

**Long-term Management Plan  
For The  
Cosumnes Floodplain Mitigation Bank**

Deleted: River

**TABLE OF CONTENTS**

<b>I Introduction</b> .....	3	Deleted: 2
<b>A Purpose of Establishment</b> .....	3	Deleted: 2
<b>B Purpose of this Long-term Management Plan</b> .....	3	Deleted: 2
<b>C Land Manager and Responsibilities</b> .....	3	Deleted: 2
<b>II Property Description</b> .....	3	Deleted: 2
<b>A Setting and Location</b> .....	3	Deleted: 2
<b>B History and Land Use</b> .....	4	Deleted: 3
<b>D Hydrology and Topography</b> .....	7	Deleted: 6
<b>E Soils</b> .....	10	Deleted: 7
<b>F Existing Easements</b> .....	10	Deleted: 7
<b>G Adjacent Land Uses</b> .....	10	Deleted: 7
<b>III Habitat and Species Descriptions</b> .....	10	Deleted: 7
<b>A Biological Resources Survey of Bank</b> .....	10	Deleted: 7
Valley Freshwater Marsh.....	10	Deleted: 7
Great Valley Mixed Riparian Forest.....	10	Deleted: 9
Great Valley Valley Oak Riparian Forest.....	10	Deleted: 9
Great Valley Willow Scrub.....	10	Deleted: 9
<b>B Summary of Bank Development Plan</b> .....	13	Deleted: 9
<b>C Endangered and Threatened Species</b> .....	13	Deleted: 9
<b>D Rare Species and Species of Special Concern</b> .....	16	Deleted: 18
<b>IV Management and Monitoring</b> .....	19	Deleted: 18
<b>A Biological Resources</b> .....	19	Deleted: 18
<b>Element A.1 Waters of the U.S., including Wetlands and Riparian Habitat</b> .....	19	Deleted: 19
<b>Element A.2 Channels (Shaded Riverine Aquatic Habitat)</b> .....	20	Deleted: 19
<b>Element A.3 Breach Locations</b> .....	20	Deleted: 20
<b>Element A.4 Non-native Invasive Species</b> .....	21	Deleted: 21
<b>Element A.5 Vegetation Management</b> .....	22	Deleted: 21
<b>B Security, Safety, and Public Access</b> .....	23	Deleted: 21
<b>Element B.1 – Trash and trespass</b> .....	23	Deleted: 22
<b>Element B.2 – Fire Hazard Reduction</b> .....	24	Deleted: 22
<b>C Infrastructure and Facilities</b> .....	24	Deleted: 23
<b>Element C.1 Fences and Gates</b> .....	24	Deleted: 23
<b>D Reporting and Administration</b> .....	24	Deleted: 23
<b>Element D.1 – Annual Report</b> .....	24	Deleted: 23
<b>V Transfer, Replacement, Amendments, and Notices</b> .....	25	Deleted: 24
<b>A Transfer</b> .....	25	Deleted: 24
<b>B Replacement</b> .....	25	Deleted: 24
<b>C Amendments</b> .....	25	Deleted: 24
<b>D Notices</b> .....	26	Deleted: 24
<b>VI Funding and Task Prioritization</b> .....	27	Deleted: 24
<b>A Funding</b> .....	27	Deleted: 25
<b>B Task Prioritization</b> .....	27	Deleted: 25
		Deleted: 26

**TABLE OF FIGURES**

**Figure 1. Vicinity Map**..... 5  
**Figure 2. Location Map**..... 6  
**Figure 3. Soil Survey of the Bank Site**..... 9  
**Figure 4. Bank Habitat Plan** ..... 12

# Long-Term Management Plan

## I Introduction

### A Purpose of Establishment

The Cosumnes Floodplain Mitigation Bank (“Bank”) was established by the Bank Enabling Instrument (“BEI”) to compensate for unavoidable impacts to, and to conserve and to protect waters of the U.S., including wetlands, other waters of the U.S., and shaded riverine aquatic habitat. The 493-acre Bank property includes restored and preserved floodplain habitat features including 295.45 acres of floodplain mosaic wetlands (of which 1.24 acres of wetlands previously existed on site), 11.87 acres of shaded riverine aquatic habitat (of which 2.47 acres previously occurred on site), and 164.39 acres of floodplain riparian habitat (of which 38.13 acres previously existed on site), for a total of 471.71 Bank credits. The BEI Signatory Agencies are the Sacramento District of the U.S. Army Corps of Engineers, Region 9 of the U.S. Environmental Protection Agency, and the California Department of Fish and Game (“CDFG”) Region 2. These agencies comprise and are referred to jointly as the Interagency Review Team (“IRT”). Terms used in this management plan have the same meaning as defined in the BEI.

Deleted: River Mitigation

Deleted: 285.20

Deleted: 16.11

Deleted: 171.14

Deleted: forest

Deleted: (

Deleted: 472.44

Deleted: total

Deleted: )

### B Purpose of this Long-term Management Plan

The purpose of this long-term management plan is to ensure the Bank is managed, monitored, and maintained in perpetuity. This management plan establishes objectives, priorities and tasks to monitor, manage, maintain and report on the waters of the U.S. and covered habitat on the Bank. This management plan is a binding and enforceable instrument, implemented by the conservation easement covering the Bank property.

### C Land Manager and Responsibilities

The land manager is Westervelt Ecological Services (WES). The land manager, and subsequent land managers, should ownership transfer occur, shall implement this long-term management plan, managing and monitoring the Bank property in perpetuity to preserve its habitat and conservation values in accordance with the Bank’s BEI, the conservation easement, and the long-term management plan. Long-term management tasks shall be funded through the Endowment Fund. The land manager shall be responsible for providing an annual report to the IRT detailing the time period covered, an itemized account of the management tasks and total amount expended. Any subsequent grading, or alteration of the Property’s hydrology and/or topography by the land manager or its representatives must be approved by the IRT and the necessary permits, such as a Section 404 permit, must be obtained if required.

## II Property Description

### A Setting and Location

The Bank is located in southern Sacramento County, California, north of the rural San Joaquin County community of Thornton, at the confluence of the Mokelumne and Cosumnes Rivers.

The 493-acre Bank Property is bounded on the north by the Cosumnes River, on the west by the Mokelumne River, on the east by Grizzly Slough and on the south by New Hope Road. It is designated Sacramento County Assessor's Parcel Numbers 146-0140-003-0000 and 146-0140-004-0000. The Property is shown on the general vicinity map (Figure 1) and the **Bank** Location Map (Figure 2). The general vicinity map shows the Bank location in relation to cities, towns, or major roads, and other distinguishable landmarks. The location map shows the Bank property boundaries on a USGS topographic map.

Deleted: approximately

Deleted: CRMB

Formatted: Font: Not Bold

The bank is within the northernmost portion of the San Joaquin Delta USGS (8-digit HUC) watershed unit and at the confluence of two other watershed units: the Lower Cosumnes-Mokelumne and Lower Sacramento. The Bank's unique position within the tidal Sacramento-San Joaquin Delta at the confluence of two Central Valley rivers provides unique opportunities for restoration of wetland functions and services on the Property. Floodplain wetland restoration could provide significant benefits for two of the regions most imperiled watersheds, the Lower Sacramento and San Joaquin Delta.

## B History and Land Use

The entire Bank property consists of two parcels that are currently zoned AG-80, and within the FEMA 100-year floodplain. The Bank site has been continuously used for agricultural production since its conversion (i.e., levee construction and clearing) between 1894 and 1910 (Philip Williams & Associates 2004). The land use at the Bank prior to habitat restoration was irrigated agriculture consisting of rotational field crops and wine grape vineyards. One farm building with associated structures occurs near the western boundary of the Bank. The property has been enrolled in the California Land Conservation Act since 1978.

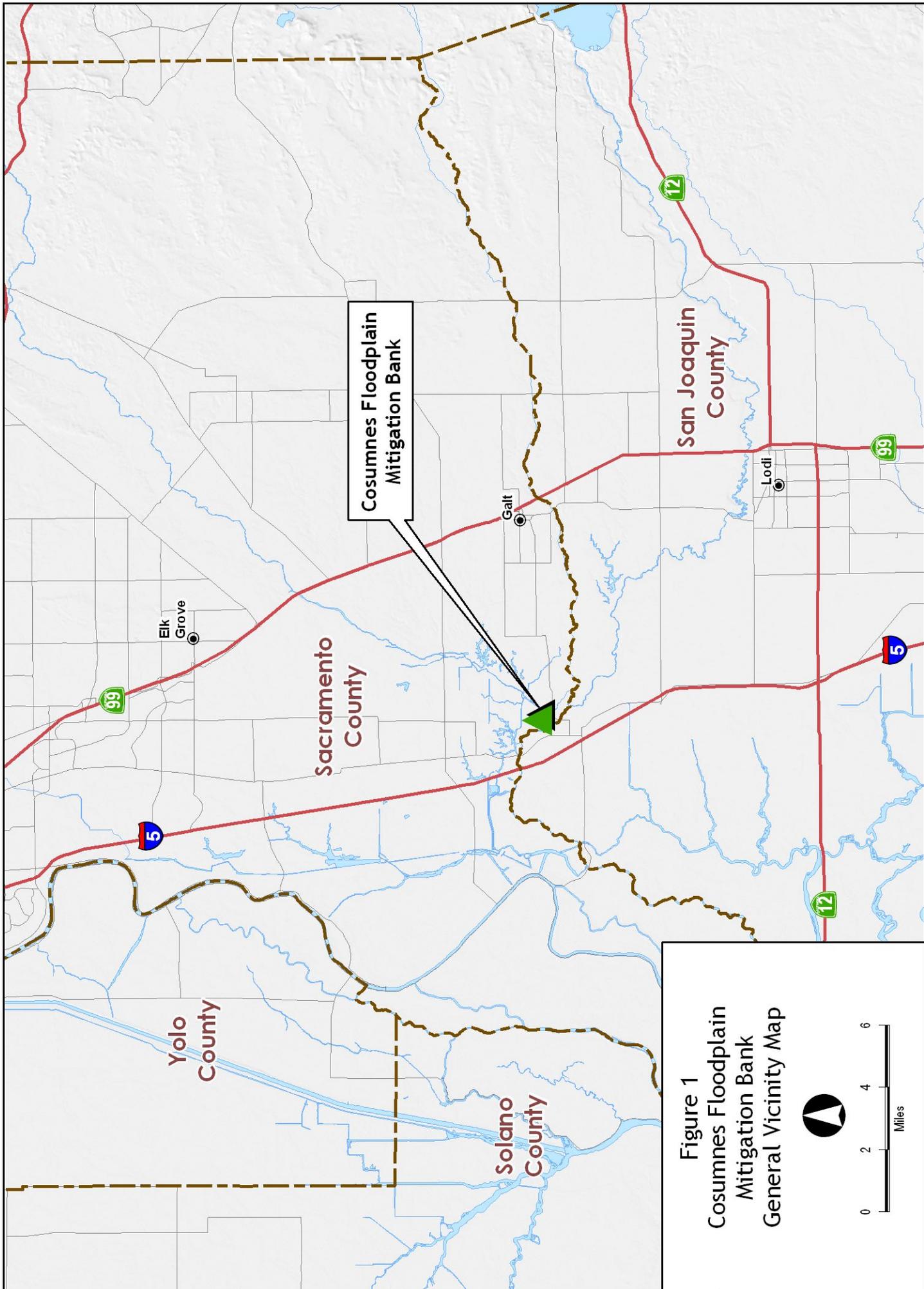
Several natural gas wells were established on the property during the mid 20<sup>th</sup> century; however, these wells are no longer in use, and were officially abandoned following California Department of Conservation Division of Oil and Gas abandonment procedures between 1968 and 1979. In recent years, there has been renewed interest in the gas field below the property. Five mineral access points have been defined on the Property where future sub-surface oil or gas mining efforts could occur. These areas are excluded from Bank crediting along with other utility access easements.

The Bank lies within the Secondary Zone of the Legal Delta (Section 12220 of the California Water Code) and is therefore subject to the land use authority of the local government and not the Delta Protection Commission. Based on a review of soil survey data (Tugel 1993), historic aerial photographs and historical maps (Philip Williams & Associates 2004), prior to the construction of levees, upstream flood control facilities, and agricultural conversion, the Property likely consisted of a mosaic of dense riparian forest and scrub habitats subject to routine flooding.

## C Cultural Resources

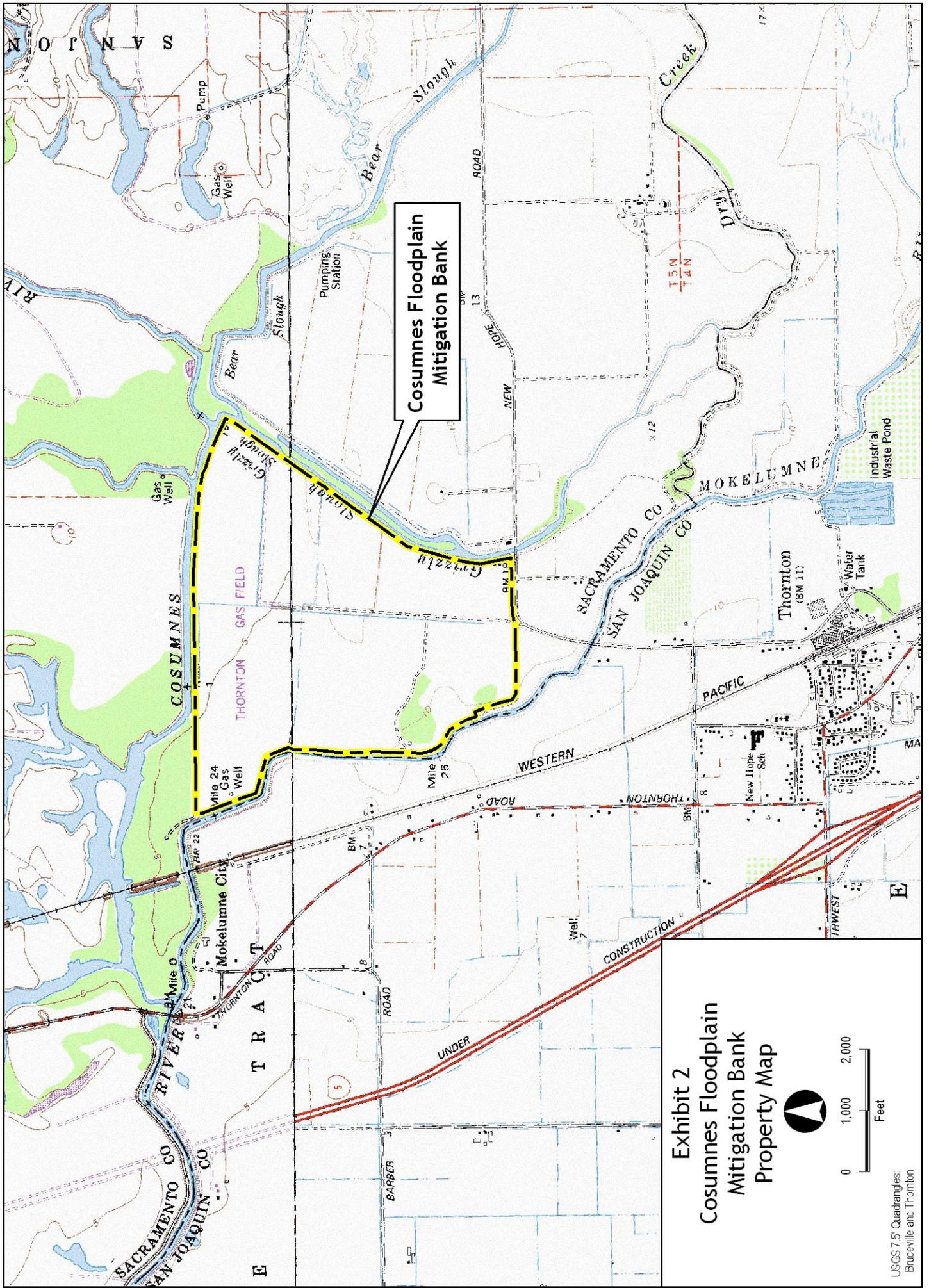
There is one culturally significant site, CA-SAC-11, reported on the Bank. It is reported in the southeastern portion of the project area, but its exact location is uncertain. The site was first recorded by Schenck and Dawson in 1929 as a burial and occupation site. In the same year, the site was reported as completely destroyed by agricultural activities. Three artifacts were later found at the site area, reportedly thrown up from a nearby canal by a dredger. The site was

Deleted: assigned a Late Horizon Phase II affiliation based on the type of artifacts (PAR Environmental Services 1991).



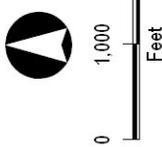
**Figure 1**  
**Cosumnes Floodplain**  
**Mitigation Bank**  
**General Vicinity Map**

0 2 4 6  
Miles



**Cosumnes Floodplain Mitigation Bank**

**Exhibit 2  
Cosumnes Floodplain Mitigation Bank Property Map**



USGS 7.5' Quadrangles:  
Bruceville and Thornton

assigned a Late Horizon Phase II affiliation based on the type of artifacts (PAR Environmental Services 1991).

Two attempts were made to find CA-SAC-11, once on September 14, 2007 and again on November 9, 2007. There are two areas reported by the Information Center as alternate site locations, and each were carefully checked for evidence of the reported site. Not a single artifact could be located within either reported location. There was no other evidence of prehistoric period cultural resources within the project area. All farm buildings present are of recent date of construction (1960s-1980s), and do not require recordation or evaluation. There are no historic period resources in the project area.

Several possibilities exist for the lack of evidence of CA-SAC-11. One possibility is that the site was recorded in the wrong location, as some of the early archeologists recorded sites on 30-minute scale maps, allowing errors in placement. The site noted in 1929 could exist on another property in the region, or have been re-recorded on another parcel with a different number. A second possibility is that the site was indeed on the property, but was totally destroyed in 1929. No evidence of the site remains. A third scenario is that the site was only partially destroyed, and a remnant of the site exists below the surface of the ground with no surface evidence. After almost eighty years of cultivation of the property since the site's destruction, surface evidence of the site may be destroyed, with any remaining artifacts removed.

As with any surface inspection, there is always a remote possibility that previous activities (both natural and cultural) have obscured prehistoric or historic period artifacts or habitation areas, leaving no surface evidence to identify the resources. If, during management activities, artifacts or non-native stone (obsidian, fine-grained silicates, basalt) are exposed, bone(s) or accumulation of shell are observed, or if areas that contain dark-colored sediment that do not appear to have been created through natural processes are discovered, then work will cease in the immediate area of discovery and a professionally qualified archeologist will be contacted immediately for a on-site inspection of the discovery, as necessary. If any bone is uncovered that appears to be human, then state law requires that the Sacramento County Coroner must be contacted. If the coroner determines that the bone most likely represents a Native American interment, then he or she must contact the Native American Heritage Commission in Sacramento so that they can identify the most likely descendants.

Deleted: or if

Deleted: unusual amounts of

## D Hydrology and Topography

Topography on site is relatively level, ranging from 3 to 11 feet (1 to 4 meters) above mean sea level (MSL) (NGVD 1929). The site generally slopes from south to north, with the lowest point on the property being at the center of the north boundary. There is an additional slight rise along the western boundary in the northern half of the property that slopes gently to the centerline of the property. The perimeter farm berm is roughly 16 feet MSL along the western, northern, and eastern property boundaries.

The Property drains from south to north, and surface flows connect to the adjacent Cosumnes River by a breach that was created in the farm berm surrounding the property as a part of the proposed mitigation bank habitat development.

The Mokelumne River to the west of the property has an average water level of  $\pm 1.67$  feet, with the channel bottom occurring at  $\pm(-4.33)$  feet MSL. The Cosumnes River to the north of the property has an average water level of  $\pm 1.27$  feet, with the channel bottom occurring at  $\pm(-4.73)$

feet MSL. With the excavation of channels within the property and the intentional breaching in the berm along the Cosumnes River, surface hydrology on the property directly connects with the Cosumnes River.

## E Soils

The soils are predominantly sandy and/or silty loams across the site. Sandy loam soil covers the western quarter of the site to the western property line. A small patch of clay is located at the low point along the central portion of the northern property line, and a small patch of clay loam at the southeastern corner near New Hope Road. The remainder of the site is comprised of silty loams, including: Cosumnes silt loam (map unit 128), Columbia sandy loam (map unit 120), Dierssen clay loam (map unit 135), and Clear Lake clay (map unit 114). Historically, these soils naturally occupied the low floodplain, natural levee, basin rim, and basin landforms respectively (Figure 3).

Deleted: ¶

Formatted: None, Indent: First line: 0", Don't adjust space between Latin and Asian text, Don't adjust space between Asian text and numbers

## F Existing Easements

The 493-acre parcel has several areas that will be excluded from the Conservation Easement area of the Bank. The mineral pads and access easements consist of 15.05 acres. Several gas pipeline and utility easements total 4.24 acres. The management outparcel along the western boundary consists of 2.0 acres for maintenance activities, materials and equipment storage. Remaining acreage of the bank is 471.71 acres.

Deleted: 14.35

Deleted: 4.21

Deleted: 472.44

## G Adjacent Land Uses

Adjacent land use includes conservation lands protected within the roughly 40,000 acre Cosumnes River Preserve on the north and east sides. Agriculture is the primary land use to the west and south.

# III Habitat and Species Descriptions

## A Biological Resources Survey of Bank

There are six vegetation communities within and adjacent to the Bank including Cultivated Lands, Ruderal, Valley Freshwater Marsh, Great Valley Mixed Riparian Forest, Great Valley Valley Oak Riparian Forest, and Great Valley Willow Scrub. These vegetation communities are described by referencing commonly used vegetation classification systems including *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), *California Vegetation* (Holland and Keil 1995), *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995), *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2003), and *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin 1979).

### Valley Freshwater Marsh

Valley Freshwater Marsh is dominated by perennial, emergent monocots 1 to 15 feet (0.40 to 4.5 meters) tall adapted to growing in conditions of prolonged inundation (Holland 1986). It typically occurs on sites that lack a significant current that are permanently flooded by

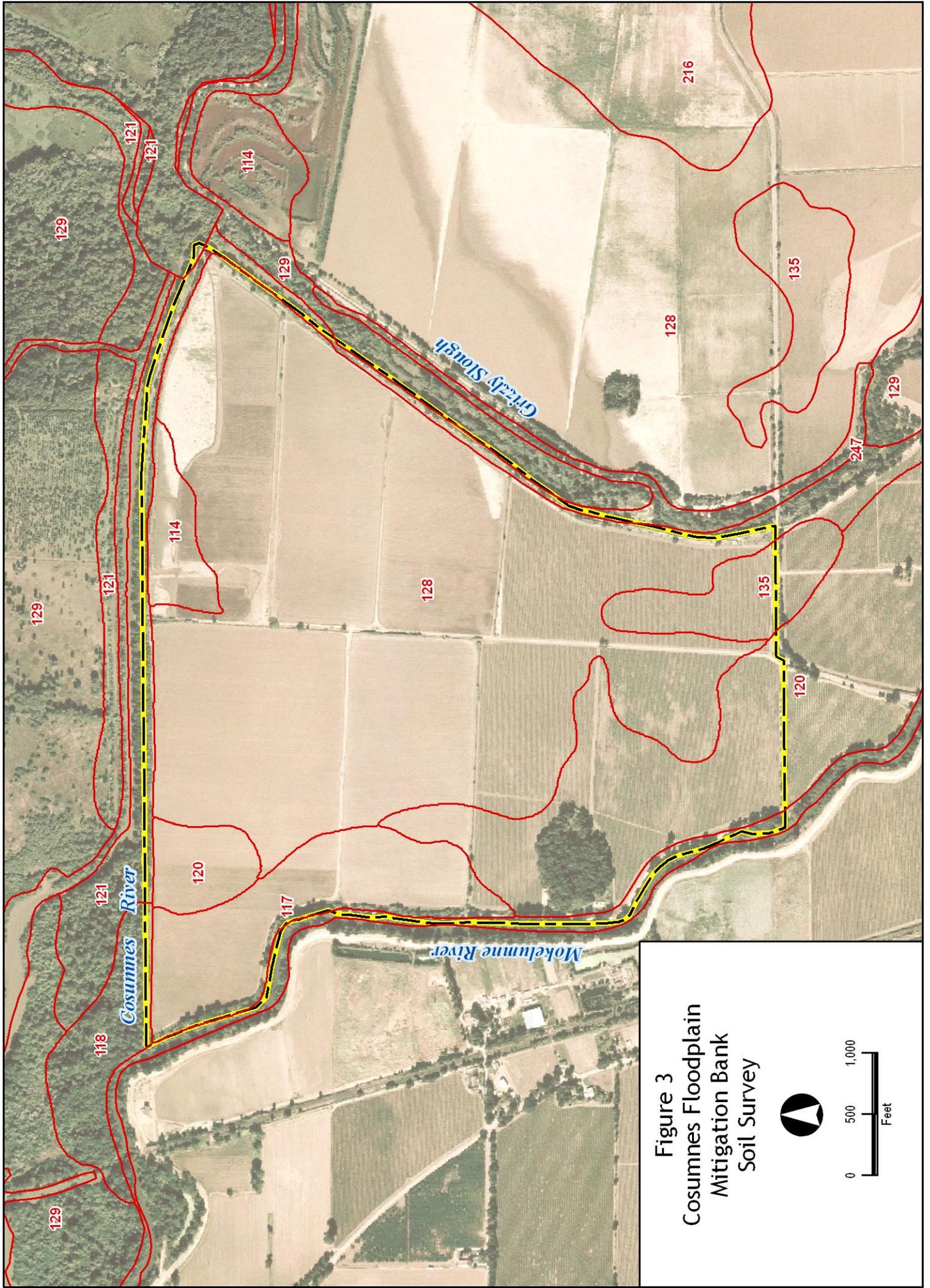
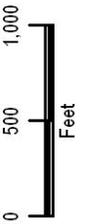


Figure 3  
 Cosumnes Floodplain  
 Mitigation Bank  
 Soil Survey



freshwater along the edges of water bodies, dune swales, slough terrace edges, banks, channels and mouth margins of rivers, bottomlands, ditch margins, lagoons, ponds, reservoir margins, and along geologic faults. This community is most extensive in the upper portion of the Sacramento-San Joaquin River Delta.

### **Great Valley Mixed Riparian Forest**

Great Valley Mixed Riparian Forest is a tall, dense, broadleaved winter-deciduous riparian forest. The tree canopy is usually fairly well-closed and moderately to densely stocked with several riparian species including box elder (*Acer negundo* var. *californica*), black walnut (*Juglans hindsii*), sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), and several species of willows. Understories consist of these taxa plus shade-tolerant shrubs like buttonwillow (*Cephalanthus occidentalis*), and Oregon ash (*Fraxinus latifolia*). This plant community occurs on relatively fine-textured alluvium near active river channels. These sites experience overbank flooding without severe physical battering or erosion. It is distributed on the floodplains of low-gradient, depositional streams of the Great Valley, usually below 500 feet (Holland 1986).

### **Great Valley Valley Oak Riparian Forest**

Great Valley Valley Oak Riparian Forest is characterized as a medium to tall (rarely to 100 feet) broadleaved, winter deciduous, closed-canopy riparian forest dominated by valley oak. Understory species include scattered Oregon ash, California black walnut, and sycamore, as well as young valley oak. Climbing vines are often conspicuous, quickly occupying wind-throw generated light gaps. Great Valley valley oak riparian forest is restricted to the highest parts of floodplains, most distant from or higher above active river channels and less subject to physical disturbance from flooding, but still receiving annual inputs of silty alluvium and subsurface irrigation. This vegetation community intergrades with Great Valley mixed riparian forest closer to rivers. This vegetation community was formerly extensive on low-gradient, depositional reaches of the major streams of the Sacramento and northern San Joaquin valleys. It has been virtually eliminated by agriculture and fire wood harvesting.

### **Great Valley Willow Scrub**

Great Valley Willow Scrub is characterized as an open to dense, broadleaved, winter deciduous shrubby streamside thicket dominated by any of several willow species. Dense stands usually have few herbaceous understory species. More open stands have grassy understories, typically dominated by introduced species. This community type is distributed along all of the major rivers and most of the smaller streams throughout the Great Valley watershed, usually below 1,000 feet.

## **B Summary of Bank Development Plan**

The habitat restoration activities at the Cosumnes Floodplain Mitigation Bank have created a mosaic of wetland types, associated upland riparian functions and services, and aquatic habitat for listed fish species. The restored features include riparian habitat features, floodplain wetlands, and channels that provide shaded riverine aquatic habitat.

Deleted: River Mitigation

## Jurisdictional Wetland Habitat

The jurisdictional wetland habitat (Wetlands) is a mosaic of freshwater wetland types, subject to periodic inundation and saturation during the growing season, and dominated by vegetation typically found in wetland environments. The wetland types include emergent, scrub-shrub and forest vegetation cover (Figure 4). The majority of the wetlands are located in the northern 300 acres of the site with the lowest existing topography (below approximately 6.5 to 7 feet NGVD). The agricultural fields have been de-leveled to vary topography and create mounds, sloughs, and flats. The greatest elevation for the Wetlands is just above the soil saturation point (i.e. capillary fringe) at approximately 6.5 feet MSL. The site was cluster planted with native riparian trees and shrubs. The remaining areas have been managed to allow natural recruitment of native riparian herbs, shrubs, and trees. Grasses and forbs were planted to establish a ground cover.

## Shaded Riverine Aquatic Habitat

Tidally influenced channels have been developed within the wetlands providing a transition intertidal aquatic habitat to shaded riverine aquatic habitat and floodplain riparian forest. Constructed channels have been designed to have a channel bottom elevation of 0.0 feet NGVD at the breach location on the Cosumnes River, sloping upwards to 3.0 feet NGVD at their upper end. These channel elevations were chosen to replicate other intertidal channels on the Cosumnes River Preserve and to also allow a complete brief drainage during the lowest low water portion of the tidal cycle. Tidal benchmarks are not available for this area and the nearest published tidal benchmarks are for New Hope Landing approximately 5.5 miles downstream of the [Bank](#). However, lowest low water on the Cosumnes River can be approximated from the California Department of Water Resources' Benson's Ferry stream gauge approximately 0.6 miles downstream of the [Bank](#). Analysis of the Benson's Ferry gauge data suggests that mean lowest low water is at about 1.5 feet NGVD with lower tidal events below 0.0 feet NGVD occurring sporadically. Mean higher high water lies at approximately 3.6 feet NGVD. These approximated mean higher high water tidal benchmarks can vary considerably from year to year within this reach of the Cosumnes River with some years approaching 5.0 feet NGVD (Philip Williams Ltd. 2004).

Deleted: CRMB

Deleted: CRMB

Under the mixed tidal regime of the Cosumnes and Mokelumne Rivers in this area the channels on the [Bank](#) are designed to drain completely, or nearly completely, during lowest low water for approximately 2 to 3 hours to help disrupt the breeding cycle of non-native predatory fish. The drainage of the channels will only occur during low flow periods in the Cosumnes River (i.e., summer and fall months) because during typical winter and spring months the hydrology of the site is primarily driven by storm and snowmelt runoff and water surface elevations are greater as a result of these flows.

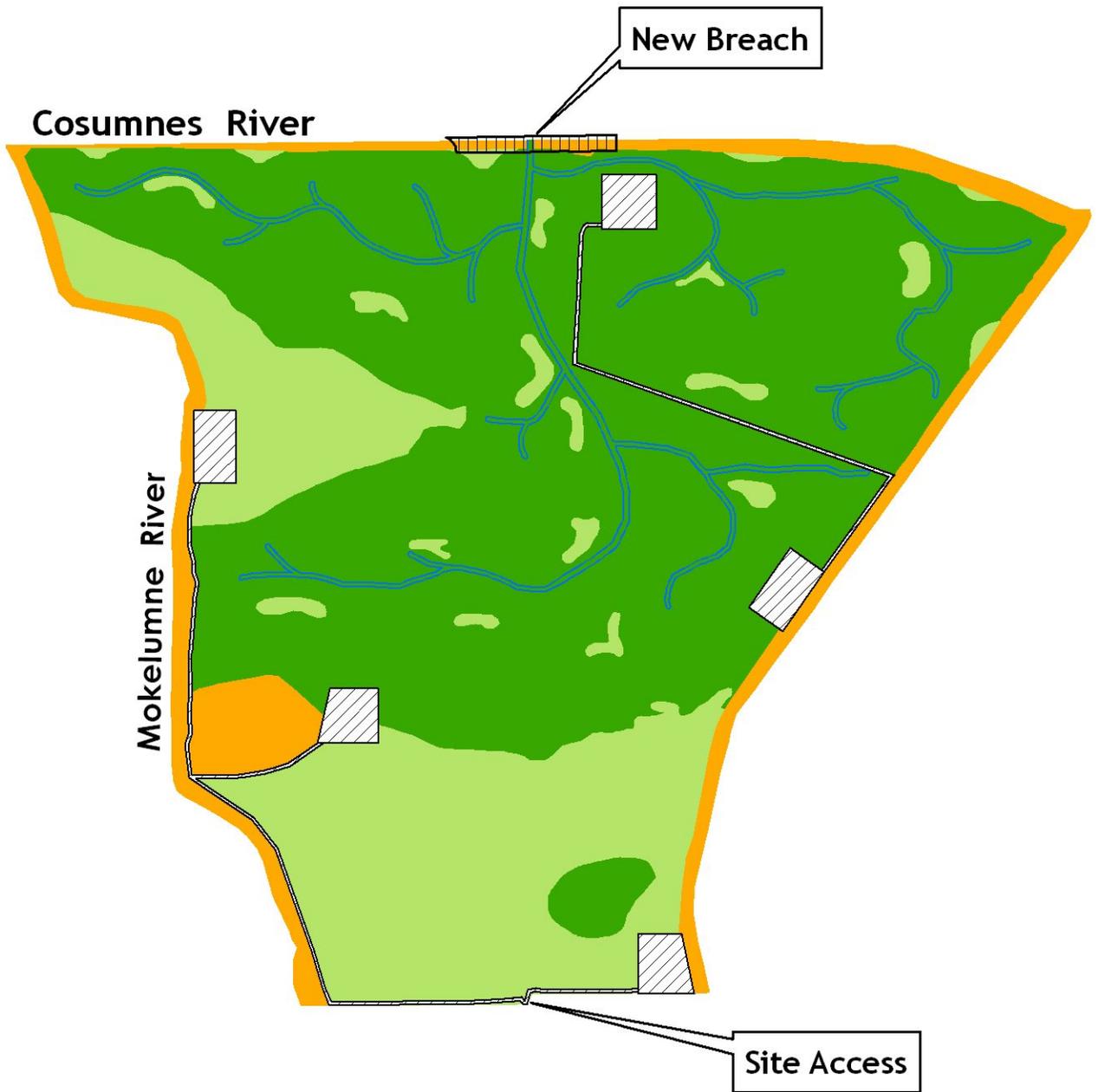
Deleted: CRMB

## Associated Riparian Habitat and Other Waters of the United States

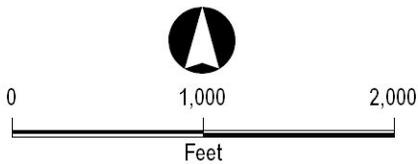
The majority of the restored associated riparian habitat (Riparian) is located on the southern half and along the fringes of [the Bank](#). In addition, Riparian areas are located on higher mounds of excavated soil along side cut channels and berms. The Riparian areas cover the ground on the site above 6.5 feet MSL and channels greater than 5.5 feet MSL. Planting methodology was the same as in wetlands, but selected vegetation included those species more commonly found in floodplains. "Dry" channels were cut in the upper extent of the Riparian area to allow late spring

Deleted: CRMB

Deleted: flooding to reach back to the southern portions of CRMB. The Other Waters of the United States



**Figure 4**  
**Cosumnes Floodplain**  
**Mitigation Bank**  
**Bank Habitat Plan**



**KEY**

-  Shaded Riverine Aquatic (SRA) Habitat
-  Floodplain Riparian Habitat
-  Floodplain Mosaic Wetland
-  Riparian Preservation
-  Mineral Pads and Access Roads

flooding to reach back to the southern portions of the Bank. The Other Waters of the United States (Other Waters) are these areas subject to frequent flooding, but do not have the same three parameter regulatory requirement (e.g., hydrological regime) as jurisdictional wetlands. The Other Waters is typically flooded from early spring runoff and is associated with the silt loam and sandy loam soils of the gently sloped floodplain landform.

Deleted:

## C Endangered and Threatened Species

There are three listed animal species that occur or have the potential to occur at the Bank. These species include two species that are federally listed as threatened, the Central Valley steelhead, and valley elderberry longhorn beetle, and one species that is state-listed as threatened, the Swainson's Hawk. One federally listed plant species, Mason's lilaepsis, has the potential to occur at the Bank. Overviews of these species are provided in this section.

Deleted: , Chinook

### Central Valley Steelhead (*Oncorhynchus mykiss irideus*)

Critical Habitat: NOAA Fisheries designated critical habitat for the Central Valley steelhead in 21 separate hydrologic units throughout the Central Valley (NOAA 2005). Two reaches of the Mokelumne River system near the project site have been designated critical habitat for the Central Valley steelhead (North Valley Floor Hydrologic Unit and San Joaquin Delta Hydrologic Unit) (NOAA 2005).

Potential for occurrence: Possible

#### Status, Distribution, and Habitat Requirements

The Central Valley steelhead ESU was federally listed as a threatened species on March 19, 1998; threatened status was reaffirmed on January 5, 2006 (NOAA 2006). Historically, steelhead existed throughout the tributaries and headwater streams of the Sacramento and San Joaquin Rivers. As a result of dam construction, Central Valley steelhead are now restricted to the Sacramento River downstream of Keswick Reservoir and its large tributaries downstream of impassable dams; small, perennial tributaries of the Sacramento River mainstem and large tributaries; the San Joaquin River downstream of the Merced River, and its large tributaries, and the Delta and bay system (NOAA 2005).

Steelhead is a cool water stream species that requires access to the ocean to complete their life history. Immigrating adults returning to spawn require sufficient cool water attraction flows, and an unimpaired transit corridor. Migrating adult steelhead enter freshwater December through April and require holding pools to rest and avoid predators, and riffle and pool tail-outs to spawn. Cover and refuge habitats (undercut banks, boulders, vegetation, etc.) are necessary at all times for survival from predators. After at least one full year and often two (or more) years in freshwater habitats, juvenile steelhead generally attempt to emigrate to the ocean as smolts during spring months (March through June). Access to the ocean can be prohibited by shallow water depths, excessive water temperature conditions or physical barriers. After spending 2 to 3 years in the ocean, steelhead return to their natal stream to spawn as 4 or 5-year-olds.

Because steelhead have a mandatory freshwater residency period, it is critical that suitable conditions for juvenile rearing exist year-round. Requirements for optimal juvenile rearing include adequate cover (i.e., greater than 25 percent of stream area), food supply (i.e., enough to sustain growth), and water temperatures of 43 to 65°F. Although juveniles are known to withstand temperatures of up to 77°F, survival at these higher temperatures is dependent on a

number of factors including exposure duration, acclimation factors, food availability, water quality, and groundwater dynamics.

#### Habitat Assessment and Occurrence in the Project Vicinity

The restored channels on the property provide suitable habitat for this species within the Cosumnes Floodplain Mitigation Bank site. NOAA identified the Mokelumne River basin as one of several major river basins known to support the Central Valley steelhead ESU (NOAA 2000). Mixed riparian forest habitat associated with the Mokelumne River within and adjacent to the project site provides an important component to maintaining suitable aquatic habitat for this species. Riparian habitat functions to maintain cool water temperatures, maintain water quality, and provide cover and refuge for migrating adult steelhead as well as emigrating smolts.

Deleted: River Mitigation

#### Swainson's Hawk (*Haliaeetus leucocephalus*)

Critical Habitat: None

Potential for occurrence: Possible

#### Status, Distribution, and Habitat Requirements

The Swainson's hawk is listed as threatened under the California Endangered Species Act (CESA). This species receives additional protection under the MBTA and MBTRA (USFWS 2005b). Swainson's hawk breed from southwestern Canada to northern Mexico (Godfrey 1986, Semenchuk 1992, Howell and Webb 1995, Smith 1996, England et al. 1997). Nearly all North American populations of Swainson's hawks winter in South America and Mexico; however, a small number of birds regularly winter in southern Florida (Stevenson and Anderson 1994) and in the Sacramento-San Joaquin Delta of central California (Yee et al. 1991, Herzog 1996). Historically, the Swainson's hawk's breeding range in California included the Great Basin; the Sacramento and San Joaquin Valleys; along the coast in Marin, Monterey, Ventura, Los Angeles, and San Diego Counties; on Catalina Island; and in a few scattered locations in the Colorado and Mojave Deserts (Bloom 1980). Today, Swainson's hawks continue to nest in most of the previously occupied regions of the state, but have been extirpated in coastal central and southern California.

A survey of nesting birds in California during 1979 revealed that Swainson's hawks nested almost exclusively in large, sparsely vegetated flatlands characterized by valleys, plateaus, broad floodplains, and large expanses of desert (Bloom 1980). In a study of movements and habitat use, it was found that single trees or riparian areas were used most often for nesting (Estep 1989). Swainson's hawks can forage in many crops, and Schmutz (1987) found that the species is more abundant in areas of moderate cultivation than in either grassland or areas of extensive cultivation. Alfalfa is routinely used by foraging Swainson's hawks (Estep 1989, Woodbridge 1991), but the ability of the hawk to use cultivated lands for foraging is a complex interaction of crop phenology and cultural practices (Schmutz 1987, Estep 1989, Woodbridge 1991). Orchards and vineyards, in general, are not suitable foraging habitat for Swainson's hawks because of the dense woody cover, and rice is unsuitable most of the season because it is flooded (Estep 1989).

#### Habitat Assessment and Occurrence in the Project Vicinity

The project site contains an abundance of suitable nesting habitat for this species in the mature valley oak and cottonwood trees within the oak riparian and mixed riparian forests. The site contains only marginal foraging habitat because of the presence of dense woody cover; however,

the fields and open grasslands on neighboring lands may provide suitable foraging habitat for this species.

### Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)

Critical Habitat: USFWS designated critical habitat for the valley elderberry longhorn beetle in two areas: along the American River Parkway Zone and in the Sacramento metropolitan area (USFWS 1984).

Potential for occurrence: Possible

#### Status, Distribution, and Habitat Requirements

The valley elderberry longhorn beetle is federally listed as threatened. A California endemic species, the valley elderberry longhorn beetle is found in scattered populations throughout its range. The species' range includes most of the California Central Valley north to Trinity County, south to San Diego County, and east to San Bernardino County (Barr 1991). The adults feed exclusively on elderberry (*Sambucus mexicanus*) foliage and are active from early March through early June. The beetles mate in May and females lay eggs on living elderberry shrubs. Larvae bore through the stems of the shrubs to create an opening in the stem within which they pupate. After metamorphosing into an adult, the beetle chews a circular exit hole through which it emerges (Barr 1991). Current information indicates that the beetle is found only with its host plant, the elderberry. Elderberry shrubs in California's Central Valley are associated with riparian habitats (USFWS 1984).

#### Habitat Assessment and Occurrence in the Project Vicinity

Suitable habitat for this species is present within the multiple elderberry shrubs found along the banks of the Mokelumne River, on the western edge of the Bank. There has been a single CNDDDB occurrence of valley elderberry longhorn beetle within a five mile radius of the Bank (CDFG 2007). This occurrence was located approximately 3.8 miles northeast of the site along an un-named tributary of the Cosumnes River. In December of 2007 biologists identified approximately 90-100 elderberry shrubs located in the mixed riparian forest and willow scrub communities along the eastern bank of the Mokelumne River (Figure 4). When possible, biologists looked for exit holes in the elderberry bark. No exit holes were observed during the survey. Biologists also surveyed riparian forest and willow scrub habitat within the levee and southern bank of the Cosumnes River, however, no elderberry shrubs were observed at these locations.

**Deleted:** throughout the mixed riparian forest within the

### Mason's lilaepsis (*Lilaepsis masonii*)

#### Status, Distribution and Habitat Requirements

Mason's lilaepsis is State-listed as Rare and is a CNPS List 1B.1 species, indicating it is seriously endangered in California (CNPS 2007). Mason's lilaepsis is a prostrate, creeping, rhizomatous, perennial herb species in the carrot family (Apiaceae). It has small white or maroon flowers and is differentiated from the one other California species in the genus by its cylindrical leaves and obscure internal cross-walls (Constance in Hickman 1993). Mason's lilaepsis blooms from April to November (CNPS 2007). This species occurs in brackish or freshwater marshes and swamps, and riparian scrub (*ibid.*). It is currently known from Alameda, Contra Costa, Napa, Sacramento, San Joaquin, and Solano counties from between 0 to 32 feet (0 to 10 meters) above mean sea level (*ibid.*).

**Deleted:** Figure 4 depicts locations of all elderberry shrubs observed during the survey. Location data was gathered using a Trimble GeoXT handheld GPS device. Often a single GPS point was collected from the levee though several individual shrubs were clustered at that location. In these cases biologists entered the number of individuals for that single point into the GPS device. When possible, biologists looked for exit holes in the elderberry bark. No exit holes were observed during the survey.

## Habitat Assessment and Occurrence in the Project Vicinity

Suitable habitat is present along the margins of the Mokelumne River, Cosumnes River, and Grizzly Slough. The nearest CNDDDB occurrence is 2.7 miles to the southwest on Beaver Slough (CDFG 2007). Other CNDDDB occurrences are present 4 miles to the west on Snodgrass Slough and 6.5 miles to the southwest on South Mokelumne River (*ibid.*). Based on the presence of suitable habitat and the project's proximity to reported occurrences, Mason's lilaeopsis may occur within the project area.

### D Rare Species and Species of Special Concern

Two sensitive animal species, the western pond turtle and fall run Chinook salmon are considered to have the potential to occur at the Bank. There are four special status plant species that may occur at the Bank. These species are described below.

Deleted: One

Deleted: is

Deleted: plant

#### **Western Pond Turtle (*Clemmys marmota*)**

The western pond turtle is a state species of special concern and a federal species of concern. These turtles are typically associated with permanent ponds, lakes, streams, irrigation ditches, or permanent pools along intermittent streams. They also require basking sites such as partially submerged logs, rocks, mats of floating vegetation or open mud banks (CDFG 2003).

Western pond turtles were not observed on the Bank site. However, it is considered to have a high potential to occur on site, because of the abundance of suitable stream habitat within and adjacent to the Bank and occurrence records from the region.

#### Fall Run Chinook Salmon (*Oncorhynchus tshawytscha*)

Formatted: Font: Not Bold

Formatted: Font: Not Italic

Central Valley ESU fall-run (and late fall-run) Chinook salmon were transferred from the federal candidate species list to the federal species of concern list in 2004 (64 FR 19975; April 15, 2004). Fall-run Chinook salmon currently maintain self-sustaining populations in the Cosumnes and Mokelumne rivers, partially supplemented by stocking from the Mokelumne River Fish Hatchery, which is owned by EBMUD and operated by CDFG.

Data collected from studies conducted by EBMUD and CDFG indicate that the long-term (1940–2003) mean annual Chinook salmon escapement in the Mokelumne River was 3,921 fish. Chinook salmon numbers in the Mokelumne River have generally increased since 1996. Adult fall-run Chinook salmon migrate into the Mokelumne River from September to early January, with peak immigration occurring in November. Spawning generally occurs from late October through January. The salmon eggs incubate in the gravel and hatch between late October and April, depending on time of spawning and water temperature. Fry emergence occurs from January to April and a small portion of these fish may emigrate toward the Delta immediately following emergence as post-emergent fry; however, the majority rear in the spawning areas for a period of several weeks. Emigration from the Mokelumne River is complete by July.

The Cosumnes River historically supported moderate size runs of Chinook salmon, with escapement ranging from several hundred to more than 4,000 fish between 1953 and 1973

(Snider and Reavis 2000). In recent decades, however, annual runs have ranged from 0 to approximately 1,000 fish, but have typically been less than 200 (Snider and Reavis 2000). Fish from the Mokelumne River Hatchery have been planted in the Cosumnes River and strays from the Mokelumne River (as identified by coded wire tags) are found annually in the Cosumnes River. Declines in the Cosumnes River populations are apparently due to the altered hydrology of the system during the critical salmon migration period coupled with a short supply of suitable spawning and rearing habitat. Adult immigration begins immediately upon hydraulic connection with the Mokelumne River and spawning begins soon after fish reach suitable spawning reaches. Snider and Reavis (2000) reported that 69% of all Chinook salmon spawning during the 1998–99 season occurred between Meiss Road and Highway 16. The upstream limit for salmonid migration is a series of high-gradient cascades near Latrobe Road. Fry emergence occurs through May and emigration from the Cosumnes River occurs into June, with early emigration apparently triggered by episodic flow events and later migration triggered by increases in water temperature (Snider and Reavis 2000). Sampling conducted by Whitener and Kennedy (1998) indicate that reconnection of the Cosumnes River to its floodplain provides valuable rearing habitat for juvenile Chinook salmon.

### **Bristly Sedge (*Carex comosa*)**

#### Status, Distribution and Habitat Requirements

Bristly sedge is designated a CNPS List 2.1 species indicating it is seriously endangered in California, but more common elsewhere (CNPS 2007). A rhizomatous, perennial herb species of the sedge family (Cyperaceae), it has 3 stigmas and a 3-sided fruit with a tough persistent style. It is differentiated from other species in the genus by its glabrous leaf sheath, lower inflorescence spikelets on long, nodding stalks, and stalked perigynium (Mastrogiuseppe in Hickman 1993). Bristly sedge flowers from May to September (CNPS 2007). It is currently known to occur in Contra Costa, Lake, Mendocino, Sacramento, Santa Cruz, Shasta, San Joaquin, and Sonoma counties and Idaho, Oregon, Washington, and elsewhere (*ibid.*). This species is presumed extirpated from San Bernardino and San Francisco counties. This species occurs in coastal prairie, marshes and swamps on lake margins, and valley and foothill grassland at elevations from 0 to 2,050 feet (0-625 meters) (*ibid.*).

#### Habitat Assessment and Occurrence in the Project Vicinity

Suitable vegetation associations are present for this taxon on the Mokelumne River, Cosumnes River, and Grizzly Slough. The nearest CNDDDB occurrence is 4 miles to the west on The Meadows adjacent to Snodgrass Slough (CDFG 2007). Based on the presence of suitable habitat and the project's proximity to local occurrences, bristly sedge may occur within the project area.

### **Rose-mallow (*Hibiscus lasiocarpus*)**

#### Status, Distribution and Habitat Requirements

Rose-mallow is designated a CNPS List 2.2 species indicating it is fairly endangered in California, but more common elsewhere (CNPS 2007). It is a rhizomatous, aquatic, emergent, perennial herb species of the mallow (Malvaceae) family. It has white or rose flowers with a red base and is differentiated from other species in the genus by having leaf blades 6 to 10 cm in

length, flowers near the stem tip, and petals that are 6 to 10 cm in length (Hill in Hickman 1993). Rose-mallow blooms from June to September (CNPS 2007). This species has been recorded from Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo counties, and elsewhere (*ibid.*). Rose-mallow occurs in freshwater marshes and swamps at elevations from 0 to 66 feet (0-20 meters) (*ibid.*).

#### Habitat Assessment and Occurrence in the Project Vicinity

Suitable habitat is present along the margins of the Mokelumne River, Cosumnes River, and Grizzly Slough. The nearest CNDDDB occurrence is 0.17 mile to the north on the Cosumnes River, with another CNDDDB occurrence 0.5 miles to the northwest, also on Cosumnes River (CDFG 2007). Numerous CNDDDB occurrences are present to the west on Snodgrass Slough and to the southwest on South Mokelumne River (*ibid.*). Based on the presence of suitable habitat and the project's proximity to local occurrences, rose-mallow may occur within the Bank.

#### **Delta Mudwort (*Limosella subulata*)**

##### Status, Distribution and Habitat Requirements

Delta mudwort is designated a CNPS List 2.1 species indicating it is seriously endangered in California, but more common elsewhere (CNPS 2007). It is a stoloniferous, tufted, annual herb species of the figwort family (Scrophulariaceae). It has small white to lavender-blue flowers and is differentiated from other species in the genus by having cylindrical, awl-like leaves (Wetherwax in Hickman 1993). Delta mudwort blooms from May to August (CNPS 2007). It is native to California, although the Jepson Manual states otherwise. It is currently known to occur in Contra Costa, Sacramento, San Joaquin, and Solano counties (*ibid.*). This species occurs in marshes and swamps at elevations from 0 to 10 feet (0 to 3 meters) (*ibid.*).

#### Habitat Assessment and Occurrence in the Project Vicinity

Suitable vegetation associations are present along the margins of the Mokelumne River, Cosumnes River, and Grizzly Slough and portions of the ditches on site. The nearest CNDDDB occurrences are 3.8 miles to the west on Deadhorse Cut near the North Mokelumne River and 4.6 miles to the southwest on the South Mokelumne River (CDFG 2007). Based on the presence of suitable habitat and the project's proximity to local occurrences, Delta mudwort may occur within the Bank.

#### **Sanford's Arrowhead (*Sagittaria sanfordii*)**

##### Status, Distribution and Habitat Requirements

Sanford's arrowhead is designated a CNPS List 1B.2 species indicating it is fairly endangered in California (CNPS 2007). A rhizomatous, emergent, perennial herb species of the water-plantain family (Alismataceae), it has linear and 3-angled to lanceolate emergent leaf blades (Turner in Hickman 1993). Sanford's arrowhead blooms from May to October (CNPS 2007). It is currently known to occur in Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Placer, Sacramento, Shasta, San Joaquin, and Tehama counties (*ibid.*). It is presumed to be extirpated in Orange and Ventura counties. This species is supported by assorted shallow freshwater marshes and swamps at elevations from 0 to 2,001 feet (0 to 610 meters) (*ibid.*).

#### Habitat Assessment and Occurrence in the Project Vicinity

Suitable habitat is present along the margins of the Mokelumne River, Cosumnes River, and Grizzly Slough and portions of the ditches on site. The nearest CNDDDB occurrence is 5.5 miles

to the northeast on Badger Creek (CDFG 2007). Based on the presence of suitable habitat and the project's proximity to local occurrences, Sanford's arrowhead may occur within the Bank.

#### IV Management and Monitoring

The overall goal of long-term management is to foster the long term viability of the Bank site's waters of the U.S., covered species and covered habitat. Routine monitoring and minor maintenance tasks are intended to assure the viability of the Bank site in perpetuity.

Deleted: ¶

##### A Biological Resources

The approach to the long-term management of the Bank site's biological resources is to conduct annual site examinations and monitoring of selected characteristics to determine stability and ongoing trends of the preserved and created waters of the U.S., including the mosaic of wetland types, associated upland riparian functions and services, and aquatic habitat for listed fish species. Annual monitoring will assess the Bank's condition, degree of erosion, invasion of exotic or deleterious (e.g., thatch producing) species, water quality, fire hazard, and/or other aspects that may warrant management actions. While it is not anticipated that major modification to the Bank will be needed, an objective of this long-term management plan is to guide monitoring to identify any issues that arise, and using adaptive management, to determine what actions might be appropriate. Westervelt Ecological Services staff has the knowledge, training, and experience to accomplish the monitoring and management responsibilities laid out in this plan.

Deleted: b

Deleted:

Adaptive management means an approach to natural resource management which incorporates changes to management practices, including corrective actions as determined to be appropriate by the IRT in discussion with the land manager. Adaptive management includes those activities necessary to address the affects of climate change, fire, flood, or other natural events, force majeure, etc. Before considering any adaptive management changes to the long-term management plan, the IRT will consider whether such actions will help ensure the continued viability of Bank's biological resources.

The land manager for the Bank site shall implement the following:

##### Element A.1 Waters of the U.S., including Wetlands and Riparian Habitat

Objective: Monitor, conserve and maintain the Bank site's waters of the U.S., including wetlands. Limit any impacts to waters of the U.S. from vehicular travel or other adverse impacts.

Task: At least one annual walk-through survey will be conducted to qualitatively monitor the general condition of these habitats. General topographic conditions, hydrology, general vegetation cover and composition, invasive species, erosion, will be noted, evaluated and mapped during a site examination in the spring. Notes to be made will include observations of species encountered, water quality, general extent of wetlands, and any occurrences of erosion, and weed invasion.

Task: Obtain high resolution aerial photography and quantify extent of SRA on Bank site. Acquire an aerial photograph of the Bank every ten years. A baseline of aerial photographs will be taken annually during the Interim Management Period to track habitat development, monitor inundation of the Bank, and evaluate the functionality of the channels and breaches with a particular emphasis on ponding or fish entrapment. Timing of the aerial photos will be targeted in late spring, following the end of spring flood events.

Task: Establish reference sites for photographs and prepare a site map showing the reference sites for the Bank file. A total of not less than 20 sites, of the overall wetland mosaic, will be identified and permanently marked in the field during interim bank management period. Photos will be taken annually during the Interim Management Period to establish a baseline for the long-term monitoring of the site. Photos will be taken in late spring after seasonal flooding events have ceased. Reference photos will be taken at least every five years from the beginning of the long-term management, with selected reference photos taken on the ground more frequently, once per year.

**Deleted:** Alternatively, utilize photographic reference sites, if any,

**Deleted:** developed

**Deleted:** Reference photographs will be taken of the overall wetland mosaic

### **Element A.2 Channels (Shaded Riverine Aquatic Habitat)**

Objective: Monitor, conserve and maintain the Bank channels to provide suitable habitat (SRA) for special-status fish species.

Objective: Conserve and protect any special-status fish species occurring on-site.

Task: As part of the annual site walk-through, the Bank site's covered habitat will be examined for any changes, current condition or pending needs. Any necessary tasks will be identified, prioritized and implemented as funding is available.

Task: Annual surveys will include a site visit in late spring following seasonal flood events. If channels conditions are resulting in fish stranding or ponding for durations which support predatory fish species, corrective actions will be taken. The Land Manager will coordinate with the IRT on the appropriate action(s) to take.

Task: Every ten years survey fish species occurring at the Bank site.

Task: Evaluate and prioritize other tasks that improve habitat quality for listed fish species if funding is available, as needed.

### **Element A.3 Breach Locations**

Objective: Monitor, conserve and maintain the Bank site's covered habitat.

Task: As part of the annual site walk-through, breach locations will be inspected to evaluate the hydrology and water flow through each structure.

Task: If breach locations are obstructed and/or if the current flow regime is negatively affecting habitat, corrective actions will be taken. Corrective actions may include the mechanical removal of debris or sediment using long-reach excavators or other suitable equipment.

#### **Element A.4 Non-native Invasive Species**

Invasive species threaten the diversity or abundance of native species through competition for resources, predation, parasitism, interbreeding with native populations, transmitting diseases, or causing physical or chemical changes to the invaded habitat. For the purposes of this Plan, plants native to the Bank will be defined as those plants believed by the scientific community to have been present in Sacramento County prior to the settlement of Europeans.

When active exotic pest plant control is needed, there are three methods: hand (or mechanical) removal, biological controls, and herbicides. Hand removal, including use of small hand powered or handheld equipment (e.g., string trimmer) is the most targeted and least likely to have indirect effects. Therefore, this method of removing exotic pest plant species from the Bank will be the default method for localized infestations. If hand removal methods are attempted and found to be ineffective, or the problem is too widespread for hand removal to be practical, then mechanical methods (use of larger equipment with motors such as mowers) or biological controls as described below can be implemented.

Deleted: will be the preferred

Biological controls are typically natural parasites, predators, or pathogens that are released to combat non-native species. For example, there are several natural enemies of yellow star thistle that have been introduced from Europe to act as biological controls against this invasive species. The insects begin life within the seed head of the flower and develop there, feeding on the seed. Biological controls should be used with caution and only after contact with the Sacramento County Agricultural Commissioners Office. Grazing is another biological control that may be selectively used at the Bank to control invasive species. If biological control methods are not available or are found to be ineffective, then herbicides can be used as outlined below.

Herbicides can be effective, but could solely used for the management of some non-native invasive plant species. Hand or mechanical removal should be the first choice for all non-native species removal. While herbicides can be potentially harmful if misused, invasive species can be extremely detrimental to native habitats. The use of chemicals should be considered carefully and the most recent research regarding the appropriate herbicide for the target plant should be consulted.

Herbicide use will be under the direction of a licensed pest control advisor at the appropriate time of year. Herbicides must be applied according to the label, in accordance with applicable federal, state, and local laws. Any actions taken will be described in the Annual Report.

Objective: Monitor and maintain control over non-native invasive species, including but not limited to noxious weeds that diminish site quality for which the Bank was established. The land manager shall consult the following sources for guidance on what species may threaten the site and on management of those

species: The California Department of Food and Agriculture (CDFA) list of "noxious weeds" that are subject to regulation or quarantine by county agricultural departments, the California Invasive Plant Council, and the University of California State Integrated Pest Management Program list of "Exotic and invasive pests and diseases that threaten California's agricultural, urban, or natural areas".

Task: Mapping of non-native invasive species cover or presence shall occur during the Interim Management Period to establish a baseline.

Mapping shall be accomplished through use of available technologies, such as GIS and aerial photography.

Deleted: first five years of Bank management,

Task: Each year's annual walk-through survey (or a supplemental survey) will include a qualitative assessment (e.g. visual estimate of cover) of potential or observed noxious weeds or other non-native species invasions, primarily in or around the wetlands. Additional actions to control invasive species will be evaluated and prioritized.

Task: If necessary, exotic pest plants will be controlled by hand removal, mechanical equipment, biological controls, or herbicides, as approved by IRT. IRT notification and approval is not required if exotic pest plants are removed by hand, hand held equipment, grazing or a small mower.

### **Element A.5 Vegetation Management**

Vegetation on the majority of the Bank site will be managed by natural processes. However, vegetation along the Bank's perimeter levee, near access roads, or in areas that are required for fire prevention will be actively managed. The most likely management technique for these areas will be mowing, and if appropriate, grazing. Additional vegetation management may be implemented if determined to be beneficial for overall habitat quality. Management actions to prevent the spread of invasive species at the Bank are described above in Element A.4.

Objective: Analyze effects of mowing and grazing on habitat quality. If determined appropriate, develop and implement specific mowing and/or grazing actions in coordination with management at other local conservation sites to maintain habitat quality.

Objective: Adaptively manage vegetation based on site conditions and data acquired through monitoring to maintain biological values.

Task: Review and explore potential vegetation management regimes as proposals and/or opportunities and funding arise. If a particular management practice is determined to potentially improve site quality, develop management practices and amend this long-term management plan with the IRT's approval to reflect these practices.

Task: Implement vegetation management techniques, to maintain vegetation height and composition similar to baseline conditions or as determined likely to maintain wetland function or habitat value.

Implementation of vegetation management techniques must be approved by the IRT.

## **B Security, Safety, and Public Access**

The Bank will be fenced and shall have no general public access, nor any regular public or private use. Research and/or other educational programs or efforts may be allowed on the Bank site as deemed appropriate by WES. These programs are not specifically funded or a part of this long-term management plan.

The Bank represents an opportunity to educate and encourage a sense of respect for open space and wildlife habitat in local students and the community as a whole. Individuals or groups using the Bank for educational purposes will coordinate their use with the Land Manager. If the educational activities will be passive in nature, such as an occasional walk through the Bank to discuss plants and animals of the Bank habitats, then the consent of the Land Manger is sufficient. If active use of the Bank is proposed, or regular, but passive use of the Bank is proposed, review and approval by the BEI Signatory Agencies is required. To avoid repeated inquiries with these agencies, a use plan could be developed by the interested organization for a one-time approval. Interpretive trails and benches are not proposed on the Bank.

Recreation activities are not currently proposed to occur on the Bank. However, the land owner may continue certain occasional passive activities such as birding, hunting, photography, or walking. Passive activities are defined as those that would have no potential affect on the sensitive resources protected on site.

The Land Manager will coordinate with the Sacramento-Yolo Vector Control District to develop Best Management Practices to minimize mosquito reproduction at the Bank. Many of the standard recommended management actions are not applicable to the Bank, because they rely on actively managed wetland system rather than one that functions on natural hydrology. However, several of the recommended manage actions, such as preventing trash on-site, providing good access roads, and removing silt or sediment that obstruct drainage structures, are already included in the management plan. Any mosquito abatement issues will be addressed through the development of a plan by the Land Manager and the Sacramento-Yolo Vector Control District in coordination with and approved by the IRT.

### **Element B.1 – Trash and trespass**

The Bank should remain free of trash and other debris that harms the aesthetic and ecological value of the site. Proper fence maintenance and site control will limit the amount of trash on Bank. Trash is most likely to occur outside of the Bank's fences and gates.

Objective: Monitor sources of trash and trespass.

Objective: Collect and remove trash, repair vandalized structures, and rectify trespass impacts.

Task: During each site visit, record occurrences of trash and/or trespass. Record type, location, and management mitigation recommendations to avoid, minimize, or rectify a trash and/or trespass impact.

Task: At least once yearly collect and remove trash and repair and rectify vandalism and trespass impacts.

## Element B.2 – Fire Hazard Reduction

Formatted: Keep with next

Objective: Maintain the site as required for fire control while limiting impacts to biological values.

Task: Mow or graze to reduce vegetation in areas required by authority agency(ies), and as approved by the IRT, for fire control.

## C Infrastructure and Facilities

Since the site is bounded by waterways on the east, north and west sides, the only land access is from the south. Access to the levee roads on the east (along Grizzly Slough) is gated and locked, and access to the western levee road (along the Mokelumne River) is only accessible by internal roads. Exclusive access to the Bank occurs through the main gate off New Hope Road, in the center of the south boundary. Therefore, only the south border of the Bank will be fenced and gated to deter unauthorized public access. Signage will be installed along the external perimeters of the Bank to inform the public of the presence of the Bank. The Land Manager will be responsible for the maintenance and replacement of the fencing and signage. Temporary fencing may be placed on the Bank to aid in partitioning the property for situation grazing, as needed.

### Element C.1 Fences and Gates

Objective: Monitor condition of fences and gates.

Objective: Maintain fences and gates to prevent casual trespass, allow necessary access. If grazing activity occurs at the Bank, provide temporary fencing to facilitate grazing regime and management, and prevent negative impacts to wetlands and other habitat features.

Task: During each site visit, record condition of fences and gates. Record location, type, and recommendations to implement fence and/or gate repair or replacement, if applicable.

Task: Maintain fences and gates as necessary by replacing posts, wire, and/or gates. Replace fences and/or gates, as necessary, and as funding allows.

## D Reporting and Administration

### Element D.1 – Annual Report

Objective: Provide annual report on all management tasks conducted and general site conditions to IRT and any other appropriate parties.

Task: Prepare annual report and any other additional documentation. Include a summary. Complete and circulate to the IRT and other parties by August 15 of each year.

Task: Make recommendations with regard to (1) any habitat enhancement measures deemed to be warranted, (2) any problems that need near short and long-term attention (e.g., weed removal, fence repair, erosion control), and (3) any changes in the monitoring or management program that appear to be warranted based on monitoring results to date.

Deleted: ¶

Formatted: Indent: Left: 0"

## **V Transfer, Replacement, Amendments, and Notices**

### **A Transfer**

Any subsequent transfer of responsibilities under this long-term management plan to a different land manager shall require commitment of the new land manager to fulfill the obligations of this long-term management plan by amendment. Any subsequent Property Owner assumes land manager responsibilities described in this long-term management plan and as required in the BEI, unless otherwise amended in writing by the IRT.

### **B Replacement**

If the land manager fails to implement the tasks described in this long-term management plan and is notified of such failure in writing by any of the IRT, land manager shall have 90 days to cure such failure. If failure is not cured within 90 days, land manager may request a meeting with the IRT to resolve the failure. Such meeting shall occur within 30 days or a longer period if approved by the IRT. Based on the outcome of the meeting, or if no meeting is requested, the IRT may designate a replacement land manager in writing by amendment of this long-term management plan. If land manager fails to implement management actions, and a direct and observable reduction in habitat value or acreage is imminent, then such public or private land or resource management organization acceptable to and as directed by the IRT may temporarily enter onto the Bank property in order to fulfill the purposes of this long-term management plan.

Similarly, the conservation easement holder may provide notice of an actual or threatened violation of the conservation easement, including failure to implement the tasks described in this long-term management plan. The timeframe for the land manager to initiate action on the issue provided in the written notice from the conservation easement holder is 30 days. Additional details are provided in Term 7 of the Conservation Easement (Exhibit E-4 of the BEI).

### **C Amendments**

The land manager, property owner, and the IRT may meet and confer from time to time, upon the request of any one of them, to revise the long-term management plan to better meet management objectives and preserve the habitat and conservation values of the Bank property. Any proposed changes to the long-term management plan shall be discussed with the IRT and the land manager. Any proposed changes will be designed with input from all parties. Amendments to the long-term management plan shall be approved by the IRT in writing shall be required management components and shall be implemented by the land manager.

If the CDFG determines, in writing, that continued implementation of the long-term management plan would jeopardize the continued existence of a listed species, any written amendment to this long-term management plan, determined by the CDFG as necessary to avoid jeopardy, shall be a required management component and shall be implemented by the land manager.

#### **D Notices**

Any notices regarding this long-term management plan shall be directed as follows:

##### Land Manager & Property Owner

Westervelt Ecological Services  
600 N. Market Boulevard, Suite 3  
Sacramento, CA 95834  
Telephone: (916) 646-3644  
Fax: (916) 646-3675

##### IRT, BEI Signatory Agencies:

US Army Corps of Engineers, Sacramento District  
1325 J Street, Room 1480  
Sacramento, CA 95814  
Attn: Chief, Regulatory Section  
Telephone: (916) 557-2520  
Fax: (916) 557-6877

U.S. Environmental Protection Agency  
Region IX  
75 Hawthorne Street  
San Francisco, CA 94105  
Attn: Director, Water Division  
Telephone: 415-947-8707  
Fax: 415-947-3549

California Department of Fish and Game  
Region 2 Office  
1701 Nimbus Road  
Rancho Cordova, CA 95670  
Attn: Regional Manager  
Telephone: (916) 358-2900  
Fax: (916) 358-2912

**Deleted:** California Department of Fish and Game¶  
Habitat Conservation Branch¶  
1416 Ninth Street, 12th Floor¶  
Sacramento, CA 95814¶  
Attn: Branch Chief¶  
Telephone: 916-653-4875¶  
Fax: 916-653-2588¶

## VI Funding and Task Prioritization

### A Funding

The PAR analysis conducted for the bank details the anticipated costs of long-term management for the Bank. These costs include estimates of time and funding needed to conduct the basic monitoring site visits and reporting, weed mowing, trash removal, fence repair, and a prorated calculation of funding needed to fully replace the fences every 30 years. The total annual funding anticipated is \$30,326, therefore, with the current annual estimated capitalization rate of 4.5% the total endowment amount required will be \$673,910.

Deleted: 2

Deleted: approximately

Deleted: 42,419

Deleted: 942,642

The Center for Natural Lands Management, or other CDFG-approved entity, shall hold the endowment principal and interest monies as required by law in a subsequent state-authorized trustee fund, which consists of monies that are paid into it in trust pursuant to law, and is appropriated to fulfill the purposes for which payments into it are made. These interest monies will fund the long-term management, enhancement, and monitoring activities on habitat lands in a manner consistent with this long-term management plan.

### B Task Prioritization

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The land manager and the IRT shall discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate habitat quality; and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the IRT and as authorized by the IRT in writing.

## REFERENCES

- Barr, C. B. 1991. The distribution, habitat, and status of the valley elderberry longhorn beetle *Desmocerus californicus dimorphus*. U.S. Fish and Wildlife Service. Sacramento, CA.
- Bloom, P. H. 1980. The status of the Swainson's hawk in California, 1979. Wildlife Mgmt. Branch, Nongame Wildl. Invest, Job II 8.0. California Department of Fish and Game. Sacramento, CA.
- California Department of Fish and Game (CDFG). 2000. The Status of Rare and Endangered Animals and Plants in California, Greater Sandhill Crane. California Department of Fish and Game. Sacramento, CA.
- \_\_\_\_\_. 2003. *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*. The Vegetation Classification and Mapping Program. Wildlife and Habitat Data Analysis Branch. September.
- \_\_\_\_\_. 2007. *California Natural Diversity Database (CNDDB) Query for the Thornton, Courtland, Bruceville, Galt, Isleton, Lodi North, Lodi South, Bouldin Island, and Terminous USGS 7-1/2 minute Quads*. Version 3.0.5. Wildlife and Habitat Data Analysis Branch. December 13.
- California Native Plant Society (CNPS). 2007. Inventory of Rare and Endangered Plants (online edition, v7-06a). California Native Plant Society. Sacramento, CA. Accessed on December 13, 2007 from <http://www.cnps.org/inventory>
- Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131 pp.
- England, A. S., M. J. Bechard, and C. S. Houston. 1997. Swainson's hawk (*Buteo swainsoni*) in A. Poole and F. Gill (eds.), *The Birds of North America*, No. 265. The Academy of Natural Sci., Philadelphia, PA, and The American Ornithologists' Union. Washington, D.C.
- Estep, J. A. 1989. Biology, movements, and habitat relationships of the Swainson's hawk in the Central Valley of California, 1986-87. California Department of Fish and Game, Nongame Bird and Mammal Sec. Rep. Sacramento, CA.
- Godfrey, W. E. 1986. *The birds of Canada*. 2nd ed. National Museum of Canada, Ottawa.
- Holland, Robert F., 1986. Preliminary Descriptions of the terrestrial Natural communities of California. California Department of Fish and Game. Draft. Sacramento, CA.
- Holland, V.L. and D.J. Keil. 1995. *California Vegetation*. Kendall/Hunt Pub. Co. Dubuque, Iowa. 516 pp.

- Howell, S. N. G., and S. Webb. 1995. *A guide to the birds of Mexico and northern Central America*. Oxford University Press. New York, NY.
- Herzog, S. K. 1996. Wintering Swainson's hawks in California's Sacramento-San Joaquin River Delta. *Condor* 98:876-879.
- Hickman, J.C. 1993. *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley, California. 1400 pp.
- National Oceanic and Atmospheric Administration (NOAA). 2000. *Designated Critical Habitat: Critical Habitat for 19 Evolutionarily Significant Units of Salmon and Steelhead in Washington, Oregon, Idaho, and California*. National Marine Fisheries Service. Federal Register 50 CFR Part 226 Vol. 65(32): 7764-7787. February 16.
- \_\_\_\_\_. 2005. *Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California; Final Rule*. National Marine Fisheries Service. Federal Register 50 CFR Part 226 Vol. 70(170): 52488-52627. September 2.
- \_\_\_\_\_. 2006. *Endangered and Threatened Species; Revision of Species of Concern List, Candidate Species Definition, and Candidate Species List*. National Marine Fisheries Service. Federal Register 50 CFR Part 226 Vol. 71(200):61022-61025. October 17.
- PAR Environmental Services Inc. 1997 Mokelumne River and Tributaries, California: Cultural Resources Summary. On file, North Central Information Center
- Philip Williams & Associates. 2004. Compiled Technical Memoranda for the Grizzly Slough Project. Sacramento, CA.
- Pogson, T. H., and S. M. Lindstedt. 1991. Distribution and abundance of large sandhill cranes (*Grus canadensis tabida*) wintering in California's Central Valley. *Condor* 93:266-278.
- Schmutz, J. K. 1987. Habitat occupancy of disturbed grasslands in relation to models of habitat selection. *J. Range Management* 40:438-440.
- Semenchuk, G. P., ed. 1992. *The atlas of breeding birds of Alberta*. Federation of Alberta Naturalists, Edmonton, Alberta.
- Smith, A. R. 1996. *Atlas of Saskatchewan birds*. Saskatchewan Nat. Hist. Soc., Regina, Saskatchewan.
- Sawyer, J.O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society, Sacramento. 471 pp.
- Stevenson, H. M., and B. H. Anderson. 1994. *The birdlife of Florida*. University Press of Florida. Gainesville, FL.
- Tugel, Arlene, J. *Soil Survey of Sacramento County, California*. 1993. U.S. Department of Agriculture. Washington, D.C.
- U.S. Fish and Wildlife Service (USFWS). 1984. *Valley elderberry longhorn beetle recovery plan*. U.S. Fish and Wildlife Service. Portland, OR.

- \_\_\_\_\_. 2005b. *Final List of Bird Species to Which the Migratory Bird Treaty Act Does Not Apply*. Notice of Availability. 50 CFR Part 17 Vol. 70 (49): 12710-12716. March 15.
- Woodbridge, B. 1991. Habitat selection by nesting Swainson's hawks: a hierarchical approach. M.S. thesis, Oregon State University. Corvallis, OR.
- Yee, D. G., S. F. Bailey, and B. E. Deuel. 1991. The winter season--middle Pacific Coast Region. *Am. Birds* 45:315-318.
- Zeiner, D. C., W. F. Laudenslayer, K. E. Mayer, and M. White. 1990. *California's Wildlife: Volume 2: Birds*. California Department of Fish and Game. Sacramento, CA.