archaeological Data

Archaeological concentrations from discrete contexts (hollow-filled features and sheet refuse) representing a sufficient quantity and variety of artifacts are needed to address gender and family research questions. Features should contain well-stratified temporally diagnostic deposits to assist researchers in documenting and understanding change over time. Features should retain integrity and have identifiable associations. Specialized activity areas such as outdoor cooking areas, kitchen gardens, or gaming areas with artifacts can be readily associated with gender and/or age. Artifacts attributable to a specific gender or age will guide researchers in the interpretation of the spatial organization of the site.

3.3.14.6 Class and Ethnicity

The term *class* is typically defined as the relationship among members of society that is continuously negotiated and is denoted through social practices, affiliations, and the symbolic use of cultural materials. It is often described as a discrete social or economic category or a relative and ranked category. Viewing class as an abstraction of ranked discrete units, however, ignores the relationships that are negotiated and relegates the study of class to a study of economic points along a continuum.

This ranked continuum bears a resemblance to discrimination-justifying social-evolutionary perspectives. An alternative to this discrete, ranked, category perspective of class is offered by McGuire and Reckner (2002) and Wurst (2006), who argue for a definition of class as a construct of

perceived economic relationships. This approach defines classes by their relationship to the means of production and to each other. The key difference in this approach is that the relationship becomes the focus of study, not the economic rank of the participants. By looking at class in this manner, classes may still be seen as categories, but these categories are fluid and have histories surrounding their formation (Wurst 1999).

A fluid perspective of class as categories affects the way we analyze the material record, so that a simple analogy between the value of goods and the status of its user is no longer valid. Paul Mullins (Shackel et al. 1999), for example, finds that African-American household sites in post-Civil War Annapolis contain half as many coarse stoneware and glass preserving jars (usually associated with cost-saving home preservation methods) as their Euroamerican counterparts.

In addition, African-American household sites contained more of the higher-priced brand goods then their Euroamerican counterparts. A simple value and status analysis might find that African Americans had more money than their Euroamerican neighbors to spend on brand goods. The historical context, however, indicates that they did not have more money, but were discouraged from engaging in the personal interactions involved with purchasing locally made items, which were lower in price than the brand goods they could purchase anonymously from a catalog.

Through a synthesis of the material record with the historical record, Mullins finds that catalog buying enabled African Americans to purchase without prejudicial interaction while allowing them to participate in the bourgeoning consumer culture of the late nineteenth century.

Some argue for the subsumption of other forms of inequality—such as gender, race, and ethnicity—under class. For example, the Latin-American caste system—which superficially seems to be based on race—allowed a person born underprivileged, who then attained wealth, to obtain legal papers declaring him "white" and, therefore, of the privileged caste (Wolf 1959). Applying the subsumption perspective to this system would reveal that class, not race, was the underlying determining factor in assigning distinction in the caste system. Likewise, economic conflicts based in Ireland have been forged largely around the distinction between Catholics and Protestants.

The point is that conflicting groups distinguish themselves from one another by magnifying their differences. These distinguishing characteristics—such as race, ethnicity, or religion—become the focus of attention and serve to conceal the complex mechanics of class. As a result, the existence of class relations becomes altogether denied (McGuire 1991: 106). Ethnicity, class, gender, and religion are ways in which we identify groups of individuals. Identity, however, is a much broader topic applicable to multiple types of human groupings. When groups interact, they identify themselves and others through perceived differences. When interacting groups express their identity, they do so as both active and responsive participants. Ethnicity as identity seems to be most apparent in situations wherein there is conflict. Spicer (1971: 98) states "what becomes meaningful is probably a function of the oppositional process."

For example, in situations with the immigrant Chinese and the dominant host society, Coughlin (1960) and Glick (1942) see the Chinese reinforcing their traditional values, behaviors, and organizations when the host society is hostile. On the other hand, Amyot (1973) sees less noticeable aspects of Chinese ethnicity when the host community and Chinese relations are amicable. This paradigm is challenged, however, by the fact that key individuals, such as merchants, served as liaisons to the dominant host society.

Omohundro (1978) sees this strategy as one of defense, however, in that Chinese merchants "advertise their ethnic distinctiveness and consequently shift the stress inherent in face-to-face commercial transactions at the ethnic group level." Merchants appear to be the most common group of individuals who held this position, interacting and negotiating with influential local entities such as local governments (Coughlin 1960: 80, Glick 1938: 74, Lee 1988: 191).

Hodder (1979) suggests the most salient archaeological data applicable to the question of ethnicity exists when there is conflict. Ethnicity is an appropriate subject for archaeological studies if it is defined as the "mechanism by which interest groups use culture to symbolize their within-group organization in opposition to and in competition with other interest groups" (Hodder 1979: 452). Barth (1969) and Spicer (1971) warn us that this mechanism or system is dynamic and that material aspects of a group may change without affecting that group's identity because ethnicity is a function of self-identification and ascription, not objective identification from outside.

Recent work illustrates that what archaeologists perceive as ethnic boundaries may be fluid, permeable in part by ethnic individuals who served as liaisons to the external community. Ah Tye Farkas and Praetzellis (2000) relate such an example from the excavation of a portion of the Sacramento Chinatown, suggesting that merchants serve in this capacity and the overall system affects the material record.

The question is whether this interpretation is testable using archaeological data. Archaeological examinations of the relationship between ethnicity and material culture have indicated that ethnicity-based differences can be identified and studied in the archaeological record, but there have to be factual data regarding how each group was identified or identified themselves in a distinctive material way.

Research Questions

- Psychological studies on bicultural individuals and immigrants have focused on "code-switching" (how people can fluctuate between certain identities depending on the situation). What (if any) examples of code-switching are evident in either the material cultural or historical record?
- Are there indications of use of traditional practices by the residents while also conforming or converting to popular mores and tastes of the dominant culture?
- Were other ethnic groups present within (or immediately adjacent to) the archaeological resource? What was the nature of these relationships and do they indicate displays of ethnic identity?
- What was the socioeconomic status of various residents? Did the resident merchants contribute to the local Delta economy?
- Did residents identify or display their class status using material culture?
- Are there differences in the archaeological record associated with owner occupancy of residences versus tenants or boarders?

Data Requirements

Historical Data

The best sources of historical data to identify socioeconomic status of residents are likely to come from an analysis of county tax assessor's records. Other sources of information regarding differences in socioeconomic status between residents will come from information available in the census, business directories, and business license records. From death and probate records it may also be possible to glean information about the overall health of individuals, as well as their possessions at the time of death. Specifically, census research will show whether the presumably highest-class individuals (merchants, doctors) lived at the location of the archaeological resource or elsewhere in the Delta region. Although colored by the times in which they were written, newspaper accounts probably provide the best information regarding the interaction between residents of different classes and ethnicities.

Archaeological Data

Archaeological concentrations from discrete contexts (hollow-filled features and sheet refuse) containing a sufficient quantity and variety of artifacts are needed to address research questions specific to ethnic display and boundary maintenance. Features should contain well-stratified temporally diagnostic deposits to assist researchers in documenting and understanding change over time. Features should retain integrity and have identifiable associations.

A large quantity and variety of identifiable and datable domestic and personal items is necessary to attribute features to a specific socioeconomic class or social group.

Artifacts reflective of ethnic identities and origins, and items that are not attributable to a specific ethnicity but can be readily identifiable as to place of origin and function will help researchers understand boundary maintenance. Medicines, hidden items, and evidence of artifact modification will assist with addressing research questions regarding traditional health and medicinal practices.

Well-stratified homogeneous (majority of traditional ethnic materials or Euroamerican items) and heterogeneous (a combination of both) deposits may indicate a change over time in the access to traditional materials or Euroamerican items, an alteration of preference, or a behavioral change in discard of materials.

Identifiable faunal remains with distinguishable cut marks and evidence of a specific meat cut should allow for researchers to use species and meat cuts to understand socioeconomic status. Studies of faunal remains should be able to differentiate between ethnically distinctive butchering patters and retention of traditional dietary preferences in terms of species and/or meat cuts, as well as health and medicinal practices. Macro- and micro-botanical analysis (e.g., seeds, pollen, and starch grains) may provide information on diet, traditional medicine, and health.

3.3.14.7 Agricultural Practices

Several studies on farms and homesteads have focused on using both archaeological and historical data to identify relationships between local and regional economies and the effect on farming and ranching households and agricultural labor force. Archaeologists such as Klein and Baugher (2002) have noted that the most important issues in researching agricultural properties were based on the shift from individual subsistence to wide-scale market farming in the nineteenth Century. Klein and Baugher also looked at the impacts that this transition from small-scale to large regional farming

had on ethnicity and technology. Studies have shown a resistance to technological advancements from evidence of adaptive reuse of equipment and tools; however, the concept of reuse could also indicate thriftiness of the farmers.

Cabak and Inkrot (1997) studied lands including 54 rural farms in South Carolina that were planned for the location of a nuclear plant. Cabak and Inkrot compared the technological advancements on these farms in relation to other farms throughout the nation to identify the impacts of technology on agrarian lifeways. The analysis used modernization theory to explain the changes in farming and agricultural operations. Modernization theory explained that the result of modernization is a combination of industrial, agricultural, urbanization, and technological forces working together to change the way agricultural properties operated with success.

Studies throughout California have looked at self-sufficiency of homestead and farming operations in relation to size of operations and time in history in which the operations were active. One comprehensive study concluded that most farms in its study population were not self-sufficient, relying heavily on purchased, manufactured goods as indicated by the large amount of goods found at the study sites (Mackey et al. 2000). Mackey also found that the larger farming operations allowed greater diversity and thus had a better chance of success during hard economic times. These large-scale farmers were able to take risks by implementing new technologies such as water supply operations that would allow the farmers to continue their operations during times of drought and hardship.

Other research has looked at ethnicity in the agricultural operations. One debatable topic that has been studied is the concept of the immigrant farmer or laborers conforming to an identity as an American and giving up their heritage. The idea of "accommodation" or acculturation has been studied in agricultural communities where different ethnicities are working together, creating a pluralistic society. Analysis of ethnically derived artifact assemblages from these pluralistic societies have demonstrated that ethnic adaptations to these societies are extremely complex and that presence of these artifacts do not necessarily mean the groups have held on to their ethnic behavior. The presence of ethnic artifacts may actually show an adoption of one ethnicity or culture onto another. Analysis of the melding of cultures allows us to explain social and cultural identities and their changes over time.

Research Questions

- Is there evidence showing changes in agricultural technology over time? Are there specific techniques, practices, tools, or machinery that remained constant through the span of agricultural use of the Delta?
- Are there patterns in the varieties of fruits or vegetables to be grown over time? Is there evidence showing that these patterns were the result of social demands, climate trends, or changes in economy?
- How did the increase in agricultural production influence the local economy and what was the relationship between nearby Delta towns and farms?
- Did labor camp facilities change over time? Were variations in layout, size, and function of labor camps dependent on type of fruits/vegetables farmed?
- Did proximity to nearby Delta towns influence where farm laborers lived (agricultural camps or within the towns)?

- Is there evidence in the archaeological record identifying specific ethnic or cultural groups as labor forces? Were there differences in labor roles for different ethnicities, ages, or genders?
- How did new technology of farming practices influence the amount of labor force needed to maintain and work the farm?

Data Requirements

Historical Data

A variety of archival resources will be used to identify how agriculture was practiced in the Delta. Sources such as historical maps and newspaper articles will be used to identify changes in land uses, developments in the nearby towns and their effect and vice versa on nearby farms. Newspaper articles, oral histories, county assessor records, census records, and diaries will also assist in determining the agricultural work force, crop productions, improvements, and acquisitions and sale of agricultural lands. Conclusions from this information will be checked against both specific historical resources, and the archaeological record to identify any disparities.

Archaeological Data

Remains of labor camps and agricultural infrastructure will help identify the types of living and working conditions of the farms and possibly provide information regarding changes of land use over time. Farming implements and abandoned machinery will also provide information on the types of farming conducted. Artifacts reflective of ethnic identities and origins, and items that are not attributable to a specific ethnicity but can be readily identifiable as to place of origin and function will help researchers understand the types of labor force on the farm. A feature that can be specifically associated (through historical research) with a particular individual and/or family will assist us with better defining "households" within the farm.

3.3.14.8 Associated Historic Properties

Archaeological properties associated with post-contact archaeological research themes are located in the study area. These properties include contributing elements to the Bacon Island Historic District as well as discrete archaeological sites.

No built environment properties that represent archaeological research themes have been identified previously in the study area. This may indicate that properties with research potential are not present, or that additional identification efforts are appropriate. The application of Criteria D/4 in the evaluation of built environment resources requires consideration of data potential, and built environment research questions may require development (see Section 4.3, *Built Environment Properties*).

Districts and landscape properties associated with archaeological research themes are located in the study area. The Bacon Island Historic District contains contributing elements of an archaeological nature.

No traditional properties that represent the archaeological research themes presented in this section have been identified previously in the study area. Traditional properties associated with these themes may be identified in future studies, or additional themes that characterize tradional cultural values relative to archaeological properties may be developed.

Chapter 4
Resource Evaluation

This chapter presents evaluation methods for Delta cultural resources. The Delta's general property types were described in Section 2.1, *General Property Types*; the National Register and California Register standards and guidance were introduced in Section 2.2, *Evaluation Criteria and Standard Guidance*; and the historic background and research designs that contextualize the Delta's history and historical studies were outlined in Chapter 3, *Historic Context and Narrative Themes*. This chapter describes the application of the standards and guidance to the Delta's cultural resources and their contexts, and addresses the registration requirements that are specific to certain property types.

4.1 Early Native American Archaeological Resources

Early Native American archaeological resources may be eligible for the National Register and/or California Register if they retain meaningful association with significant peoples and events, are an important component of a larger significant cultural resource, and/or retain important information about prehistory. In many instances, early Native American archaeological resources are evaluated for their potential to address significant research themes and questions under Criterion D/4 (as outlined in Chapter 3), which requires that they contain a sufficient quantity, variety, and density of artifacts to address these research questions. Less commonly, early Native American archaeological resources may be considered under other California Register/National Register criteria if there is sufficient supporting information, such as ethnographic studies and outreach to Native American tribes.

The following subsections provide a discussion of the criteria, examples of early Native American resources that could be eligible under each criterion, the types of information needed for an early Native American archaeological resource to be considered under each California Register/National Register criterion, and the features that they must retain, at minimum, to be considered significant under each criterion.

Contact period Native American resources are not well understood. These resources are likely to date to AD 1800-1900, and may require application of criteria for the evaluation of Early Native American resources, as outlined here, or the application of criteria for Post-Contact Archaeological resources, as outlined in Section 4.2.

4.1.1 Criterion A/1

Under Criterion A, an archaeological resource must not only convey chronological association with historic events or trends, but its specific association must be considered important as well (Little et al. 2000: 22). Under Criterion A/1 "important" sites are associated with either a specific event, or a pattern of events, repeated activities, or historic trends. National Register Bulletin 15 provides several examples of early Native American site types that might be eligible under Criterion A; sites associated with single events include archaeological sites at which the discovery of an important aspect of prehistory was first made, such as a "type site" or the location of the discovery of important individual artifacts, such as the site at which the first Clovis points or Folsom points were

discovered. Sites associated with a pattern of events might be places such as gathering areas that were utilized seasonally, or a trail or site of repeated religious use associated with a specific people (Shrimpton 1990). While early Native American sites are typically not evaluated under Criterion A, examples do exist such as type sites, sites related to the development of archaeology as a discipline, contact-period sites that are also associated with specific historic events, and cultural landscapes that contain both early Native American sites and TCPs (Little et al. 2000).

There are two types of Native American properties within the study area that are most likely to be eligible under Criterion A/1. The first type are those sites that are either important to the current understanding of Delta prehistory and/or the development of California archaeology, such as those excavated by Lillard and Purves throughout the 1930s, upon which they based their "Delta Sequence" (Moratto 1984: 178–180). The second type are sites that occur within cultural landscapes which also contain TCPs.

Sites eligible under Criterion A must retain their integrity. Generally, this would mean that sites retain the majority of their stratigraphic integrity, but there are several exceptions to this rule when considering eligibility under Criterion A/1.

Even if a site had been fully excavated and all data potential had been exhausted, some sites would retain their integrity as they are associated with the importance of the data potential that did exist at the site at one point and with the development of archaeology as a discipline. Such sites are treated essentially as historic sites, in which the excavation that occurred at the site is considered part of the activity that contributes to eligibility of the site rather than an impact on the integrity of the site (Little et al. 2000).

If an early Native American site has been significantly disturbed, but is a part of a cultural landscape that contains TCPs, it may still retain its integrity. While the context of individual artifacts and stratigraphic relationships within the site has been lost, its contextual relationship to the rest of the cultural landscape as a part of that cultural landscape may be intact.

Sites within the study area potentially eligible under Criterion A include P-34-000087 (Heizer 1934) and P-39-000260 (Heizer 1937). This list is not exhaustive, and it is possible that a minority of new sites encountered within the study area would be appropriate to consider under Criterion A/1.

4.1.1.1 Habitation Sites and Resource Collection Sites

National Register Bulletin 15 provides an example of seasonal gathering places that were used throughout prehistory as an example of a type of site that would be potentially eligible under Criterion A/1. Depending on how broadly this definition is interpreted, habitation sites that were occupied seasonally or sites at which resources were gathered seasonally could be interpreted as eligible under Criterion A/1.

Two factors make Criterion A/1 less appropriate for the consideration of such sites, the first being that establishing the importance of the pattern of events and association of the property with that pattern of events would be challenging. Seasonal use of these sites is common throughout all of California prehistory, and such sites are ubiquitous across the Delta. Secondly, to demonstrate this seasonal use, the site would need to have been excavated and analyzed, which would reduce the number of potential sites within the study area that could be convincingly argued to be eligible under Criterion A/1. Given the first factor, when analyzing the importance of the historical pattern with which a site is associated, it will be appropriate to consider the relative rarity or ubiquity of

such sites. Thus, Criterion A/1 could be applicable to the Delta's habitation sites and resource collection sites that could be associated with specific events or less-well-understood and rare patterns within prehistory, but not the majority of such sites that would be encountered within the study area.

4.1.1.2 Ceremonial Sites

It is possible that sites showing use from prehistory through the present for consistent ritual or ceremonial use could be eligible under Criterion A/1. These would be sites that contemporary Native American tribes identify as sacred and that show a similar pattern of use prehistorically. Such sites could be argued to show the persistence of Native American religious practices through significant disruption to their lifeways, and would likely be associated with specific local religious belief and practice. No such sites have currently been identified within the study area, but may be identified through consultation with interested Native American parties.

4.1.2 Criterion B/2

Under Criterion B/2, an archaeological resource must be associated with an important person's productive life, must be a property that is most closely associated with that person, and must illustrate that person's important achievements (National Park Service 1995: 14–15). The person must have been important within the relative historic context of the area being examined, and the event which occurred at that given site should be related to their importance (Little et al. 2000). In the case of historical archaeology, such associations are made through reference to the historic record and documentary evidence of the association of the site with the given individual. In the case of early Native American sites, for which there is no written historical record, the threshold for establishing such a relationship is necessarily lower. While there is some written historical documentation of important Native American individuals from the contact period, most other knowledge of important individuals within Native American communities was, and still is, passed on through oral tradition. Early Native American sites have not typically been evaluated under Criterion B/2; to do so, consultation with interested Native American parties will likely be necessary to identify individuals whom they consider to be important to their history.

For an early Native American site to be eligible under Criterion B/2, it would need to be associated with an individual that Native American groups have identified through consultation as important to their history, or associated with an important Native American individual who lived during the contact period, and for which there is existing historical documentation of their importance independent of consultation. Furthermore, these sites would need to be associated with the reason the person is important.

For an early Native American site to be eligible under Criterion B/2, it must retain its integrity. This would mean that it had not been significantly disturbed by human activity. There could be rare cases in which there is no material cultural evidence of the activity of the individual (consider hypothetically a site at which a historic compact was made between two tribal leaders); in this case, the setting of the site must be undisturbed (Little et al. 2000). The primary condition in either scenario is the same, that the physical aspects of the site associated with the life of the important person must be intact (Little et al. 2000).

Sites in the study area that could be eligible under Criterion B/2 could include sites associated with Estanislao's rebellion against the Mission system and Mexican government (Kyle 2002: 516–517).

Other figures important to Native American prehistory, and sites associated with those figures, would likely need to be identified through consultation, as making such associations in the absence of oral tradition would be difficult on the basis of the archaeology alone. No such individuals or sites associated with any important individuals have been identified within the study area at this point.

4.1.3 Criterion C/3

Under Criterion C/3, an archaeological resource must embody the distinctive characteristic of a type, period, or method of construction; represent the work of a master; or possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction.

Early Native American sites have not typically been evaluated under Criterion C/3. Typical structures associated with California Native Americans in general and Native Americans of the Delta in particular do not preserve archaeologically in such a way as to have persisted into the present.

Integrity is the largest obstacle in evaluating early Native American sites under Criterion C/3. Generally, for a resource to have integrity under Criterion C/3, a resource would need not only to be well preserved, but aspects of the structure that highlight the design and construction of the structure must also be preserved. As an exception to this rule, National Register Bulletin 36 suggests that archaeological sites which contain relatively intact architectural remains could be eligible under Criterion C, but given methods of construction, remains of dwellings found in the Delta are unlikely to consist of more than outlines of structures and preserved housefloors (Little et al. 2000).

Monumental architecture, a Hopewellian Mound site being the example provided in National Register Bulletin 36, is called out as potentially eligible under Criterion C/3. Such monumental architecture is not known within the study area. While mound sites do exist within the study area, California mound sites do not show evidence of construction, but rather of development over time through repeated human occupation of the same area. This is reflected in the stratigraphy of many mound sites in California.

For an early Native American site to be eligible under Criterion C/3, it must contain an intact structure or relatively intact structural remains. If such a site were discovered within the study area, it would be one of the only examples of an intact prehistoric structure within the Delta, and would almost certainly be eligible under Criterion C/3. The possibility of preservation of such structures or their remains, given the depositional environment of the Delta and the tendency for construction materials to decompose, is exceedingly unlikely, making it unlikely that any resources within the study area would be eligible under Criterion C/3.

4.1.4 Criterion D/4

Archaeological resources are typically evaluated under National Register Criterion D/4 for their potential to yield important information, or data. Data are considered important if they contribute to our understanding of significant research themes in a way that cannot be replicated by other sources or means. An important role of archaeological research is in providing valuable information on the lives and routines of people that is difficult to discern in the absence of a written historic record. Most early Native American sites contain a unique assemblage of artifacts, all of which conceivably have some value in answering questions about prehistory. In the absence of a written historic record, and given the unique and irreplaceable nature of any given archaeological

assemblage, most early Native American sites, so long as they retain integrity, would be eligible under Criterion D/4.

Sites that have been disturbed by significant human or animal activity to the point that their stratigraphic and other contextual relationships have been disturbed are likely not eligible under Criterion D/4; the data value of these sites is understood to have been compromised. An exception might be a site containing isolated artifacts that are extremely rare; such artifacts would have important data potential independent of whether or not the context in which they were discovered was disturbed. Consider, for example, a Delta site in which Clovis points were discovered. The rarity of projectile points of that age within California, and the rarity of cultural materials of that age within the Delta would likely make the site eligible under Criterion D/4 even if it had been significantly disturbed.

Assessment of integrity under Criterion D/4 ensures that the resource reflects the original human activity that occurred at an early Native American site and not subsequent human activity. To this end, in order for an early Native American site to have integrity under Criterion D/4, the constituents of the resource must be in their original location, in the arrangement in which they were deposited.

Early Native American sites within the study area are likely to be eligible under Criterion D/4 provided that they contain more than three artifacts, and that they retain their integrity. Most early Native American resources that have been identified thus far within the study area are likely eligible under Criterion D/4 unless they have been destroyed by human or animal activity. It is possible that sites within the study area that do not retain integrity are still eligible under Criterion D/4 if they contain exceedingly rare artifacts, but no such sites are currently known within the study area.

4.1.5 Integrity Considerations

In addition to the significance criteria, an archaeological site must also possess integrity. When considering archaeological resources, it is common to find that nearly all sites have been affected by post-use processes and the severity of disturbance is often the most severe on the oldest sites. If, however, an archaeological resource retains enough integrity that its relative age and the kinds of activities that occurred at the site can be ascertained, then that resource is generally considered to have adequate integrity for the application of National Register criteria.

Early Native American archaeological sites often lose integrity through impacts due to human activity such as construction or active agricultural use, or through animal activity, such as burrowing by small mammals, or wallowing or rooting by large mammals.

At least four resources within the study area are documented as having been entirely destroyed by agricultural or construction activity. These are P-34-89, P-34-276, P-39-260, and P-51-32. Three sites are noted as being significantly disturbed, with a degree of uncertainty as to whether or not they retain any integrity; these are P-34-355, P-57-29, and P-39-263. While the recorder notes that P-34-83 has been significantly disturbed, they indicate that a significant portion of the site appears to be intact. Many of the most recent updates for these sites are several decades old; it is possible that any archaeological site within the study area has been affected and has had its integrity affected by human or animal disturbance since the record was last updated.

Such a site retains integrity if stratigraphic and contextual relationships are not significantly disturbed (i.e., older material has not been churned on top of younger material, or material from one

part of the site has not been removed and spread across the site). It may be obvious when an early Native American site no longer retains integrity, such as when a structure has been constructed on top of or has used borrow materials from a site. It may also only become apparent that a site has not retained its integrity during the course of excavation, when it becomes obvious that there has been disturbance to the subsurface stratigraphic and contextual relationships of artifacts that was not apparent from the site surface.

There are exceptions to all of these parameters, and these exceptions are outlined for each criterion in Sections 4.1.1 through 4.1.4. For instance, early Native American sites may retain integrity even when they have been significantly mechanically disturbed.

4.2 Post-Contact Archaeological Resources

Post-contact archaeological resources are similar to early Native American archaeological resources, in that they are subjected to similar post-depositional processes, and also need to contain sufficient quantity, variety, density, and clear association to address research questions. However, post-contact archaeological resources face some additional challenges brought by their later age, including, but not limited to, a wider range of artifacts (including both handcrafted and manufactured goods), and an additional information source in primary and secondary written sources. These additional items and information sources must be identified, tracked down, and sorted for their applicability and association with the post-contact archaeological resources in question.

The following sections discuss how each criterion pertains to this resource type, methods for identifying if a criterion applies to the resource in question, and thresholds for each criterion. Integrity considerations are also discussed, as well as examples where applicable and possible.

Contact period Native American resources are not well understood. These resources are likely to date to AD 1800–1900, and may require application of criteria for the evaluation of Early Native American resources, as outlined in Section 4.1, or the application of criteria for Post-Contact Archaeological resources, as outlined here.

4.2.1 Historic Research

An essential source of information for post-contact archaeological resources is historic literature: maps, photographs, primary documents, and secondary documents. Upon identification of a potentially eligible post-contact archaeological site, the first step to better understand the resource is to conduct resource-specific historic research to understand its contents, association, and potential disturbances. Within Northern California, several repositories, historical groups, government agencies, and online resource databases can provide historical information specific to individual resources as well as broad information on regional and state history.

4.2.1.1 Historical Societies

The first place to look when researching site-specific information is a local historical society. Several towns within and surrounding the study area along the Delta have their own historical societies, often operated by a few individuals who have collected information pertaining to their community including photographs, references, maps, journals, family histories, business documents, and

information on individuals important to the development of that community. Below is a list of local historical societies in the Delta.

- Isleton-Brannan-Andrus Historical Society
- Locke Foundation
- Locke Boarding House Museum
- Dai Loy Museum
- Rio Vista Museum

In addition to local historical societies, region-wide information may be found through the following historical societies.

- Sacramento River Delta Historical Society
- San Joaquin County Historical Society
- Sacramento County Historical Society
- Center for Sacramento History
- Yolo County Historical Society
- East Contra Costa Historical Society and Museum
- Solano County Historical Society
- Contra Costa Historical Society
- California Historical Society

In addition to local and regional historical societies, the following groups focus on the heritage and historical information specific to ethnic groups who have a strong history in the Delta.

- Sacramento-Delta Chapter of Filipino American National Historical Society
- Chinese American Council of Sacramento
- Japanese American Citizens League, Florin Chapter
- Portuguese Historical and Cultural Society

Assessor's Office

Information regarding change of ownership or change in value of property that affects taxes would be recorded by the county or city and housed at assessor offices. Assessor records provide tax data associated with property transfer (names of individuals, dates of transfer, and amount paid), improvements made to properties, or purchases by the landowners such as supplies, equipment, or building materials. The assessor data could provide information specific to a resource's association with an individual or individuals, the types of operations that occurred on a property, or indications of economic growth or decline. This information would be useful for researching large-scale agricultural operations, industrial operations, rural farms, and businesses in local communities in the Delta. Assessor data would not necessarily provide information applicable to sites associated with Delta explorations or trapping sites, which occurred prior to the establishment of towns, cities, and counties.

Libraries, Universities, and Online Resources

Information for regional/statewide histories and general historical themes can be found in libraries, university archives, and online databases. Resources consulted may consist of books, documents, journal articles, and reference guides for dating and identifying manufactured goods. The reference material found through these sources could provide sufficient data to use when comparing historical resources in other areas that are similar to the resources that may be found in the Delta. An example is researching historical innovations for reclamation or agricultural features in other parts of the country or world. In addition to comparative sites, libraries, universities, and online resources may contain reference guides for identifying, dating, and sourcing manufactured artifacts such as bottles, ceramics, tools, farming equipment, and a variety of domestic, building, and industrial materials. These reference tools can help determine site type, function, ethnicity, and period of usage when diagnostic material is present.

4.2.2 Period of Significance

A resource eligible for the National Register must exhibit physical characteristics associated with an established period of significance. Periods of significance for the Delta have been identified in Chapter 3.

For post-contact archaeological resources, period of significance is established primarily through well-documented, reliable historical texts and references and then compared against the archaeological data of the resource. National Register Bulletin 36 identifies a period of significance as "the time range (which is usually estimated) during which the property was occupied or used and for which the property is likely to yield important information if evaluated under Criterion D." (Little et al. 2000: 34). Archaeological data and historic research used for identifying the period of significance for a post-contact archaeological resource can vary between site types, but universally, the greater detail of relevant information on the resource, the more accurate the period of significance. Examples of historical data used for determining period of significance include assessor rolls and parcel maps, Sanborn maps, historical hand-drawn maps, early twentieth century aerial photographs, historic journals, well-documented historical texts, and photographs. These documents provide detailed dates of occupation, and evidence of construction and abandonment of historic farms, residences, or businesses that were important in Delta history.

Characteristics of archaeological resources that would need to be present to identify period of significance for a resource include datable archaeological deposits. This could be intact buried or sheet refuse deposits containing diagnostic artifacts or foundation remains that accurately depict the data found in historical building plans or maps constructed for that period of significance.

4.2.3 Criterion A/1

Under Criterion A, an archaeological resource must not only convey chronological association with historic events or trends, but its specific association must be considered important as well (Little et al. 2000: 22). Under Criterion A/1, sites which are "important" are associated with either a specific event, or a pattern of events, repeated activities, or historic trends. National Register Bulletin 15 provides examples of post-contact archaeological site types that might be eligible under Criterion A, as an example for a specific event, a building in which an important invention was developed, or as site where important European exploration occurred. A resource associated with a pattern of events may be a main shipping or receiving location along the Delta or a heavily used transportation route

that has led to the growth of a community. Because post-contact archaeological resources often have written sources, either primary or secondary, with which they can be associated, this criterion is more possible to identify in this resource type versus early Native American archaeological resources.

To determine if a post-contact archaeological resource is associated with a historic event or trend, the archaeological data would need to contain enough information to clearly show the relationship between the event or pattern of events and the resource. A property is not eligible if there is speculation between the associations of the events. To determine the association, we would first need to identify the event or pattern of events that are considered important in history. This would be identified through historic research with historical societies, libraries, and primary and secondary literature such as newspapers, journals, and oral histories. By consulting these references, specific dates, locations, people involved, and detailed descriptions of events or trends would need to be identified. Once this information is acquired, the archaeological resource being evaluated would need to contain either archaeological deposits or remains that clearly demonstrate the association with the event or trend. Even if there is a clear association, the resource would also need to demonstrate that the association is important as well as retain integrity.

Although no individual resources eligible under Criterion A/1 have been identified in the study area, one agricultural district containing 13 sites was evaluated as eligible under Criterion A (PAR 1993). Bacon Island was evaluated as eligible under Criterion A for its pattern of ethnic continuity and involvement with Japanese-American farms and its contribution to the development of agriculture in the Delta. This district contained both archaeological resources and built features; however, the combination led to the overall eligibility of the district. Historical research consisted of oral interviews, extensive archival and comparative research on agricultural practices in the Delta, Japanese farmers and laborers, and history of Bacon Island. Archaeological elements of the district consisted of the foundation remains and artifacts from two of the original camps, and Japanese domestic refuse at seven of the other ten camps. The domestic refuse consisted of white earthenware, and Japanese blue and white transfer-printed porcelain, and glass. The archaeological remains and refuse provided sufficient evidence of Japanese farming throughout the years on Bacon Island. Only surface artifacts at the camp locations were analyzed without subsurface testing or analysis. Although the vertical limits of the artifact were not analyzed for these Bacon Island elements, other resources within the study area may contain buried deposits that could provide information leading to that resource being eligible under Criterion A.

4.2.4 Criterion B/2

Under Criterion B/2, an archaeological resource must be associated with an important person's productive life, must be a property that is most closely associated with that person, and must illustrate that person's important achievements (National Park Service 1995: 14–15). The person must have been important within the relative historic context of the area being examined, and the event which occurred at that given site should be related to their importance (Little et al. 2000). In the case of post-contact archaeological resources, such associations are made through reference to the historic record and documentary evidence of the association of the site with the given individual. Such documentary evidence would consist of researching county and town records, newspapers, business ledgers or journals kept by the individual or people associated with that individual, property ownership maps and assessor data, as well as regional historical texts that may provide information on that individual.

Determining direct associations between an important individual and a post-contact resource is difficult if relying strictly on the archaeological data. For a resource to represent clear, important association with a person, the archaeological data would have to indicate that the deposits or remains were used or directly associated with that person. Often, archaeological resources do not contain information that is required to be associated with the important individuals or even illustrate the person's achievements; therefore, most archaeological sites are not eligible under Criterion B/2.

Sites in the study area that could be eligible under Criterion B/2 would be reclamation or agricultural sites associated with George Shima. A known pioneer and innovator of agriculture development of the Delta, an archaeological site associated with Delta agriculture or reclamation showing strong important associations with Mr. Shima could potentially be eligible under Criterion B/2. The information needed to identify relationships between such sites and Mr. Shima would rely heavily on historical documentation such as assessor rolls and maps, business ledgers, journals, and biographical texts. Archaeological characteristics that would need to be present would be intact artifact deposits or features that could be identified as either being constructed, used, or developed by Mr. Shima. In addition to showing association, the resource would also have to be unique in that it could provide information that would add to the body of knowledge regarding Mr. Shima or the development of agriculture in the Delta. Finally, the resource would need to have sufficient integrity by either the archaeological deposits or feeling of the landscape to convey the association with Mr. Shima and his development of the land.

4.2.5 Criterion C/3

Under Criterion C/3, an archaeological resource must embody the distinctive characteristic of a type, period, or method of construction; represent the work of a master; or possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction.

Archaeological remains of structures and built features may contain elements that may express a high degree of craftsmanship or engineering; however, these features often lack the integrity needed for the resources to be eligible under Criterion C/3.

Integrity is the largest obstacle in evaluating archaeological sites under Criterion C/3. Generally, for a resource to have integrity under Criterion C/3, a resource would need to not only be well preserved, but aspects of the structure highlighting the design and construction of the structure would need to also be preserved. As an exception to this rule, National Register Bulletin 36 suggests that archaeological sites which contain relatively intact architectural remains could be eligible under Criterion C/3, but given methods of construction, remains of structures found in the Delta are unlikely to consist of more than concrete or dirt foundations or framing and siding remains. An exception to this may be in the form of architectural remains that had been buried through natural processes and preserved, or sites which contain both archaeological deposits in addition to standing structures (Little et al. 2000).

To determine if a post-contact archaeological resource contains distinctive characteristics of a type, period, or method of construction, research of features and structures from similar periods and design would need to be carried out and compared to the resource being evaluated. Historical engineering records, photographs, reference guides, and previous studies of similar resources would provide the research information needed to determine if the resource represents the specific type,

period, or method of construction. These types of reference materials would also apply to information needed to determine if the resource represented the work of a master or high artistic value or craftsmanship compared to that which is considered to be standard. Once the comparative data is obtained, in-depth analysis of construction elements would need to be carried out for the resource being evaluated.

Using the example of a rural Delta residential site, the kinds of characteristics that would need to be present to make a resource eligible under Criterion C/3 would be well-preserved remains that clearly demonstrate a rare construction style or method, or are indicative of a specific architect or master builder. Examples could be handcrafted designs in molding or rare types of wood or imported materials used in structures. If the resource is to be found eligible by representing a specific style, period, or method of construction, it should retain enough of the characteristics to fully embody and represent that style. In addition, the resource would need to retain enough integrity that would, without a doubt, identify it as a good example of that style. Characteristics could include original materials and design from that period without distinguishable modifications.

4.2.6 Criterion D/4

Archaeological resources are typically evaluated under Criterion D/4 for their potential to yield important information, or data. Data are considered important if they contribute to our understanding of significant research themes in a way that cannot be replicated by other sources or means. An important role of archaeological research is in providing valuable information on the lives and routines of people that is sparse or absent from archival records from that time period.

Unlike most early Native American sites which contain a unique assemblage of artifacts, most post-contact archaeological assemblages contain manufactured, mass-produced fragmentary artifacts that lack new information. Conversely, sites that have intact deposits of handmade rare artifacts or assemblages specific to an underrepresented group of people and can help answer important research questions, so long as they retain integrity, would be eligible under Criterion D/4.

Sites that have been disturbed by significant human or animal activity to the point that their stratigraphic and other contextual relationships have been disturbed are likely not eligible under Criterion D/4; the data value of these sites is understood to have been compromised.

To determine if a post-contact archaeological resource has data potential there are five primary steps of information gathering that should be followed as outlined in National Register Bulletin 36 (Little et al. 2000: 29) and listed below:

- Identify the property's data set(s) or categories of archeological, historical, or ecological information.
- Identify the historic context(s), that is, the appropriate historical and archeological framework in which to evaluate the property.
- Identify the important research question(s) that the property's data sets can be expected to address.
- Taking archeological integrity into consideration, evaluate the data sets in terms of their potential and known ability to answer research questions.
- Identify the important information that an archeological study of the property has yielded or is likely to yield.

Data sets are groups of information that take into account all elements of a resource, which can include the artifacts, features, landscape, and the relationship between them. All of these groups of information can establish patterns and describe the nature of the resource and activities that took place at the resource. Data sets are identified through field efforts consisting of recording artifacts and features above and below the surface. This can include recording and/or collection of surface artifacts, or subsurface testing in areas where subsurface deposits may be located.

Historic contexts and themes relevant to the study area have already been addressed in Section 3.3.2, *Native American Ethnographic Themes*, through Section 3.3.14, *Post-Contact Archaeological Research Themes*. These contexts were compiled using previous research and documentation regarding history of the Delta. Although these contexts have already been identified for the Delta, studies through fieldwork and identification of additional post-contact archaeological resources may identify historical contexts and themes that have not been addressed in the written record for the Delta. In addition to data gathered from archaeological resources, additional contexts may be identified by conducting updated archival research and consulting local historical societies with possible information on underrepresented themes and people in the area.

Important research questions relevant to the themes identified in Sections 3.3.2 through 3.3.13 are provided in Section 3.3.14. These questions are designed to be applied to resources in which archaeological techniques and data can be used to provide answers for topics where there is inadequate historical or archaeological documentation. Therefore, if the resource contains sufficient data to answer these questions, then they could be eligible under Criterion D/4.

Post-contact archaeological sites within the study area have the potential to be eligible under Criterion D/4 if they contain adequate information through archaeological data that can answer research questions for historical themes such as exploration, trapping, reclamation, agriculture, community development, water management, and transportation development in the Delta. The data sets within these resources needed to answer questions associated with these themes would have to contain intact or lightly disturbed deposits that can adequately identify a chronology and demonstrate a clear understanding of the use and nature of the deposit. These deposits would also need to contain the quantity, variety and density of diagnostic material relevant to answer these questions.

An example of a resource in the study area that could be eligible under Criterion D/4 would be the archaeological remains of an inn located in one of the towns along Delta. If the resource contained a privy where refuse was deposited by occupants of the inn, the archaeological data from the privy could provide information such as: the chronology and usage of the inn (when it operated), who occupied the inn (indicators of ethnicity, social class), and how the inn was used for travel between other communities throughout California. By examining the artifacts against the historical record, and if amounts, type, and variety of the artifacts can provide information to answer the research questions, then the site could be eligible under Criterion D/4.

4.2.7 Integrity Considerations

In addition to the significance criteria, a post-contact archaeological site must also possess integrity. When considering archaeological resources, it is common to find that nearly all sites have been affected by post-use processes and disturbance is often the most severe on the oldest sites. If, however, an archaeological resource retains enough integrity that its relative age and the kinds of

activities that occurred at the site can be ascertained, then that resource is generally considered to have adequate integrity for the application of National Register criteria.

As mentioned in Section 2.2.1, *National Register and California Register Criteria*, the National Register recognizes the following seven aspects or qualities that, in various combinations, define the integrity of a property and are used to determine the integrity of both historic resources and archaeological sites.

- **Location**. Involves the site location where a resource was originally constructed, or where it attained its historical significance.
- **Design**. The form, plan, and style of a resource should remain essentially unchanged from its original design, with few or no alterations that drastically change its outward appearance.
- **Setting**. The characteristics of a resource established by its physical surroundings.
- **Materials**. The physical components used in a resource's construction, consisting of original materials from the period of significance and not replacements.
- **Workmanship**. Evidence of craftsmanship or methods of construction that are the work of a master or are the result of recognized cultural practices.
- **Feeling**. The property's ability to express a particular sense of time.
- **Association**. The "direct link" evident between the property and an important event or person.

Resources often lose aspects of integrity through impacts of human activity. Within the study area, loss of integrity caused by humans may likely be a result of grading for and construction of new buildings and installation of associated or updated infrastructure in towns. In rural and agricultural settings, loss of integrity and destruction of sites may be caused by expansion or plowing of agricultural fields, installation of updated water delivery systems, and expansion or upgrading of transportation corridors. In addition to human-related activities, natural forces may also affect the integrity of sites. Rodent burrowing, heavy rains, and flood events could cause heavy disturbance to resources with surface and subsurface deposits. A site retains integrity if stratigraphic and contextual relationships that provide the information necessary for the site to be eligible are not significantly disturbed (i.e., older material has not been churned on top of younger material, or material from one part of the site has not been removed and spread across the site).

The evaluation of integrity should first be based on the property's physical features and if they are relevant to its significance. If the features that would make the property significant are modified to the point that the features cannot provide meaningful information in addition to answering the where, why, and when, the property would lack the integrity needed to be eligible. These questions also determine which aspects of integrity are needed to convey significance of a site.

The features and elements that make the site significant need to provide information for the criteria or criterion under which the site is being nominated. These features and elements also need to contain aspects of integrity specific to those criteria. For example, sites nominated under Criteria A/1 and B/2 typically need the contributing features and elements to retain certain aspects of design, materials, location, feeling, setting, and association. Sites nominated under Criterion C/3 typically need the contributing features and elements to retain certain aspects of design, materials, and workmanship, while sites nominated under Criterion D/4 typically need the contributing features and elements to retain certain aspects of location, setting, design, association, and materials.

4.3 Built Environment Properties

Section 2.1.3, *Built Environment Property Types*, and Section 3.3, *Historic Context and Themes*, introduced the Delta's known historic built environment property types and their historical context. This section describes how resources will be evaluated for National Register and California Register eligibility relative to the Delta's known built resources population and historical themes.

The Delta contains a large variety of built resources spanning a period from about 1850 to the present. These resources include levees, communities, residences, agricultural buildings and structures, bridges, and a variety of water management structures. Any built environment resource also has the potential to contribute to, or be evaluated as, a historic district or landscape, or a traditional property.

Evaluations of built resources types are based on knowledge of the Delta region's property types, significant historical themes that the resources represent, resource-specific information revealed during archival research, and a description of the architectural or engineering characteristics of the built resource.

4.3.1 Criterion A/1

A built environment property found eligible for listing in the National Register or California Register under Criterion A/1 would be associated with a historical event or theme and its period of significance, and retain characteristics that allow the property to convey its significance. As described in Chapter 3, properties that have been identified previously in the Delta as eligible under Criterion A/1 are associated with themes of Delta agriculture, transportation, community development, and water management. Previously identified cultural resources that have not yet been evaluated, such as river levees, roads and railroads, and duck clubs may be evaluated in association with these themes as well.

4.3.2 Criterion B/2

A built environment property found eligible for listing in the National Register or California Register under Criterion B/2 would be associated with a significant person or persons and their period of historical significance. Under this criterion, it would also retain characteristics that allow the property to convey its significance. As described in Section 3.3.11, *Biographies*, properties that have been identified previously in the Delta as eligible under Criterion B/2 are associated with biographies of George Shima, Nathanial Goodell, and Alex Brown. Cultural resources that have not yet been evaluated may be evaluated in association with these or others identified in the future as being persons of importance.

4.3.3 Criterion C/3

A built environment property found eligible for listing in the National Register or California Register under Criterion C/3 would embody a significant architectural style or engineered design and its period of significance, or architect, engineer, or builder and their period of historical significance. Under this criterion, the property would also retain characteristics that allow it to convey its significance. As described in Section 3.3.12, *Architectures*, properties that have been identified previously in the Delta as eligible under Criterion C/3 are associated with the Italianate,

Mediterranean, Georgian and Foursquare architectural styles. Previously identified cultural resources that have not yet been evaluated may be evaluated in association with these important styles as well.

4.3.4 Criterion D/4

In general, previous built resources evaluation efforts have not considered Criterion D/4 for built resources, and application of these criteria are explained here in greater detail to appropriately guide future work.

The application of Criterion D addresses the important information, or potential for information, that a resource may contain. Commonly the focal point of archaeological resources evaluations, Criterion D must also be applied to built resources to completely evaluate National Register eligibility.

The following six excerpts from Chapter 6 of the *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (National Park Service 1997) address application of this important criterion. These excerpts pertain to built environment resources evaluations, and do not include the bulk of the bulletin's Criterion D guidance that is specific to archaeological resources.

Understanding Criterion D: Information Potential: Certain important research questions about human history can only be answered by the actual physical material of cultural resources. Criterion D encompasses the properties that have the potential to answer, in whole or in part, those types of research questions. The most common type of property nominated under this Criterion is the archeological site (or a district comprised of archeological sites). Buildings, objects, and structures (or districts comprised of these property types), however, can also be eligible for their information potential. Criterion D has two requirements, which must *both* be met for a property to qualify:

- The property must have, or have had, information to contribute to our understanding of human history or prehistory, and
- The information must be considered important.

Under the first of these requirements, a property is eligible if it has been used as a source of data and contains more, as yet unretrieved, data. A property is also eligible if it has not yet yielded information but, through testing or research, is determined a likely source of data.

Under the second requirement, the information must be carefully evaluated within an appropriate context to determine its importance. Information is considered "important" when it is shown to have a significant bearing on a research design that addresses such areas as: 1) current data gaps or alternative theories that challenge existing ones or 2) priority areas identified under a State or Federal agency management plan (National Park Service 1997: 21).

Applying Criterion D: Information Potential: While most often applied to archeological districts and sites, Criterion D can also apply to buildings, structures, and objects that contain important information. In order for these types of properties to be eligible under Criterion D, they themselves must be, or must have been, the principal source of the important information.

4.3.4.1 Eligible

- A building exhibiting a local variation on a standard design or construction technique can be eligible if study could yield important information, such as how local availability of materials or construction expertise affected the evolution of local building development.

Not Eligible

- The ruins of a hacienda once contained murals that have since been destroyed. Historical documentation, however, indicates that the murals were significant for their highly unusual design. The ruins cannot be eligible under Criterion D for the importance of the destroyed murals if the information is contained only in the documentation (National Park Service 1997: 21).

Association with Human Activity: A property must be associated with human activity and be critical for understanding a site's historic environment to be eligible under Criterion D. A property can be linked to human activity through events, processes, institutions, design, construction, settlement, migration, ideals, beliefs, lifeways, and other facets of the development or maintenance of cultural systems (National Park Service 1997: 22).

Establishing a Historic Context: The information that a property yields, or will yield, must be evaluated within an appropriate historic context. This will entail consulting the body of information already collected from similar properties or other pertinent sources, including modern and historic written records. The researcher must be able to anticipate if and how the potential information will affect the definition of the context. The information likely to be obtained from a particular property must confirm, refute, or supplement in an important way existing information. A property is *not* eligible if it cannot be related to a particular time period or cultural group and, as a result, lacks any historic context within which to evaluate the importance of the information to be gained (National Park Service 1997: 22).

Developing Research Questions: Having established the importance of the information that may be recovered, it is necessary to be explicit in demonstrating the connection between the important information and a specific property. One approach is to determine if specific important research questions can be answered by the data contained in the property. Research questions can be related to property-specific issues, to broader questions about a large geographic area, or to theoretical issues independent of any particular geographic location. These questions may be derived from the academic community or from preservation programs at the local, regional, State, or national level. Research questions are usually developed as part of a "research design," which specifies not only the questions to be asked, but also the types of data needed to supply the answers, and often the techniques needed to recover the data (National Park Service 1997: 22).

Establishing the Presence of Adequate Data: To support the assertion that a property has the data necessary to provide the important information, the property should be investigated with techniques sufficient to establish the presence of relevant data categories. What constitutes appropriate investigation techniques would depend upon specific circumstances including the property's location, condition, and the research questions being addressed, and could range from surface survey (or photographic survey for buildings), to the application of remote sensing techniques or intensive subsurface testing. Justification of the research potential of a property may be based on analogy to another better known property if sufficient similarities exist to establish the appropriateness of the analogy (National Park Service 1997: 23).

4.3.5 Integrity Considerations

To meet registration requirements under Criterion A/1 as an individual resource, a property would need to retain most of its character-defining features such that it has integrity of location, setting, and association. Similarly, to meet registration requirements under Criterion B/2 as an individual resource, a property would need to retain most of its character-defining features such that it has integrity of location, setting, and association. In contrast, under Criterion C/3, a property would need to retain most of its character-defining features such that it has integrity of design, feeling, and materials.

Built environment properties eligible under Criterion D/4 would require considerations of integrity such as that outlined in National Register guidance for applying Criterion D:

> **Integrity**: The assessment of integrity for properties considered for information potential depends on the data requirements of the applicable research design. A property possessing information potential does not need to recall *visually* an event, person, process, or construction technique. It is important that the significant data contained in the property remain sufficiently intact to yield the expected important information, if the appropriate study techniques are employed.

4.3.5.1 Eligible

- An irrigation system significant for the information it will yield on early engineering practices can still be eligible even though it is now filled in and no longer retains the appearance of an open canal.

4.3.5.2 Not Eligible

- A plowed archeological site contains several superimposed components that have been mixed to the extent that artifact assemblages cannot be reconstructed. The site cannot be eligible if the data requirements of the research design call for the study of artifacts specific to one component (National Park Service 1997: 23).

4.3.5.3 Building and Structures

Generally, architectural styles may continue to convey their historical significance through retained fenestration configuration, entrances, building form and massing, cladding materials, and roofline features. For instance, while windowpanes may be replaced over the course of a building's life, the size, shape and position of the windows are generally the character-defining feature of the architectural style rather than the window materials. These thresholds for integrity can be applied to buildings originally designed in most architectural styles, as well as for older buildings remodeled to the style. A lower threshold for integrity is warranted for excellent, unique or rare high-style expressions of the architectural style. The earliest examples of style in the Delta (i.e., constructed c.1860–1870), and buildings designed by master architects, likewise qualify for lower integrity thresholds. Comparison of high-style residential buildings that have been listed, or have been determined eligible for listing, should be considered.

As part of defining registration criteria for Delta's built environment properties, integrity considerations were developed during previous cultural resources assessments. Properties ranging from single-family residences to large farms with multiple buildings were recorded during surveys in 2012 and 2013, but minimally researched when visual inspection made it clear that their historic integrity had been seriously compromised by alterations to historic-era buildings or a combination of alterations to historic-era buildings and construction of new buildings.

Generally, a property with buildings and/or structures known to have been constructed 50 or more years ago is considered to have inadequate integrity if it appears to:

- Have been significantly altered within the last 45 years
- No longer retain characteristics making it recognizable as a historical resource
- No longer convey its historical associations or attributes

In contrast to general examples, rare or early examples of built resources are held to lower integrity standards. For instance, houses that represent the Delta style are some of the oldest residential buildings in the region. Fitted to the local environment and designed to survive flooding, they are also particular to the region. Due to their age and modest origins, however, they are likely to have undergone incongruous alterations over the years, or to suffer from poor maintenance, especially in comparison to the region's grand late-nineteenth-century and early-twentieth-century farm estates or large riverfront homes. During the survey, early Delta-style houses with some loss of integrity were recorded and evaluated because of their importance in the history of the region's built environment.

Integrity conclusions for larger, complex properties often require consideration as districts consisting of multiple associated features. For instance, the Delta's large agricultural complexes were developed over long periods of time and are associated with technological advances, changes in land use, and changes in the workforce. When assessing integrity for this kind of property, the property is assessed as a whole and determinations are made for which resources contribute to the historic property and which of those would be of primary importance to the property's significance. Such an agricultural property may have altered residences, new outbuildings, an altered barn, and a shed that appears to be original or unaltered within the last 45 years. Based on the ubiquitous nature of sheds in rural landscapes, it is highly unlikely that a shed would be individually eligible.

ICF architectural historians meeting or exceeding the Secretary of the Interior's professional qualifications collectively identified and analyzed typical alterations encountered during previous field surveys. The previous surveys reported properties that visual inspection revealed to consist of a shed, several sheds, or similarly ubiquitous ancillary buildings distributed among more prevalent heavily altered older buildings or buildings less than 45 years old. The group reviewed photographs of properties identified by individual survey teams as lacking integrity. Although not exhaustive, the following list specifies the types of building alterations commonly encountered in the Delta.

- Windows have been replaced with inconsistent window types, such as aluminum or vinyl.
- Window openings have been changed, enclosed, or new opening have been made.
- Siding has been replaced with a substitute material, such as vinyl, aluminum, or stucco.
- Rooflines have been changed.
- Doors have been replaced with new doors inconsistent with the original in style and/or material.
- Door openings have been altered, enlarged, or moved.
- Ornamentation characteristic to specific architectural styles has been added or removed.
- Additions, particularly those out of scale or otherwise inconsistent in materials, form, or massing, have been constructed.

The ICF architectural historians established criteria for recording and evaluating properties encountered in subsequent surveys. **Buildings with minimal alterations such as a new door or new windows fitted to original openings were determined to retain enough integrity to merit**

evaluation. More recent buildings, such as late 1950s or early 1960s Ranch-Style houses with numerous alterations, and older early twentieth-century houses with some combination of major additions, non-original siding, resized and replaced windows, or major porch or entry alterations, were determined to have undergone such overwhelming diminishment of integrity that they no longer have the potential to convey historical significance. Properties dominated by buildings that have undergone such overwhelming loss of integrity were recorded during the remaining surveys, but were only minimally researched, primarily only for the construction date.

Assessing integrity can vary depending on which significance criteria apply, and also depending on what property type is being evaluated, as discussed in the following subsections.

Residential Buildings

Residential buildings are expected to be associated with significant community and agricultural development, biographical, and architectural historical themes. Under Criterion C/3, the buildings integrity discussion above is applicable. The Delta's historic residences were often associated with farming on the property parcel, and may be evaluated as a contributor to a historic district.

Commercial Buildings

Commercial properties in the Delta include buildings such as stores, banks, and gas stations, and are typically one-part commercial block buildings with moderately decorative facades and stepped parapets. Commercial buildings, structures and complexes are expected to be associated with significant community development, biographical, and architectural historical themes.

Under Criterion C/3, the buildings integrity discussion above is applicable, and well as the following considerations that apply specifically to commercial buildings. Commercial architectural styles are revised over time according to commercial fashions, and intact examples of original historical architectures are rare and thus lower thresholds of integrity are warranted. Commercial buildings may continue to convey their historical significance through retained ground floor storefronts, fenestration configurations, entrances, building form and massing, cladding materials, and roofline features. Examples of storefront alterations that would not preclude eligibility include transom alterations, installation of flush or projecting box signs, removal of terrazzo paving, door replacement, and alterations to stories above the ground floor.

Institutional Buildings

Institutional properties in the Delta include such built environment resources as courthouses, libraries, schools, ecclesiastical buildings, and civic spaces. An institutional building may be evaluated as an individual resource, or as a contributor to a complex district. Institutional buildings, structures and complexes are expected to be associated with significant community development, recreational, biographical, and architectural historical themes.

Generally, institutional architectural styles that have been substantially revised over time according to civic architectural fashions would not qualify under Criterion C/3. Institutional buildings continue to convey their architectural significance through retention of primary entrances, fenestration configuration, building form and massing, and projecting overhangs and towers. Examples of alterations that would not preclude eligibility include additions and modifications that are sympathetic to the building's design, such as appropriate accessible entrance approaches, door replacements, and window materials replacements. A lower threshold for integrity is warranted for

excellent, unique or rare high-style expressions of an architectural style. The earliest examples of institutional buildings in the Delta qualify for lower integrity thresholds. Comparison of high-style institutional buildings that have been listed, or have been determined eligible for listing, should be considered.

Industrial Buildings

Industrial properties in the Delta include agricultural packinghouses, canneries, and distribution structures. Industrial buildings may be evaluated as individual resources, or as contributors to agricultural complex districts. Buildings, structures and complexes are expected to be associated with significant community development, agricultural development, biographical, and architectural historical themes.

Generally, industrial buildings that have been substantially revised over time according to changes in architecture that reflects changes in commercial production processes would not qualify under Criterion C/3. Industrial buildings continue to convey their architectural significance through retention of primary entrances, fenestration configuration, building form and massing, and structural components that relate to specific industries. Examples of alterations that would not preclude eligibility include additions and modifications that are sympathetic to the building's design, such as appropriate accessible entrance approaches, door replacements, and window materials replacements. A lower threshold for integrity is warranted for excellent, unique, or rare high-style expressions of an architectural style. The earliest examples of industrial buildings in the Delta qualify for lower integrity thresholds. Comparison of high-style industrial buildings that have been listed, or have been determined eligible for listing, should be considered.

Agricultural Buildings

Agricultural properties in the Delta include residential, commercial, and industrial farming buildings, structures and complexes. An agricultural building may be evaluated as an individual resource, or as a contributor to an agricultural complex district. Agricultural resources are expected to be associated with significant agricultural development, biographical, and architectural historical themes.

Generally, agricultural architectures that have been substantially revised over time according to changes in agricultural trends would not qualify under Criterion C/3. Agricultural properties continue to convey their architectural significance through retention of primary entrances, fenestration configuration, building form and massing, and structural components that relate to specific agricultural themes. Examples of alterations that would not preclude eligibility include additions and modifications that are sympathetic to the building's design, such as appropriate accessible entrance approaches, door replacements, and window materials replacements. A lower threshold for integrity is warranted for excellent, unique, or rare high-style expressions of an architectural style. The earliest examples of agricultural properties in the Delta qualify for lower integrity thresholds.

4.3.5.4 Water Conveyance, Transportation, and Transmission Properties

To meet registration requirements under Criteria A/1 or B/2 as an individual resource, a water conveyance, transportation, or transmission property would need to retain most of its character-

defining features such that it has integrity of location, setting, and association. Under Criterion C/3, water conveyance, transportation, or transmission properties continue to convey their architectural and engineering significance through retention of structural components that relate to specific parts and functions of the system.

Water conveyance, transportation, and transmission properties may be ubiquitous within a given historical theme and region and, similar to considerations for buildings, representation of the earliest advent of the resource type within the context's period of significance would be required.

4.4 Historic District and Cultural Landscape Properties

As with other cultural resources, district and landscape resources will be evaluated according to the National Register and California Register criteria. They will also be evaluated according to the guiding documents outlined in Section 2.2.2, *Historic Districts and Landscape Guidance,* and the significant themes described in Section 3.3, *Historical Context and Themes*.

The Delta contains a small number of designated historic districts spanning a period from about 1850 to the 1950s, including properties associated with community development and Delta agriculture. These historic districts designations were the result of a methodology that examined the properties as collections of archaeological sites and historic buildings and did not include a study of associated landscape characteristics. In order to meet current SHPO expectations and offer a more holistic understanding of these districts and their character-defining features, new cultural resources studies will consider such resources through the cultural landscape approach and methods. This consideration extends to properties that have yet been identified or evaluated, as well as those that were evaluated solely through the historic district approach.

Evaluations of these resource types are based on knowledge of the Delta region's significant historical themes and resource-specific information revealed during archival research or onsite survey. Because districts and landscapes are complex property types that usually involve multiple components, any district or landscape resource also has the potential to be evaluated as a site or to contribute to, or be evaluated as, a traditional property. Likewise, it is possible that both archaeological sites and individually significant built resources may also contribute to a larger historic district or cultural landscape. A holistic approach to evaluating district and landscape properties is recommended, and will be helpful in understanding how multiple features that may seem undistinguished individually might collectively compose a significant and distinguishable entity.

As part of defining registration criteria for district and landscape properties, this section outlines the integrity considerations that were developed during earlier cultural resources assessments in the Delta as well as previously unconsidered federal guidance.

4.4.1 Historic Districts

A historic district must be significant and retain integrity. It must be important for historical, architectural, archeological, engineering, or cultural values; districts are often significant for more than one reason. The population of known eligible historic districts in the study area currently includes collections of historic resources associated with significant themes of community

development and architectures, such as the Locke and Walnut Grove Historic Districts, as well as the significant themes of agricultural development, the historical figure George Shima, and historic archaeological research and data potential at the Bacon Island Historic District.

Historic districts may qualify for listing under Criteria A/1, B/2, C/3 or D/4, and may contain contributing elements that are either individually eligible or only eligible as contributing elements to the district. As such, a historic district is assessed based on the collective historical significance of its components, and examples will range from a ranching complex to a vast water management infrastructure system. The collection of contributing elements may be described in terms of distribution within a historic district boundary or as a collection of discontiguous but related features (e.g., the Enlarged Erie Canal Historic District in New York).

Historic districts in the study area are expected to be associated with the themes of reclamation, agriculture, transportation, community, water management, and recreation. They may also be associated with significant biographical and architectural themes, and archaeological research themes.

4.4.1.1 Criterion A/1

A historic district found eligible for listing in the National Register or California Register under Criterion A/1 would be associated with a historical event or theme and its period of significance and retain characteristics or character-defining features that allow the property to convey its significance. A historic district would likely need to possess integrity of location, setting, feeling, and association. As described in Chapter 3, properties that have been identified previously in the Delta as eligible under Criterion A/1 are associated with themes of reclamation, agriculture, and community development. Previously identified potential resources that have not yet been evaluated, such as the vernacular development along River Road, may be evaluated in association with these themes as well. It is possible that a historic district may retain characteristics from multiple themes with periods of significance, representing a multi-layered context.

4.4.1.2 Criterion B/2

A historic district found eligible for listing in the National Register or California Register under Criterion B/2 would be associated with a significant person or persons and their period of historical significance. Under this criterion, it would retain characteristics or character-defining features that allow the property to convey its significance. Similar to Criterion A/1, these characteristics would likely display integrity of location, setting, feeling—and most importantly for this criterion—association. Historic districts that are eligible under criterion B/2 may also possess integrity of workmanship and materials. While several important persons associated with the study area have been identified, including agriculturalist George Shima, further study is required to identify historic districts that are eligible for their association with these persons.

4.4.1.3 Criterion C/3

A historic district property found eligible for listing in the National Register or California Register under Criterion C/3 would embody a significant architectural style or engineered design and its period of significance, or architect, engineer, or builder and their period of historical significance. Under this criterion, a historic district would need to retain most of its characteristics or character-defining features such that it has integrity of location, design, setting, materials, workmanship,

feeling, and association. As described in Section 3.3.12, *Architectures*, several individual properties in the Delta have been identified as eligible under Criterion C/3. Several architectural styles have also been identified as characteristic of the region. It is likely that the Delta contains historic districts associated with Italianate, Mediterranean, Georgian, and Foursquare architectural styles. Previously identified cultural resources should be evaluated for their contribution to a larger district. It is also likely that vernacular historic districts are present in the Delta where a concentration of "Delta" or "River" style homes are found. These districts would likely also contain additional characteristics that make the district eligible under additional criteria, such as Criterion A/1, Criterion B/2, or Criterion C/3. Lastly, there is potential in the Delta for a historic district that is significant under this criterion for its association with engineering advancements under the theme of water control.

4.4.1.4 Criterion D/4

To meet registration requirements under Criterion D/4, a historic district would need to contain contributing elements that have the potential to provide data that would supplement, confirm, refute, or identify a new perspective about significant historical themes. The most common application of Criterion D/4 would describe a contributing element's potential to address important archaeological research questions, such as spatial organization.

4.4.2 Integrity Considerations

Historic Districts are evaluated under the same aspects of integrity as other built resources. The seven aspects are outlined in Section 2.2.1, *National Register and California Register Criteria*. According to National Register guidance, a district will possess several, if not all, of the aspects in order to convey its significance. In other words, a majority of the physical components that contribute to the district's historic character, even if they are individually undistinguished, must remain intact for the district to convey its significance as a whole. As illustrated above, different aspects of integrity play different roles depending on the significance of the resource. For example, a vernacular rural district would likely need to retain integrity of location, setting, feeling, and association to convey its significance. A master-planned community would also need to retain integrity of design and workmanship.

4.4.3 Cultural Landscapes

The Delta contains a few designated resources that may also qualify as cultural landscapes. They are largely associated with the reclamation and community development themes. Additional potential landscape resources would likely be associated with those themes, as well as agriculture, water management, transportation, recreation/conservation, biographies, architectures, and the themes specified in the National Heritage Area study. Archaeological artifacts may also contribute to the significance of a cultural landscape. The cultural landscape guidance documents outlined in Section 2.2.2.2, *Cultural Landscapes Guidance*, provide an important big-picture framework for the unique considerations required for landscape evaluation. These guidelines, specifically the *National Register Bulletin 30: Guidelines for Evaluating and Documenting Rural Historic Landscape,* informed the cultural landscape registration criteria detailed below.

As has been previously stated in this report, landscape identification and evaluation is not as established as a practice as that of resources that are primarily significant for their architecture or archaeological value, including historic districts. Therefore, landscapes are typically underrepresented in inventory and documentation efforts. Yet a large-scale landscape such as the

Delta requires a strong landscape evaluation framework to effectively capture its nuanced and layered history. For example, it is likely that many of the known historic districts within the Delta region that are significant under the themes of community development, such as the Locke Historic District, could also be classified as cultural landscapes. The contributing features in the Locke Historic District are primarily architectural. An additional level of evaluation would identify further characteristics that might contribute to a deeper level of understanding regarding the significance of that community. Therefore, an important step in evaluating cultural landscapes in the Delta would be to re-evaluate known historic resources for landscape characteristics that may have been previously overlooked. It is also important to evaluate potential cultural landscapes that have not yet been identified or designated in the Delta. Most of the significant themes outlined in Section 3.3, *Historical Context and Themes*, have the potential to be represented by cultural landscapes. In applying a landscape evaluation methodology, cultural resources that seemed unremarkable on their own may be identified for their ability to contribute to a larger landscape and provide a nuanced understanding of the Delta.

4.4.3.1 Criterion A/1

A landscape found eligible for listing in the National Register or California Register under Criterion A/1 would be associated with a historical event or theme and its period of significance and retain landscape characteristics or character-defining features that allow the property to convey its significance. As described in Chapter 3, cultural landscapes that have been identified previously in the Delta as potentially eligible under Criterion A/1 are associated with themes of reclamation, agriculture, community development, water management, transportation, recreation/conservation, and architectures. There is also potential for cultural landscapes to be identified under the themes of archaeology and those specified in the National Heritage Area study. A cultural landscape, especially vernacular and rural landscapes like those found throughout the Delta, is very likely to possess significance under Criterion A/1, sometimes in combination with other criteria. This is due to their relationship to land use and cultural heritage. A cultural landscape would likely need to possess integrity of location, setting, feeling, and association to convey its significance under these themes.

4.4.3.2 Criterion B/2

A cultural landscape found eligible for listing in the National Register or California Register under Criterion B/2 would be associated with a significant person or persons and their period of historical significance. Under this criterion, it would retain landscape characteristics or character-defining features that allow the property to convey its significance. Similar to Criterion A/1, these characteristics would likely display integrity of location, setting, feeling, and—most importantly for this criterion—association. Cultural landscapes that are eligible under criterion B/2 may also possess integrity of workmanship and materials. As described in Section 3.3.11, *Biographies*, potential properties previously identified in the Delta are associated with the biographies of George Shima, Wayne Thiebaud, Nathanial Goodell, and Alex Brown. However, these cultural resources have not yet been evaluated using a cultural landscape approach.

4.4.3.3 Criterion C/3

A cultural landscape found eligible for listing in the National Register or California Register under Criterion C/3 would embody a significant architectural style or engineered design and its period of significance; or an architect, engineer, or builder and their period of historical significance. Under this criterion, a historic district would need to retain most of its characteristics or character-defining

features such that it has integrity of location, design, setting, materials, workmanship, feeling, and association. Typically, designed landscapes are significant under this criterion. The landscapes found in the Delta are more likely to be significant under other National Register or California Register criteria as they are largely vernacular. However, it is possible that large-scale cultural landscapes will contain character-defining features that are designed, such as an Italianate house at the center of a farm complex, and therefore might still be determined eligible for architecture/design. However, excepting designed landscapes, it is important to note that cultural landscapes are rarely significant under associative Criterion C/3 alone, but rather in tandem with themes found under Criteria A/1 or B/2.

4.4.3.4 Criterion D/4

To meet registration requirements under Criterion D/4, a cultural landscape would need to contain contributing elements that have the potential to provide data that would supplement, confirm, refute, or identify a new perspective about significant historical themes. The most common application of Criterion D/4 would describe a contributing element's potential to address important archaeological research questions, such as spatial organization, urban geography, trade networks, or agricultural practices.

4.4.4 Integrity Considerations

Integrity considerations for cultural landscapes are an evolving practice and require acknowledgment that cultural landscapes often represent a continuum of change through history. Additionally, cultural landscapes are often significant under multiple historic themes with several periods of significance. For example, an agricultural landscape in the Delta may have evolved over multiple generations and owners, and experienced cultivation of various types of crops. As such, it would be a combination of the landscape's physical features that remain extant from the period of significance (such as fences, buildings and structures, or roads), along with the spatial organization of the fields and their functional relationship to the main residential complex that would fully convey the landscape's significance.

That being said, for a cultural landscape to be eligible for the National Register or California Register it must still retain most, if not all, of the seven aspects of integrity. Integrity may be expressed through the following characteristics that are associated with the landscape's historic context, development, and use, such as the following.

- Land uses and activities
- Patterns of spatial organization
- Response to the natural environment
- Cultural traditions

These characteristics provide a largescale and holistic lens for evaluation that allows for change over time to contribute to a property's significance rather than diminish it. Integrity may be found in the relationship of features to each other rather than as individual physical artifacts. For example, a waterway in the Delta may have evolved in terms of its material construction (peat dams and levees may have been replaced with concrete), but its general location and purpose remain intact. Application of this integrity approach allows the multi-faceted evaluation and interpretation of the significant themes in the Delta environment.

4.5 Traditional Properties

As with other cultural resources, resources defined by historical traditions will be evaluated according to the National Register and California Register criteria. This section addresses the two most commonly evaluated categories of traditional properties: Traditional Cultural Properties and Tribal Cultural Resources.

4.5.1 Traditional Cultural Properties

Traditional cultural resources may qualify for evaluation as TCPs. Like all historic properties, TCPs must meet the National Register eligibility criteria. They will also be evaluated according to guidelines provided in *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (National Park Service 1998).

DWR will ensure that copies of TCP evaluation reports are reviewed by the individuals who contributed information to the study in order to confirm that the data are presented appropriately. It is important to note that some reports may contain confidential information that will limit distribution of TCP reports only to those who are required to receive the information.

4.5.2 Integrity Considerations

For TCPs, integrity of relationship—the presence of both an integral relationship to traditional cultural practices or beliefs, and the property's physical conditions such that the relevant relationship is conveyed—is a nuance of integrity analysis that is unique to this property type. Evaluation requires "understanding about how the group that holds the beliefs or carries out the practices is likely to view the property" and "if the property is known or likely to be regarded by a traditional cultural group as important in the retention or transmittal of a belief, or to the performance of a practice, the property can be taken to have an integral relationship with belief or practice" (National Park Service 1998: 11).

While physical integrity is essential for conveying integrity, "cultural values are dynamic, and can sometimes accommodate a good deal of change." As such, methods appropriate for analyzing the integrity of a TCP include consideration of integrity in terms of the views of traditional practitioners. "If [a potential TCP's] integrity has not been lost in their eyes, it probably has sufficient integrity to justify further evaluation" for eligibility.

Under Criterion A/1, historical significance may include traditional oral history as well as recorded history. Under Criterion B/2, persons may include living people as well as gods and demigods whose presence cannot be physically verified. Under Criterion C/3, the property may be considered to be that of a master, even if the identity of that person is unknown; the property may contain work considered to be of artistic value for traditional cultural reasons; or the property, while lacking individual cultural significance, may be an integral part of a larger entity of traditional importance (National Park Service 1998: 12–14).

Finally, to meet registration requirements under Criterion D/4, a property would need to be able to contribute data that would supplement, confirm, refute or identify a new perspective about significant historical themes. The most common application of Criterion D/4 would describe a resource's potential to address important archaeological research questions; however, all types of traditional cultural resources also have the potential to contribute information to the historical

record. Traditional cultural data is not commonly framed as information that may yield information important to the Delta's history, and therefore data-based traditional themes may require development for the application of Criterion D/4. For instance, research topics may relate to questions about material culture, oral history, and ethnographic representation of historical traditions.

4.5.3 Tribal Cultural Resources

Traditional cultural resources may also qualify for evaluation as TCRs. Like all historical resources, TCRs must meet the California Register eligibility criteria. They will also be evaluated according to guidelines provided in *Technical Advisory: AB 52 and Tribal Cultural Resources in CEQA* (Office of Planning and Research 2017).

DWR will ensure that copies of TCR evaluations are reviewed by the individuals who contributed information to the study in order to confirm that the data are presented appropriately. It is important to note that some reports may contain confidential information that will limit distribution of TCR evaluations only to those who are required to receive the information.

Chapter 5
Conclusions and Applications

The content of this RD&CS provides baseline information for conducting cultural resources assessments in the Delta. This chapter describes objectives for using this RD&CS for identifying and assessing the Delta's cultural resources, as well as meeting the challenge of identifying and resolving data gaps in our knowledge of the Delta's history and cultural traditions. This chapter also describes goals for obtaining and using new information to build on the content of this RD&CS.

5.1.1 Historic Properties Identification

As part of cultural resources assessments for future Delta projects, DWR may apply this RD&CS and:

- Continue to identify historic properties and significant themes in the Delta that represent histories important at the national, regional and local levels.
- Continue to develop its methods for identifying traditional properties.
- Continue to develop its approach to evaluating cultural landscapes.

5.1.1.1 Suggested Sources of Information

Numerous sources of information about the Delta's history are available for future studies to enhance identification efforts, such as:

- Archaeological reports obtained from regional archival and collections facilities.
- Historical maps on file at local and regional archives such as the California State Library, the Shields Library Map Room at UC Davis, and the Doe and Bancroft Libraries at UC Berkeley.
- Records obtained from the CHRIS Central California Information Center (Turlock), the North Central Information Center (Sacramento), and the Northwest Information Center (Rohnert Park).
- Oral history materials associated with regional studies, such as the Delta Narratives project at CSU Sacramento.
- Archaeological collections analysis and reporting information.
- Historical documents, newspapers, diaries, and photograph collections on file at local and regional archives.

5.1.2 Data Gaps

Data gaps refer to the areas of the Delta's history that are not well understood and that are underrepresented by its current population of historic properties. Such gaps have been identified throughout this document in relation to the topics covered in each section, and are summarized here.

5.1.2.1 Early Properties

All cultural resources and historical property type topics have identified how properties related to the earliest time period of the Delta's significant historical themes are both rare and of great value. The earliest time periods of these themes are also the least well understood and, therefore, archaeological properties have the potential to contribute representation and information to the themes that otherwise does not currently exist.

5.1.2.2 Contact Period History

The RD&CS has highlighted how the Delta's contact period (circa 1800–1900) is not well described. The relationship of the period's ethnographic record and potential archaeological components found at sites in the study area is currently under-explored in Delta historical studies. Cultural resources and historic properties representing this time period therefore have the potential to represent and contribute information that otherwise does not currently exist. Opportunities to investigate material culture collections and review or collect oral history and archived ethnographic data may also directly benefit the historical narrative for this era in the Delta's history by contributing to the information that is currently available for synthesis.

5.1.2.3 Significant Individuals

Certain historical figures, such as the Delta agriculturalists George Shima, Catherine Moser, and Josiah Greene; the Delta pioneers George Cornish, Amos Pylman, Edward Bunnell, and Cornelius Hugaboom; and early reclamation district director Ralph Moors are not very well understood. In consulting the historic properties documentation for the study area, it is evident that many of these names have been taken from secondary history texts, rather than primary sources or through examination of local histories. Information about these figures, as well as others that have been overlooked, and their historical contributions may be better brought to light through oral histories and additional archival research, particularly at the local level. Similarly, identification methods may include bias toward common historical accounts, and the significance of individuals in histories that are underrepresented in common archives may be discovered through targeted research.

For instance, George Shima, the Japanese-American agriculturalist, is a particularly significant historical figure in the Delta, and few resources regarding his life and work have been substantially investigated. Opportunities to interview living relatives, as well as investigate private material culture collections, are likely sources of information that may also directly benefit the properties associated with George Shima by improving their specific contexts and therefore our understanding of this very significant person's role in the Delta's heritage.

5.1.2.4 Cultural Landscape Inventories and Reports

As discussed in Sections 2.1.4, 2.2, and 4.4, the cultural landscape approach to evaluating historic properties has existed for several decades. The landscape approach has gained momentum, in particular for its value in describing elements that contribute to the historical significance of complex properties.

Following NPS guidance and adapting the cultural landscape approach to meet the needs of the Delta would offer an in-depth, property-specific tool for future cultural resource evaluation efforts in the Delta. Specific guidance includes:

- Page, Robert, et al. *A Guide to Cultural Landscape Reports: Contents, Process and Techniques*. U.S. Department of the Interior: National Park Service, Washington, DC: 1998.
- *Secretary of the Interior's Standards for the Treatment of Historic Properties: Guidelines for the Treatment of Cultural Landscapes*, Online available at: https://www.nps.gov/tps/standards/four-treatments/landscape-guidelines/.
- Page, Robert et al. *National Park Service: Cultural Landscapes Inventory Professional Procedures.* U.S. Department of the Interior: National Park Service, Washington, DC: Revised 2009.

The documentation of cultural landscapes could be accomplished by completing NPS-style cultural landscape inventories to document existing conditions, and cultural landscape reports to evaluate the significance of landscapes and offer treatment recommendations. These reports could inform long-term management of cultural landscapes and offer a more holistic picture of the historical significance of properties and historic districts that may have the potential to be affected by projects.

5.1.2.5 National Heritage Area

The Sacramento-San Joaquin Delta NHA was adopted by Congress in 2019. The NHA documents were prepared by the Delta Protection Commission in the interest of its constituents, the Delta's inhabitants. Consideration of its heritage themes and associated cultural resources may prove applicable to future cultural resources identification and evaluation assessments.

5.1.2.6 Traditional Properties

The RD&CS has noted throughout its identification and evaluation framework that traditional properties appear to be underrepresented in the study area's historic properties population. It is unclear if this is because traditions have been disrupted over time and thus may not meet the requirements for registration. Opportunities to address this question may arise during the course of cultural resources identification and evaluation in the study area.

5.1.2.7 Archaeological Research Questions

The archaeological research questions described in Sections 3.1.3 and 3.3.14 are intended to provide context for both archaeological resources evaluation and future data recovery. In both instances, the research themes would be further tailored for appropriate application to specific identified resources. All of the research questions presented in the RD&CS indicate gaps in our understanding of the Delta's history, and opportunities to address these questions may arise during the course of cultural resources identification and evaluation in the study area.

5.1.3 Historical Synthesis

This RD&CS provides a baseline for our current understanding of the Delta's history and the historic properties that represent that history. As such, the document may be built upon as new information is assessed. The process of cultural resources identification and evaluation in the study area, as described in this document, is expected to provide new information. As such, this RD&CS supports future synthesis of current and new information in order to improve understanding of Delta history, and to help address the current gaps in data as presented in Section 5.1.2.

Chapter 6
References

6.1 Works Cited

This section provides citations for materials that have been used to complete this RD&CS.

6.1.1 DWR Project Documents

DWR project source material has informed this RD&CS, such as:

- *Final Bay Delta Conservation Plan/California WaterFix Project EIR/EIS* (2016)
- *Built Historical Resources Evaluation Report for the Bay Delta Conservation Plan Project* (2012)
- *Addendum 1 to the Built Historical Resources Evaluation Report for the Bay Delta Conservation Plan Project* (2013)
- *Archaeological Survey Report for the Bay Delta Conservation Plan Project* (2013)
- *Draft Programmatic Historic Properties Treatment Plan for the California WaterFix Project* (2018)
- *Bouldin Island Geotechnical Investigations: Cultural Resources Survey Report* (2018)
- *Bay Delta Conservation Plan/California WaterFix Project Supplemental EIR/EIS* (2018)
- Cultural resources site records and study reports obtained from the Central California Information Center (Turlock), the Northwest Information Center (Rohnert Park), and the North Central Information Center (Sacramento)

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