Mitigation and Monitoring Plan

# Natomas Levee Improvement Program
# Landside Improvements Project



Prepared for:

SAFCA
Sacramento
Area Flood
Control
Agency


Prepared by:

EDAW
2022 J Street
Sacramento, CA 95814


April 2009

EDAW | AECOM

Mitigation and Monitoring Plan

# Natomas Levee Improvement Program
# Landside Improvements Project



Prepared for:

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# INTRODUCTION

This mitigation and monitoring plan (MMP) has been prepared for Phase 2 of the Landside Improvements Project of the Sacramento Area Flood Control Agency's (SAFCA's) Natomas Levee Improvement Program (NLIP). The MMP has been developed to address the compensatory mitigation requirements of the U.S. Army Corps of Engineers (USACE) Clean Water Act 404 authorization, U.S. Fish and Wildlife Service (USFWS) Endangered Species Act Section 7 consultation, California Department of Fish and Game (DFG) Code California Endangered Species Act 2081, and Central Valley Regional Water Quality Control Board (Central Valley RWQCB) Clean Water Act Section 401 Water Quality Certification. If any inconsistencies exist between this MMP and the aforementioned authorizations, those authorizations will take precedence.

# 1 PROJECT REQUIRING MITIGATION

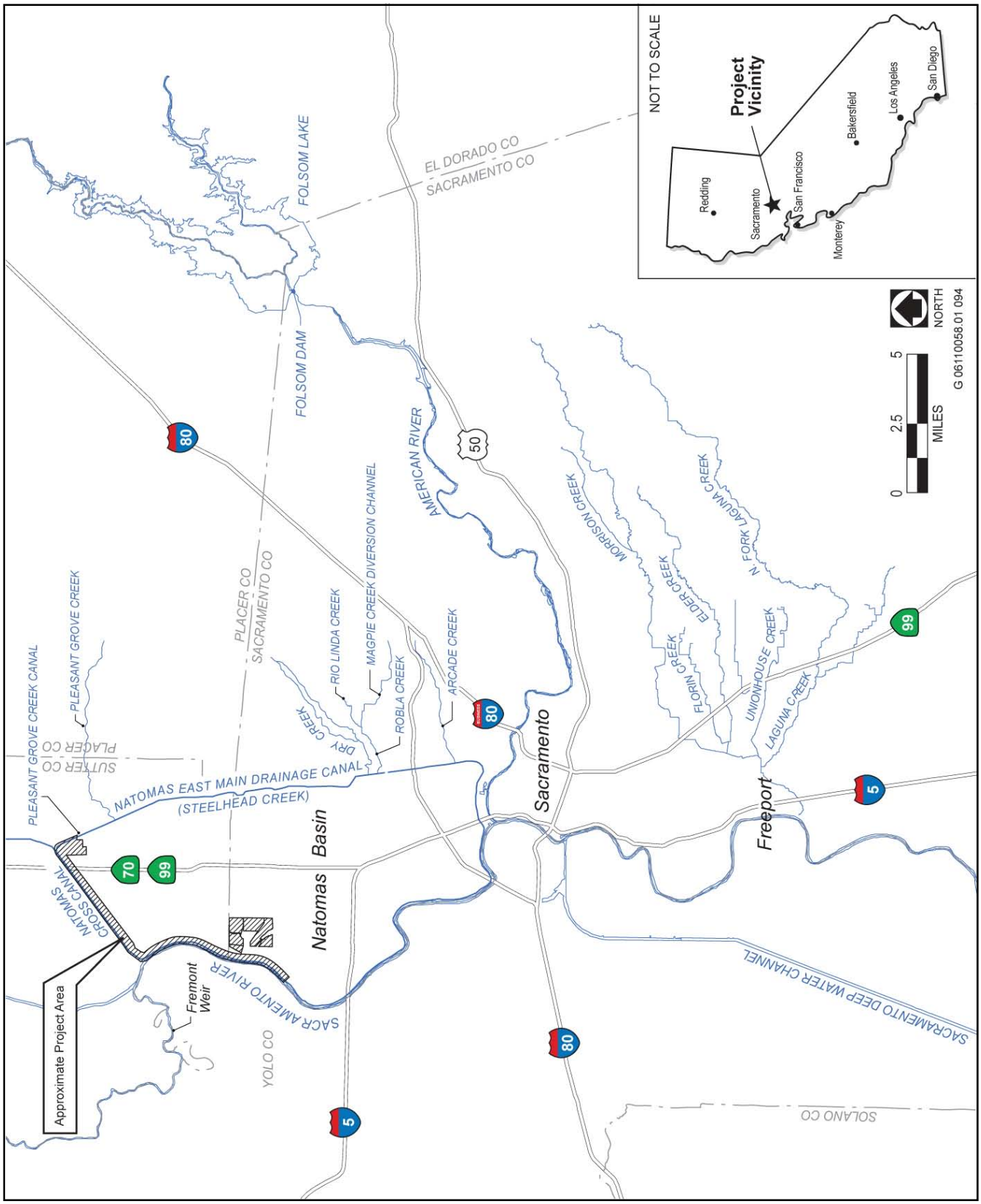
## 1.1 PROJECT SUMMARY

SAFCA's NLIP entails improving the levee system that protects the 53,000-acre Natomas Basin (Basin) in northern Sacramento and southern Sutter Counties, California, including a portion of the city of Sacramento (Exhibit 1-1), to provide the Basin with at least a 100-year level of flood protection. The Basin is generally bounded by leveed reaches of the Natomas Cross Canal (NCC) on the north, the Sacramento River on the west, the American River on the south, and the Pleasant Grove Creek Canal (PGCC) and Natomas East Main Drainage Canal (NEMDC)/Steelhead Creek on the east (Exhibits 1-2 and 1-3). The Landside Improvements Project consists of the landside components of the larger NLIP. The Landside Improvements Project includes improvements to correct levee freeboard deficiencies and seepage potential along the NCC south levee, Sacramento River east levee, and the PGCC west levee, and related landscape and irrigation/drainage infrastructure improvements throughout the Natomas Basin.

The Landside Improvements Project consists of several phases of construction, spanning approximately 3 to 4 years, generally between 2009 and 2012. Phase 2 of SAFCA's NLIP Landside Improvements Project (Phase 2 project), previously described as the 2008 construction phase, will be initiated in 2009 and completed in 2010. The Phase 2 project consists of:

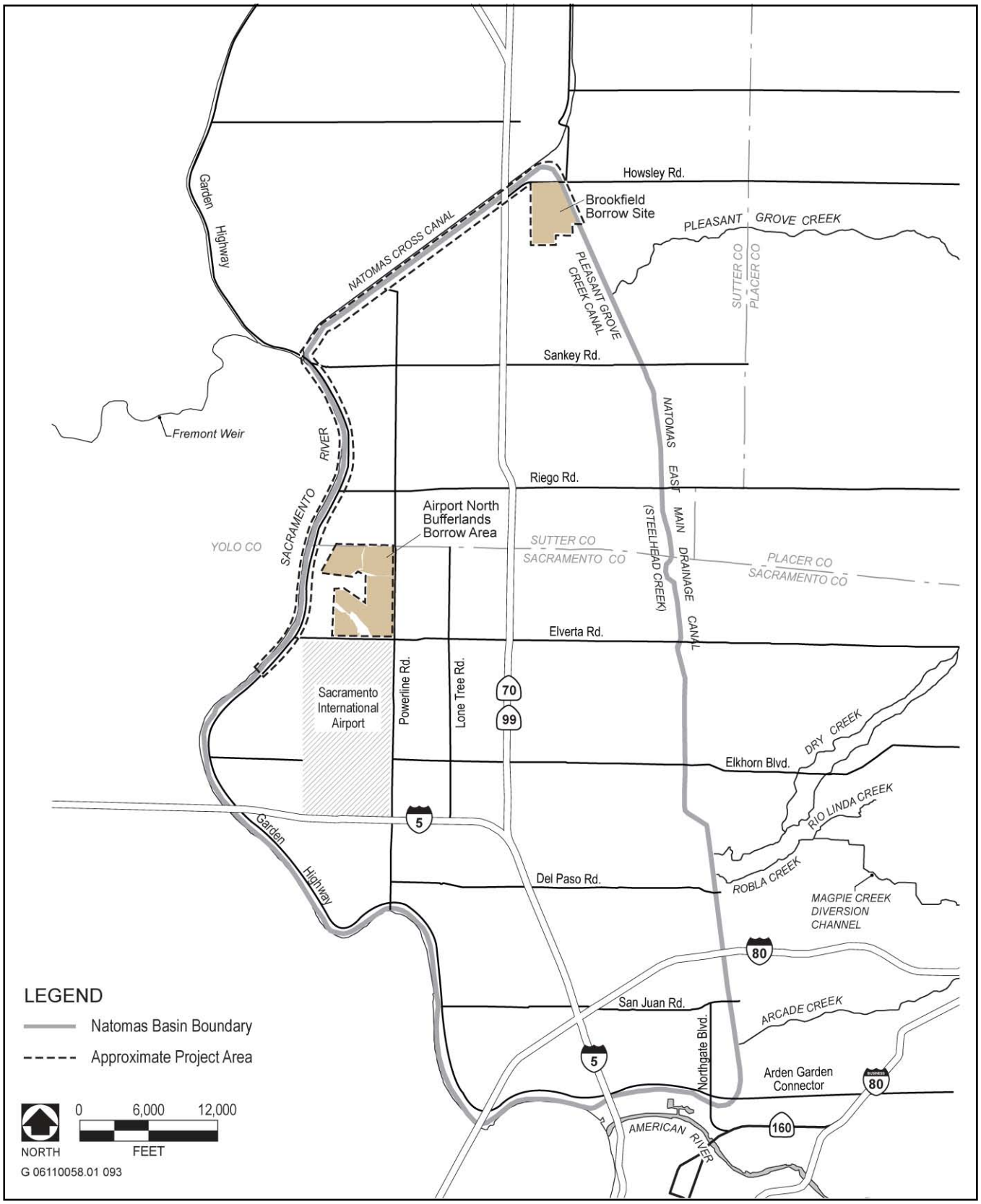
- improvements along the 5.3-mile-long NCC south levee and the Sacramento River east levee from the NCC south levee to 2,000 feet south of the North Drainage Canal (Reaches 1–4B) (Exhibits 1-4a and 1-4b),
- relocation of the existing Elkhorn Irrigation Canal and construction of the Giant Garter Snake (GGS)/ Drainage Canal between the North Drainage Canal and Elkhorn Reservoir (Exhibits 1-5 and 1-6),
- removal of the culvert under Garden Highway adjacent to the former Reclamation District (RD) 1000 Pumping Plant No. 2 site, and
- associated activities (Exhibits 1-5 and 1-6).

This SAFCA NLIP Phase 2 MMP addresses the Phase 2 project, including the components causing impacts on jurisdictional resources (impact project) and the accompanying mitigation components (mitigation project). Additional details regarding all project impacts, including exhibits, can be reviewed in permit applications and wetland delineation reports prepared for the U.S. Fish and Wildlife Service (SAFCA 2008a), the California Department of Fish and Game (SAFCA 2008b, 2008c), the U.S. Army Corps of Engineers (SAFCA 2006, 2007, 2008d), and the Central Valley Regional Water Quality Control Board (SAFCA 2008e).



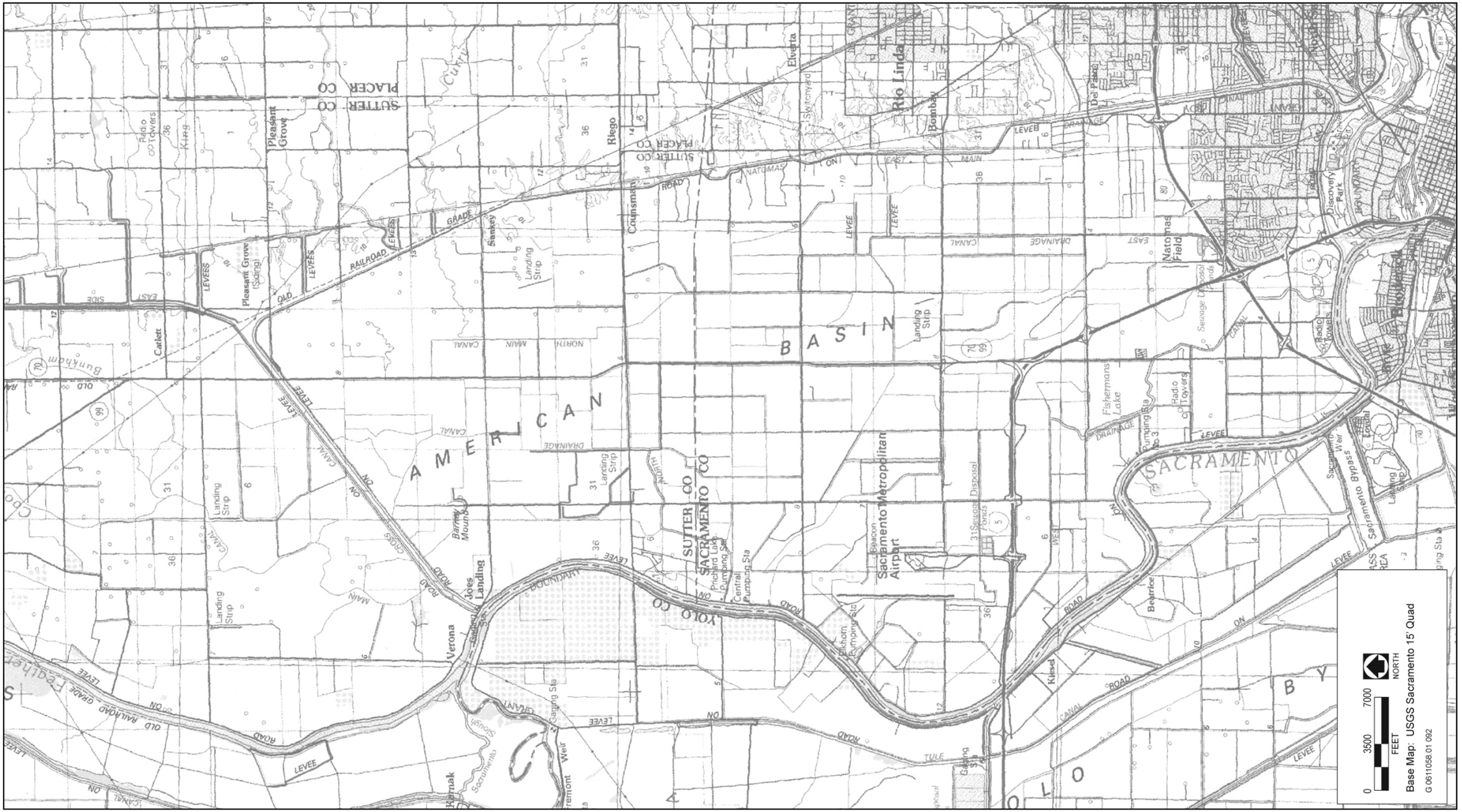

Source: Data provided by CaSil and adapted by EDAW in 2008

**Project Vicinity** **Exhibit 1-1**



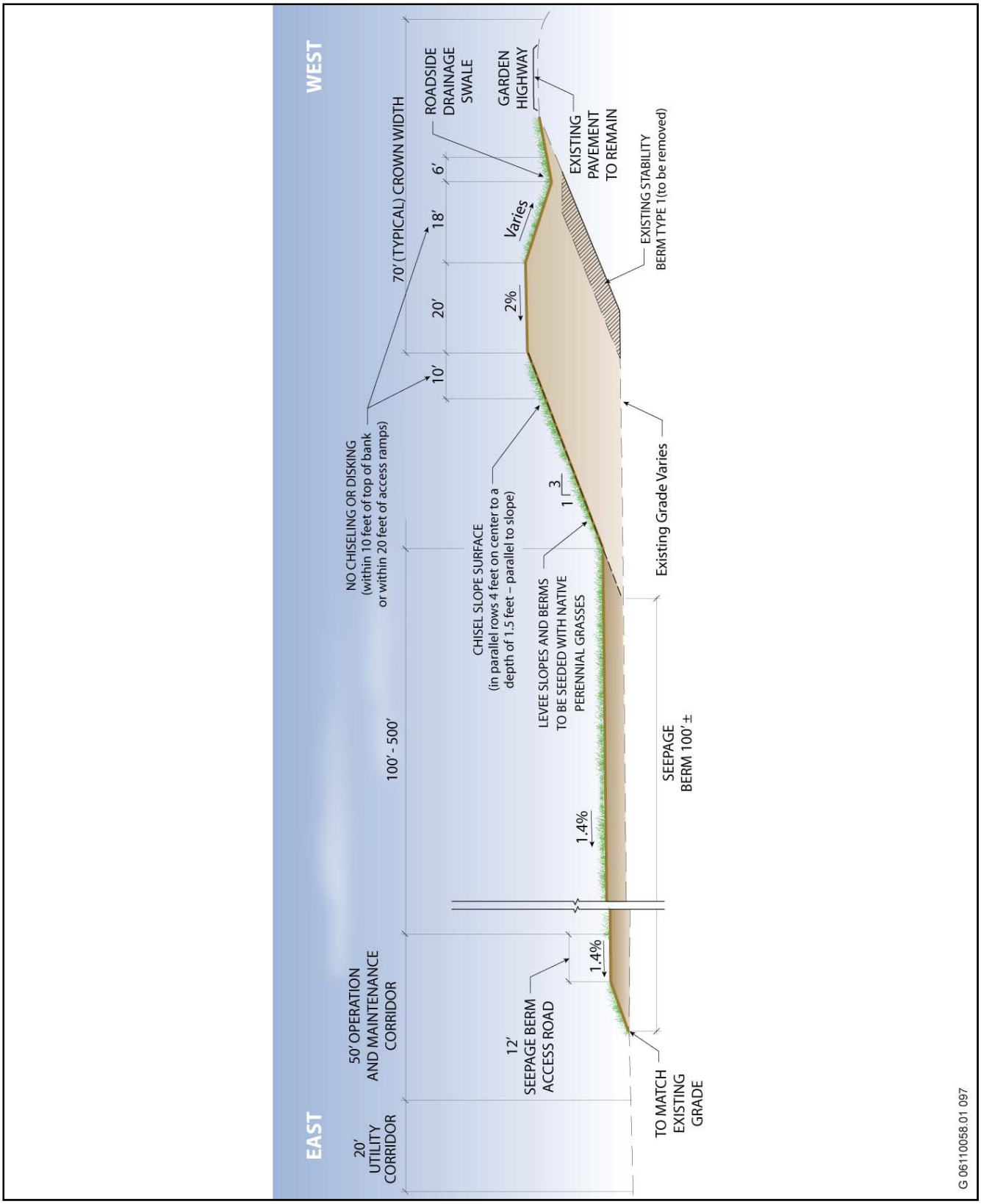

Source: Data provided by CaSil and adapted by EDAW in 2008

**Project Area** **Exhibit 1-2**



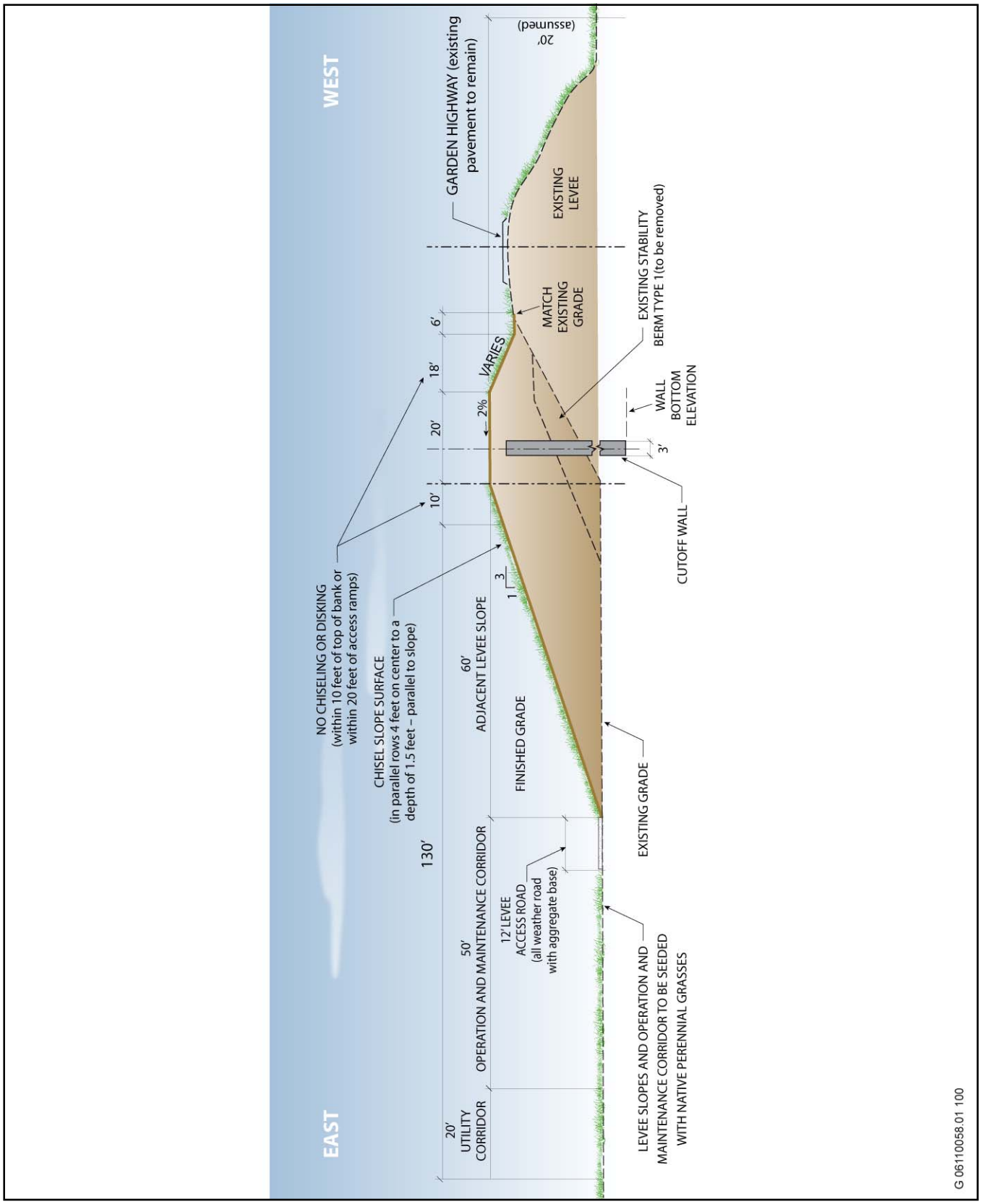

Source: Adapted by EDAW in 2008

**U.S. Geological Survey 15-Minute Quadrangle Map** **Exhibit 1-3**




Source: Data provided by HDR and adapted by EDAW in 2008

**Typical 3:1 Levee Cross Section with Seepage Berm** **Exhibit 1-4a**

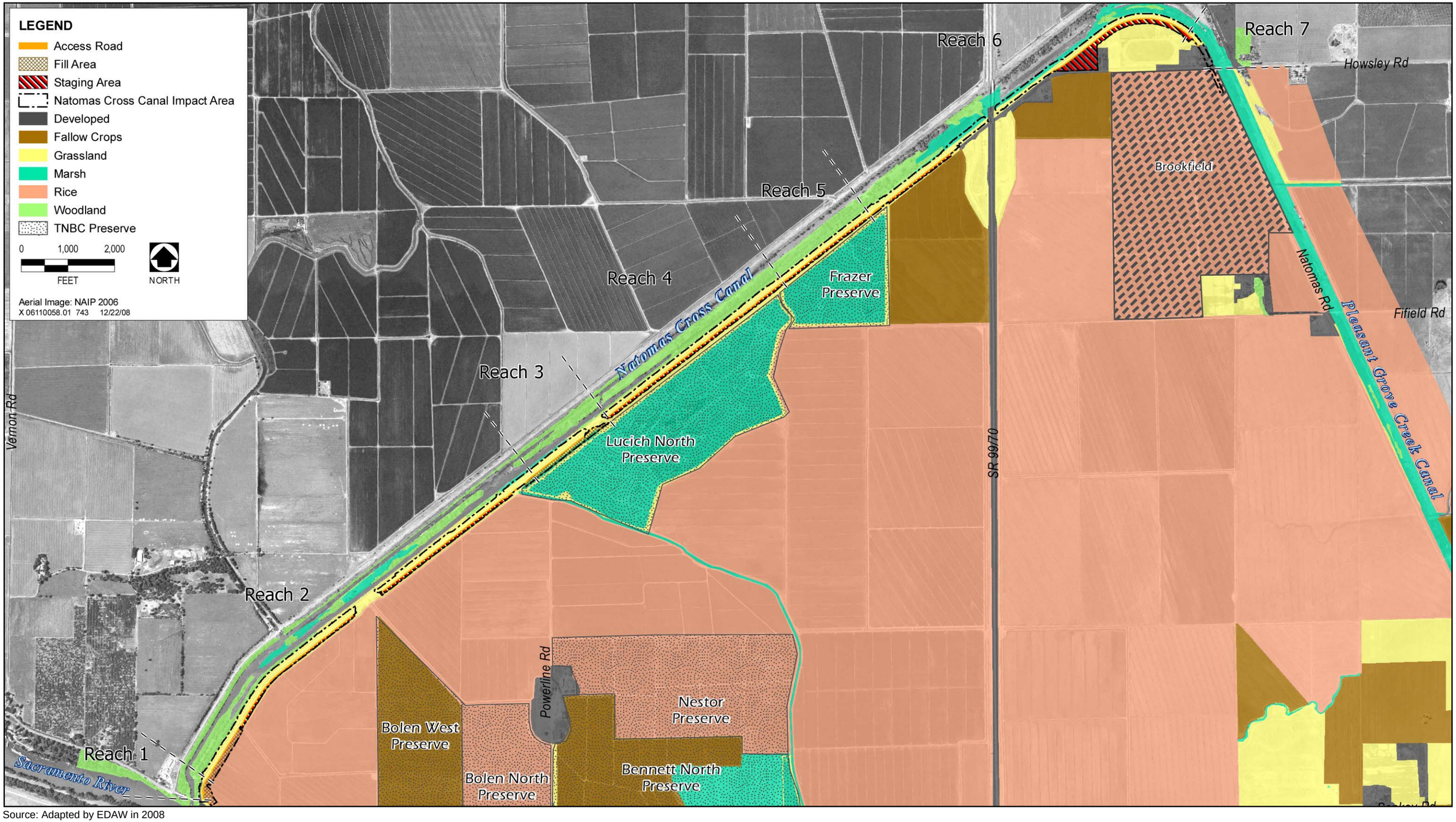



Source: Data provided by HDR and adapted by EDAW in 2008

**Typical 3:1 Levee Cross Section with Cutoff Wall** **Exhibit 1-4b**

Source: Adapted by EDAW in 2008

**Sacramento River East Levee Project Elements and Habitats** **Exhibit 1-5**




Source: Adapted by EDAW in 2008

**Natomas Cross Canal Project Elements and Habitats** **Exhibit 1-6**

## 1.2 SITE CHARACTERISTICS

All Phase 2 project construction activities will take place within the Basin. Although the Phase 2 project covers a large geographic area, site characteristics are similar across the project area because it is all located within the Basin and east of the left bank of the Sacramento River, and on soils of the historic natural floodplain and basin deposits. Because the mitigation project features would be located adjacent to the impact areas, most of this setting description applies to both the impact project and the mitigation project.

### 1.2.1 TOPOGRAPHY

The topography of the entire Basin is relatively flat. Ninety percent of elevations in the south-central part of the Basin are 10 feet above mean sea level (msl) that gently rise to more than 30 feet msl along the eastern edge of the Basin. Flood control levees provide the only significant topographic relief in and near the project's impacts and mitigation habitats. Thus, the elevation for the various impact and mitigation habitat components averages 10–20 feet above msl.

### 1.2.2 SOILS

The Basin generally consists of deep soils derived from alluvial sources. Soils immediately adjacent to the Sacramento River are dominated by deep, nearly level, well-drained loamy and sandy soils. The natural drainage is good, and the soils have slow to moderate subsoil permeability. The river terraces consist of very deep, well-drained alluvial soils (NRCS 1988, 1993).

According to the *Soil Survey of Sacramento County* (NRCS 1993) and *Soil Survey of Sutter County* (NRCS 1988), the soils within the project area belong to the Capay, Clear Lake, Columbia, Cosumnes, Egbert, Galt, Jacktone, Laugenour, Marcum, Nueva, Sailboat, San Joaquin, Shanghai, Uvas, and Valpac soil series. These soil types range from moderately well drained soils near the river and natural sloughs, to poorly drained basin-deposited and historic lake soils. Several soils mapped in the study area are listed as hydric on the National Hydric Soils List. However, because the Basin and its historic hydrology have been modified extensively by levees, canals, and drainage systems, the soils within the study area are subject to an "atypical situation" as described in the 1987 wetland delineation manual (Environmental Laboratory 1987). The soils within the Basin formed under conditions that were subject to frequent, prolonged flood events and associated shallow groundwater, as documented by the map unit soil series descriptions. However, the current hydrology of the Basin is not the condition under which soil formation took place. Descriptions and exhibits of soil map units that occur within the study area are included in wetland delineation reports prepared for the SAFCA NLIP Landside Improvements Project (SAFCA 2006, 2007).

### 1.2.3 SURFACE WATER HYDROLOGY

The Natomas Basin lies just north of the confluence of the Sacramento and American Rivers. The Sacramento River drainage basin includes the Feather River drainage basin (approximately 5,500 square miles), which is located just upstream of the Natomas Basin. The Sacramento River drainage basin covers approximately 26,150 square miles. The Fremont Weir at the head of the Yolo Bypass diverts a large percentage of Sacramento River flood flows before it reaches the Natomas Basin. Consequently, the American and Feather Rivers supply about 90% of the flood flows approaching Sacramento from the north and the east.

Hydrologic conditions throughout the Basin have been altered dramatically from natural conditions. Historically, much of the Basin was composed of shallow lakes, seasonal wetlands, riparian forest, and freshwater tule marshes. Over the past 150 years the entire Basin has been reclaimed, primarily for agricultural purposes, through a network of levees, drainage and irrigation canals, and pumping facilities. The hydrology of a substantial portion of the Natomas Basin is now managed through this interconnected network. The direction of managed flow

follows the natural gradient of the topography of the Basin. Sacramento River water is pumped into the Basin from the northwest (from the river directly, or via diversions out of the NCC), and is then distributed throughout the Basin in irrigation and drainage canals. Stormwater or surplus irrigation tailwater is pumped back into the Sacramento River at the topographically low end of the Basin, generally on the southeast.

Reclamation of the Basin for agricultural development required construction of two major ditch and canal systems within the Basin: an irrigation system owned and operated by Natomas Central Mutual Water Company (NCMWC) and a drainage system owned and operated by RD 1000. NCMWC pumps water into the Basin to provide irrigation water to its shareholders for agricultural use within the Basin. During winter (October–April), drainage is primarily rainfall runoff and a smaller contribution of seepage inflow from seasonally high groundwater; during summer (May–September), drainage water from agricultural fields is typically recirculated for irrigation. Because the Basin is surrounded by levees, all excess drainage within the Basin must be pumped out. In general, water is pumped into the Basin from the Sacramento River and NCC as irrigation water and returned to the perimeter drainage channels via RD 1000's interior drainage system.

### 1.2.4 GROUNDWATER HYDROLOGY

Groundwater in the Basin is part of the North American Subbasin. Major recharge to the local aquifer system generally occurs along river, slough, and stream channels where extensive sand and gravel deposits exist, particularly in the American River and Sacramento River channels (SGA 2002). Where surface water is hydrologically disconnected from groundwater, it percolates through the unsaturated zone beneath the streambed to the groundwater and is a function of the underlying aquifer materials and water levels in the channel. Some evidence suggests this occurs in parts of the Sacramento River in northern Sacramento County (SGA 2003). Groundwater levels remain relatively high throughout the Basin, generally 10–20 feet below msl (approximately 20–40 feet below average ground level), although groundwater extraction has created an extensive cone of depression in the southern section of the Basin (SGA 2006:12–14). Natural sloughs and portions of some canals that have been excavated below natural grade may be in direct contact with shallow groundwater, particularly in the wet season and during higher stages in the Sacramento River.

### 1.2.5 WATER QUALITY

Because the majority of the Basin is used for agriculture, the primary pollutants of concern are fertilizers, pesticides, and herbicides, associated with agricultural production, and anaerobic water quality conditions from high biochemical oxygen demand and standing water in the warm season. However, multiple regulations exist to manage these pollutants. Expanding urban development, particularly in the southern portion of the Basin, has introduced typical stormwater pollutants such as phosphates and heavy metals. An area between Sacramento International Airport (Airport) and the Bear River to the north has high levels of total dissolved solids, chloride, sodium, bicarbonate, manganese, and arsenic (DWR 2006).

### 1.2.6 VEGETATION AND SENSITIVE HABITATS

The dominant habitat in the Basin is agricultural, including cropland and orchards. The primary crops produced in the Basin are rice, corn, grain, alfalfa, and tomatoes. Only small fragments of native habitat persist in the Basin. Some of these native habitats are considered sensitive by DFG and are identified as natural communities that are "rare and worthy of consideration" as recognized by the California Natural Diversity Database (CNDDB). These sensitive communities provide essential habitat to special-status species that are often restricted in distribution, or decreasing throughout their range, such as valley oak woodland. Some woodland patches within the project area could be categorized as Great Valley cottonwood riparian forest, which is a natural community documented in the CNDDB. Other native habitats, including mostly small patches of valley oak woodland, scrub, and wetland habitats dominated by native species, are scattered throughout the Basin. Most native habitats are relatively close to the Sacramento River or adjacent to other features that support surface water. Habitats within the project area are depicted in Exhibits 1-5 and 1-6.

Sensitive habitats, such as seasonal and perennial wetlands, valley oak woodland, and riparian vegetation, are of particular value to special-status species. The irrigation/drainage canals and ditches, as well as the freshwater marshes, seasonal wetlands and portions of the rice fields in the project area are considered waters of the United States and subject to regulation under Clean Water Act (CWA) Section 404, and are also anticipated to qualify as waters of the state and regulation under the Porter-Cologne Water Quality Control Act. In addition, waterways and associated riparian habitats are likely subject to regulation under Section 1600 et seq. of the California Fish and Game Code.

Of particular concern are canals and ditches that provide movement corridors and connectivity of giant garter snake (*Thamnophis gigas*) habitats, rice fields that provide giant garter snake foraging and rearing habitat, agricultural fields and grasslands that provide Swainson's hawk (*Buteo swainsoni*) foraging habitat, and woodlands that provide potential Swainson's hawk nesting and perching habitat. Because of the large acreage of rice and managed marsh in the northwestern Basin (much of which is occupied by giant garter snake), canals and ditches that connect sites with rice and marsh habitat can provide regionally important corridors for giant garter snake movement. Swainson's hawks nest in riparian forest and valley oak woodlands along the Sacramento River and forage in grassland and non-rice cropland in the project area.

The lower Sacramento River and its tributaries, including the NCC and PGCC, are within designated critical habitat for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley steelhead. Small, typically isolated patches of elderberry shrubs, valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) habitat, occur within the Basin and Sacramento River east levee project footprint. The project area is not within designated critical habitat for any other special status species.

### 1.2.7 SPECIAL-STATUS SPECIES

Several special-status wildlife species have the potential to occur within the project area:

- giant garter snake, which is federally and state listed as threatened;
- Swainson's hawk, which is state listed as threatened;
- valley elderberry longhorn beetle, which is federally listed as threatened; and
- four Sacramento River fish species federally listed as threatened or endangered, two of which are also state listed.

Three special-status plant species were determined to have potential to occur within the Phase 2 project area: rose mallow, Delta tule pea, and Sanford's arrowhead. However, focused surveys did not detect these species within the project area. The biological assessment (BA) (SAFCA 2008a) and the application for CESA Section 2081(b) incidental take permit (SAFCA 2008b) prepared for the SAFCA NLIP Landside Improvements Project conclude that the project could result in potential adverse effects on each of these species. Details regarding these potential species impacts can be reviewed in the aforementioned documents.

### 1.2.8 FLOOD CONTROL FACILITIES, IRRIGATION INFRASTRUCTURE, AND PROPOSED BORROW SITES

Most of the Phase 2 project impacts on jurisdictional resources would occur from the expansion of the existing levee system, which would necessitate the fill and reconstruction of the existing Elkhorn Irrigation Canal and associated drainages, the temporary disturbance of rice fields that contain areas of irrigated wetlands, the removal of valley oak woodlands and Swainson's hawk foraging and potential nesting habitat, and the relocation of valley elderberry longhorn beetle host plants. Detailed descriptions, tables, and exhibits of jurisdictional resources that would be affected, including waters and wetlands of the United States, waters of the state, riparian forest and oak

woodland habitats under the jurisdiction of DFG, and habitats for special-status species protected under federal and state endangered species regulations, can be reviewed in the permit applications referenced in Section 1.1, "Project Summary," above.

The following subsections describe the existing flood control facilities, their general setting, adjacent irrigation infrastructure, and the borrow sites for the impact project.

### NATOMAS CROSS CANAL SOUTH LEVEE

The NCC is a 5.3-mile-long channel that carries water from several tributary watersheds in western Placer County and eastern Sutter County to the Sacramento River. The NCC begins at the PGCC and East Side Canal and extends southwest to its confluence with the Sacramento River near the Sankey Road/Garden Highway intersection (Exhibit 1-6). During periods of flooding, the Sutter Bypass, Sacramento River, and NCC all contribute to higher river stage elevations that can affect the NCC levees. An approximately 80- to 100-foot maintenance access area extends along the land side of the levee through most of the NCC's length.

Farms and rural residences are located on both sides of the NCC, with rice the primary crop under cultivation. The Lucich North and Frazer Habitat Preserves, owned and maintained by The Natomas Basin Conservancy (TNBC), lie south of the NCC south levee from the eastern end of Reach 2 to the western end of Reach 6. A drainage canal, referred to as the Vestal Drain, runs parallel to the NCC south levee through much of Reach 2, approximately 100 feet from the landside levee toe. There is a private irrigation pump and irrigation canal at the landside levee toe in Reach 1. NCMWC's Bennett Pumping Plant and RD 1000's Pumping Plant No. 4 are located in Reach 2, and the NCMWC Northern Pumping Plant is located in Reach 3. NCMWC's North Main Canal runs parallel to the levee through Reaches 4 and 5, approximately 100 feet from the landside levee toe.

### SACRAMENTO RIVER EAST LEVEE

An 18-mile-long section of the east levee of the Sacramento River protects the Natomas Basin between the NCC and the American River (Exhibit 1-5). For planning purposes, the levee is divided into 20 reaches. Garden Highway, a major north-south thoroughfare, is located on top of the existing levee crown within all 20 reaches. A sub-drained, 10-foot-wide stability berm is present on the landside slope of the Sacramento River east levee between the NCC and Powerline Road (Reaches 1–11). Slurry (soil cement) cutoff walls to address through-levee seepage remediation were previously constructed through the levee in Reaches 12–20.

The land uses along the levee vary from north to south. Along the land side, Reaches 1–13 are bordered mainly by private agricultural lands containing a few rural residences, Airport bufferlands, and two farmed TNBC parcels. Teal Bend Golf Club is west of the Airport, adjacent to the levee along Reach 6. The parcels bordering Reaches 14–18 contain more residences, several rural estates, and three TNBC parcels. The land side of Reaches 19 and 20 is bordered by residential subdivisions, a business park, and the City of Sacramento's Natomas Oaks Park, undeveloped Costa property, and Shorebird Park. In addition, a marina, commercial buildings, and several restaurants are located along Garden Highway on top of or waterside of an over-widened section of the levee.

Several irrigation canals, pipelines, wells, and pump stations exist along the Sacramento River east levee. The existing Elkhorn Irrigation Canal and the Riverside Canal are key agricultural irrigation canals in the NCMWC system. The existing Elkhorn Irrigation Canal runs parallel to the Sacramento River east levee from the North Drainage Canal in Reach 4B through Reach 8 and into the start of Reach 9 (1,250 feet south of Elkhorn Boulevard); this canal is supplied by the Prichard and Elkhorn Pumping Plants on the Sacramento River. The Riverside Canal extends from just north of Reach 13 to the middle of Reach 19 and is supplied by the Riverside Pumping Plant, on the Sacramento River just north of Radio Road. Several lateral canals connect to the Elkhorn Irrigation and Riverside Canals. The existing Elkhorn Irrigation and Riverside Canals are highline canals that use gravity flow to deliver water for irrigation by maintaining water levels above the surrounding ground levels. These canals have typically narrow easements and earthen embankments with steep side slopes, some that

are nearly vertical, requiring regular maintenance and repair. Steep canal banks often collapse and are a major source of sediment accumulation in canals, in addition to decaying organic debris from widespread aquatic weed infestations, which requires periodic sediment removal. The existing Elkhorn Irrigation Canal is concrete lined for approximately 1 mile; the remainder of the canal is earth lined. The Riverside Canal is concrete lined for its entire length.

In addition to the NCMWC irrigation systems, there are several landowner-operated systems along the landside of the levee. These facilities are located primarily in Reaches 1–4A and 9–12, in areas not currently served by the NCMWC systems. The areas are serviced by either well pumps on the land side or by river pumps that discharge into buried pipelines, into small irrigation ditches, or directly onto fields. The distribution systems run along the landside toe of the levee to supply fields that slope away from the levee. Approximately nine small pumping plants provide water from the river and approximately 10 wells provide groundwater.

Several drainage pumping plants are operated by RD 1000 along the Sacramento River east levee: Pumping Plant No. 2 (located in Reach 4B), Pumping Plant No. 5 (Reach 10), Pumping Plant No. 3 (Reach 13), and Pumping Plant No. 1 (Reach 20A). These plants pump drain water from the main drainage canal system into the river. Pumping Plant No. 2 was temporarily removed as part of an emergency levee repair in 2006 and will be replaced in a future project. In addition to these RD 1000 pumping stations, the City of Sacramento operates the Willow Creek drainage pumping station, which is located in Reach 19B.

### BORROW SITES

Borrow sites are areas from which earthen materials will be removed at relatively shallow depths for use in levee and berm construction. SAFCA has identified the Brookfield borrow site and the Airport North Bufferlands property for the construction of the flood control and irrigation infrastructure improvements along the NCC south levee and the Sacramento River east levee respectively (Exhibits 1-5 and 1-6).

The Brookfield property is a privately owned parcel west of the PGCC at Fifield Road that was in rice cultivation in 2007. Material from portions of this property will be used for levee expansion during the Phase 2 project. After the removal of borrow material, the land will be returned to rice cultivation.

The Airport North Bufferlands property is approximately 330 acres of idle agricultural land and ruderal annual grassland located north of the Airport on property owned by Sacramento County. Portions of this property will be used to provide levee fill for use along the middle reaches of the Sacramento River east levee. After the removal of borrow material, this property will be reclaimed as annual grassland.

# 2 MITIGATION PLANNING AND DESIGN

## 2.1 MITIGATION PLAN SUMMARY

The mitigation project components are in the same vicinity as the impact project components described in Section 1.2, "Site Characteristics," above. Therefore, the site characteristics are generally the same. The locations, habitat types, and land uses in the vicinity of the mitigation project components are depicted in Exhibits 1-5, 1-6, and 2-1a through 2-1f.

The mitigation project includes:

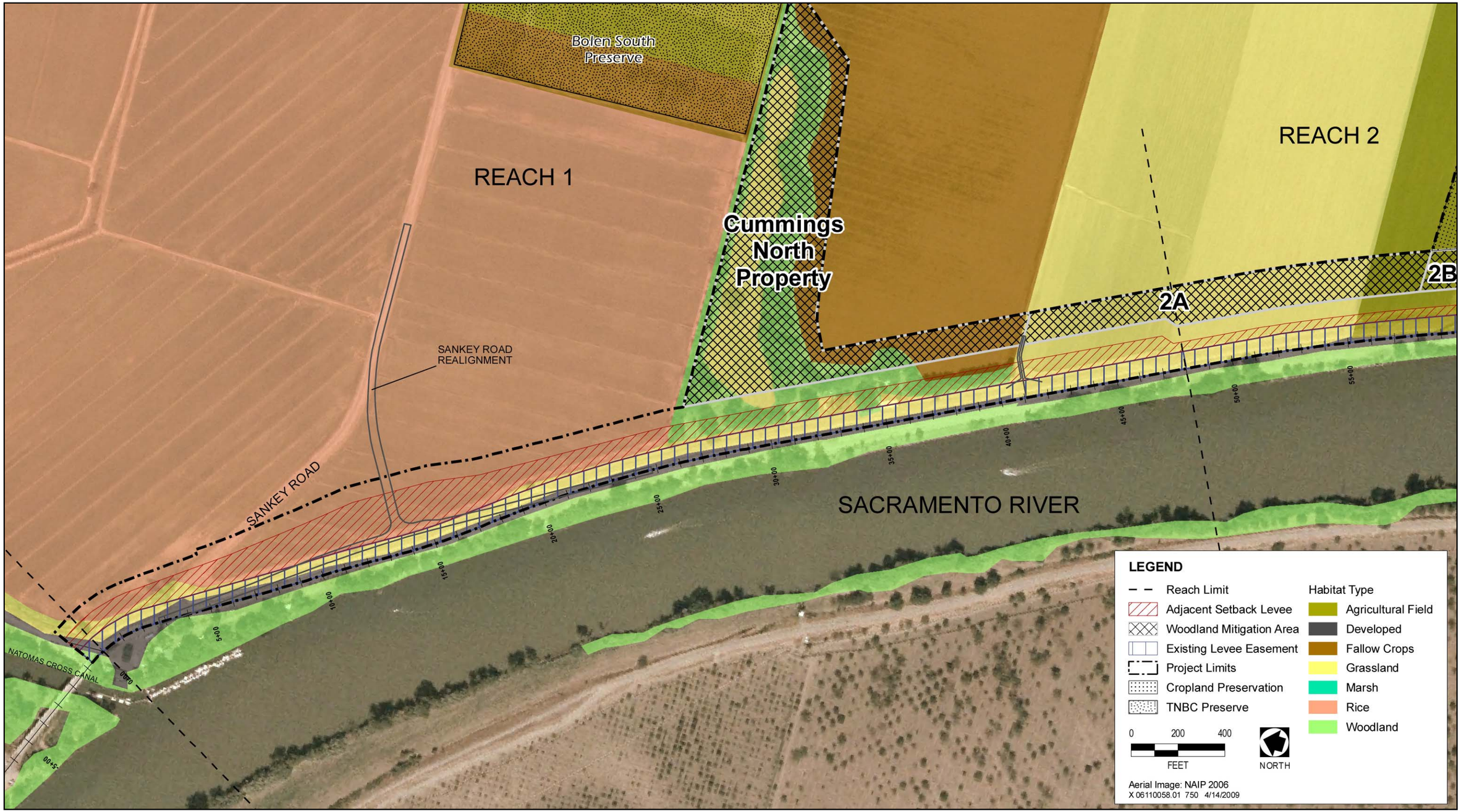
- construction of an 11,800-foot segment (approximately 12.46 acres) of a new GGS/Drainage Canal,
- relocation of an 11,950-foot segment (approximately 16.37 acres) of the Elkhorn Irrigation Canal,
- preservation of up to 175 acres of rice, including up to approximately 30 acres of irrigated wetlands,
- preservation of approximately 84 acres of field crops,
- creation of approximately 335 acres of managed native perennial grasslands,
- preservation of approximately 18 acres of existing landside woodlands, and
- creation of approximately 43 acres of new landside woodlands.

The creation of the GGS/Drainage Canal will provide compensatory mitigation for impacts to water features regulated by the USACE and the Central Valley RWQCB by replacing irrigation services, drainage services, and wetland habitat functions (wildlife habitat, water quality treatment, flood attenuation, groundwater recharge). The creation of this canal will also partially compensate for losses of potential giant garter snake habitat, regulated by the USFWS and DFG, by replacing mostly low quality potential aquatic habitat removed by the impact project (e.g., degraded secondary canals, ditches and wetlands) with high quality habitat provided by the new canal. The GGS/Drainage Canal will also provide upland habitat for the giant garter snake along the canal banks and adjacent rights-of-way. Formal agreements between SAFCA, RD 1000, and SCAS will be established to facilitate management practices along this canal that are favorable to the protection of regulated resources (e.g., giant garter snake, wildlife habitat, water quality). This canal will be protected in perpetuity by a drainage easement. (See Sections 8 and 9 for a summary of mitigation funding and protection mechanisms.)

The relocation of the new Elkhorn Irrigation Canal will also compensate for impacts on water features regulated by the USACE and the Central Valley RWQCB by replacing irrigation services. The relocation of this canal will also compensate for temporary losses of potential giant garter snake habitat, regulated by the USFWS and DFG, which would occur when the corresponding segment of the existing Elkhorn Canal is filled by levee improvement activities in Phase 3. The relocated canal may provide giant garter snake habitat. This canal will be protected by a water facilities easement. It is possible that this canal, along with all other habitat managed by the NCMWC, will be managed under the provisions of the *Natomas Basin Habitat Conservation Plan* (NBHCP) if the NCMWC becomes a signatory to the NBHCP in the future.

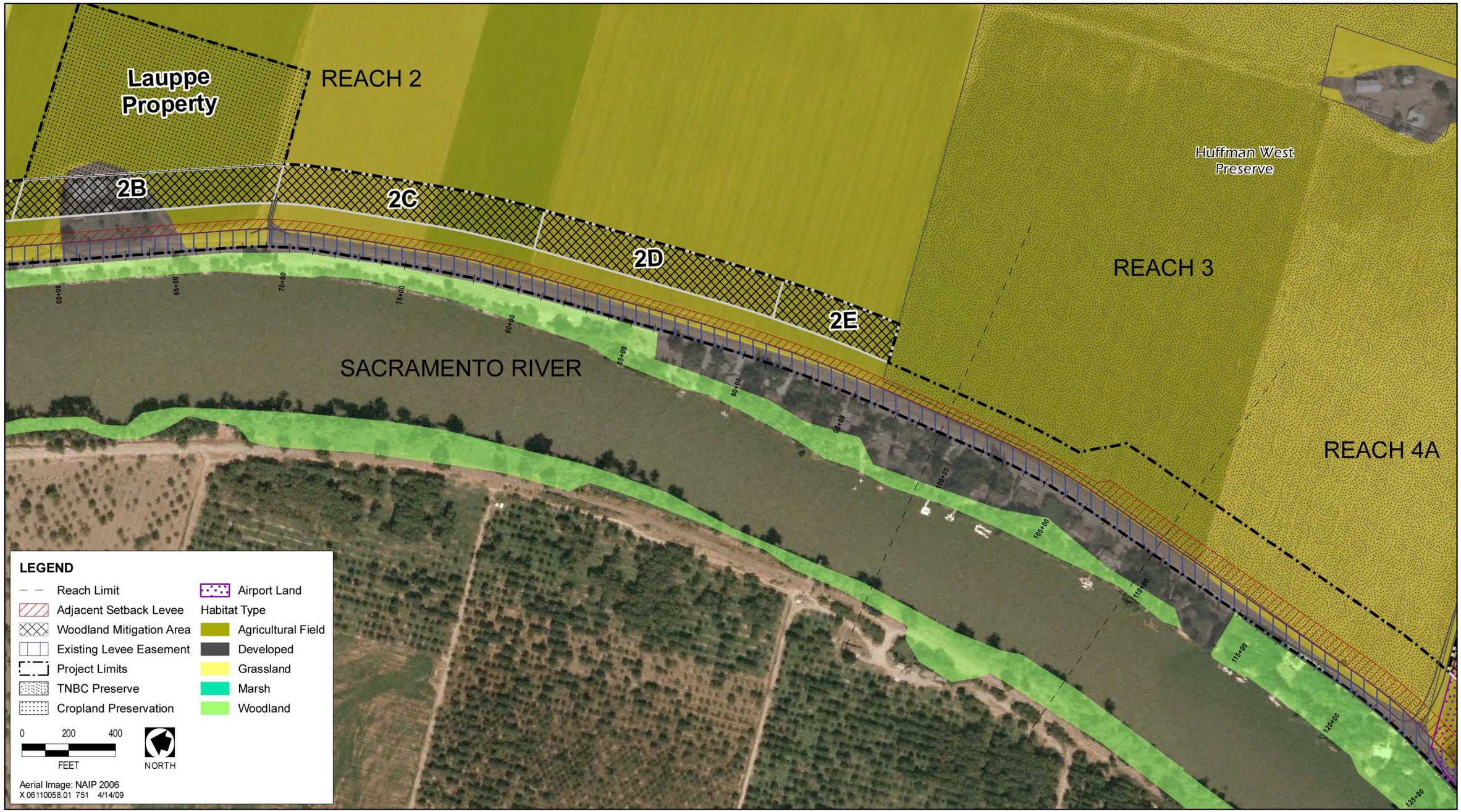
Temporary impacts to rice habitat regulated by the USFWS and DFG as potential giant garter snake habitat, will be mitigated through the restoration and partial preservation in perpetuity of this same rice habitat. Preservation of irrigated wetlands within this rice habitat will also help to mitigate for impacts to other habitat under the jurisdiction of the USACE.

The canal banks and adjacent rights-of-way, as well as other managed native perennial grasslands and agricultural fields created and preserved throughout the project area, will compensate for the loss of potential Swainson's hawk foraging habitat. DFG seeks to ensure protection of this foraging habitat for wildlife under its responsibilities as a trustee agency, as defined by CEQA. The preservation and creation of landside woodlands will compensate for the loss of potential Swainson's hawk nesting habitat. DFG also seeks to ensure protection of



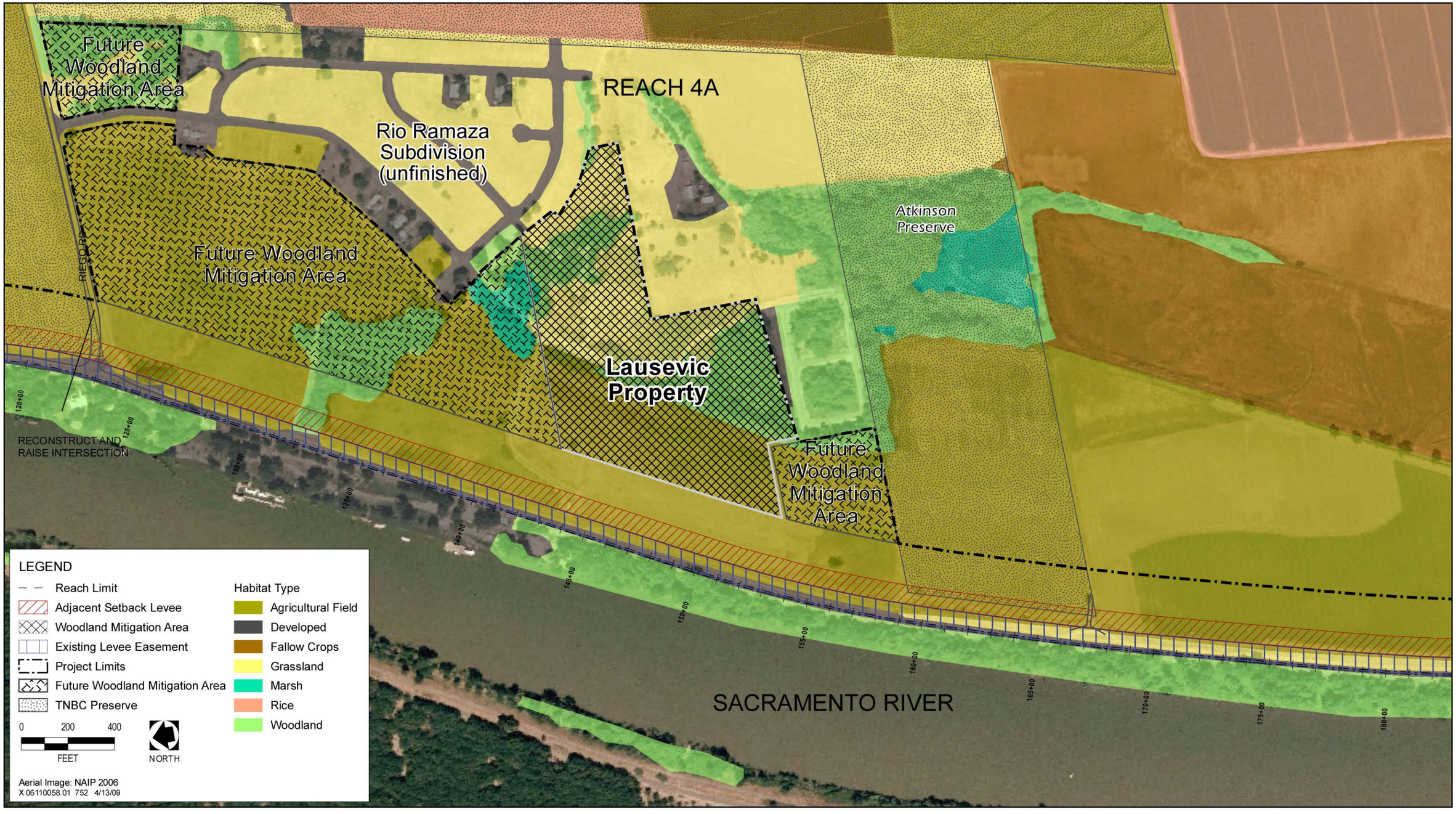

Source: Adapted by EDAW in 2008

**Sacramento River East Levee Project Elements and Habitat Details** **Exhibit 2-1a**



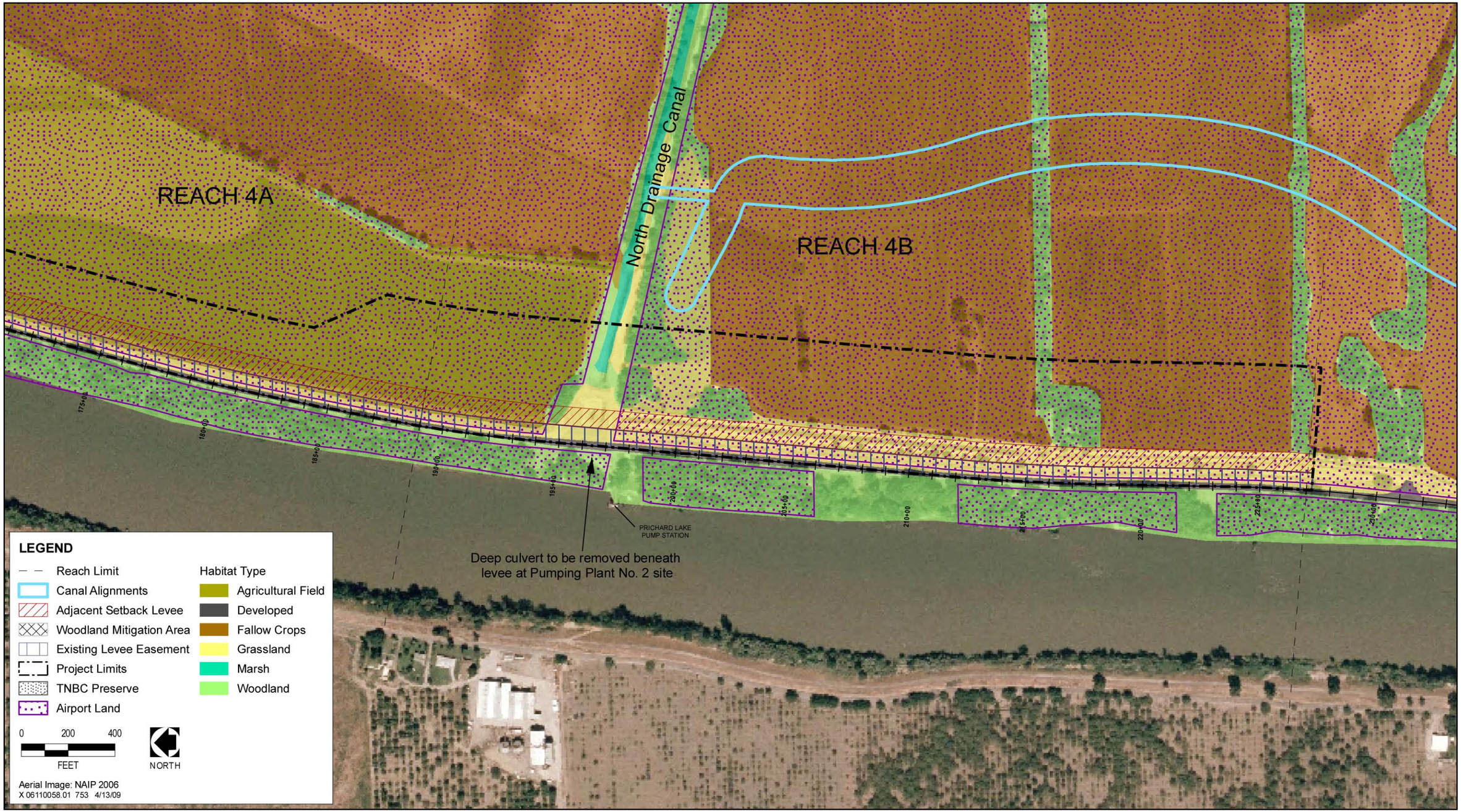

Source: Adapted by EDAW in 2008

**Sacramento River East Levee Project Elements and Habitat Details** **Exhibit 2-1b**



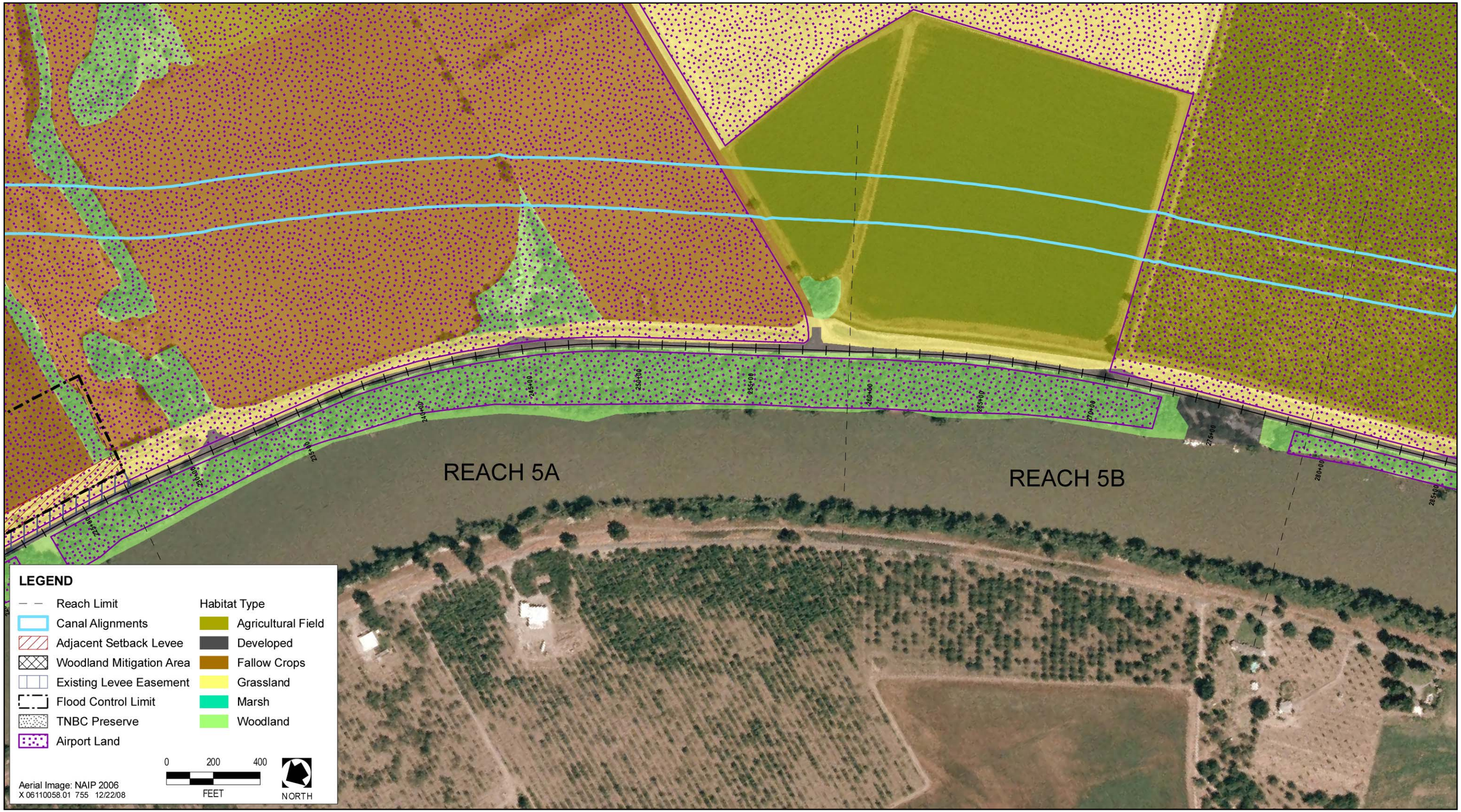

Source: Adapted by EDAW in 2008

**Sacramento River East Levee Project Elements and Habitat Details** **Exhibit 2-1c**




Source: Adapted by EDAW in 2008

**Sacramento River East Levee Project Elements and Habitat Details** **Exhibit 2-1d**




Source: Adapted by EDAW in 2008

**Sacramento River East Levee Project Elements and Habitat Details** **Exhibit 2-1e**


Source: Adapted by EDAW in 2008

**Sacramento River East Levee Project Elements and Habitat Details** **Exhibit 2-1f**

this nesting habitat under its responsibilities as a trustee agency. Portions of these habitats will be preserved in perpetuity.

Details for each of the mitigation components are provided in Sections 2.2 and 2.3 below.

## 2.2 BASIS FOR CONCEPTUAL MITIGATION PLANNING AND DESIGN

The NLIP Landside Improvements Project presents a unique, one-time opportunity to reconfigure and protect large nodes of habitat and connective corridors in the Basin at a landscape scale that will help to advance the goals and objectives of the NBHCP and assist the Federal Aviation Administration (FAA), USACE, and the local reclamation districts in achieving their management goals. The project's conservation strategy, which is described in more detail in the June 18, 2008, *Conceptual Mitigation, Management, and Monitoring Plan for SAFCA's NLIP Landside Improvements Project* (Conceptual MMP) and the March 20, 2009 *Updated Conservation Strategy memo* (memo) (Appendix A), will create, restore, and preserve sensitive habitats in the Basin. (The Conceptual MMP varies in some specifics from this MMP and the memo because it was produced at a conceptual level of detail, because it describes the entire, multiphase NLIP project rather than just the Phase 2 project, and because the conservation strategy has been updated since the date of its production.) This conservation strategy has four primary goals or objectives:

1. Increase the amount of protected habitat and habitat corridors available for NBHCP-covered species.

2. Consolidate large areas of habitat, assisting in the expansion of TNBC reserve blocks in the northwestern and southwestern regions of the Basin.

3. Improve the connectivity between core habitat reserves and other existing natural habitats distributed throughout the Basin, improve linkages between isolated wildlife populations, and substantially increase acreage and patch size of these critical habitats.

4. Meet regulatory compensatory mitigation requirements.

A description of each of the mitigation components, including the basis for planning and design for each component, follows.

## 2.3 MITIGATION COMPONENT DESCRIPTIONS

### 2.3.1 GGS/DRAINAGE CANAL

#### BASIS FOR DESIGN

The GGS/Drainage Canal will be a below-grade canal designed to provide habitat for the giant garter snake and local drainage and minor irrigation water conveyance for a portion of the Basin. Water will flow in the canal on the west side of the Basin, in a south to north direction from Elkhorn Reservoir to the North Drainage Canal, and in a north to south direction from Elkhorn Reservoir to the West Drainage Canal (Exhibits 2-1d through 2-1f). The GGS/Drainage Canal will enhance habitat functionality by permanently linking known giant garter snake population centers and TNBC preserves managed for giant garter snakes in the northern and southern areas of the Basin. This will improve habitat connectivity between the North Drainage Canal and West Drainage Canal and will augment opportunities for movement and genetic diversity of this species throughout the Basin. Irrigation and drainage water currently flowing through the Airport West Ditch will also be incorporated into the GGS/Drainage Canal.

Improved slope grading and a bank vegetation management program designed to optimize habitat quality and eliminate or reduce the frequency of bank disturbance will provide continuous, high-quality shoreline cover and

feeding and rearing area for giant garter snake and other semi-aquatic species. Corridors with high-quality managed canal habitat will substantially enhance the viability, resilience, and exchange of giant garter snake populations. The canal has also been designed to reduce the frequency and extent of maintenance disturbance to canal bed and banks, which will benefit the targeted species over the long-term.

Additional discussion regarding the basis of design for the GGS/Drainage Canal, including information about the benefits of the mitigation plan, is included in the Conceptual MMP (Appendix A, pages 5, 6, 9, 10, and 11) and the memo titled *Updates to 2081 Permit Application for the Natomas Levee Improvement Program's Landside Improvements Project* (also in Appendix A).

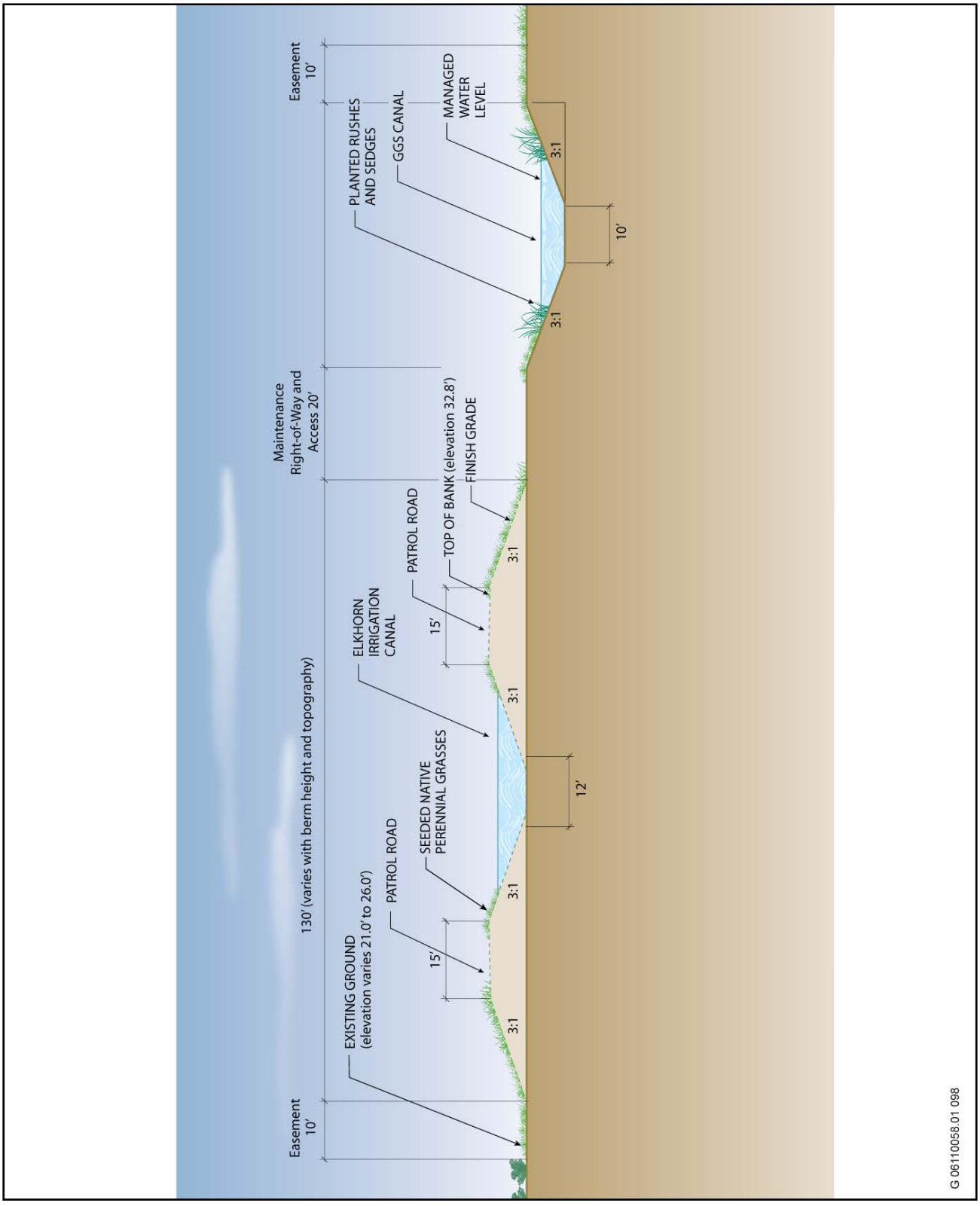
### HABITAT DESCRIPTION

The GGS/Drainage Canal will generally extend parallel to the Sacramento River east levee. It will extend from the North Drainage Canal near the RD 1000 Pumping Plant No. 2 in the north to the West Drainage Canal in the south by I5. Construction of the GGS/Drainage Canal system will include bank modifications and plantings to improve the habitat quality of the West Drainage Canal from 1-5 to Fisherman's Lake. The length of the entire GGS/Drainage Canal, including the reconstruction, will be approximately 43,800 linear feet (8.2 miles). The canal north of I-5 will be a major new canal and not a replacement of an existing canal of the same size and extent.

The 11,800-foot segment of the GGS/Drainage Canal that will be constructed during the Phase 2 project is north of Elkhorn Reservoir and will be parallel to and approximately 30 feet west of the new Elkhorn Irrigation Canal. North of Reservoir Road the canal will be set back a minimum of 200 feet from the projected levee toe. The majority of land designated for construction of the GGS/Drainage Canal in the Phase 2 Project is owned by the Sacramento County Airport System (SCAS).

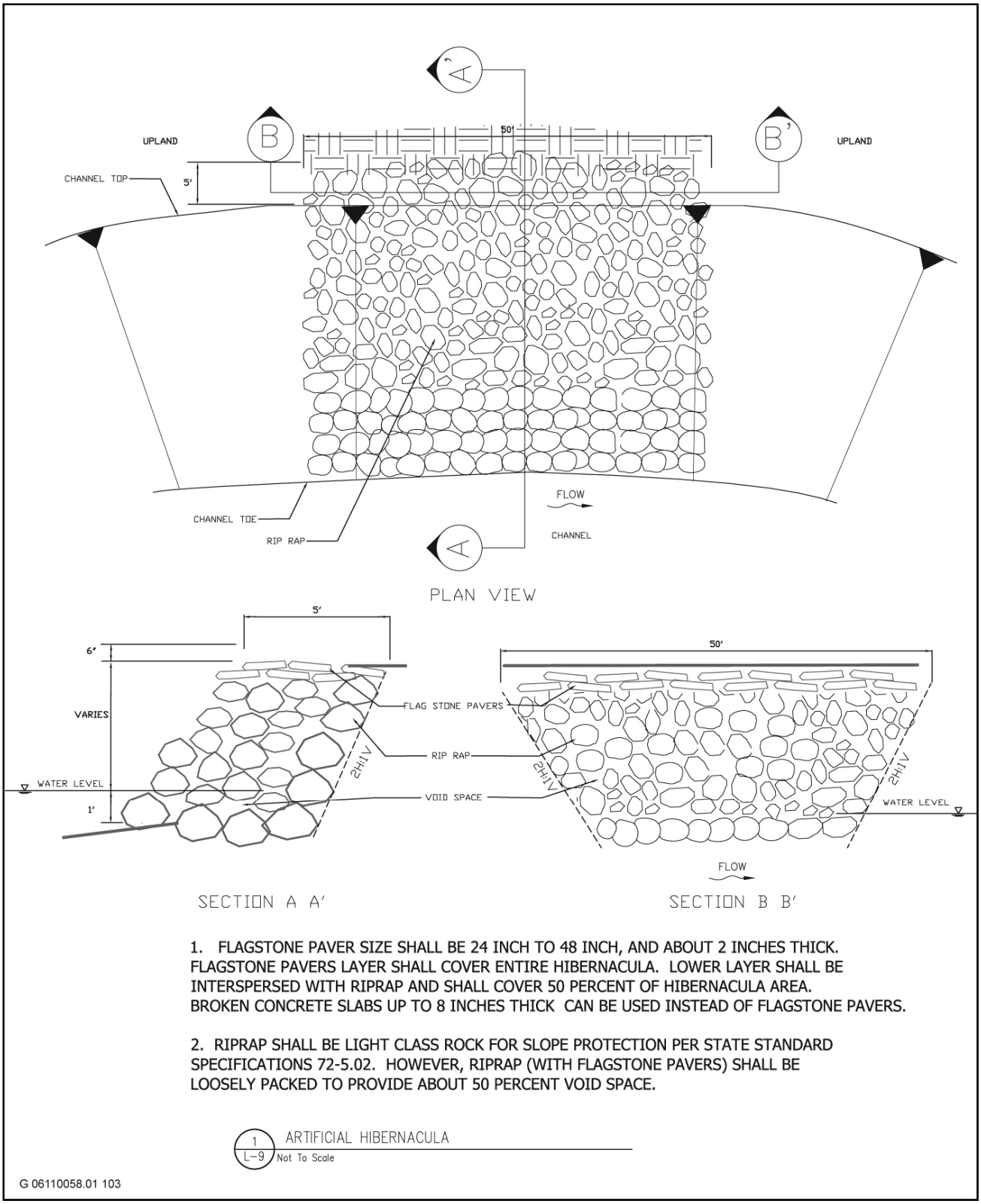
Most existing canals in the Basin have typically steep, horizontal-to-vertical side slopes of 2H:1V to 1H:1V. The GGS/Drainage Canal will be constructed with 3H:1V bank slopes (Exhibit 2-2), thus requiring less frequent dredging, bank repair, and bank disturbance. The gentle side slopes will facilitate the shoreline growth of freshwater marsh plants, including native sedges and rushes that will provide habitat for giant garter snake. Upper canal banks will be planted with native perennial grasses to provide better cover for giant garter snake, discourage weeds, raise cutting height above the ground, and reduce the frequency of disturbance to bank vegetation. SAFCA will purchase specialized equipment and vehicles, such as a large hydraulic-arm excavator, to increase the efficiency and ease of canal maintenance and reduce or eliminate the need to drag a bucket, scraper, or V-plow on canal banks. Giant garter snake hibernacula (rock piles keyed into the bank), about 50 feet long, will be placed along the canal bank slopes approximately every 300–500 feet (Exhibit 2-3). Rock piles may extend to the toe of the bank if unstable soils necessitate additional support for the hibernacula. Refer to Section 3.2, "Mitigation Design," below for specific information about soil preparation and planting plans.

The GGS/Drainage Canal will be 6–7 feet deep, will have a 10 to 12-foot-wide bottom width, and will have a top bank flush with the ground surface. The GGS/Drainage Canal will have a series of check structures approximately every 2000 feet along its length to maintain consistent water levels in the canal during the snake's active season (April–October) (Exhibit 2-4). These water control structures will be planted with the same types of vegetation as the rest of the canal to provide giant garter snakes cover while they pass the structure. Supplemental water will be provided from the NMCWC irrigation system. Water depth in the canal is designed to be 4.5 feet ± 6 inches, which will help to minimize tule growth and submerged aquatic weeds in the bottom of the channel. Water will flow at approximately 5 cfs to avoid eutrophication and anaerobic conditions. A maintenance right of way (including a dirt access road) approximately 20 feet wide will be constructed on one side of the canal between the GGS/Drainage Canal and the adjacent Elkhorn Irrigation Canal, and a 10-foot upland native perennial grassland easement (mowed to approximately 6 inches) will be maintained on the other side.



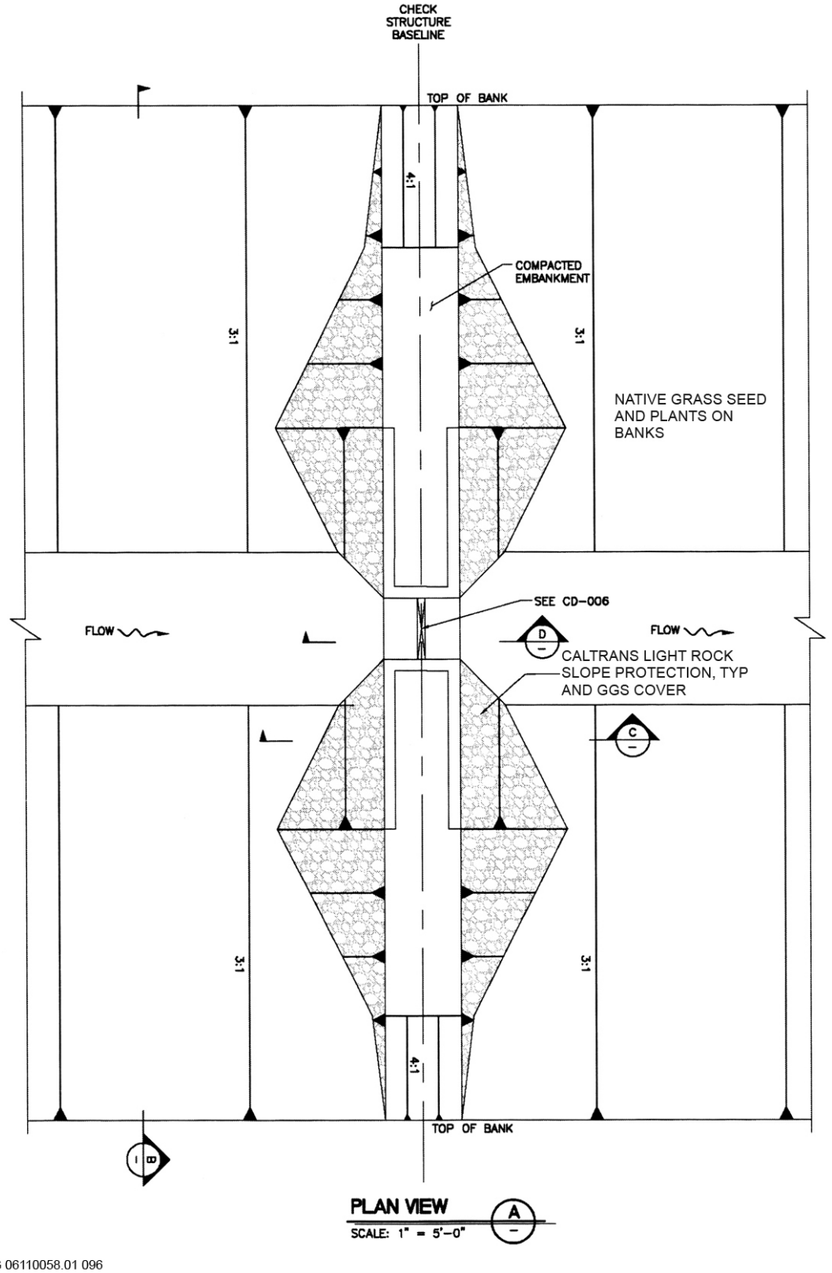

Source: Data provided by Mead & Hunt and adapted by EDAW in 2008

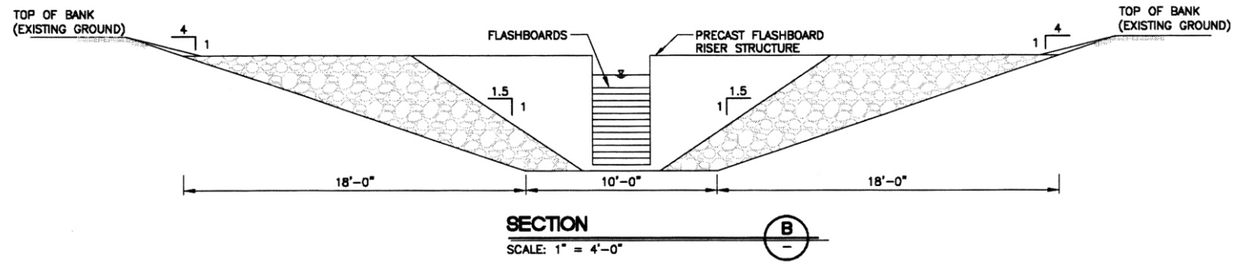
**Typical Cross Section of Elkhorn and GGS/Drainage Canals** **Exhibit 2-2**

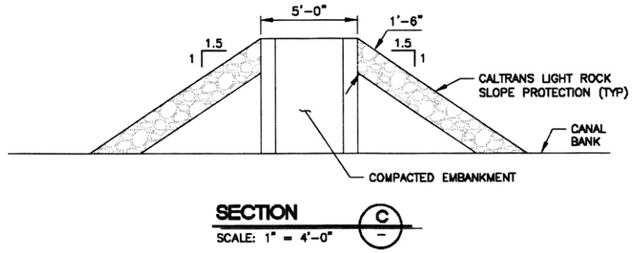


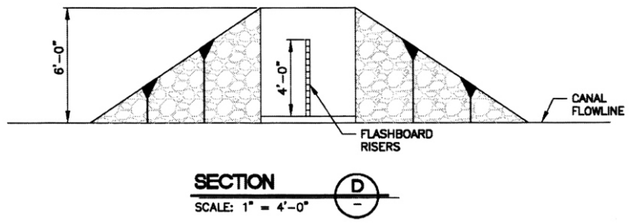

Source: Created by EDAW, West Yost, and Eric Hansen in 2008

**Design of Giant Garter Snake Hibernacula Rock Pile** **Exhibit 2-3**

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Data provided by Mead & Hunt and adapted by EDAW in 2008

**Typical Water Control Structure** **Exhibit 2-4**

In addition to the wetland and Giant Garter Snake habitat functions described above, the created GGS/Drainage Canal would serve as:

- a secondary source or pass-through of surface irrigation water for agricultural purposes (canal flow, estimated to be 5 cfs, will drain into collector canals managed by NCMWC for their reuse);
- incidental groundwater recharge by the GGS/Drainage Canal, which is unlined (permeable earth banks and bed);
- a secondary use for the conveyance of local, surface stormwater drainage from adjacent fields, TNBC lands and Airport fallow lands (North Bufferlands); and,
- a source of improved water quality (river water) in Fisherman's Lake located at the canal system outlet.

## 2.3.2 ELKHORN IRRIGATION CANAL

### BASIS FOR DESIGN

The new Elkhorn Irrigation Canal will be a "highline canal," which will flow above grade, confined by flanking earth berms, so that diverted river water can flow by gravity to distribution canals serving agricultural fields (Exhibits 2-1d through 2-1f). The primary purpose of constructing the Elkhorn Irrigation Canal is to replace existing NMCWC water supply infrastructure and irrigation services affected by the fill of the existing Elkhorn Irrigation Canal, necessary for levee widening. In addition, the relocated canal is expected to provide giant garter snake habitat and foraging habitat for Swainson's hawk along its banks and right-of-ways. The canal's design (e.g., gentle side slopes, wider easement area and improved maintenance roads) and modified management of the bank vegetation will reduce the frequency and intensity of bank disturbance and provide some continuous shoreline cover for giant garter snake and other semi-aquatic species. Further, it will facilitate long-term implementation of NCMWC's existing best management practices (BMPs) designed to improved habitat stewardship. Other secondary functions include water filtration and sediment storage.

Additional discussion regarding the basis of design of the new Elkhorn Irrigation Canal, including information about the benefits of this mitigation component, is included in the Conceptual MMP (Appendix A, pages 5, 6, 7, and 8) and the memo titled *Updates to 2081 Permit Application for the Natomas Levee Improvement Program's Landside Improvements Project* (also in Appendix A).

### HABITAT DESCRIPTION

The existing Elkhorn Irrigation Canal serves NMCWC's Central and Elkhorn systems and a number of lateral irrigation canals from their Prichard and Elkhorn Pumping Plants on the Sacramento River. The entire length of the existing Elkhorn Irrigation Canal (approximately 22,300 feet or 4.2 miles), as well as the canal's associated field services, roadway crossings, and diversion boxes, will be relocated to accommodate the levee construction from the Central Main Canal to its southernmost point south of Elkhorn Road (Sacramento River east levee Reaches 4B–8). The 11,950-foot section between Reaches 4A and 6B will be constructed during the Phase 2 Project to minimize interruption of the water supply distribution system for the Basin and to provide concurrent compensation of giant garter snake habitat. The corresponding section of the existing canal will be decommissioned during construction of Phase 3.

Most of the new Elkhorn Irrigation Canal will be aligned parallel to Garden Highway, as close to the edge of the levee improvements as possible (Exhibits 2-1d through 2-1f). In some areas there will be a seepage berm extending from the levee with an overall width of up to 300 feet. A 50-foot maintenance corridor and a 20-foot-wide overhead utility corridor will be located between the toe of the new levee's landside slope and the edge of the relocated canal right-of-way.

Much of the Phase 2 project segment of the new Elkhorn Irrigation Canal falls within lands owned by the SCAS. The canal will have a 10 to 12-foot-wide bottom and 3H:1V slopes (Exhibit 2-2). The canal will be approximately 6–7 feet deep with a 5- to 6-foot maximum water depth during the irrigation season. Previous project documents have stated that the bottom of this canal will be lined with concrete; however, it has since been determined that this measure is impractical. The canal is designed to maintain flow demand and existing water delivery levels at each service point. The cross-sectional area of the canal is based on the conveyance area required to maintain existing downstream water-service elevations at each service point during peak-flow operations, while considering the allowable elevation provided at the pumping plants. The canal will have a very flat hydraulic grade line (s = 0.0001 to 0.0003 foot vertical/foot horizontal). The canal will include water control structures typical of irrigation canals, as required, to maintain water levels at each service point when flows are less than peak demand.

The gentle side slopes are designed to facilitate the shoreline growth of freshwater plants. Perennial grasses will be planted on the canal banks to provide cover for giant garter snake, discourage weeds, raise cutting height above the ground, and reduce the frequency at which bank vegetation is disturbed. Outer canal banks (dry side of berms) will be seeded and managed as grassland. Refer to Section 3.2, "Mitigation Design," below for specific information about soil preparation and planting plans.

The top of the west (levee-side) canal embankment will serve as a patrol road for operators to monitor water levels, adjust water control structures for level control, operate irrigation turnouts, and maintain the canal as needed (i.e., dredge sediment, remove organic debris). The patrol road will be 15 feet wide with a gravel surface. The east (field-side) canal embankment top will also be 15 feet wide to provide access for maintenance equipment (e.g., for dredging and mowing). Access along the east embankment will provide for joint use of the area for flood control in the wet season and irrigation in the dry season.

In addition to the irrigation service and giant garter snake habitat functions described above, the new Elkhorn Irrigation Canal would provide incidental groundwater recharge through the unlined (permeable earth banks and bed) main canal as well as unlined secondary delivery canals served by the main canal.

### 2.3.3 BROOKFIELD PROPERTY (RICE HABITAT)

#### BASIS FOR DESIGN

The Brookfield property, located in the northeastern part of the Basin, is currently used for rice production and will be used as a borrow site for levee construction (Exhibit 1-6). After the borrow material is extracted, the property will be returned to rice production and part of it will be preserved in perpetuity. Rice fields support foraging and rearing habitat for the giant garter snake. By protecting rice fields in the northeast Basin the mitigation plan will create a large area that is managed in perpetuity for giant garter snake, thus contributing to giant garter snake recovery in the Basin. In addition, the preserved rice fields will be cultivated in a manner to maximize habitat suitability and minimize potential for snake injury and mortality, thus improving the habitat quality of the existing rice fields.

Because few surveys for giant garter snake have been conducted in the northeastern part of the Basin, giant garter snakes have not yet been documented in this portion of the Basin. Nonetheless, giant garter snake is known to occur in suitable habitat throughout the Basin, including areas to the west (e.g., TNBC preserves along the NCC) south (e.g., Snake Alley and nearby TNBC preserves) and east. Therefore, it is likely that giant garter snake will use the rice fields in this portion of the Basin as foraging and rearing habitat.

SAFCA will improve the canal on the south side of the property, improving its connection under State Route (SR) 99/70 to other habitats managed for giant garter snake farther west along the NCC. SAFCA will also improve surface-water irrigation to the site to reduce the site's dependence on groundwater. In this way SAFCA will contribute to maintaining a balance of the groundwater aquifer, which otherwise could be negatively affected by

new cutoff walls to be installed in the levees. A balanced groundwater aquifer would also improve habitat connectivity between rice fields and the existing canal network which are used as movement corridors by the snake.

Additional discussion regarding the basis of design for the Brookfield property, including additional information about the benefits of this mitigation component, is included in the Conceptual MMP (Appendix A) and the memo titled *Updates to 2081 Permit Application for the Natomas Levee Improvement Program's Landside Improvements Project* (also in Appendix A).

### HABITAT DESCRIPTION

Some of the borrow material for the Phase 2 project will come from the 353-acre Brookfield property. All of the property used for borrow will be restored to rice production when borrow activities are complete. Half of the acreage used for borrow activities, up to 175 acres (1/2 of 353), will be preserved under a conservation easement (granted to TNBC) restricting land use to rice production.

58.96 acres of the entire 353-acre Brookfield property are also considered USACE jurisdictional irrigated wetlands. These irrigated wetlands are spread fairly uniformly across the 353-acre site. Portions of these irrigated wetlands fall within the area of property to be disturbed, restored, and preserved. Therefore, it is estimated that up to approximately 30 acres of these irrigated wetlands will be preserved for the Phase 2 project.

The 353-acre Brookfield site is a privately owned property located between Howsley Road and Fifield Road, west of the PGCC west levee in the northeastern part of the Basin. As of summer 2008, the property was in rice cultivation. The surrounding area is rural and consists primarily of agricultural lands with a few scattered residences. The Brookfield site is within the boundaries of the NBHCP area, yet outside the permit area. Soils are composed mostly of impermeable clay and hardpan. Approximately 2–3 feet of borrow material will be excavated; following borrow operations the site will be returned to rice production.

The rice field is a series of flat patties separated by berms or terraces to maintain constant water surface elevations. Interior berms are 4–5 feet wide and 2–3 feet high. Exterior berms typically include roads along drains, roads separating fields, and roads along irrigation canals. The exterior berm roads are typically 15–20 feet wide and 2–3 feet high.

Occasionally, surface water supply is limited and farmers must rely on wells. The site is irrigated from three on-site wells, and water levels are maintained approximately 6 inches deep during the growing season. An irrigation canal runs along the south side of the site and drainage channels run along the west and south sides of the site. Much of the water that enters the rice field is used by the rice plant as part of the evapotranspiration process, and a portion of the water supply percolates into the groundwater. The remaining water supply drains off the rice field, enters the RD 1000 drainage system, and is either recycled for irrigation elsewhere in the Basin or pumped back to the Sacramento River. The irrigation season typically extends from early May through the end of August. Occasionally, the irrigation season begins in April when the spring is dry or warm, or it will extend into September if planting was delayed in the spring. Several weeks after harvest, the fields are flooded again for rice straw decomposition.

Rice is typically planted in May and harvested between late August and October, depending on the planting date, rice variety, seasonal growth progress, and rainfall events that may interrupt the harvesting process. The rice is harvested with combines, collected in a storage tank on the combine, transferred to a grain cart, and transferred to a truck.

After rice harvest and drainage of rice fields, rice stubble or straw decomposition is managed with different practices to minimize disease and residue. Several approaches are used:

- The rice stubble is disked (stubble disk) and subsequently flooded via irrigation.

- The rice stubble is disked prior to winter rains. No irrigation water is applied.
- The rice stubble is plowed to bury the residue.
- The rice stubble is cut, windrowed, baled, and removed from the field with little stubble remaining on the field.
- The rice stubble is burned in the fall or spring. The amount of burning allowed is limited.

The use of fallowing and crop rotation is a function of water availability, disease and pest control, weed control, and the price of rice. Low rice prices occasionally result in a reduction in acreage (fallow). Crop rotations include such crops as wheat, safflower, and corn. Disease control is usually accomplished with the rice stubble management techniques described above. Weed control is accomplished with crop rotations and herbicides. Weed control on the berms varies from allowing the weeds to grow unchecked to maintaining the growth via herbicides. The area devoted to berms is not harvested and weed growth can compromise rice production and crop quality.

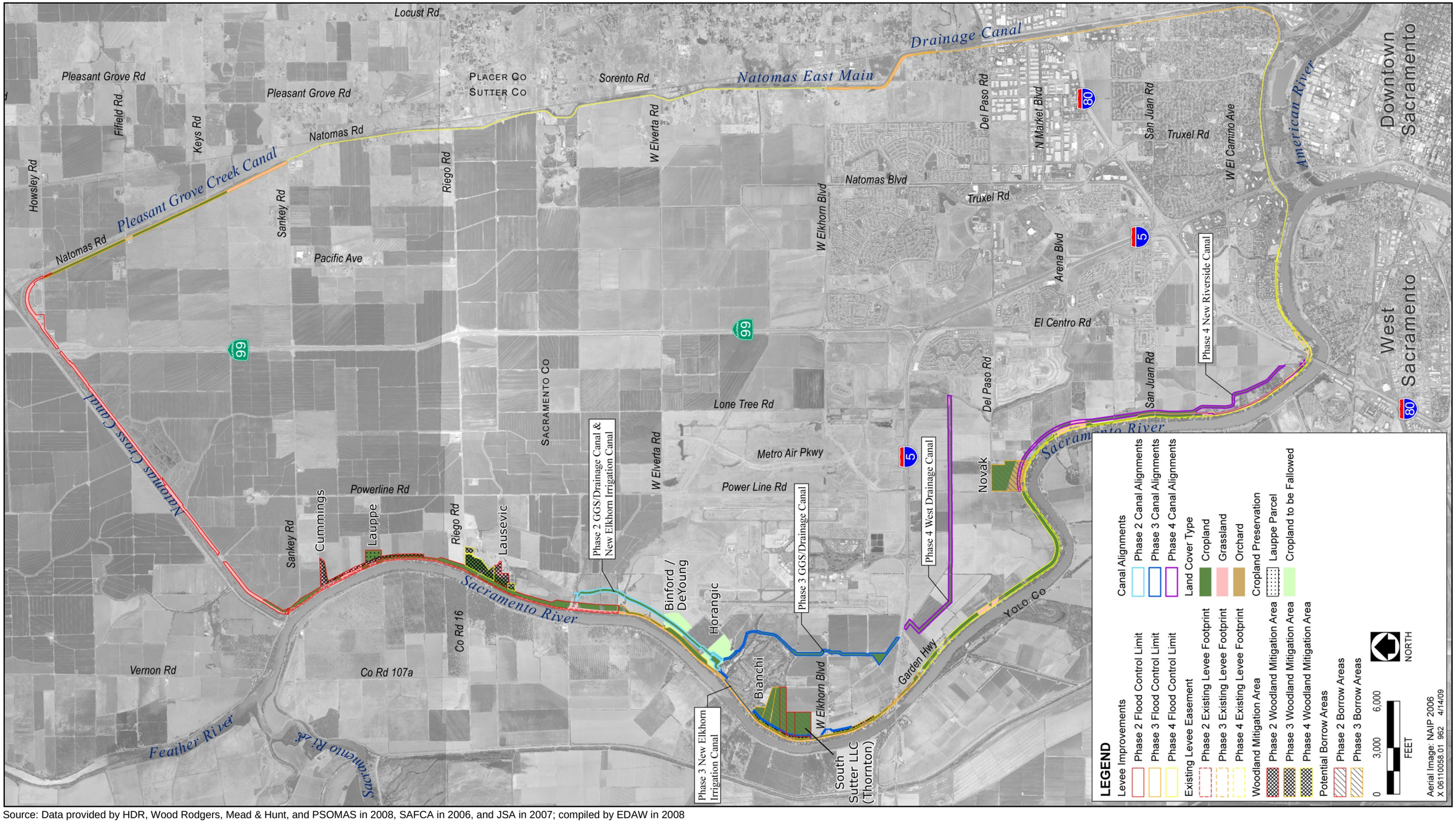
## 2.3.4 MANAGED NATIVE PERENNIAL GRASSLANDS

### BASIS FOR DESIGN

To partially mitigate impacts on cropland and grassland suitable for Swainson's hawk foraging habitat, SAFCA will create managed native perennial grassland habitats on the new levee slopes, seepage berms, access rights-of-way, and canal embankments (Exhibits 2-5a through 2-5e). This grassland will be drill-seeded with a mix of native perennial grasses, and then managed to minimize colonization by ruderal annual grasses and broad-leaved weeds. This grassland will provide moderate-quality Swainson's hawk foraging habitat. In addition, grasslands on and adjacent to canal banks will provide basking and aestivation habitat for giant garter snake.

From a Swainson's hawk foraging habitat perspective, the quality of foraging cover is related to the availability of rodent prey. Cover types supporting an available rodent base include native grassland, ruderal grassland, agricultural fields soon after crop harvest and disking, alfalfa and other cut-hay crops, fallow fields, and lightly grazed pasture (City of Sacramento 2003). Native perennial grasslands may attract larger populations of small mammals than ruderal annual grasslands or some annual croplands. See Appendix B for personal communications regarding this topic. Native perennial grassland cover is available to small mammals year-round. Ruderal annual vegetation has a growth spurt in spring and is typically dry and less palatable by mid-summer. It is also significantly more prone to wildfire and once burned provides little or no habitat. In contrast, perennial grasses grow throughout early spring to late fall, providing a more palatable food source and more cumulative food biomass for small mammals, and are less prone to wildfire. In addition, although rodents may occur in abundance in tall grass or weeds, the height of the vegetation provides them better cover from predators, making the rodents less available to foraging Swainson's hawk or other raptors. For prey to be available, vegetative cover must be short (i.e., ideally about 4–12 inches). Mowers will be set to approximately 6" above grade, which is the minimum practical mowing height for the equipment, and the lowest setting to avoid damage to the root crown of bunchgrasses where new growth originates.

Many of the managed grassland sites will connect with adjacent TNBC properties that are managed for Swainson's hawk foraging habitat and nesting habitat. Also, much of the managed grassland will be located in close proximity to new woodland nodes and a new woodland corridor created as part of this MMP to provide nesting habitat (see below). New woodlands adjacent to foraging habitat will provide optimal habitat conditions. By connecting these

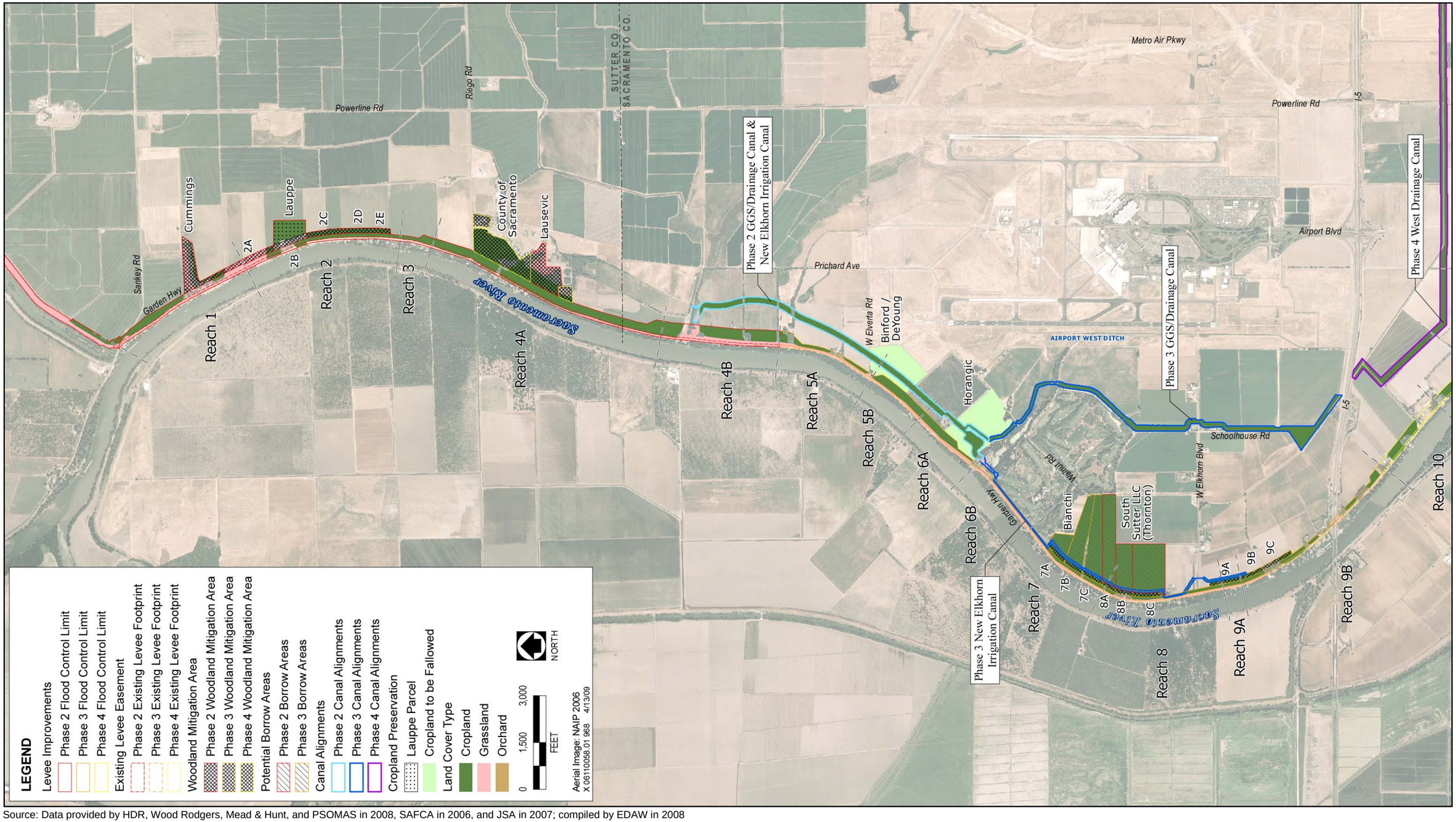



Source: Data provided by HDR, Wood Rodgers, Mead & Hunt, and PSOMAS in 2008, SAFCA in 2006, and JSA in 2007; compiled by EDAW in 2008

**Natomas Levee Improvement Program Land Cover Effects to Swainson's Hawk Foraging Habitat** **Exhibits 2-5a**

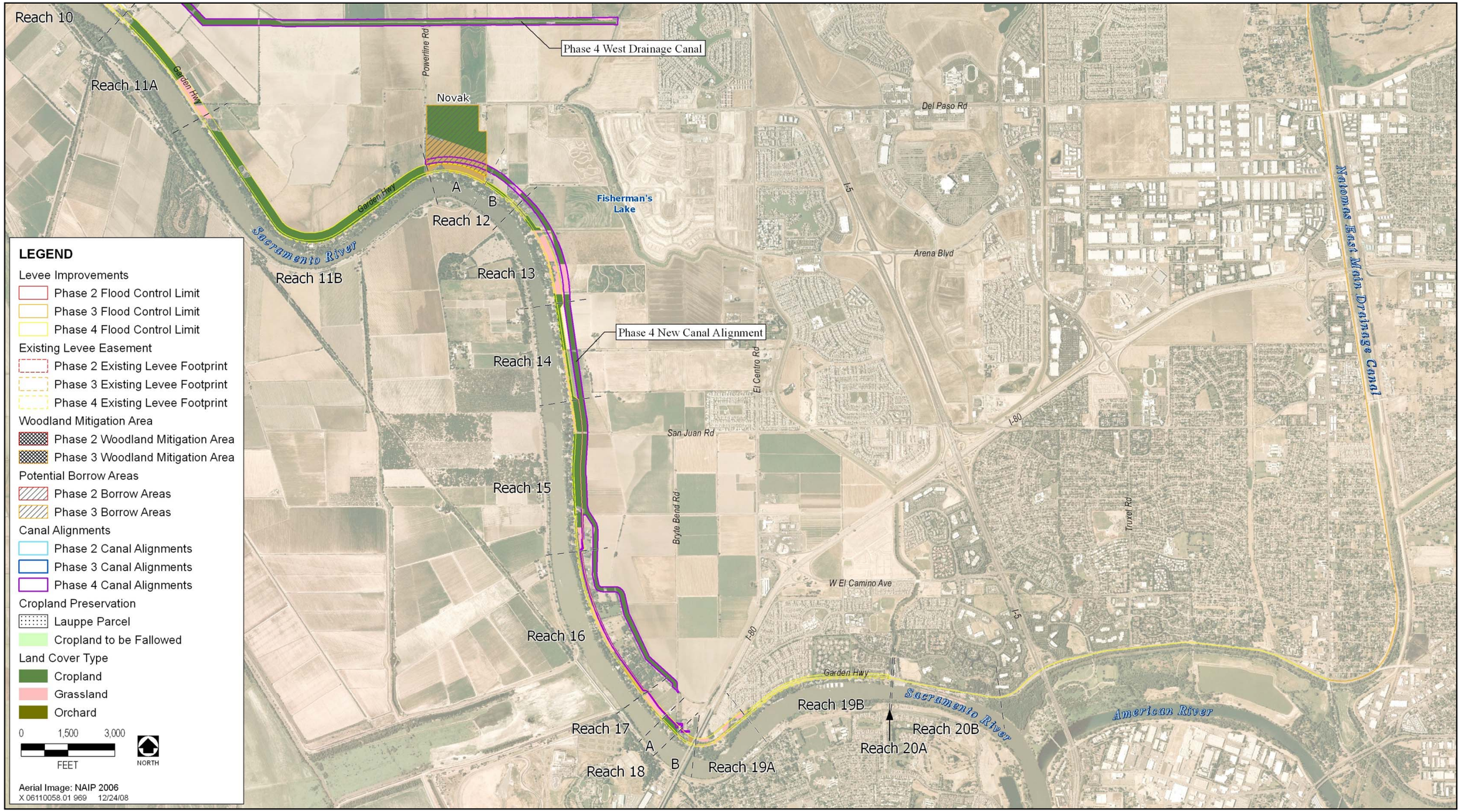

Source: Data provided by HDR, Wood Rodgers, Mead & Hunt, and PSOMAS in 2008, SAFCA in 2006, and JSA in 2007; compiled by EDAW in 2008

**Natomas Levee Improvement Program Land Cover Effects to Swainson's Hawk Foraging Habitat** **Exhibits 2-5b**



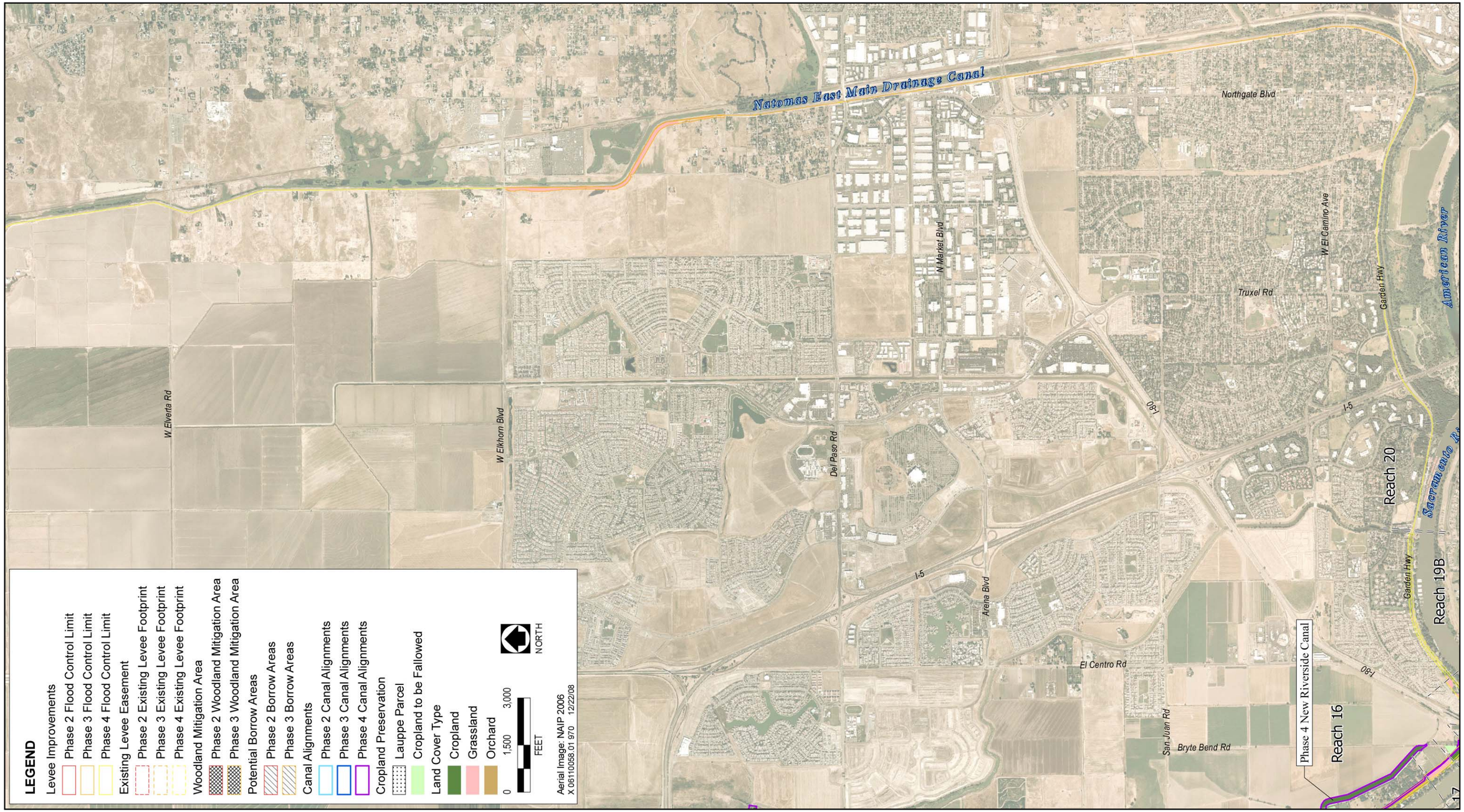

Source: Data provided by HDR, Wood Rodgers, Mead & Hunt, and PSOMAS in 2008, SAFCA in 2006, and JSA in 2007; compiled by EDAW in 2008

**Natomas Levee Improvement Program Land Cover Effects to Swainson's Hawk Foraging Habitat** **Exhibits 2-5c**




Source: Data provided by HDR, Wood Rodgers, Mead & Hunt, and PSOMAS in 2008, SAFCA in 2006, and JSA in 2007; compiled by EDAW in 2008

**Natomas Levee Improvement Program Land Cover Effects to Swainson's Hawk Foraging Habitat** **Exhibits 2-5d**




Source: Data provided by HDR, Wood Rodgers, Mead & Hunt, and PSOMAS in 2008, SAFCA in 2006, and JSA in 2007; compiled by EDAW in 2008

**Natomas Levee Improvement Program Land Cover Effects to Swainson's Hawk Foraging Habitat** **Exhibits 2-5e**

properties, the mitigation project will create a larger contiguous area to be managed for Swainson's hawk than currently exists. This will increase the habitat value and functions that these individual properties would otherwise provide in isolation and will contribute to Swainson's hawk recovery in the Basin. In addition, grasslands that will be temporarily impacted on existing levee slopes will be enhanced once restored on new levee slopes. Managed native perennial grassland is higher quality foraging habitat than unmanaged ruderal annual grassland found on and next to the existing levee, maintenance roads, and canal systems affected by the NLIP.

Additional discussion regarding the basis of design for managed native perennial grasslands, including information about the benefits of this mitigation component, is included in the Conceptual MMP (Appendix A) and the memo titled *Updates to 2081 Permit Application for the Natomas Levee Improvement Program's Landside Improvements Project* (also in Appendix A).

## HABITAT DESCRIPTION

### Managed Grassland in the Flood Control Footprint

The project will expand the existing slopes of the Sacramento River east levee and NCC south levee (Exhibits 2-5b and 2-5c). Along portions of the Sacramento River east levee, SAFCA will construct 100- or 300-foot-wide earthen seepage berms with a nearly flat slope (50H:1V or less). (In one or more locations, this berm will be up to 500 feet wide.) A 70-foot-wide maintenance and overhead utility access right-of-way will be created parallel to the landside toe of the new levee and seepage berms. Additional setback buffer land will flank some of these features, and property acquisition for the proposed project will leave SAFCA with remnant portions of acquired parcels that are not essential to flood control uses. With the exception of the crown of the levee, managed native perennial grassland will be created in these areas and on levee/berm surfaces. These grasslands will be mowed to approximately 6–12 inches. Refer to Section 3.2, "Mitigation Design," below for specific information about soil preparation and planting plans.

Most of the property within the Phase 2 Project's flood control footprint will be acquired or placed under permanent easement by SAFCA as part of the project. The Phase 2 areas are located primarily in Sutter County within the Basin, with a smaller proportion (i.e., the flood control footprint along Reaches 4A and 4B of the Sacramento River east levee) in Sacramento County northwest and west of the Sacramento city limits. Phase 2 lands are currently a combination of un-irrigated grassland, field crops, rice, canals, and woodlands.
The surrounding area is rural and consists primarily of agricultural lands and TNBC reserves, with a few scattered residences.

### Managed Grassland on Canal Embankments

Adjacent to the newly constructed GGS/Drainage Canal and new Elkhorn Irrigation Canal will be embankments and access rights-of-way on which native perennial grasslands will be established. Many of these grasslands will be mowed to approximately 6–12 inches; however, the grasslands directly adjacent to the canals may be maintained at a taller height to provide cover and to avoid damage to giant garter snakes. Refer to Section 3.2, "Mitigation Design," below for specific information about soil preparation and planting plans.

Most of the property within the Phase 2 Project's canal alignments is currently owned primarily by the SCAS. These areas are located in Sacramento County northwest and west of the Sacramento city limits. These lands are currently a combination of un-irrigated grassland, field crops, rice, canals, and woodlands. The surrounding area is rural and consists primarily of agricultural lands, with a few scattered residences.

## 2.3.5 AGRICULTURAL UPLAND SWAINSON'S HAWK FORAGING HABITAT

### BASIS FOR DESIGN

To reduce impacts to Swainson's hawk foraging habitat, SAFCA will create, enhance, and preserve Agricultural Upland Swainson's Hawk Foraging Habitats (Exhibit 2-5a). Biologists have determined that Swainson's hawk prefer particular types of foraging habitat, particularly alfalfa (Estep 1989, Woodbridge 1998). Although the multi-phase NLIP Landside Improvements Project will result in the creation of many more total acres of foraging habitat than the total acres of affected foraging habitat, much of the affected acreage is higher-value cropland, while most of the mitigation acreage will be moderate-value managed native perennial grassland. To mitigate this loss in foraging habitat value, SAFCA will create or enhance approximately 150 acres of Agricultural Upland Swainson's Hawk Foraging Habitat to be preserved in perpetuity. These Agricultural Upland Swainson's Hawk Foraging Habitats will be managed to provide high-quality foraging habitat. Crop rotations will include field crops considered to provide high-value foraging habitat for the Swainson's hawk. The types of crops produced will be defined in a site-specific management plan prepared for each mitigation site, and may include: alfalfa; hay; clovers; and annual row crops with a low vegetative profile such as beets and tomatoes. Each management plan will include required management criteria to maximize foraging habitat value for Swainson's hawk. Criteria used to define suitable crop types for each mitigation site will be consistent with research described in Estep 1989, Estep 2008, and Woodbridge 1998.

The locations of approximately 84 of the 150 acres have been identified at the Novak and Lauppe properties, and the remaining 66 acres will be identified as part of the Phase 3 and Phase 4 projects. At this time, it is anticipated that these 66 acres will be preserved at the Bianchi borrow site or the South Sutter LLC/Thornton borrow site. Like the grasslands described above, in order to maximize the value of preserved foraging crops, mitigation locations were selected and are being purchased to connect with or be in close proximity of TNBC properties that are managed for Swainson's hawk foraging habitat and nesting habitat, and new landside woodlands that will be created as part of this MMP to provide nesting habitat. By connecting these properties, the mitigation project will create a larger contiguous area managed for Swainson's hawk than currently exists. This will increase the habitat value and functions that these individual properties would otherwise provide in isolation and will contribute to Swainson's hawk recovery in the Basin.

Additional discussion regarding the basis of design for agricultural land acquisition, including information about the benefits of this mitigation component, is included in the Conceptual MMP (Appendix A) and the memo titled *Updates to 2081 Permit Application for the Natomas Levee Improvement Program's Landside Improvements Project* (also in Appendix A).

### HABITAT DESCRIPTION

Two properties have been identified for forage crop creation, enhancement, and preservation: the Lauppe property (Exhibit 2-1b) and the Novak property (Exhibit 2-5d).

The Lauppe property is located along Reach 2 of the Sacramento River east levee, in the northwest area of the Basin. It is surrounded by agricultural lands and the Sacramento River. This 20.6-acre property is used to produce field crops, including rotations of alfalfa and other high-value foraging crops. A house and associated outbuildings are located on about 3.5 acres of the property. The house and outbuildings will be removed from the property, and most of these 3.5 acres plus an additional 3 acres of cropland will be used to create the adjacent levee and woodland corridor. The remaining 14 acres will be enhanced by farming field crops that provide high-quality forage habitat, including rotations of alfalfa crops. All 14 acres of Agricultural Upland Swainson's Hawk Foraging Habitat will be preserved in perpetuity.

The Novak property is located along Reach 12A of the Sacramento River east levee, in the southwest area of the Basin. This property is surrounded by agricultural lands and the Sacramento River. The 83-acre property includes approximately 33 acres of orchards, and approximately 50 acres of cropland, which were fallow in 2007. The

orchards and crops will be removed as part of the project so that the site can be used for borrow material and for construction of the new Riverside Canal during a future phase. Following borrow and construction activities, the remaining 70 acres of land will be enhanced by farming field crops that provide high-quality foraging habitat, including rotations of alfalfa. These 70 acres of Agricultural Upland Swainson's Hawk Foraging Habitat will be preserved in perpetuity as mitigation.

## 2.3.6 LANDSIDE WOODLANDS

### BASIS FOR DESIGN

To mitigate the loss of woodlands that may provide Swainson's hawk nesting habitat and valley elderberry longhorn beetle habitat, SAFCA will acquire cropland and ruderal grassland properties, establish woodlands on this land, preserve these properties in perpetuity, and preserve additional landside valley oak woodland already in existence.

Two types of landside woodlands will be created: a 100–200 foot wide corridor of woodlands running generally north-south along the east side of the new levees, and larger nodes of woodland groves created contiguous to the linear corridor as well as adjacent to existing high quality valley oak woodlands (Exhibits 2-1a through 2-1d). Trees provide nesting habitat for Swainson's hawk and enhance the value of foraging habitat (i.e., new woodland + foraging land = optimal habitat). Large areas within the Basin have few or no mature trees or recruitment of saplings, so additional trees could increase long term habitat values for Swainson's hawk. Increasing landside woodlands in the Basin is expected to bring new nesting opportunities to areas farther inland from the levees where those habitat values have been lost, and to make existing Swainson's hawk foraging habitat on interior agricultural fields more accessible. This will increase the productivity of these lands as foraging habitat.

The priority for woodland corridors is for tall, fast-growing tree species to be planted adjacent to Swainson's hawk foraging fields to increase potential nest sites for Swainson's hawk and other bird species, to maximize habitat-edge transitions between nesting and foraging habitat, and to minimize distances between nesting and foraging areas.

New woodland corridors will be wider than most of the existing tree rows, and more contiguous than other landside woodlands that are scattered throughout the Basin in small groves or narrow tree rows along the edges of fields, canals, and roads. Establishing the woodland corridors will substantially increase the acreage and spatial distribution of landside woodlands adjacent to surrounding protected and managed native perennial grasslands, cropland, and wetlands. This, in turn, will provide an important opportunity to diversify the complexity of the landscape and increase beneficial habitat edge effects. Most of the riverside forest that borders the Sacramento River along the Natomas Basin is substantially wider than the remaining riparian forest bordering most of the lower Sacramento River levee system between Colusa and the Delta. However, there are gaps and very narrow benches where bank erosion has obliterated the natural riverside berm between the levee and channel, most notably on Reaches 1 and 2 along the Sacramento River east levee. Establishing landside woodland corridors in these reaches will compensate for gaps in the riverside forest community and increase the interface of landside woodlands connected to the riverside riparian forest. This will enhance daily and seasonal movement corridors for wildlife and avian populations between habitat types, and between foraging and breeding areas.

The woodland groves will provide superior refuge, habitat diversity, and cover for many wildlife species. These woodland groves will also promote successful nesting by a variety of native birds deeper within the grove canopy, where nest parasitism by crows, cowbirds, and starlings is less of a factor in breeding success. The establishment of larger woodland groves will likely also attract oak woodland bird species, such as oak titmouse, acorn and Nutall's woodpecker, Western scrub-jay, and raptor species.

The sites will provide connectivity between adjacent TNBC properties that are managed for Swainson's hawk habitat. By connecting these properties, the project will create a larger contiguous area managed for Swainson's

hawk than currently exists. This will increase the habitat value and functions that these individual properties would otherwise provide in isolation, and will contribute to Swainson's hawk recovery in the Basin.

Additional discussion regarding the basis of design for woodland habitat, including information about the benefits of this mitigation component, is included in the Conceptual MMP (Appendix A) and the memo titled *Updates to 2081 Permit Application for the Natomas Levee Improvement Program's Landside Improvements Project* (also in Appendix A).

### HABITAT DESCRIPTION

These landside woodlands will consist of a mixture of native oak woodland and riparian species, including elderberry shrubs, but the dominant tree species will be valley oak, sycamore, and cottonwood.

#### Cummings North Property

The Cummings North property, which is adjacent to the Sacramento River east levee in Reach 1, will be enhanced and preserved in perpetuity (Exhibit 2-1a). The surrounding area is rural and consists primarily of agricultural lands and TNBC reserves, with a few scattered residences. This 22-acre property contains some mature oak woodland and ruderal grassland adjacent to cropland. Existing ruderal annual grassland in the interior of the surrounding woodland will be converted to native perennial grassland, with tree, shrub and elderberry clusters planted within the meadow. In addition, the woodland perimeter will be expanded to maximize habitat-edge transitions between nesting and foraging habitat. Refer to Section 3.2, "Mitigation Design," below for specific information about soil preparation and planting plans.

#### Lausevic Property

The Lausevic property, which is east of the Sacramento River east levee in Reach 2, has also been acquired by SAFCA, and will be enhanced and preserved in perpetuity (Exhibit 2-1c). This 23-acre property is adjacent to the Sacramento River on the west and the largely abandoned Rio Ramaza residential subdivision on the east. The Rio Ramaza subdivision contains some scattered woodland groves, but consists mostly of ruderal grasslands and scattered houses and roadways. The Lausevic property and the Rio Ramaza subdivision are surrounded by cropland and by TNBC preserves containing woodlands, grasslands, and agricultural crops.

The Lausevic property contains some high quality woodland groves, including a large valley oak woodland, but consists mostly of ruderal grasslands. Woodland groves, elderberry clusters, and native perennial grassland will be created on the portions of the property that consist of ruderal grassland. Woodland plantings will be contiguous with existing mature oak and riparian woodlands both within and bordering the Lausevic parcel boundaries. Existing woodlands will also be preserved in perpetuity. Refer to Section 3.2, "Mitigation Design," below for specific information about soil preparation and planting plans.

#### Woodland Corridor

Woodland corridors will be created along Reaches 1–4A (Exhibits 2-1a through 2-1d) adjacent to the Sacramento River east levee. The woodland corridors will be created on the east side of the levee access rights-of-way, immediately adjacent to agricultural fields, and contiguous with new and existing woodland nodes. Most of the corridors will be approximately 100–200 feet wide, but they will be substantially wider in some areas. The corridors will be several hundred to a few thousand feet long, depending on location and land use constraints, and they will not extend into the Airport RPZ (Runway Protection Zone).

The woodland corridors will be created on property that will be acquired by SAFCA as a part of the project. The woodland corridors are located in relatively flat agricultural areas. The Alluvial soils bordering the Sacramento River are mostly loams found along historic high-flow overbank channels where river alluvium deposited. These soils include sandy loam and silt loam, ranging from 0% to 2% slopes. These particular soil types such as the

Columbia loams flanking the river represent the location of historical riparian forest and oak woodland, and are ideal for the growth and long-term viability of created woodland corridors. The surrounding area is rural and consists primarily of agricultural lands, fallow ruderal fields, and TNBC reserves, with a few scattered residences.

Refer to Section 3.2, "Mitigation Design," below for specific information about soil preparation and planting plans.

## 2.4 CHARACTERISTICS OF DESIGN REFERENCE SITE

Because the hydrology of the entire Natomas Basin is substantially and irreversibly altered from natural conditions, no suitable unaltered swale or wet-meadow reference sites remain. Fragments of created or enhanced canal and wet-meadow habitats exist within the Basin (e.g., those managed as part of the NBHCP). However, the science of creating and enhancing habitat within the Basin specifically for giant garter snake improves with each newly created or enhanced site by TNBC and other practitioners. Therefore, the created and enhanced habitat proposed herein should be superior to the habitats already created or enhanced, thus making the use of existing created or enhanced habitats as reference sites inappropriate. The canal habitats proposed as mitigation within this MMP are designed to meet the habitat needs of the giant garter snake, while also serving the functions currently provided by habitats to be affected by the impact project (e.g., irrigation conveyance) as described in Section 1.2, "Site Characteristics," above.

Because habitats and topography within the Natomas Basin are so modified, no suitable valley oak woodland reference sites on active river floodplains remain. Therefore, an analogous woodland site outside of the Basin, but within the Sacramento Valley watershed was selected. The analog site chosen is the Golden State Island and Phelan Island area (approximately 39°40'16"N, 121°57'32"W), located in Butte County along the Sacramento River southeast of Hamilton City, east of SR 45 and south of SR 32 (Exhibit 2-6). Phelan Island and Golden State Island are broad, natural floodplains of the Sacramento River between River Miles 189 and 192 at the confluences with Stony Creek and Murphy Slough. The site is 4.5 miles upstream of the federal/state project levee at Ord Bend. The riparian woodlands at the site include a mosaic of floodplain riparian forest, oak woodland and grassland successional vegetation types. They have more direct interaction with the Sacramento River than the landside, late-succession valley oak woodlands affected by the impact project, or the valley oak woodlands proposed herein as mitigation. Therefore, not all aspects of the analog site are applicable to the proposed woodland mitigation design. The mitigation woodlands will mimic some of the functions, native vegetation types, and micro-scale habitat relationships (e.g., edge effects of woodland canopy adjacent to grassland, diversity of botanical composition) found at the natural riparian forest complex at the analog site, but it is not feasible to replicate physical ecological processes found there (e.g., seasonal hydrologic variability, inundation of natural floodplain, morphological and sediment transport dynamics of the meander belt). The reference site was investigated for design elements such as vegetation stand structure and species composition, and for typical spatial patterns of plant community types. It serves as an example of a similar local, relatively undisturbed woodland ecosystem typically found on higher natural floodplains.

Because transplanting, planting, maintenance, and management of elderberry shrubs would follow the USFWS guidelines (USFWS 1999), the use of an elderberry reference site is not warranted. However, elderberry clusters will be sited within preserved and created landside woodlands in spatial relationships and community types similar to the reference site, and to optimize the viability of valley elderberry longhorn beetle populations.


**Reference Site Aerial** **Exhibit 2-6**

## 2.5 COMPENSATION RATIOS

Proposed compensation ratios are as follows:

*Waters of the United States/Waters of the State/Wetland Resources:*

The Phase 2 project will permanently impact 7.89 acres of seasonal wetlands, freshwater marsh, and irrigated wetlands, and 8.29 acres of waters of the United States (e.g., irrigation canals), for a total impact of 16.18 acres of habitat under the jurisdiction of the USACE. The Phase 2 project will permanently impact an additional 0.16 acres of waters of the state, for a total impact of 16.34 acres of habitat under the jurisdiction of the RWQCB. Borrow activities in the Brookfield rice fields will cause a temporary impact to up to approximately 58.56. acres of irrigated wetlands within the rice fields. However, because these rice fields will be restored to rice at the end of the construction season in which they are disturbed, the existing aquatic resource functions will be maintained such that compensatory mitigation is not required.

To mitigate these impacts, this MMP provides for the concurrent creation of 12.46 acres of the GGS/Drainage canal, which will constitute jurisdictional waters of the U.S. and the state and will provide many freshwater marsh habitat functions. This habitat will be protected in perpetuity. In addition, irrigation services provided by the existing Elkhorn Irrigation Canal will be replaced by the concurrent creation of approximately 11,950 linear feet (16.37 acres) of the new Elkhorn Irrigation Canal. Finally, the preservation in perpetuity of up to approximately 30 acres of irrigated wetlands within the Brookfield rice property will sustain irrigated wetland functions that are currently not protected.

This compensatory mitigation proposal focuses on replacing aquatic resource functions that would be impacted by the proposed project. A quantitative functional analysis has not been conducted to equate these impacts and mitigation (e.g., on a per-acre basis). However, based on a qualitative comparison of aquatic resource functions that would be lost versus those that would be provided under the proposed mitigation program, no net loss of aquatic resource functions would occur. The irrigation and habitat functions of the impacted jurisdictional features will be fully maintained or enhanced through creation of the new canals and the preservation of the irrigated wetlands. The concurrent creation and preservation of 12.46 acres of beneficial jurisdictional habitat in the new GGS Canal, and the replacement of irrigation services provided by the new Elkhorn Irrigation Canal are considered to provide at least 1:1 mitigation for permanent impacts to approximately 16 acres of variable-quality waters of the United States and the state. Protection in perpetuity of up to approximately 30 acres of irrigated wetlands surrounded by irrigated rice fields at the Brookfield property will contribute to full compensation of all Phase 2 project-related impacts to jurisdictional features.

If it is determined that additional mitigation is required, alternative mitigation may be provided through the use of wetland habitat acreage previously created by SAFCA in excess of mitigation required for an earlier project, the Rio Linda Creek Conservation Area in northern Sacramento County.

*Potential Giant Garter Snake Habitat*:

Borrow material for construction of the NCC during the Phase 2 project will come from the 353-acre Brookfield property (Exhibit 1-6). All of the property used for borrow will be restored to rice production at the end of the construction season in which it is disturbed. Half of the acreage used for borrow activities, up to 175 acres (1/2 of 353), will be preserved in perpetuity under a conservation easement restricting land use to rice production. Therefore, to mitigate for temporary impacts to this potential giant garter snake habitat, the Brookfield rice property will be restored and preserved at a ratio of ½:1.

The Phase 2 project will cause a permanent loss of potential giant garter snake habitat; 6.25 acres of canals and ditches, 2.31 acres of other wetlands, and 3.01 acres of upland habitat (Exhibit 1-5). During Phase 2, SAFCA will partially offset these permanent losses through the creation of 12.46 acres of aquatic habitat in the GGS/Drainage

canal, plus 10.84 acres of associated upland habitats, which will enhance habitat connectivity in the Natomas Basin. In addition, SAFCA will create 11.57 acres of managed marsh (aquatic and upland habitat) in the vicinity of Fisherman's Lake during the Phase 4 project to further offset the permanent loss of aquatic and upland habitats resulting from the Phase 2 project.

SAFCA will also construct 16.37 acres of aquatic habitat, plus 17.61 acres of associated uplands, in the newly constructed Elkhorn Irrigation Canal. This canal will be constructed in advance of the elimination of the existing Elkhorn Irrigation Canal that will be filled for levee construction during Phase 3. This will offset Phase 3 temporary impacts to potential giant garter snake habitat by allowing the new canals to be established and vegetated prior to the removal of existing canal habitat.

The entire multi-phase NLIP is estimated to permanently convert a total of approximately 71 acres of rice to upland habitat. The Phase 2 project will result in the conversion of 22.91 of these 71 acres. To offset all of these impacts to rice habitat, during Phase 4 SAFCA will create approximately 71 acres of managed marsh (aquatic and upland habitat) along the western boundary of Fisherman's Lake. These 71 acres of managed marsh will combine with the 11.57 acres of managed described above for a total of approximately 83 acres of managed marsh. Therefore, compensation for the permanent loss of rice habitat in Phase 2 would occur during Phase 4.

The Biological Opinion prepared by the USFWS (Appendix C) discusses in detail the many habitat values of the mitigation components, and describes the improved habitat conditions that will exist in the Basin as a result of the construction of the NLIP, including mitigation. Although the USFWS determined that an incidental take of giant garter snake may occur as a result of the NLIP project, they also concluded that the project is not likely to jeopardize the continued existence of the giant garter snake. Consultation with the USFWS has been reinitiated to address long-term protection and management refinements to the project; therefore, a revised Biological Opinion is anticipated.

*Elderberry Shrubs:*

Each transplanted elderberry stem measuring 1 inch or greater in diameter at ground level will be replaced with elderberry seedlings and seedlings of associated species, in accordance with the USFWS conservation guidelines for valley elderberry longhorn beetle (Appendix F) and recent research findings published through UC Davis. Elderberry seedlings or cuttings will be replaced at ratios ranging from 1:1 to 8:1 (new plantings to affected stems), depending on the diameter of the affected elderberry stems and the presence of beetle exit holes. If it is not feasible to transplant elderberry shrubs during their dormant season, compensation will be increased by 2.5 times. Other native riparian plant species will be planted, in association with the replacement elderberry shrub seedlings or cuttings, at 1:1 or 2:1 ratios, depending on the presence of beetle exit holes in the affected elderberry stems. Table 3 in the USFWS Biological Opinion (Appendix C) summarizes the specific planting ratios used to determine the appropriate number of mitigation seedlings.

The transplantation of 21 elderberry shrubs and the potential loss of beetles during the Phase 2 project shall be offset by incorporating plantings of 797 elderberry shrub seedlings and a minimum of 1,139 associated native species into the Cummings and Lausevic woodland restoration areas (which are at least 7.5 acres in size). 313 seedlings will be planted at the Cummings property, and 483 seedlings will be planted at the Lausevic property, as depicted on planting plans in Appendix E. This provides 116 more seedlings than the 681 seedlings required by the USFWS conservation guidelines for valley elderberry longhorn beetle.

*Swainson's Hawk Nesting Habitat:*

Impacts to potential SWHA nesting habitat were determined by measuring (via GIS on an aerial photograph) all woodland habitats (in acres) to be removed within the project footprint. Impact calculations included areas of ruderal grasslands and other habitat types found within larger woodland polygons. Impacts to SWHA nesting habitat from all phases of the NLIP are estimated to be 65 acres. Phase 2 project impacts to SWHA nesting habitat will be approximately 15 acres.

During the Phase 2 project, landside woodlands will be created at the Cummings property, the Lausevic property, and in woodland corridor segments 1 through 4B (Exhibits 1-5, and 2-1a through 2-1d). The Cummings woodland mitigation area is approximately 17.5 acres in size. Planting plans have been created for these 17.5 acres to maximize potential nesting habitat for the SWHA (Appendix E). Within these 17.5 acres, approximately 9.5 acres of mature valley oak woodlands already exist and will be preserved in perpetuity. The remaining 8 acres will be used to create new woodland habitat, which will also be preserved in perpetuity. Like the impact acreage calculations, these mitigation acreage calculations include small areas of native perennial grasslands and other habitat types interspersed within the entire woodland mitigation parcel.

The Lausevic woodland mitigation area is approximately 22.5 acres in size. Planting plans have also been created for these 22.5 acres to maximize potential nesting habitat for the SWHA (Appendix E). Within these 22.5 acres, approximately 8.5 acres of mature valley oak woodlands already exist and will be preserved in perpetuity. The remaining 14 acres will be used to create new woodland habitat, which will also be preserved in perpetuity. Like the impact acreage calculations, these mitigation acreage calculations include small areas of native perennial grasslands and other habitat types interspersed within the entire woodland mitigation parcel.

Woodland corridor segments 1 through 2 total approximately 21 acres. Planting plans have not yet been prepared for these woodland corridors but all 21 acres will be created landside woodlands on existing annual grasslands and croplands. The planting plans will include similar tree species and densities as those prepared for the Cummings and Lausevic properties. However, corridor plantings will not have inclusions of grasslands and other habitat types associated with woodlands because these other habitat types will surround the perimeters of the woodland corridors.

Although future project Phases have not been planned in as much detail as the Phase 2 project, locations for anticipated woodland mitigation sites have been selected. Approximately 43 acres immediately north, northeast, and south of the Lausevic mitigation site have been identified as the locations for other woodland groves (Exhibit 1-5). Although detailed planting plans have not been prepared for these sites, it is anticipated that the approximately 8.5 acres of existing mature valley oak woodlands will be preserved, and the remaining 34.5 acres will be used to create new woodland habitat, which will also include areas of native perennial grasslands and other habitat types associated with the entire woodland mitigation parcel. The approximate location of woodland corridor segments 7a through 9c have also been selected (Exhibit 2-5c). These woodland corridor segments total approximately 21 acres, 18.5 acres of which will be created landside woodlands and 2.5 acres of which will be preserved.

During the Phase 2 project, a total of approximately 43 acres of landside woodlands will be created, and approximately 18 acres of mature valley oak woodlands will be preserved, while only 15 acres of landside woodlands will be impacted. However, woodland habitats are being created and preserved during the Phase 2 project in anticipation of future woodland impacts that will occur during Phases 3 and 4 of the NLIP. Therefore, a programmatic analysis of impact and mitigation ratios is most appropriate.

The entire multiphase NLIP will impact approximately 65 acres of woodland, will create approximately 111.5 acres of landside woodlands, and will preserve approximately 28.5 acres of existing landside woodlands. Therefore, the anticipated created to impacted habitat ratio will be approximately 111.5:65, or 1.72:1. In addition, approximately 28.5 acres of existing landside woodlands will be preserved. If woodland creation and preservation are combined, the anticipated created/preserved to impacted habitat ratio will be 140:65, or 2.15:1.

Appendix D includes a memo discussing the analysis performed to make a CEQA determination of significance regarding project impacts to potential SWHA nesting habitat. This CEQA analysis was prepared using the best project detail available at the time, including the mitigation measures described within this MMP. EDAW concluded that the anticipated cumulative impact to potential SWHA nesting habitat through all phases of the NLIP would be less than significant relative to the percent of existing nesting habitat in the Basin. This analysis accounts for temporal losses associated with woodland habitat impacts and creation, and for increased habitat

values based on habitat quality improvements incorporated in the mitigation designs. The analysis determined that mitigation landside woodlands will ultimately increase potential nesting habitat within the Basin by approximately 13%.

Appendix D also includes examples of tables showing impact and mitigation acreages used to summarize project habitat conversions. These tables are "living documents" that are updated as project details from Phases 3 and 4 are refined. These tables are provided to demonstrate the level of detail that has gone into calculating the impact and mitigation acreages, since it is impractical to graphically depict all impact and mitigation acreages on exhibits. Keeping these tables up to date with the latest detailed project information also ensures that the calculations of impact and mitigation acreages that result from more detailed project designs correlate with acreage calculations anticipated during the CEQA review process. If refined calculations result in impacts substantially in excess of those anticipated during the CEQA analysis, this mitigation proposal would be revisited for adequacy. However, because it is common for impacts to be overestimated during a CEQA analysis in order to allow flexibility in detailed project design, impact acreages are anticipated to decrease rather than increase as project details are refined.

*Swainson's Hawk Foraging Habitat:*

Exhibits 2-5a through 2-5e depict existing foraging habitat (cropland and ruderal annual grassland) land cover types in the Phase 2 project area. Following project implementation, most areas identified as levee improvements, existing levee easement, and portions of the canal alignments will be restored as managed native perennial grasslands. Woodland mitigation areas will be converted to SWHA nesting habitat. The Lauppe, Bianchi, South Sutter LLC (Thornton), and Novak properties will be restored to crop production, and the Binford/DeYoung and Horangic properties, currently in agricultural production, will be allowed to fallow.

The conversion of potential SWHA foraging habitat during all project phases was estimated by measuring (via GIS on an aerial photograph) all foraging habitats (in acres) to be altered within the multiphase NLIP footprint. Total acreage conversion calculations include all foraging habitats (i.e., cropland and ruderal annual grassland) depicted on Exhibit 2-5a, including:

- Levee improvements for all phases,
- Woodland mitigation areas for all phases, and,
- Canal alignments for all phases.

In total, approximately 730 acres of foraging habitat (460 acres of cropland including fallow crops and 270 acres of ruderal annual grassland) will be converted to a different habitat type at the completion of all project phases.

In addition, approximately 32 acres of cropland at the Binford/DeYoung and Horangic parcels (in alfalfa production in 2007) will be degraded from active cropland to fallow cropland following construction of the Phase 2 project canal segments. These acres are not included in the total acreage conversion calculations described above because they do not represent a permanent loss or conversion of foraging habitat. However, these acres are included in the cropland conversion analysis described below. Also, up to 134 acres of cropland at the Bianchi and South Sutter LLC (Thornton) parcels are anticipated to be used for borrow material in Phase 3. However, this property will be returned to agricultural production following project construction; therefore, these acres are not included in the total acreage conversion calculations described above. Finally, 70 acres of cropland at the Novak parcel are anticipated to be used for borrow material in Phase 3. However, this property will be returned to agricultural production following project construction (including the creation of approximately 20 acres of foraging crops converted from orchard); therefore, these acres are not included in the total acreage conversion calculations described above.

Following project implementation, many of these same project components (levees, landside woodlands, and canals) will result in the creation of foraging habitat, primarily managed native perennial grasslands. In total, project implementation will result in the creation of approximately 850 acres of foraging habitat (managed native

perennial grassland). Therefore, the ratio of total created foraging habitat to total converted foraging habitat will be 850 acres to 730 acres, or 1.16:1.

Biologists have determined that particular types of foraging habitat, particularly alfalfa, provide higher-value Swainson's hawk foraging habitat than other habitat types. Although the multi-phase NLIP Landside Improvements Project will result in the creation of many more total acres of foraging habitat than the total acres of converted foraging habitat, much of the converted acreage is higher-value cropland, while most of the created acreage will be moderate-value native grassland. This habitat value difference is partially offset by the fact that many of the converted acres are currently low-value ruderal grassland, whereas these same acres will be enhanced to moderate-value managed native perennial grassland following project implementation. (See Appendix B for information regarding the foraging value of native grassland.) However, to compensate for the difference in foraging habitat value between some types of cropland (particularly alfalfa) and managed native grassland, SAFCA will also preserve cropland (Agricultural Upland Swainson's Hawk Foraging Habitat). The types of cropland will be selected to provide foraging habitat for SWHA, as described in Section 2.3.5 Agricultural Upland Swainson's Hawk Foraging Habitat. These habitats will be managed and monitored consistent with practices used for similar NBHCP croplands, and as described in the Long-Term Management Plan (see Section 8).

Because crop types throughout the Basin rotate annually, it is impractical to determine the exact amount of converted cropland that would be considered a high-quality foraging crop. Therefore a snap-shot of variable existing conditions was used to establish a baseline for analysis. This snap-shot provides an estimate of how many acres of cropland are typically in an alfalfa crop rotation during any given year. The land use data compiled in 2007 for monitoring habitat in the Basin according to the NBHCP was selected to serve as the baseline for analysis. To determine an estimate of how much high-quality foraging crop will be converted by the multiphase NLIP project, all acres of alfalfa were measured (via GIS on an aerial photograph) within the multiphase NLIP footprint. Using this approach, it is estimated that approximately 90 acres of alfalfa will be converted by the Phase 2 project (including 32 acres at the Binford/DeYoung and Horangic properties, which are anticipated to be fallowed), and approximately 174 acres of alfalfa will be converted by the multiphase NLIP.

SAFCA investigated cropland parcels within the project vicinity that would be suitable for alfalfa farming, and would be located within close proximity of potential SWHA nesting habitat. SAFCA identified approximately 150 acres of cropland that would meet these criteria and may be available for purchase and preservation. Therefore, SAFCA will create or enhance approximately 150 acres of Agricultural Upland Swainson's Hawk Foraging Habitat to be preserved in perpetuity. These Agricultural Upland Swainson's Hawk Foraging Habitats will be managed to provide high-quality foraging habitat, and crop rotations will include alfalfa, hay, or other field crops considered to provide high-value foraging habitat for the Swainson's Hawk. These 150 acres of preserved Agricultural Upland Swainson's Hawk Foraging Habitat may provide higher value foraging habitat than existing alfalfa crops because they will be managed specifically to provide foraging habitat, while existing crops are managed for profit. Existing crop rotations depend, in part, upon market conditions, whereas the preserved crops will rotate on a schedule designed to benefit the SWHA, within the constraints necessary to maintain viable farmland.

The locations of approximately 84 of the 150 acres have been identified at the Novak and Lauppe properties, and the remaining 66 acres will be identified as part of the Phase 3 and Phase 4 projects. At this time, it is anticipated that these 66 acres will be preserved at the Bianchi borrow site or the South Sutter LLC/Thornton borrow site.

In summary, a total of 460 acres of cropland and 270 acres of grassland will be converted to other habitat types. A total of 850 acres of managed native perennial grassland will be created, and a total of 150 acres of high-quality Agricultural Upland Swainson's Hawk Foraging Habitat will be preserved. Although an impact to mitigation analysis on an acreage basis does not take into account habitat value variations, the ratio of total created/preserved foraging habitat to total converted foraging habitat is 1,000 acres to 730 acres, or 1.37:1.

Appendix D includes a memo discussing the analysis performed to make a CEQA determination of significance regarding project impacts to potential SWHA foraging habitat. This CEQA analysis was prepared using the best

project detail available at the time, including the mitigation measures described within this MMP. EDAW concluded that the anticipated cumulative impact to potential SWHA foraging habitat through all phases of the NLIP would be less than significant relative to the percent of existing foraging habitat in the Basin. This analysis accounts for variation in habitat values, especially the increases in habitat values of mitigation properties as a result of their interactions with NBHCP preserves.

Appendix D also includes examples of tables showing impact and mitigation acreages used to summarize project habitat conversions. These tables are "living documents" that are updated as project details from Phases 3 and 4 are refined. These tables are provided to demonstrate the level of detail that has gone into calculating the conversion and creation acreages, since it is impractical to graphically depict all conversion and creation acreages on exhibits. Keeping these tables up to date with the latest detailed project information also ensures that the calculations of conversion and creation acreages that result from more detailed project designs correlate with acreage calculations anticipated during the CEQA review process. If refined calculations result in habitat conversions substantially different from those anticipated during the CEQA analysis, this mitigation proposal would be revisited for adequacy. Because Phase 3 and Phase 4 project designs are not yet defined in detail, project impacts may be overestimated. It is anticipated that the number of acres of converted foraging habitat will decrease as a result of project refinement. However, SAFCA has committed to the preservation of 150 acres of Agricultural Upland Swainson's Hawk Foraging Habitat to be managed for SWHA foraging habitat.

## 2.6 LONG-TERM GOALS

The objective of the mitigation project is to support and significantly contribute to the establishment of a valuable habitat reserve in the increasingly urbanized landscape in the Basin. The refuge is projected to occupy approximately 15,000 acres once the NBHCP objectives and other proposed conservation programs are complete. Goals of the mitigation project include increasing total habitat acreage for special-status species; increasing patch sizes of these habitats; increasing beneficial edge effects between Swainson's hawk nesting and foraging habitats; increasing connectivity of these habitats and movement of populations between habitat nodes; consolidating large areas of habitat, assisting in the expansion of The Natomas Basin Conservancy's (TNBC) habitat reserve blocks in the northwestern and southwestern regions of the basin; and replacing and improving the functions, services, and values of affected regulated habitats.

In the Phase 2 project, creating and relocating canals, preserving rice, creating managed native grasslands, and creating and preserving landside woodlands will increase the amount of protected habitat available for NBHCP-covered species and assist in the expansion of habitat reserve blocks in the northwestern region of the Basin. Constructing new canals and establishing woodland corridors will greatly improve the connectivity between core habitat reserves that are distributed throughout the Basin and substantially increase acreage and patch size of these critical habitats. Establishing maintenance and management agreements for special-status species habitats and other regulated habitats will improve the functions, services, and values of these habitats.

# 3 IMPLEMENTATION PLAN

## 3.1 RESOURCE PROTECTION MEASURES

Although the overall project will result in loss and reconfiguration of landside habitats adjacent to the widened levees in the Natomas Basin, the project has been specifically designed to minimize impacts on these landside habitats, and to avoid impacts on riparian habitats along the Sacramento River and NCC. The construction of an adjacent setback levee (in contrast to upgrading and enlarging the Garden Highway levee in place) and installation of seepage cutoff walls enable SAFCA to retain the mature riparian tree corridor and numerous Swainson's hawk nests located along the river side of the Natomas Basin levees. Project design has sought to avoid all sensitive habitats as much as possible; for example, maintenance and utility corridors and canal alignments were located to minimize disturbance to jurisdictional water and wetland features and to woodland habitats, as well as to avoid sensitive archaeological resources.

The proposed project is made up of integrated project elements designed to minimize the need for the transport and disposal of soil. Soils excavated from the GGS/Drainage Canal will be used to build the berms of the new adjacent highline Elkhorn Irrigation Canal. Soil will be removed from the soil borrow areas identified above for use in the construction of the proposed expanded levees.

Woodland project areas will be accessed by existing roads. Levees and canals will be accessed by newly created maintenance roads and staging areas adjacent to the proposed levees and canals. All project elements will be created with the use of BMPs (both general and species-specific) intended to minimize potential impacts on the surrounding environments and resources.

### 3.1.1 GENERAL BMPS

- General BMPs are as follows:A worker awareness training program for construction personnel shall be conducted by a qualified biologist before project activities begin. The program shall include discussion about the importance of cultural resources and riparian, woodland, and wetland habitats; the biology and general behavior of the giant garter snake, Swainson's hawk, and valley elderberry longhorn beetle; information about the distribution and habitat needs of these species; the sensitivity of these species to human activities; the protected status of these resources including legal protections, recovery efforts, and penalties for violations; and project-specific protective measures for these resources. Interpretation shall be provided for non-English speaking workers, and the same instruction shall be provided for any new workers prior to their performing work on-site. Permittee shall prepare and distribute wallet-sized cards or a fact sheet handout containing this information for workers to carry on-site. Upon completion of the program, employees shall sign a form stating they attended the program and understand all protection measures. These forms shall be filed at the worksite offices and be available to regulatory agencies upon request. Written documentation of the training will be submitted to USFWS, USACE, the Central Valley RWQCB, and DFG at the end of the construction season.

- Copies of all regulatory permits shall be maintained at the worksite.

- Before the commencement of project activities, high-visibility fencing shall be erected as appropriate to protect environmentally sensitive areas (including buffers) designated for preservation, such as wetlands, native woodland areas, and special-status species habitats. Buffers sizes will be determined on an individual basis depending upon the resource being protected and the type of construction disturbance occurring in the vicinity of the resource. These areas shall be avoided by all construction personnel. The fencing shall be inspected before the start of each work day and shall be maintained until all construction activities in the vicinity are completed.

- A qualified biologist shall be available throughout the construction period and shall conduct a monitoring visit at least once per week to ensure that all BMPs described herein, in USACE, USFWS, DFG, and RWQCB regulatory authorizations, and in related CEQA documents, are being properly implemented. If BMPs are not being implemented properly, problems and necessary corrective actions will be communicated with construction personnel and SAFCA, corrective actions will be taken, and additional worker awareness training will be conducted if such training is determined to be necessary by the monitoring biologist. The monitoring biologist will report any noncompliance events and corrective actions, as appropriate, to the pertinent agency(ies).

- Before initiating ground- or vegetation-disturbing project activities, SAFCA shall designate a representative responsible for communications with regulatory agencies and overseeing compliance with permit conditions. SAFCA shall notify regulatory agencies in writing prior to commencement of ground- or vegetation-disturbing activities of the representative's name, business address, and contact information, and shall notify regulatory agencies in writing if a substitute representative is designated.

- At least 30 days before initiating ground- or vegetation-disturbing activities, SAFCA shall submit to regulatory agencies in writing the name, qualifications, business address, and contact information for the biological monitor. The monitor shall be knowledgeable and experienced in the biology and natural history of the species covered by agency permits and will be responsible for monitoring construction and/or ground- or vegetation-disturbing activities in areas of these species' habitat to help avoid the take of individual animals and to minimize habitat disturbance. Permittee must obtain DFG approval of the biological monitor prior to the commencement of project activities. To ensure compliance with permit conditions, the biological monitor shall have authority to immediately stop any activity that is not in compliance with any permit, and/or order any reasonable measure to avoid the damage or destruction of a resource or an individual of the species covered by permits. SAFCA shall provide regulatory agency staff with reasonable access to the project site and mitigation lands under its control, and shall otherwise fully cooperate with agency efforts to verify compliance with or effectiveness of mitigation measures set forth in this MMP and in permits. Neither the monitoring biologist nor regulatory agencies shall be liable for any costs incurred in complying with this MMP or permit Conditions of Approval, including cease-work orders issued by regulatory agencies.

- SAFCA shall initiate a trash abatement program during pre-construction phases of the project and continue the program throughout the duration of the project. Trash and food items shall be contained in closed (raven-proof) containers to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs. All trash items, such as wrappers, cans, bottles, and food scraps, must be disposed of in closed containers and removed at least once a day from the entire project site. Upon project completion, SAFCA shall remove from the project site and properly dispose of all construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.

- SAFCA shall prohibit firearms and domestic dogs from the project site and site access routes during construction and development of the project, except those in the possession of authorized security personnel or local, State, or Federal law enforcement officials.

- A dust control program shall be implemented throughout the life of the project to comply with regulatory requirements of the CA Air Resources Board.

- To the extent feasible, SAFCA shall confine clearing of vegetation and scraping, or digging, of soil to the minimal area necessary to facilitate construction activities. The number of access routes, number and size of staging and parking areas, and the total area of the proposed project activity shall be limited to the minimum necessary. Movement of heavy equipment to and from the project site shall be restricted to these established roadways and designated staging and parking areas to minimize habitat disturbance. Project-related personnel shall not cross habitat outside of these designated sites. To minimize the use of Garden Highway, vehicles and

equipment shall use access roads approaching from the east and south, on the land side of the construction area. Project-related vehicles shall observe a 20-mile-per-hour speed limit within construction areas, except on county roads and on federal and state highways. If construction of new off-site routes of travel will be required, SAFCA shall contact regulatory agencies prior to carrying out such an activity as permit amendements may be required.

- During construction operations, equipment maintenance and stockpiling of construction materials, portable equipment, vehicles, and supplies shall be restricted to construction staging areas as designated on construction documents and demarcated in the field. These staging areas shall be located away from sensitive resources, such as wetlands and waterways and protected wildlife. Appropriate BMP's shall be used to ensure that any spills or leaks that occur are contained within the staging areas, that all spills or leaks of hazardous materials are cleaned up immediately, and that all hazardous materials, including contaminated soils, are disposed of appropriately outside of the project site. SAFCA shall exclude the storage and handling of hazardous materials from the construction zone.

- A storm water pollution prevention plan (SWPPP) shall be prepared and implemented by the contractor for the project. The components of a SWPPP include source reduction, erosion and sediment control measures, and BMPs designed to reduce the amount of pollutants that may be discharged to the environment via stormwater. SWPPP requirements generally apply to the construction of all mitigation sites. For the project sites, erosion control barriers shall be constructed to protect waterways from soil runoff. All erosion control material shall be constructed of natural material to prevent snake entrapment. All erosion control material shall be free from noxious weed seed.

- Adverse effects on known and potential prehistoric archeological sites and resources (SAFCA 2008f, 2008g, 2009a, 2009b) shall be treated in accordance with measures stipulated in a historic property treatment plan developed in consultation between USACE, the State Historic Preservation Officer, and SAFCA. These measures may include, but would not be limited to, the following:

    - The archaeologist shall determine an appropriate radius around the sites and resources for monitoring adjacent construction work, and SAFCA shall retain an archaeological monitor and Native American monitor as stipulated in the historic property treatment plan to be present during this work.

    - If prehistoric resources are discovered during construction work, a professional archaeologist shall assess the significance of the find and recommend additional treatment measures, such as data recovery, to retrieve the information important to the understanding of prehistory that would be destroyed by project activities.

DFG-specific Notification and Reporting Provisions:

- SAFCA shall notify DFG fourteen (14) calendar days before initiating ground- or vegetation-disturbing activities and shall document compliance with all pre-project permit conditions of approval before initiating ground- or vegetation-disturbing activities.

- SAFCA shall immediately notify DFG in writing if it determines that it is not in compliance with any condition of approval of DFG permits, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods indicated in DFG permits and/or this MMP. SAFCA shall report any non-compliance during the construction phase to DFG within 24 hours.

- Monthly Report: The monitoring biologist shall be on-site daily while construction and/or surface-disturbing activities are taking place to minimize take of the species covered (covered species) by DFG Incidental Take Permit(s) (ITP) to check for compliance with all mitigation and avoidance measures. These inspections shall be compiled into Monthly Compliance Reports and submitted to DFG's Regional Office and via e-mail to DFG's Regional Representatives at tgardner@dfg.ca.gov, and pmoeszinger@dfg.ca.gov. DFG may at any

time increase the timing and number of compliance inspections and reports required under this provision depending upon the results of previous compliance inspections.

- All observations of covered species and their sign, oversight activities, verifications, compliance inspections, surveys, monitoring, and records required by DFG permits shall be reported in writing to DFG by SAFCAs designated representative or monitoring biologist. SAFCA shall submit reports of these activities to DFG in the next monthly compliance report. DFG can change this condition at any time to require that additional reports are generated. If DFG determines the reporting schedule is inadequate, DFG will notify SAFCA by letter of the new reporting schedule.

- Annual Report: SAFCA shall provide DFG with an annual status report no later than January 31 of every year beginning with issuance of the ITP and continuing until DFG accepts the final mitigation report identified below. Each annual status report shall include, at a minimum: 1) a general description of the status of the project site and construction activities, including actual or projected completion dates, if known; 2) a table with notes showing the current implementation status of each mitigation measure described in this MMP and the ITP(s); and 3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for project impacts.

- Final Report: No later than 45 days after completion of the project, including completion of all mitigation measures, SAFCA shall provide DFG with a final mitigation report. This report shall be prepared by the monitoring biologist and shall include, at a minimum: 1) a copy of the mitigation table from the annual report(s) with notes showing when each of the mitigation measures was implemented; 2) all available information about project-related incidental take of the covered species; 3) information about other project impacts on the these species; 4) construction dates; 5) an assessment of the effectiveness of the ITP's conditions of approval in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the covered species; and 7) any other pertinent information, including the level of take of the covered species associated with the project. Notwithstanding any expiration date on the ITP(s)' take authorizations, SAFCA's obligations under those permits do not end until DFG accepts the final mitigation report as complete.

- If a covered species is killed by project-related activities during construction, or if a covered species is otherwise found dead, DFG shall be immediately notified by calling the DFG Regional Office at (916)358-2900 and providing information on the location, species, number of animals injured or killed, and the ITP number. Following the initial notification, SAFCA shall send DFG a written report within two (2) calendar days. The report will include the date, time and location of the finding or incident, location of the carcass, and if possible provide a photograph, cause of death, and any other pertinent information.

### 3.1.2 BMPs FOR GIANT GARTER SNAKE

BMPs for giant garter snake are as follows:

- Construction and other ground-disturbing activities within 200 feet of suitable aquatic habitat for giant garter snake shall not commence before May 1, with initial ground disturbance expected to correspond with the snake's active season (as feasible in combination with minimizing disturbance of nesting Swainson's hawk), and shall conclude by October 1.

- Any aquatic habitat for giant garter snake that is dewatered after April 15 shall remain dry for at least 15 consecutive days and before excavating or filling of the dewatered habitat. If complete dewatering is not possible, potential giant garter snake prey (i.e., fish and tadpoles) shall be removed so that snakes and other wildlife are not attracted to the construction area.

- Within 24 hours before the commencement of ground-disturbing activities, areas within 200 feet of suitable aquatic habitat for giant garter snake shall be surveyed for giant garter snake by a qualified biologist. The biologist shall provide USFWS and DFG with written documentation of the monitoring efforts within 24 hours after the survey is completed. The project area shall be re-inspected by the monitoring biologist whenever a lapse in construction activity of 2 weeks or greater has occurred. A monitoring biologist shall be present on-site during initial ground disturbance activities. The biologist shall be available throughout the construction period and shall conduct monitoring visits at least once per week to ensure that BMPs are being properly implemented. If BMPs are not being implemented properly, problems and necessary corrective actions will be communicated with construction personnel and SAFCA, corrective actions will be taken, and additional worker awareness training will be conducted if such training is determined to be necessary by the monitoring biologist.

- If a snake is encountered during construction activities, the biologist shall have the authority to stop activities until appropriate corrective measures have been completed or until it has been determined that the snake will not be harmed. Snakes encountered during construction shall be allowed to move away from the activities on their own volition. Capture or relocation of giant garter snake shall be attempted only by individuals who hold a valid Section 10(a)(1)(A) permit from USFWS. The monitoring biologist shall notify USFWS and DFG immediately if any covered species are found on-site, and will submit a report, including date(s), location(s), habitat description, and any corrective measures taken to protect the species found. The biologist shall be required to report any take to the Department's Regional Representative immediately by telephone at (209) 745-1968 and by electronic mail to tgardner@dfg.ca.gov and written letter, within one (1) working day of the incident.

- During construction operations, stockpiling of construction materials, portable equipment, vehicles, and supplies shall be restricted to the designated construction staging areas. All heavy equipment, vehicles, and supplies shall be stored at the designated staging area at the end of each work period. Runoff from dust control and oil and other chemicals used in other construction activities shall be retained in the construction site and prevented from flowing into areas containing snake habitat. The runoff shall be retained in the construction areas by creating small earthen berms, installing silt fences or hay-bale dikes, or implementing other measures on the construction site to prevent runoff from entering the habitat of the snake.

- Erosion control structures will be installed concurrently with construction. Erosion control structures will be constructed so runoff will be directed away from sensitive habitats. Tightly woven fiber netting (mesh size less than 0.25 inch) or similar material shall be used for erosion control or other purposes at the project site to ensure giant garter snakes and other reptiles or amphibians are not trapped by the erosion control material. This limitation will be communicated to the contractor through use of Special Provisions included in the bid solicitation package. Coconut coir matting is an acceptable erosion control material. No plastic mono-filament matting shall be used for erosion control. The edge of the material shall be buried in the ground to prevent giant garter snakes and other reptiles and amphibians from crawling underneath the material. Erosion control measures shall direct water flow into existing drainages or disperse water across vegetated areas in order to avoid concentrating water.

- After construction activities are complete, any temporary fill or construction debris shall be removed and temporarily disturbed areas restored to their pre-project conditions. An area subject to "temporary" disturbance includes any area that is disturbed during the project, but that, after project completion, will not be subject to further disturbance and has the potential to be re-vegetated. All giant garter snake habitats subject to temporary ground disturbances, including storage and staging areas and temporary roads, shall be restored. These areas will be re-contoured, if appropriate, and re-vegetated with appropriate locally collected native plant species to promote restoration of the area to pre-project conditions. Appropriate methods and plant species used to re-vegetate such areas shall be determined on a site-specific basis in consultation with USFWS and DFG and in accordance with USFWS's "Guidelines for the Restoration and/or Replacement of

Giant Garter Snake Habitat" (USFWS 1997). Most of the area to be temporarily disturbed during project construction is already included in the mitigation seeding and planting plans and specifications.

- SAFCA shall maintain and monitor temporarily disturbed areas of giant garter snake habitat for 1 year after the completion of construction and restoration activities. Monitoring reports documenting restoration of these areas shall be submitted to USFWS upon the completion of the restoration implementation and 1 year after the restoration implementation. Monitoring reports shall include photo documentation and shall describe when restoration was completed, what materials were used, specified plantings, and justification of any substitutions to the USFWS-recommended guidelines.

### 3.1.3 BMPs FOR SWAINSON'S HAWK AND OTHER RAPTORS

BMPs for Swainson's hawk and other raptors are as follows:

- Permittee shall restrict removal of woody vegetation (trees and shrubs) to between September 15 and March 15th of any construction year to avoid impacts to nesting birds.

- Preconstruction surveys during the nesting season (March 1 through September 15), within 0.5 mile of construction areas, shall be conducted by a qualified biologist prior to beginning construction and related activities in each construction phase. Surveys shall be conducted in accordance with DFG guidelines, NBHCP requirements, and *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000). Survey results shall be provided to DFG in a written report, within 30 days of commencement of construction activities. If nesting Swainson's hawks are found, the monitoring biologist shall consult with DFG to determine if construction activities could cause reproductive failure (nest abandonment and loss of eggs and/or young). Impacts on active nests shall be avoided by establishing and maintaining buffers around the nests. The appropriate size and shape of the buffers shall be determined by a qualified biologist, in coordination with DFG, and may vary depending on the nest location, nest stage, and construction activity. No project activity shall commence within the buffer area until the biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted to confirm that project activity is not resulting in detectable adverse effects on active nests.

- During the nesting season (March 1 through September 15), the monitoring biologist shall be present daily, on site, monitoring the behavior of any Swainson's hawks nesting within 0.25 miles of the project. The biological monitor shall have authority to order the cessation of all construction activities if the birds exhibit abnormal nesting behavior and construction shall not resume until the avian biologist confirms that the bird's behavior has normalized.

- If, in the course of consultation with DFG, a determination is made that the construction activities could cause reproductive failure (nest abandonment and loss of eggs and/or young), then, 1) no construction activities will be allowed between May 1 and September 15 within 0.25 miles from the nest site until young have fledged, or the adults are no longer nesting, or 2) SAFCA shall pay for all costs associated with recovery, hacking and release of eggs or young on the nest at a DFG approved raptor recovery center.

- If a Swainson's hawk is found injured during project-related activities on the project site, it shall be immediately relocated to a raptor recovery center approved by DFG's Regional Representative. Any costs associated with the care or treatment of such injured Swainson's hawk shall be borne by SAFCA. The Swainson's hawk may only be relocated by a qualified biologist. The monitoring biologist or SAFCA's designated representative shall immediately notify DFG of the incident unless the incident occurs outside of normal business hours. In that event, DFG shall be notified no later than noon on the next business day. Notification to DFG shall be via telephone or email, followed by a written incident report. Notification shall

include the date, time, location and circumstances of the incident, the name of the party that actually relocated the animal, and the location (including GPS coordinates) to where the animal was moved.

Other general BMPs described above in Section 3.1.1 will also help to minimize disturbance to Swainson's hawks.

### 3.1.4 BMPs FOR VALLEY ELDERBERRY LONGHORN BEETLE

BMPs for valley elderberry longhorn beetle are as follows:

- No insecticides, herbicides, or other chemicals that might harm the beetle or its host plant shall be used within 100 feet of the elderberry shrubs.
- Dirt roadways and disturbed areas within 100 feet of elderberry shrubs shall be watered at least twice a day to minimize dust emissions.
- Elderberry shrubs that require removal shall be transplanted to the woodland corridors and woodland restoration/creation areas. If none of the areas of suitable habitat to be created as part of the proposed project would be available before the impact would occur, alternative transplantation locations (e.g., TNBC preserves, SCAS lands) will be identified.

## 3.2 MITIGATION DESIGN

### 3.2.1 GGS/DRAINAGE CANAL

Soil excavated to create the GGS/Drainage Canal will be used to construct the berms of the new adjacent highline Elkhorn Irrigation Canal (Exhibit 2-2); therefore, soil will not be removed and disposed of off-site, with the exception of a small amount of surface soils "contaminated" with root fragments of rhizomatous invasive plants such as blackberry and perennial pepperweed. A location for disposal of these contaminated soils has not been determined, but the soils will be disposed of at a location and in a manner to avoid any impacts to jurisdictional resources. Details of the grading plans for the GGS/Drainage Canal are included in the permit applications described in Section 1, "Project Requiring Mitigation," above.

Two tiers of different types of plants will be used within the GGS/Drainage Canal. Along the waterline, native sedges and rushes will be planted. Above this a native grass mix will be seeded to the top of the bank, along the adjacent maintenance right-of-way, and around the locations of artificial giant garter snake hibernacula. Planting and seeding will be conducted October 1 through November 30 when soil temperatures are still warm enough for perennial grasses to germinate and irrigation is not needed.

The bank planting operations shall be conducted according to the following sequence of events:

1. Entire planting area shallow disked
2. Seed mix broadcast
3. Seeded area lightly harrowed
4. Seeded areas sprayed with broadleaf selective herbicide
5. Plug planting holes formed
6. Tree bands and plugs installed at and slightly above design waterline

Before the start of seeding operations, all areas above the waterline shall be disked in two directions to a depth of 4 inches. The seed mix shall be broadcast by hand or by mechanical spreader onto the prepared soil surface from the staked waterline to the top of the bank and along the adjacent maintenance right-of-way. The seeded areas then will be harrowed with a 4-foot-wide by 6-foot-long Fuerst tine harrow pulled by an all-terrain vehicle.

Seeded and plugged canal banks initially will be vulnerable to colonization by noxious broadleaf weeds. Therefore, an essential establishment measure includes the application of selective broadleaf herbicides registered for use near water. After germinating rains bring weed growth and before native seeds have germinated, the seeded area will be sprayed. At no time shall fertilizer be applied to seeded areas because it promotes weed growth at the expense of native perennial grasses.

The seed mix and quantities (Type 1) that will be used along the GGS/Drainage Canal are shown in Table 3-1 below.

**Table 3-1**
**Type 1 Seed Mix**

| Species | Live Seed/ Pound | Pounds/ Acre | Seeds/ Sq. Ft. | % Mix |
|---|---|---|---|---|
| Purple needlegrass (*Nassella pulchra)* | 59,500 | 14 | 19.1 | 46.67% |
| Creeping wildrye (*Leymus triticoides*) | 110,000 | 5 | 12.6 | 16.67% |
| Slender wheatgrass (*Elymus trachycaulus*) | 79,000 | 5 | 9.1 | 16.67% |
| Meadow barley (*Hordeum brachyantherum*) | 71,000 | 6 | 9.8 | 20% |
| **Total for Mix** | | **30** | **50.6** | **100%** |

After seeding, tree band rushes (*Juncus balticus*) will be planted ("plugged") on 3-foot centers at the waterline in holes excavated to two times the width and 1.5 times the depth of the containers. Approximately 1 foot upslope of the waterline, plug plants (*Carex barbarae, Leymus triticoides,* and *Scirpus acutus*) will be installed on 3-foot centers in hand-dug holes approximately twice the size of the plug containers. Any remaining weeds that survived disking shall be removed within a 1-foot minimum of all planting sites. All planting holes shall be scarified before plant placement, and backfilled to no more than half the depth of the hole. Backfill material shall be native soil from the immediate vicinity of each planting hole. All holes shall be tamped and watered after planting to remove air pockets and reduce settling. Plants shall be maintained moist at all times before planting and shall be completely watered 1 hour or less before installation. Planting shall not occur in saturated soils or while heavy rain is falling. Plant and seed material shall be purchased from a reputable nursery and propagated from local genetic stock from within 200 miles of the project site unless otherwise approved by a qualified ecologist.

### 3.2.2 ELKHORN IRRIGATION CANAL

Soil excavated to create the GGS/Drainage Canal will be used to construct the berms of the new adjacent highline Elkhorn Irrigation Canal (Exhibit 2-2); therefore, soil will not be removed and disposed of off-site, with the exception of a small amount of surface soils "contaminated" with root fragments of rhizomatous invasive plants such as blackberry and pepperweed. A location for disposal of these contaminated soils has not been determined, but the soils will be disposed of at a location and in a manner to avoid any impacts to jurisdictional resources. Details of the grading plans for the new Elkhorn Irrigation Canal are included in the permit applications described in Section 1, "Project Requiring Mitigation," above.

A native perennial grass mix will be seeded along the banks, top, and back sides of the new Elkhorn Irrigation Canal berms, and along the adjacent canal maintenance right-of-way. Most seeding will be conducted October 1 through November 30 when soil temperatures are still warm enough for perennial grasses to germinate and irrigation is not needed. Site preparation and seeding methods and sequence will be similar to those described below for 3:1 levee slopes. The seed mix and quantities (Type 2) that will be used are shown in Table 3-2 below.

| Table 3-2<br>Type 2 Seed Mix | | | | |
|---|---|---|---|---|
| Species | Live Seed/Pound | Pounds/ Acre | Seeds/Sq. Ft. | % Mix |
| Purple needlegrass (*Nassella pulchra*) | 59,500 | 16 | 21.9 | 53.33% |
| Creeping wildrye (*Leymus triticoides*) | 110,000 | 4 | 10.1 | 13.33% |
| Slender wheatgrass (*Elymus trachycaulus*) | 79,000 | 4 | 7.3 | 13.33% |
| Blue Wildrye (*Elymus glaucus*) | 98,000 | 3 | 6.7 | 10% |
| Meadow barley (*Hordeum brachyantherum*) | 100,000 | 3 | 6.9 | 10% |
| **Total for Mix** | | **30** | **52.8** | **100%** |

If germinating rains bring substantial weed growth before native seeds have germinated, the seeded area will be sprayed with a broadleaf selective herbicide outside of the canal banks. At no time shall fertilizer be applied to seeded areas because it promotes weed growth at the expense of perennial grasses.

### 3.2.3 LEVEE SLOPES, SEEPAGE BERMS, AND RIGHTS-OF-WAY

Soil will be brought from the Brookfield and Airport North Bufferland properties to construct the new levees along the NCC and Sacramento River east levee respectively. Details of the grading plans for the levees are included in the permit applications described in Section 1, "Project Requiring Mitigation," above.

To create grasslands, native grass mixes will be seeded along new levee slopes and seepage berms, staging areas, and adjacent maintenance and utility rights-of-way (Exhibits 1-4a and 1-4b). Occupied portions of the rights-of-way such as inspection roads and maintenance staging areas will remain un-vegetated. Most seeding will occur between October 1 and November 30, depending on weather conditions, when soil temperatures are still warm enough for perennial grasses to germinate and to avoid the need for irrigation.

The planting operations shall be conducted according to the following sequence of events:

1. Topsoil stripped and stored
2. Constructed soil surfaces loosened with a chisel bar
3. Large dirt clods reduced by shallow disking if needed
4. Stockpiled topsoil applied in a 12-inch" layer
5. Seed applied with a range drill
6. Straw mulch applied and tracked in
7. Seeded areas sprayed with broadleaf selective herbicide

To ensure that perennial sod is established uniformly and completely on bare soil surfaces, soils will be prepared for seeding. The top 6–12 inches of topsoil will be stripped and stockpiled from all areas to be excavated or mass graded for the levee/berm footprint, canals, and roads. All soil surfaces to be seeded will be loosened using a chisel bar pulled in wide rows parallel to the berm slope. On 3:1 levee slopes, rows shall be 4 feet or closer on center and 2.0 feet deep, and on berms and rights-of-way rows shall be 4 feet on center or closer and 1 foot deep. No de-compaction tilling will occur within 10–20 feet from roads, underground utilities, the landside edge of seepage berms, or the top of levees. Large dirt clods will be reduced by shallow disking as needed to promote root extension and lateral growth, and then a 12-inch layer of stored topsoil will be applied. Alternatively, topsoil may be applied before chiseling.

The Type 2 seed mix will be drilled into the soil surface with a Truax no-till "range drill," a piece of agricultural-type equipment commonly used for sod and bunchgrass establishment in large, un-irrigated, or wildland settings.

The drill will be pulled by a tractor that has 60 horsepower or more. Grass seed shall be planted no deeper than 1 inch below the surface of the soil, and a chain or harrow will be pulled behind the drill to provide the seed with adjacent soil cover to a depth of one-quarter inch. Seed material shall be purchased from a reputable nursery and must be from local genetic stock within 200 miles of the project site unless otherwise approved by a qualified ecologist.

Seed application will be followed by a uniform layer of straw (2,000 pounds per acre), blown or applied by hand to prevent surface erosion during the first rainy season. Straw coverage shall be 80% and a maximum of 2 inches deep. The soil surface shall be visible through the straw to allow the seeds to germinate. The straw shall be mixed into the seeded areas by pulling a bladed puncher or crimper lengthwise along the slope behind a tracklayer tractor. Straw shall be mold-free, air-dried rice straw certified weed-free by the Sacramento County Agricultural Commissioner. Initially, native grasslands will be vulnerable to colonization by noxious broadleaf weeds. Therefore, an essential establishment measure includes the application of selective broadleaf herbicides. After germinating rains bring weed growth and before native seeds have germinated, the seeded area will be sprayed. At no time shall fertilizer be applied to seeded areas because it promotes weed growth at the expense of perennial grasses.

### 3.2.4 GRASSLANDS WITHIN LANDSIDE WOODLANDS

Grassland areas within preserved and/or created woodland mitigation habitats shall be prepared and seeded. No off-site soil disposal is anticipated, with the exception of a small amount of surface soils "contaminated" with root fragments of rhizomatous invasive plants such as blackberry and pepperweed. A location for disposal of these contaminated soils has not been determined, but the soils will be disposed of at a location and in a manner to avoid any impacts to jurisdictional resources. Site preparation will occur as described in the Request for Proposal "Site Preparation Services and Native Grass Drill Seeding (optional)" issued by SAFCA on September 5, 2008 (Appendix F), and shall include the following:

- mowing to control invasive and noxious plants,
- clearing of invasive and noxious brush and trees up to 4 inches in diameter,
- disking soil,
- applying broadleaf selective herbicide to invasive and noxious plants, and
- an optional task of drilling native grass seed.

After site preparation is complete, native grasses will be drill-seeded, sprayed with broadleaf selective herbicide, and mulched as described above for the levee seepage berm. The woodland seed mix and quantities (Type 3) that will be used are shown in Table 3-3 below.

**Table 3-3**
**Type 3 Seed Mix**

| Species | Live Seed/ Pound | Pounds/ Acre | Seeds/ Sq. Ft. | % Mix |
|---|---|---|---|---|
| Purple needlegrass (*Nassella pulchra*) | 66,000 | 8 | 12.1 | 19% |
| Creeping wildrye (*Leymus triticoides*) | 115,000 | 3 | 7.9 | 12% |
| Slender wheatgrass (*Elymus trachycaulus*) | 90,000 | 3 | 6.2 | 10% |
| Blue wildrye (*Elymus glaucus*) | 98,000 | 3 | 6.7 | 11% |
| Meadow barley (*Hordeum brachyantherum*) | 267,000 | 5 | 30.6 | 48% |
| **Total for Mix** | | **22** | **63.5** | **100%** |

### 3.2.5 LANDSIDE WOODLANDS

Woodland mitigation areas at the Cummings North property, the Lausevic property, and the woodland corridors along the Sacramento River will include a combination of woodland preservation, enhancement, and creation. No off-site soil disposal is anticipated, with the exception of a small amount of surface soils "contaminated" with root fragments of rhizomatous invasive plants such as blackberry and pepperweed. A location for disposal of these contaminated soils has not been determined, but the soils will be disposed of at a location and in a manner to avoid any impacts to jurisdictional resources.

Site preparation will occur as described in the Request for Proposal "Site Preparation Services and Native Grass Drill Seeding (optional)" issued by SAFCA on September 5, 2008 (Appendix F), and shall include the tasks summarized above in Section 3.2.4, "Grasslands within Landside Woodlands."

Planting and irrigation details for the Cummings North property and the Lausevic property are included in the woodland planting plans and specifications provided in Appendix E. Woodland corridors will be planted in a similar fashion, although without interior meadows or some of the habitat and vegetation type variations as designed at the larger woodland groves.

Generally, the woodland mitigation areas will vary somewhat depending on the characteristics of their unique locations. Many trees under 10 inches dbh, mostly valley oaks, that are located within impact project areas will be transplanted into woodland mitigation areas. Tree species will be planted in mixed groves or single-species bands or clusters. Sun-adapted shrub species shall be planted on the outer edges of tree clusters, and shade-adapted shrub species shall be placed within the tree clusters. The botanical species composition of individual clusters and rows will mimic vegetation types commonly found along the Sacramento River, including:

- Valley oak woodland
- Mixed riparian forest, cottonwood-dominant
- Willow scrub (at moist soil sites or depressions)
- Sycamore and oak savanna (with native perennial grassland)
- Elderberry shrub/scrub

Treepot, treeband, deepot container plants, and plug plants will be used to enhance and create woodland habitats. Elderberry shrubs will be transplanted and planted within woodland mitigation areas. Elderberry site preparation, transplanting, and planting will all be conducted according to the USFWS conservation guidelines for valley elderberry longhorn beetle provided in Appendix G, with the exception described in 3.2.7 Elderberry below. Other plant species, locations, and densities will occur as depicted on planting plans in Appendix G, while planting pit sizes and preparations will be performed as described in the planting specifications. Planting and transplanting will occur in stages from mid January 2008 through fall 2010.

All plant material will be obtained from reputable nurseries, primarily nurseries that specialize in native revegetation material, and propagated from local genetic stock from within 200 miles of the project site unless otherwise approved by a qualified ecologist. Table 3-4 lists the primary species to be planted in woodland groves and woodland corridors.

Detailed planting palettes are included in Appendix E, and a list of species to be used is summarized in Table 3-5 below.

**Table 3-4**
**Species to Be Planted in Woodland Groves (details included in Appendix E)**

| Scientific Name | Species Name |
|---|---|
| *Acer negundo* | Box elder |
| *Aesculus californica* | California buckeye |
| *Baccharis pilularis* | Coyote brush |
| *Cercis occidentalis* | Western redbud |
| *Fraxinus latifolia* | Oregon ash |
| *Juglans californica* var. *hindsii* | California black walnut |
| *Platanus racemosa* | California sycamore |
| *Populus fremontti* | Cottonwood |
| *Quercus lobata* | Valley oak |
| *Rhamnus californica* ssp. *tomentella* | Hoary coffeeberry |
| *Rosa californica* | California rose |
| *Salix gooddingii* | Black willow |
| *Salix laevigata* | Red willow |
| *Salix lasiandra* | Pacific willow |
| *Salix lasiolepis* | Arroyo willow |
| *Sambucus mexicana* | Blue elderberry |

### 3.2.6 BROOKFIELD RICE

The Brookfield property will be used as a soil borrow site, then returned to rice production after construction. All soils taken from the site will be used in the construction of the project; no off-site soil disposal is anticipated. Planting, management, and maintenance of the preserved rice fields, including pest plant management, will generally follow the practices described above in Section 2.3, "Mitigation Component Descriptions." Because this property will be managed by TNBC, it will be managed in compliance with practices approved as part of the NBHCP (City of Sacramento, Sutter County, and The Natomas Basin Conservancy 2003) and with those described in the "Guidelines for the Restoration and/or Replacement of Giant Garter Snake Habitat" (USFWS 1997). Seed sources will vary depending on rice production needs and annual weather variation.

### 3.2.7 ELDERBERRY

As described above, elderberry shrubs will be transplanted and planted within woodland mitigation areas. Generally, site preparation for elderberry plantings will be consistent with that described above for landside woodlands. Elderberry site preparation, transplanting, and planting will be conducted according to the USFWS conservation guidelines for valley elderberry longhorn beetle (USFWS 1999) provided in Appendix G. Details of elderberry planting are provided in the woodland plans and specifications included as Appendix E.

If feasible, based on USFWS authorization, elderberry shrubs will be transplanted when the plants are dormant (November through the first 2 weeks of February) to increase the success of transplanting. Transplantation will not occur during the beetle's flight season (March 15–June 15). A qualified biologist will be available to monitor transplanting activity.

Transplanted elderberry shrubs to be will be cut back 3–6 feet above the ground or to 50% of their height (whichever is taller) prior to excavation. The trunk and all stems measuring 1 inch in diameter or greater at ground level will be replanted. All leaves on the shrubs will be removed. In response to a request by SAFCA to vary the transplanting protocol for experimental purposes, USFWS approved a plan to move 10 shrubs without top pruning and compare their growth and survival to comparable shrubs pruned per the conservation guidelines. Observations by SAFCA staff of elderberry transplanting projects conducted over the past few years suggest that the current protocol, which requires extensive pruning of shrubs prior to relocation, may be more harmful then beneficial. SAFCA will document the experimental results in the annual monitoring report. Shrubs will be removed with a Vemeer spade, backhoe, front-end loader, or other suitable equipment. During transplanting, as much of the root ball as possible will be excavated with the shrub. The shrub then will be immediately replanted and watered at the mitigation site. Care will be taken to ensure that soil is not dislodged from the root ball. The root ball will be planted so that the top is level with the existing ground and the soil will be compacted so that settlement is minimized.

The planting area will be at least 1,800 square feet (0.04 acre) for every transplanted elderberry shrub. Elderberry shrubs will be clustered to create larger patch sizes based on research conclusions from a comprehensive 3-year study by researchers from UC Davis, sponsored by SAFCA, in which USFWS participated. Riparian tree and shrub species associated with elderberry will also be planted around the transplants. A watering basin measuring at least 3 feet in diameter with a continuous berm (approximately 8 inches wide at the base and 6 inches high) will be constructed around each transplanted elderberry shrub. Upon completion of planting, soil will be saturated with water. No fertilizers or other supplements will be used on the shrubs. The frequency of watering will be determined based on soil conditions present at the mitigation site. Either a drip irrigation system or a watering truck will be used to provide water to the site.

Each transplanted elderberry stem measuring 1 inch or greater in diameter at ground level will be replaced with elderberry seedlings and seedlings of associated species, in accordance with the USFWS conservation guidelines for valley elderberry longhorn beetle (Appendix G).Stock of seedlings and/or cuttings will be obtained from local sources. Other native riparian plant species will be planted, in association with the replacement elderberry shrub seedlings or cuttings.

## 3.3 CONSTRUCTION MONITOR

A firm with 5 years or more of habitat restoration construction and maintenance experience and who is familiar with the project's mitigation goals, design, and techniques, and with this MMP, will implement and supervise all phases and locations of mitigation construction operations. SAFCA or SAFCA's authorized representative will have authority to direct the Contractor and Sub Contractor's equipment operators and will submit a summary report to SAFCA, USACE, USFWS, DFG, and the Central Valley RWQCB. This summary report will document construction observations, plant species installation, any substitutions or other modifications to the site design, and any problems that arise during construction.

No plant substitutions or modifications to the site design will be implemented without prior written recommendation from SAFCA's authorized representative, and without review and approval from the appropriate regulatory agency(s). SAFCA will inform USACE, USFWS, DFG and the Central Valley RWQCB in writing of any proposed changes (e.g., plant substitutions) and the rationale for those changes prior to implementing the changes onsite.

## 3.4 IMPLEMENTATION SCHEDULE FOR ALL MITIGATION PROPERTIES

- *GGS/Drainage Canal and Elkhorn Irrigation Canal:* Phase 2 project construction of the GGS/Drainage Canal and new Elkhorn Irrigation Canal will occur simultaneously, as soil excavated from the GGS/Drainage Canal alignment will provide borrow material for the construction of the embankments for the new Elkhorn

Irrigation Canal. Construction of these canals is expected to commence May 1, 2009, and conclude by November 1, 20010.

- *Rice Fields:* After the completion of borrow activities in 2009/2010, the site will be regraded and topsoil replaced in preparation for renewed rice cultivation on the Brookfield property in 2010.

- *Managed Native Perennial Grasslands:* Following the completion of construction grading activities managed native perennial grasslands will be established on levee slopes, seepage berms, access rights-of-way, and canal embankments. Restoration actions are anticipated to begin in fall 2009.

- *Landside Woodlands:* Site grading and planting is scheduled to take place in 2009 on the Cummings and Lausevic properties. Planting of the woodland corridors will occur in 2009/2010 after levee and canal grading activities are complete.

## 3.5 MAINTENANCE DURING ESTABLISHMENT PERIOD

An important element of any mitigation plan is to create habitats that are self-sustaining and require little or no maintenance over the long term. Initially, maintenance is often necessary to ensure success, but a properly restored habitat should eventually be self-sustaining. The intent of restoration actions is to have healthy, vigorous, and persistent ecosystems that thrive and reproduce without supplemental intervention (e.g., irrigation). In the case of landside woodland habitat this would mean established healthy plants exhibiting vigorous growth, free of disease and insect infestation.

Under the terms of this MMP, SAFCA, through its habitat restoration contractor, shall be responsible for implementing a maintenance regime that will accomplish the intent of the restoration actions as set out above. During construction and through the success establishment period, SAFCA or its authorized representative will conduct periodic site assessments to determine general mitigation site conditions and to determine if prescribed actions are leading to overall mitigation success. These observations will supplement formal annual monitoring that will occur at fixed times during the calendar year. Any deficiencies identified shall be corrected as described in Section 4, “Monitoring Plan,” of this MMP. If a performance goal is not met during annual monitoring surveys, any identified remedial actions will be implemented as needed. Adaptive management strategies and techniques will be implemented to identify and meet the performance goal. Substantial remedial measures or any substantial changes to the mitigation program and design elements will be reported to the appropriate agencies in the annual monitoring reports.

Remedial actions will be identified by SAFCA or SAFCA’s authorized representative and implemented by SAFCA’s habitat restoration contractor under the framework of adaptive management with the goal of expeditiously taking an action when it is the most feasible to implement. For example, replacing dead trees during the spring, fall or winter, or undertaking weed control actions such as mowing, string trimming or herbicide application in advance of ground nesting bird activities.

SAFCA’s habitat restoration contractors will be responsible for maintaining the health, vigor, and survivorship of all plant materials, including replacement plants if needed. In addition to periodic inspections conducted by SAFCA or SAFCA’s authorized representative, SAFCA’s habitat restoration contractor will inspect the mitigation sites to examine plant condition and weed growth, to determine whether supplemental irrigation may be required, to remove any accumulated debris, and to ensure that the site is adequately protected. Maintenance of the mitigation sites will include but is not limited to: plant irrigation and irrigation system maintenance, weed control (hand pulling, string trimming, mowing and herbicide application), periodic tree pruning, browse guard maintenance, debris removal, and remedial activities such as replanting, reseeding and site preparation if needed. Maintenance practices and schedules are described below. These actions are intended to supplement initial site preparation measures required during planting and seeding, as described in Section 2, “Mitigation Planning and Design,” of this MMP.

### 3.5.1 GGS/DRAINAGE CANAL

The GGS/Drainage Canal will provide two different habitat types—waterline plantings and native perennial grasslands—that will be managed accordingly. Table 3-5 presents the maintenance schedule for the GGS/Drainage Canal; further details are provided below.

**Table 3-5**
**Maintenance Schedule for the GGS/Drainage Canal**

| Activity | Frequency |
|---|---|
| Site inspection | Inspect monthly during the first 6 months, then a minimum of twice per year for 3 years. |
| Weed Control | *Waterline plants:* Spot spray a minimum of twice in the 1st year, once during the spring and again in late summer; wick or spot spray weeds a minimum of once per year as needed in perpetuity.<br>*Seeded grassland areas:* Spot spray a minimum of one or two times per year during the spring and late summer as needed in perpetuity.<br>*Aquatic weeds*: Apply approved aquatic herbicide up to once per year as needed in perpetuity. |
| Mowing | Mow seeded areas to 6–12 inches in spring and late summer/fall for 3 years, then one or two times per year as needed in perpetuity. |
| Debris removal | Remove floating debris identified during inspections, as needed. |

The entire canal will be inspected monthly during the first 6 months, then a minimum of twice per year for 3 years.

As described in the Mitigation Design Section 3.2.3, seeded and plugged canal banks initially will be vulnerable to colonization by noxious broadleaf weeds. Therefore, an essential establishment measure includes the application of selective broadleaf herbicides registered for use near water. Another essential measure includes mowing before broadleaf weeds and nonnative grasses set seed or shade out the planted grasses and sedges. The waterline planting area will be spot sprayed as needed a minimum of twice in the first year during the spring and late summer. Waterside broadleaf weeds and nonnative grasses will be wicked or spot sprayed a minimum of once per year as needed in perpetuity. Seeded areas along the top of the canal and in the adjacent right-of-way will be spot sprayed by hand a minimum of twice per year during the spring and late summer as needed in perpetuity. Well-timed annual mowing may be sufficient to control broadleaf weeds and nonnative grasses on banks, and herbicide use may no longer be necessary once the perennial grasses are fully established.

Occasional application of an approved aquatic herbicide (up to once per year) may be required to maintain adequate flow rates in the canal. However, because this canal will have a larger surface area than typical drainage canals in the region, it is anticipated that it will take longer for vegetative growth expanding inwards from the edges of the canal to clog the canal, thus reducing the frequency of aquatic herbicide application. In addition, because this canal will be detwatered periodically, opportunities will exist to use manual or mechanical means to remove these invasive weeds, thus further reducing the frequency of aquatic herbicide application.

Waterline plug plantings (sedges and rushes) may not be mowed once established. All areas seeded with perennial grasses will be mowed in the same way as the levee grasslands described below, with one exception: depending on the results of inspection and monitoring, grasslands along canal banks may be maintained at higher stubble lengths to provide better cover for giant garter snake.

Occasional dredging of the canal bottom (while avoiding canal bank slopes) and removal of floating debris will be required to maintain adequate cross sectional area and flow rates in the canal. However, this measure is not anticipated to be necessary during the establishment phase. Supplemental irrigation of these habitats is not

anticipated. Waterside plantings will be sustained by canal water. Grasslands will be seeded in the late fall to take advantage of early fall rains, thus avoiding the need for supplemental irrigation.

### 3.5.2 ELKHORN CANAL

Table 3-6 presents the maintenance schedule for the Elkhorn Canal. As shown in the table, the Elkhorn Canal will be inspected monthly during the first 6 months, then a minimum of twice per year for 3 years. Grasslands seeded along the top of the canal and in adjacent rights-of-way will be maintained as described above for the GGS/Drainage Canal. Aquatic weeds will be eliminated with application of an approved aquatic herbicide up to once per year as needed in perpetuity. The need for irrigation of these habitats is not anticipated. Grasslands will be seeded in the late fall to take advantage of early-fall rains, thus avoiding the need for supplemental irrigation.

**Table 3-6**
**Maintenance Schedule for the Elkhorn Canal**

| Activity | Frequency |
|---|---|
| Site inspection | Inspect monthly during the first 6 months, then a minimum of twice per year for 3 years. |
| Weed Control | *Seeded grassland areas:* Spot spray a minimum of one or two times per year during the spring and late summer as needed in perpetuity.<br>*Aquatic weeds*: Apply approved aquatic herbicide up to once per year as needed in perpetuity. |
| Mowing | Mow to 6–12 inches in spring and late summer/fall for 3 years, then one or two times per year as needed in perpetuity. |
| Debris removal | Remove floating debris identified during all inspections, as needed. |

### 3.5.3 LEVEE SLOPES, SEEPAGE BERMS, AND RIGHTS-OF-WAY

Table 3-7 presents the maintenance schedule for levee slopes, seepage berms, and rights-of-way; further details are provided below.

**Table 3-7**
**Maintenance Schedule for Levee Slopes, Seepage Berms, and Rights-of-Way**

| Activity | Frequency |
|---|---|
| Site inspection | Inspect monthly during the first 6 months, then a minimum of twice per year for 30 months. |
| Weed Control | Boom spray in the spring for 1–2 years as needed; spot spray one or two times per year during the spring and late summer as needed in perpetuity. |
| Mowing | Mow to 6–12 inches in spring and late summer/fall for 1–2 years, then one or two times per year as needed in perpetuity. |
| Debris removal | Remove floating debris during all inspections, as needed. |

Native perennial grassland on levee slopes, seepage berms, and rights-of-way will be managed to enhance their foraging value for Swainson's hawk, within the constraints of the management regime for maintenance and inspection of the flood control system. The primary purpose and management priority of levee slopes and berms will be flood protection. However, some necessary management practices (such as rodent control) could diminish habitat value for Swainson's hawk. Grassland management on levee slopes and berms will be implemented in a manner to minimize negative impacts on Swainson's hawk (e.g., nonlethal control practices, except during emergency situations) where habitat management is compatible with levee management.

Native perennial grasses establish more slowly above ground than annual grasses in the early growing season, although root growth may be more vigorous. Broadleaf weeds and nonnative grasses can out-compete and dominate native perennial grasses in the first years of establishment unless a consistent weed management program is followed.

For 1–2 years established grasslands will be mowed twice per year to a 6–12-inch stubble height (depending on field conditions and season) to optimize these areas for Swainson's hawk foraging habitat. The grasslands will be mowed in the spring before broadleaf weeds and nonnative grasses grow high enough to shade out native species, and in summer or fall before weed seed heads mature and shatter. After the first 2 years, the mowing regime will revert to standard maintenance practice needed for adequate levee inspection. This typically involves mowing to a stubble height in the range of 6–12 inches a minimum of twice per year in perpetuity. Mowing regimes for fire prevention near inspection roads may require more frequent mowing events and shorter stubble heights; however this will depend on field conditions and season.

For 1–2 years a broadleaf selective herbicide will be applied as needed in the spring using a tractor mounted with a spraying boom. Persistent clumps will be spot sprayed by hand during the spring and late summer as needed in perpetuity.

Irrigation of these habitats is not anticipated. Grasslands will be seeded in the late fall to take advantage of early-fall rains, thus avoiding the need for supplemental irrigation.

RD 1000 conducts periodic rodent control using mechanical or chemical means to prevent through-seepage in the levee, which may be caused by deep-burrowing ground squirrels during flood stage in the Sacramento River. This standard levee maintenance practice is used primarily on the upper portion of the levee where the levee width is narrower. The practice may reduce the presumed quality of Swainson's hawk foraging habitat on grassland of the levee slope. Most of the managed grassland on other NLIP-related features is not affected by ground squirrel control practices. SAFCA is coordinating with UC Davis Wildlife Extension researchers and RD 1000 to explore alternative control measures less hazardous to foraging raptors.

Orchard trees, a common food source for ground squirrels, have recently been removed on SCAS land adjacent to the levee and within the Critical Zone for low flying aircraft. In addition, perennial and annual seed and vegetable crops near the existing levee will be removed to accommodate the Sacramento River East Levee (SREL) footprint, irrigation and GGS/Drainage canals, a 100' wide woodland corridor, and a 70' wide maintenance and utility corridor. The aggregated width of these NLIP features will be several hundred feet, making ground squirrel food sources and cover more distant and separated from existing burrows by physical barriers. Therefore these food sources will be less available to ground squirrels. Loss of food supply and cover near the levee will reduce ground squirrel populations, and a corresponding reduction is anticipated in the frequency and extent of rodent control on the SREL by RD 1000.

### 3.5.4 LANDSIDE WOODLANDS

Table 3-8 presents the maintenance schedule for landside woodlands; further details are provided below.

Maintenance activities within woodland mitigation areas will be conducted with the primary goal of ensuring the survival of all planted and transplanted trees and shrubs (including elderberry shrubs), and with a secondary goal of establishing a native-plant understory. Weed control is crucial for achieving these goals; weeds must be controlled during the first 3 years so that they do not compete with planted or seeded native species. Weed control will continue for up to 8 years as needed until success criteria are met.

| Table 3-8<br>Maintenance Schedule | |
|---|---|
| Activity | Frequency |
| Site inspection | Inspect monthly during the first 6 months, then a minimum of twice per year for 3 years. |
| Weed Control | Spot spray one or two times per year during the spring and late summer as needed (while avoiding elderberry shrubs) until year 5 success criteria are met. |
| Mowing | Mow to 6–12 inches in spring and late summer/fall for 1–3 years, then one or two times per year in perpetuity as needed for fire safety. |
| Debris removal | Remove excessive thatch buildup, as needed for fire safety. |

Weeds will be controlled through mechanical (e.g., mowing, string trimming & hand pulling) and chemical (selective herbicide) means, depending on site-specific variables (e.g. weed species, topography, proximity to elderberry shrubs). All woodland areas will be inspected twice per year, in the spring and summer/fall, and treated as necessary. Grassland patches within woodland areas will be maintained as described above for levee slopes, although within constraints necessary to protect elderberry shrubs (e.g., no herbicide use around elderberry shrubs).

Elderberry shrubs will be maintained as required by the USFWS conservation guidelines for valley elderberry longhorn beetle (USFWS 1999) in Appendix G until success criteria are achieved. A watering basin measuring at least 3 feet in diameter with a continuous berm (approximately 8 inches wide at the base and 6 inches high) will be constructed around each transplanted elderberry shrub. Upon completion of planting, soil will be saturated with water. No fertilizers or other supplements will be used on the shrubs.

Bubblers and/or drip systems will be used to irrigate all planted and transplanted trees. Irrigation water at the North Cummings property will be obtained from an existing on-site well. Irrigation water at the Lausevic property will be obtained from a new irrigation well or using surface-water canal sources in the vicinity. Irrigation water for woodland corridors will be obtained from either well or canal water sources unique to each parcel. Details of all irrigation plans for woodland areas are included in the North Cummings and Lausevic site planting plans and specifications in Appendix E.

### 3.5.5 BROOKFIELD

The Brookfield rice property will be managed and maintained consistent with the requirements of the NBHCP. The rice fields will be irrigated as described in Section 2.3, “Mitigation Component Descriptions,” above.

# 4 MONITORING PLAN

After the initial planting effort, the mitigation sites will be monitored throughout the year for 30 months to 8 years as defined below, or until the success criteria are met, whichever period is longer. After success criteria have been met, monitoring will occur as described in the Long-Term Management Plan that is being prepared to accompany this MMP. The mitigation components will be considered successful overall if the habitats meet the success criteria described below and meet the goals described above in Section 2.6, "Long-Term Goals." SAFCA will be responsible for providing success monitoring which will be conducted by a qualified ecologist, botanist, or biologist. The monitor will be objective and independent from the installation contractor responsible for maintenance of the site.

Performance goals and success criteria are outlined below. Performance goals are targets for mitigation performance to assist in determining how well mitigation is establishing and to assess the need for adaptive management (e.g., mitigation design or maintenance revisions). Success criteria are formal criteria that must be met in order for the mitigation site to be declared successful during that monitoring interval (i.e., year or month), and at the end of the establishment period. Replacement planting/seeding can be used if monitoring demonstrates that performance goals or success criteria are not met during a particular monitoring interval. If replacement planting/seeding is required because a performance goal was not met, there will be no monitoring consequence and monitoring can proceed to the next monitoring interval as scheduled. However, if such actions are required because a success criterion is not met, that interval's monitoring must be repeated the following year until that monitoring interval's success criteria are met without repeat replacement planting/seeding.

All habitat types and mitigation sites will receive quantitative and qualitative monitoring. Quantitative monitoring will be conducted as outlined below. Qualitative monitoring will provide an opportunity to document general plant health, overall plant community composition, hydrologic conditions, damage to the site, infestation of weeds, signs of excessive herbivory, signs of wildlife use, erosion problems, and signs of human disturbance and vandalism. These criteria will be assessed and noted for use in adaptive management of the mitigation sites, but they will not be used to determine project success. In addition, a complete list of all wildlife species encountered will be compiled for each mitigation site during each monitoring visit. Particular attention will be given to looking for evidence of giant garter snake, valley elderberry longhorn beetle exit holes, and Swainson's hawk. Temporarily impacted giant garter snake habitats will be monitored as described in Section 3.1.2 BMPs for Giant Garter Snake.

Qualitative monitoring of the mitigation sites will include photo-documentation of the sites from fixed photo points, at least annually, typically during quantitative monitoring. Selection of the photo points will provide appropriate views and orientation for a comprehensive assessment of the progress of mitigation efforts over the monitoring period. The photographic record of the sites will be kept from the time of the initial planting through the end of the establishment period. Photographs will include the location number and date of photograph. Field notes associated with photographs will be copied and archived along with other monitoring data. Digital photos will be submitted with the annual monitoring report.

All transect markers and photo point markers will be metal fence posts, 133-gauge heavy-duty steel, and painted yellow on top. Markers in shrubby or treed habitats will be 6 feet long, set vertical, and installed 2 feet below grade with 4 feet exposed above grade. Markers along canals and in grasslands can be shorter, but will be installed 2 feet below grade and will be tall enough to remain visible above mature plant growth. Soil will be compacted around the markers at the time of placement, and a concrete footing, soil anchor, or "deadman" will be used to hold the markers where necessary.

All site-specific monitoring data will be recorded using a Global Positioning System (GPS) unit.

# 4.1 GGS/DRAINAGE CANAL

## 4.1.1 PERFORMANCE GOALS AND SUCCESS CRITERIA

### WATERLINE PLANTINGS

After the construction of the GGS/Drainage Canal, when all grading and planting is complete, an 8-year monitoring program will be conducted to determine the site's progress toward meeting established success criteria. Performance goals in years 1, 3, 4, 6, and 7 are goals for mitigation performance. The created habitat will be considered successful when it exhibits the success criteria specified for years 2, 5, and 8 in Table 4-1 below. Replacement planting/seeding may occur after monitoring years 1, 3, and 4 without consequence. However, if success criteria for years 2 and 5 are not met at a planting site, thus necessitating replacement planting/seeding, that year's monitoring must be repeated the following year until success criteria are met. The success criteria specified for year 8 must be reached without human intervention (e.g., irrigation, replacement plantings), aside from perpetual canal maintenance practices described in section 3.5 Maintenance During the Establishment Period, for a minimum of 3 sequential years prior. Thus, the site must achieve independence by the end of year 5.

**Table 4-1**
**Performance Goals and Success Criteria**

| Year | Total Cover (%) | Relative Cover by Wetland Indicator Species (%) | Water Level within +/- 6 Inches of Design |
|---|---|---|---|
| 1 | 90 | 90 | Yes |
| **2** | **85** | **85** | **Yes** |
| 3 | 85 | 85 | Yes |
| 4 | 85 | 85 | Yes |
| **5** | **85** | **85** | **Yes** |
| 6 | 85 | 85 | Yes |
| 7 | 85 | 85 | Yes |
| **8** | **85** | **85** | **Yes** |
| Monitoring Frequency | Annually early summer | Annually early summer | Monthly May 1–September 30 |

* Note: Wetland indicator species are herein defined as those species listed as OBL or FACW in the National List of Plant Species that Occur in Wetlands (USFWS 1988).

### NATIVE PERENNIAL GRASSLANDS

When all grading and planting is complete along native perennial grassland sites within and adjacent to the GGS/Drainage canal, a 30-month monitoring program will be conducted to determine progress toward meeting established success criteria. The created habitat will be considered successful when it exhibits the success criteria specified in Table 4-2 below, with no human intervention (e.g., irrigation, replacement seeding) aside from perpetual maintenance practices described in section 3.5 Maintenance During the Establishment Period, for a minimum of 1 year prior. Thus, the site must achieve independence by the end of month 18. If success criteria are not met at 6 months, 18 months, or 30 months, thus necessitating replacement seeding, that year's monitoring must be repeated the following year until success criteria are met.

| Table 4-2<br>GGS Canal Native Perennial Grassland Success Criteria | | |
|---|---|---|
| Month | Relative Cover of Broadleaf Invasive Species (%) | Total Cover (%) |
| 6 | <5% | >75% |
| 18 | <5% | >90% |
| 30 | <10% | >90% |
| Monitoring Frequency | Up to 2X per year: spring and fall | Up to 2X per year: spring and fall |

### 4.1.2 MONITORING METHODS AND SCHEDULE

Vegetation assessments of the GGS/Drainage Canal will be conducted once per year during the peak flowering period for native perennial grasses. The timing of surveys will be adjusted according to annual site-specific conditions, but surveys will generally occur in late spring or early summer. To measure percent total cover, ocular estimates will be conducted along 100-foot band transects set one-quarter mile apart. To measure percent relative cover of broadleaf invasive species , and wetland indicator species, step-point counts of plant species will be taken along the total cover transects. To measure water elevations, markers will be placed at station points along the canal downstream of the point of water influx (i.e., by Elkhorn Slough) and upstream of water outflow (i.e., by the North Drainage Canal). These markers will indicate the design waterline, and monthly measurements will be taken during the giant garter snake's active season (May 1–September 30) to determine whether the actual waterline is within +/- 6 inches. The presence of giant garter snakes will be monitored and recorded along this canal, consistent with monitoring methods currently conducted for SAFCA and TNBC elsewhere in the Basin. All monitoring will occur for 8 years or until the success criteria are met, whichever period is longer.

## 4.2 ELKHORN CANAL

The primary function and service of the Elkhorn Canal is to deliver irrigation water to users throughout the Natomas Basin. The water supply within the Elkhorn Canal will vary depending on the needs of those users. Therefore, the success criterion for the Elkhorn Canal is the delivery of irrigation water. This will be observed by SAFCA or its authorized representative during monthly monitoring visits to the adjacent GGS/Drainage Canal from May 1 through September 30, and through the annual review of water supply records.

## 4.3 LANDSIDE WOODLANDS

### 4.3.1 PERFORMANCE GOALS AND SUCCESS CRITERIA

After each woodland mitigation site has been constructed, an 8-year monitoring program will be conducted to determine the site's progress toward meeting established success criteria. Performance goals in years 1, 3, 4, 6, and 7 are goals for mitigation performance. The created habitat will be considered successful when it exhibits the success criteria specified for years 2, 5, and 8 in Table 4-3 below. Replacement plantings may occur following monitoring years 1, 3, and 4 without consequence. However, if success criteria for years 2 and 5 are not met, thus necessitating replacement planting, that year's monitoring must be repeated the following year until success criteria are met. The success criteria specified in year 8 must be reached without human intervention (e.g., irrigation, replacement planting) aside from perpetual maintenance practices described in section 3.5 Maintenance During the Establishment Period, for a minimum of 3 sequential years prior. Thus, the site must achieve independence by the end of year 5.

| Table 4-3<br>Performance Goals and Success Criteria | | | |
|---|---|---|---|
| Year | Survival of Planted Trees (%) | Survival of Transplanted Trees (%) | Relative Canopy Cover (%) |
| 1 | 85 | 85 | 5 |
| **2** | **85** | **80** | **10** |
| 3 | 80 | 75 | 15 |
| 4 | 75 | 70 | 15 |
| **5** | **75** | **65** | **20** |
| 6 | 75 | 65 | 25 |
| 7 | 70 | 60 | 30 |
| **8** | **65** | **60** | **35** |
| Monitoring Frequency | Annually Spring or Late Summer | Late Summer | Late Summer |

### 4.3.2 MONITORING METHODS AND SCHEDULE

Field assessments of woodland planting areas will be conducted once per year. The timing of these assessments will be adjusted according to annual site-specific conditions, but assessments will generally occur in late summer. To measure percent survival of trees and shrubs, each plant will be inspected and the species of each live plant will be recorded. Qualitative assessments will be recorded to track the health and vigor of each species for use with adaptively managing the mitigation sites. In the woodland corridor areas parallel to the Sacramento River, qualitative assessments will be conducted to ensure that corridors do not have gaps greater than 50 feet between trees.

To determine the success of the woodland plantings as a functioning ecosystem, percent canopy will be estimated each fall by recording the extent of woodland habitat on aerial photographs, or using repeat transects or fixed radius plots at ground level. The timing of these assessments will be adjusted according to annual site-specific conditions, but assessments will generally occur in late summer or early fall while trees are still in full foliage. The results of these assessments will also be used to determine where replanting should occur to maintain suitable Swainson's hawk habitat.

Monitoring of woodland habitats will be recorded independently for each planting project site because different sites may be planted at different times, and may have slightly different planting regimes and maintenance needs specific to their unique location. Phase 2 project woodland habitat sites include the Cummings North property (Exhibit 2-1a), Lausevic property (Exhibit 2-1c), and woodland corridor segments divided by property boundaries (i.e. corridor segment 1, 2a, 2b, 2c, etc.) (Exhibits 2-1a through 2-1d).

Incidental observations of Swainson's hawk that occur during any project monitoring will be recorded and analyzed. Starting in year 3, formal Swainson's hawk monitoring will occur during the breeding season at woodland mitigation sites. All potential nesting trees will be searched for nests and adult Swainson's hawks using binoculars and/or a spotting scope. One survey will occur early in the breeding season (late March to mid-April) to detect any early nesting attempts or nest failures. A second survey will occur from mid-May through June to determine whether any potentially breeding pairs detected in the first survey are actively nesting, and to resurvey all previously unoccupied potential nesting habitat to detect any late-nesting pairs. If any nests are observed during the first two surveys, a third survey will occur in July to determine nesting success and to record the number of young fledged from each nest.

All monitoring will occur for 8 years or until the success criteria are met, whichever period is longer.

## 4.4 NATIVE PERENNIAL GRASSLAND

### 4.4.1 SUCCESS CRITERIA

When all grading and planting is complete at native perennial grassland sites (levee slopes, seepage berms, and right-of-ways), a 30-month monitoring program will be conducted to determine the site's progress toward meeting established success criteria. The created habitat will be considered successful when it exhibits the success criteria specified in Table 4-4 below, with no human intervention (e.g., irrigation, replacement seeding) aside from perpetual maintenance practices described in section 3.5 Maintenance During the Establishment Period, for a minimum of 1 year prior. Thus, the site must achieve independence by the end of month 18. If success criteria are not met at 6 months, 18 months, or 30 months, thus necessitating replacement seeding, that year's monitoring must be repeated the following year until success criteria are met.

**Table 4-4**
**Native Perennial Grassland Success Criteria**

| Month | Relative Cover of Broadleaf Invasive Species (%) | Total Cover (%) | Relative Cover of Native Species (%) |
|---|---|---|---|
| 6 | <5% | >80% | >50% |
| 18 | <10% | >90% | >50% |
| 30 | <10% | >90% | >50% |
| Monitoring Frequency | Up to 2X per year: spring and fall | Up to 2X per year: spring and fall | Up to 2X per year: spring and fall |

### 4.4.2 MONITORING METHODS AND SCHEDULE

An initial baseline assessment of grassland mitigation sites will be conducted following the initial drill seeding program to coincide with the onset of the late winter growing season. Following this initial vegetation assessment ongoing monitoring of grassland mitigation sites will be conducted up to two times per year. The timing of floristic surveys will be adjusted according to annual site-specific conditions, but surveys will generally occur during the spring and summer when it is easiest to identify target species. To measure percent total cover along linear features, ocular estimates will be conducted along 100-foot band transects set one-quarter mile apart from a random starting point. To measure percent relative cover of broadleaf invasive species and native plant species, step-point counts of plant species will be taken along the total cover transects. As described above, incidental observations of Swainson's hawk that occur during any project monitoring will be recorded and analyzed. In addition, formal Swainson's hawk monitoring will occur during the breeding season at grassland mitigation sites located within foraging distance of known nesting habitat. Grassland mitigation sites will be surveyed from mid-May through June to detect the presence of any Swainson's hawk that may be using the sites for foraging.

Grassland vegetation and Swainson's hawk monitoring will occur for 3 years or until the success criteria are met, whichever period is longer.

## 4.5 BROOKFIELD RICE

Giant garter snake have adapted successfully to typical rice agricultural practices because rice fields provide sufficient water, cover, and food during the snake's active season. Therefore, the success criterion for the Brookfield rice mitigation site is the continued production of rice using the methodologies developed for the

NBHCP. This will be monitored qualitatively once per month between May 1 and September 30, and through the annual review of water supply and harvest records.

## 4.6 ELDERBERRY

Success criteria and monitoring of elderberry shrubs will be as described in the USFWS conservation guidelines for valley elderberry longhorn beetle in Appendix G.

# 5 MONITORING REPORTS

## 5.1 AS-BUILTS

Within 120 days of completing construction of the mitigation sites, SAFCA will submit to USACE, USFWS, the Central Valley RWQCB, and DFG a report that includes, at a minimum, the following information:

- as-built drawings and a clear description of and rationale for any deviations from the original designs;
- dates of completion;
- information regarding success in meeting planned conservation measures;
- any known project effects on special-status species, including giant garter snake, Swainson's hawk, and valley elderberry longhorn beetle; and
- occurrence of incidental take (if any) of special-status species, including giant garter snake, Swainson's hawk, and valley elderberry longhorn beetle.

If mitigation habitats are created in excess of that needed to mitigate Phase 2 project impacts, the acreage of these habitats will be recorded with the as-built drawings. Any extra acreage will serve two purposes: it will offer a buffer against a need for project modifications if portions of the mitigation project do not fulfill the success criteria, and any additional acreage successfully created will be reserved for future use as mitigation for impacts that may occur during subsequent project phases or as a result of other projects.

## 5.2 ANNUAL REPORTS

SAFCA will prepare an annual report in conjunction with the resource managers that will be submitted to USACE, USFWS, the Central Valley RWQCB, and DFG by December 31 of each year during the success monitoring period, or until the agencies have verified that final success criteria have been met. The report will assess the attainment of or progress toward meeting the success criteria for the mitigation sites.

The report will include all relevant information requested in Appendix D of the USACE *Mitigation and Monitoring Proposal Guidelines for the San Francisco and Sacramento Districts*, dated December 30, 2004, and at a minimum will include the following:

- list of individuals who prepared the report or participated in the monitoring activities for that year, including titles and affiliations;
- maps of the mitigation sites identifying monitoring areas, transects, and planting zones;
- photos documenting the conditions of the mitigation sites;
- summary and analysis of the monitoring data collected, including results of qualitative assessments of site characteristics, functions, and services;
- list of species growing within the mitigation areas;
- description of actions for which regulatory agency notification or approval was not needed, but that were carried out during the year;
- discussion of and rationale for any modifications made to monitoring methods;

- recommendations for additional or modified management practices, as needed, for the next calendar year, containing a written description of proposed activities that includes timing, methodology, and a map showing what areas will be targeted (Regulatory agencies will have 30 days to contact the manager[s] to discuss any areas of disagreement or concern);

- comparison of the monitoring results with performance goal, including a discussion of trends toward meeting the success criteria;

- hydrological monitoring results (primarily recorded water levels and dates of seasonal water supply in the two canals);

- results of giant garter snake monitoring;

- recommendations for adaptive management so the mitigation effort will meet the success criteria within the establishment period; and

- copies of original field notes and monitoring data sheets. Copies of all field data sheets will be available for agency review upon request.

The report will refer to the USACE regulatory division's file number for the project, which is #SPK-2007-211. The first annual monitoring report will be delivered by December 31 of the year of the first growing season after project construction and planting. Each subsequent annual monitoring report will be delivered by the same date until success criteria are achieved. Progress reports will be provided annually after completion of construction, until success criteria are achieved.

# 6 POTENTIAL CONTINGENCY MEASURES

If a success criterion (as defined in Section 4 of this MMP) is not met for any or all portions of the mitigation project, SAFCA or its representative will analyze the cause(s) of failure and implement remedial actions to correct the performance deficiency. SAFCA will summarize the analysis and the specific remedial actions taken to correct the identified deficiency in the annual report submitted to the appropriate agency (USACE, Central Valley RWQCB, USFWS, and /or DFG). If a mitigation site does not meet a final success criterion, SAFCA's maintenance and monitoring obligations will continue until the appropriate agency/agencies provide SAFCA with written confirmation that SAFCA has met the required conditions.

On March 11, 2009, SAFCA provided CDFG with a memorandum (Appendix H) that detailed a series of contingency assurances regarding the creation, management, and monitoring of the habitat features included in the Phase 2 Project. These contingency assurances include: funding through the Consolidated Capital Assessment District (CCAD); an endowment agreement with TNBC; a record of land acquisitions; water supplies; existing contracts and bid-ready plans and specifications; and SAFCA's Board Resolution. Altogether, these contingency assurances demonstrate SAFCA's commitment and sufficient resources to implement all of the Phase 2 Project's habitat mitigation features, including land acquisition, construction, monitoring, and long-term management.

**Consolidated Capital Assessment District:** During the success establishment and monitoring period, secured funding will be provided on an annual basis from the special assessments collected as part of the CCAD. Approximately 30 % of the cost of constructing the Phase 2 Project improvements, including the habitat mitigation components, and 100% of the cost of monitoring and managing these components will be funded by SAFCA through the CCAD, which was created in April 2007 by a vote of property owners occupying the American and Sacramento River floodplains in the Sacramento Area. The purpose of the CCAD is to fund the local share of the cost of constructing, operating and maintaining the projects that are necessary to provide the Sacramento Area with at least a 200-year level of flood protection. Under the terms of Final Engineer's Report (Final Report) adopted in connection with the CCAD, SAFCA is authorized to collect special benefit assessments from the properties in the district through 2037.

**Endowment Agreement with The Natomas Basin Conservancy:** Funding for the agreement with TNBC will be provided on an annual basis from CCAD special assessments through 2037 and thereafter from a non-wasting endowment funded by CCAD assessments. TNBC will hold the conservation easement for several of the habitat mitigation features components, including the rice fields, agricultural field crops, and landside woodlands. SAFCA will make annual appropriations from the CCAD assessment to cover TNBC's management costs through 2037 and will make a single lump sum payment into the endowment fund in 2009 funded by CCAD assessments. Compounding interest earnings from 2009 through 2037 will result in full funding of the endowment in 2038. Interest earned on this account will cover the annual payments due to TNBC under the agreement thereafter.

**Record of Land Acquisitions:** SAFCA has already acquired or is in the process of acquiring through direct purchase or condemnation the land that is needed to support the Phase 2 Project footprint, including the habitat mitigation sites. These sites include the rice fields and agricultural field crops that will be preserved, the sites where landside woodlands will be established and preserved, the flood control footprint where managed native perennial grasslands will be established, soil borrow sites reclaimed to Agricultural Upland Swainson's Hawk Foraging Habitat, and the land (including Airport land) where the new GGS/Drainage Canal and relocated Elkhorn Main Irrigation Canal will be constructed.

**Water Supplies:** Water supplies for the new GGS/Drainage Canal, rice fields, and field crops will be provided by NCMWC under existing landowner/ shareholder rights acquired by SAFCA or under a long-term water purchase contract under negotiation between SAFCA and NCMWC. SAFCA will fund the cost of these water supplies

from CCAD assessments. These costs will be included in the annual CCAD appropriation for TNBC through 2037, and from the TNBC endowment thereafter.

**Existing Contracts and Bid-Ready Plans and Specifications:** Under State law SAFCA cannot enter into a contractual agreement without encumbering the funds necessary to complete the work. SAFCA has issued several contracts and/or bid-ready plans and specifications that demonstrate its commitment to constructing the habitat mitigation components. These contracts include grading of the various habitat mitigation features, soil preparation and pre-planting weed removal, planting of woodlands and GGS Canal banks (in process), transplanting oak trees and elderberry shrubs, and establishment of native perennial grassland.

**SAFCA's Board Resolution:** On January 29, 2009 the SAFCA Board adopted a resolution approving the Mitigation Monitoring and Reporting Program for the Phase 2 Project and committing SAFCA to complete the Phase 2 Project habitat mitigation features. Many of these features are already in progress (e.g., land acquisition, tree and elderberry shrub transplantation). In addition, SAFCA has a reliable record of innovative design and successful implementation and management of habitat mitigation projects throughout the Sacramento Region. Many of these projects have been designed and closely coordinated/integrated with staff input from CDFG, USFWS, and the National Marine Fisheries Service.

# 7 COMPLETION OF MITIGATION RESPONSIBILITIES

When the success criteria are met and the establishment period monitoring program is complete, USACE, USFWS, DFG, and the Central Valley RWQCB will be notified in the annual report. It is recognized that USACE, USFWS, DFG, and the Central Valley RWQCB may require visits to the mitigation sites. With prior notification, USACE, USFWS, DFG, and the Central Valley RWQCB may visit the mitigation sites at any time to verify that project mitigation requirements have been completed. After verification, these agencies will provide SAFCA with written confirmation that SAFCA has met the required conditions for mitigation of impacts on the resource(s) within their purview.

# 8 LONG-TERM MANAGEMENT PLAN

A Long-Term Management Plan (LTMP) will be implemented by SAFCA in connection with the NLIP's MMP. The LTMP will describe the management practices and land protection mechanisms that will be implemented as each phase of the NLIP is approved and permitted. Land ownership, management responsibilities, and protection obligations will be held by SAFCA, RD 1000, NCMWC, TNBC, and the SCAS. Table 8-1 below summarizes these roles and mechanisms for the Phase 2 project's compensatory habitat components.

A description of the land protection and management mechanisms follows.

- *Fee:* Private lands needed to support the NLIP mitigation components will be acquired in fee title by SAFCA. In the case of lands acquired for flood control facilities (e.g., levee slopes, seepage berms, and operation and maintenance corridors), land titles will be given to RD 1000, which will manage these lands under a long-term contract with SAFCA. The contract will specify that RD 1000's obligations to maintain and manage the grasslands established on the levee slopes, seepage berms, and maintenance corridors in the areas occupied by these flood control facilities will comply with the terms of the LTMP.

- *Conservation Easement (CE):* Private lands acquired in fee title by SAFCA for the creation and/or preservation of woodlands, rice fields, and field crops will be encumbered by conservation easements granted to TNBC to protect the habitat values of these lands in perpetuity. USFWS and DFG will both be third-party beneficiary (TPB) to these easements. TNBC will manage these lands according to the terms of the LTMP and corresponding site-specific management plan (SSMP), utilizing similar land management practices as are currently employed by TNBC in connection with the NBHCP. Irrigation water for these lands will be provided by NCMWC under existing landowner/shareholder rights acquired by SAFCA and, where necessary, under long-term water purchase contracts with SAFCA.

- *Drainage Canal Easement (DCE):* Private lands acquired by SAFCA for the new GGS/Drainage Canal and SCAS lands used for the new GGS/Drainage Canal will be encumbered by drainage canal easements granted by SAFCA to RD 1000 and by SCAS to SAFCA and RD 1000. These easements will require that the lands be used exclusively for the GGS/Drainage Canal, that the aquatic and upland habitat functions associated with the canal be preserved in perpetuity, that the secondary drainage and irrigation services associated with the canal be preserved in perpetuity, and that the lands be managed according to the terms of the LTMP and the respective SSMP. The easements on non-airport land will identify TNBC as a third party beneficiary (TPB) with the rights necessary to monitor and enforce the terms of the easements. TNBC will carry out its monitoring activities under a long-term contract with SAFCA. SAFCA will either negotiate a long-term contract with a third-party entity to conduct monitoring of the on-airport canal habitat, or SAFCA biologists will conduct this monitoring. Both off and on airport property, easements will identify USFWS as a TPB. RD 1000 will manage these lands under a long-term operation and maintenance contract with SAFCA, which will specify that management practices will adhere to the terms of the LTMP and respective SSMP. These management practices will be based in part on the draft "Take, Avoidance, Minimization, and Mitigation Plan" developed by NCMWC in collaboration with USFWS and DFG. Water supplies for the new GGS/Drainage Canal will be provided by NCMWC under existing landowner/shareholder rights acquired by SAFCA and, where necessary, under long-term water purchase contracts with SAFCA.

- *Flood Control Easement (FCE):* SCAS lands that are needed to accommodate flood control facilities will be encumbered by flood control easements granted by SCAS to SAFCA and RD 1000. RD 1000 will manage the affected flood control facilities under a long-term operation and maintenance contract with SAFCA. The contract will specify that management practices to be employed, including the practices necessary to maintain and manage the native grasslands established on the levee slopes, seepage berms, and operation and maintenance corridors, will adhere to the terms of the LTMP, and are consistent with the levee operation and maintenance requirements developed by USACE in connection with Sacramento River Flood Control Project.

- *Water Facilities Easement (WFE):* Private lands acquired by SAFCA for the new Elkhorn Irrigation Canal and SCAS lands needed for the new Elkhorn Irrigation Canal will be encumbered by water facilities easements granted by SAFCA to NCMWC and by SCAS to NCMWC. These easements will protect and preserve the use of these lands for this irrigation canal. NCMWC will manage the relocated canal as part of the integrated system of pumps and irrigation facilities in the Natomas Basin. The design of the new Elkhorn Irrigation Canal will call for the planting and establishment of native grasslands on the landside of the berms confining the canals. NCMWC will manage these grasslands under a long-term contract with SAFCA that will specify the management practices to be employed.

The drainage canal, flood control, and water facilities easements encumbering SCAS lands will reserve to SCAS as the owner of these lands, the rights necessary to protect the Airport's aviation safety interests without compromising the interests protected by the easements. In case of conflicts between these interests, the easements will provide for conflict resolution through mediation.

**Table 8-1**
**Summary of Phase 2 Habitat Management Components and Associated Land Protection and Management Mechanisms**

| Habitat Management Component | Management Entities and Land Protection and Management Mechanisms | | | | |
|---|---|---|---|---|---|
| | SAFCA | NCMWC | RD 1000 | SCAS | TNBC |
| GGS/Drainage Canal | | | | | |
| **On-Airport Land*[1] | DCE | Contract | DCE Contract | Fee | |
| **Off-Airport Land* | Fee | Contract | DCE Contract | | TPB Contract |
| Elkhorn Irrigation Canal | | | | | |
| **On-Airport Land* | | WFE | | Fee | |
| **Off-Airport Land* | Fee | WFE | | | |
| Rice Fields[2] | Fee | Contract | | | CE Contract |
| Field Crops | Fee | Contract | | | CE Contract |
| Managed Grassland | | | | | |
| **On-Airport Flood Control Facilities* | FCE | | FCE Contract | Fee | |
| **Off –Airport Flood Control Facilities* | | | Fee Contract | | |
| **On-Airport Irrigation Canal Uplands* | | WFE Contract | | Fee | |
| **Off –Airport Irrigation Canal Uplands* | Fee | WFE Contract | | | |
| ** On-Airport Drainage Canal Uplands* | DCE | Contract | DCE Contract | Fee | |
| ** Off –Airport Drainage Canal Uplands* | Fee | Contract | DCE Contract | | TPB Contract |
| Landside Woodlands | Fee | | | | CE Contract |

*Notes: Airport = Sacramento International Airport; CE = conservation easement; Contract = long-term management or water delivery contract with SAFCA; DCE = drainage canal easement; FCE = flood control easement; Flood Control Facilities = levee slopes, seepage berms and operation and maintenance corridor; GGS/Drainage Canal = new canal designed to provide drainage and associated giant garter snake habitat; NA = not applicable; NCMWC = Natomas Central Mutual Water Company; RD = Reclamation District; SAFCA = Sacramento Area Flood Control Agency; SCAS = Sacramento County Airport System; TPB = third party beneficiary; TNBC = The Natomas Basin Conservancy; WFE = water facilities easement
*Footnotes: 1 – USFWS will be TPB to the Drainage Canal Easement. 2 – USFWs and DFG will be TPB to these easements.

# 9 FUNDING MECHANISM

## 9.1 SUMMARY OF FUNDING MECHANISMS

All funding for monitoring and managing the mitigation sites relies on appropriations from the CCAD and the Operation and Maintenance Assessment District assessments. In addition, funding for TNBC relies upon the establishment of a non-wasting endowment. These funding components are described below in more detail.

**Consolidated Capital Assessment District:** As discussed in Chapter 6 "Potential Contingency Assurances" above, the CCAD was created in April 2007 to fund the local share of the cost of constructing, operating and maintaining the projects that are necessary to provide the Sacramento Area with at least a 200-year level of flood protection. Under the terms of Final Engineer's Report (Final Report) adopted in connection with the CCAD, SAFCA is authorized to collect special benefit assessments from the properties in the district through 2037. A portion of the assessment revenue is specifically allocated to the cost of operating, maintaining, and managing the constructed improvements, including mitigation features.

**Operations and Maintenance Assessment District:** The CCAD will terminate in 2037, after which any funding for the mitigation sites, and specifically RD 1000 and NCMWC, will be covered by assessments collected as part of SAFCA's existing Operation and Maintenance Assessment District.

**Endowment Agreement with The Natomas Basin Conservancy:** SAFCA will make annual appropriations from the CCAD assessment to cover TNBC's management costs through 2037 and will make a single lump sum payment into a non-wasting endowment fund in 2009 funded by CCAD assessments. Compounding interest earnings from 2009 through 2037 will result in full funding of the endowment in 2038. Interest earned on this account will cover the annual payments due to TNBC thereafter.

## 9.2 LONG-TERM MANAGEMENT AGREEMENTS

Funding for the management and administration of the various habitat components will be provided through long-term management agreements with RD 1000 (GGS/Drainage Canal management, managed native perennial grasslands), TNBC (rice fields, field crops, and landside woodlands), NCMWC (water delivery), and a third party entity (GGS/Drainage Canal monitoring). These long-term management agreements are summarized here.

**Management Agreement for RD 1000:** SAFCA will enter into a long-term management agreement with RD 1000, which will manage both the GGS/Drainage Canal and the grasslands on the flood damage reduction footprint. Funding for this agreement will be provided annually from CCAD assessments through 2037 and thereafter from assessments collected as part of SAFCA's Operation and Maintenance Assessment District. To ensure timely payment for the services rendered under these agreements, SAFCA will maintain reserve accounts with balances sufficient to support annual funding for 2 years of the agreement.

**Management Agreement for NCMWC:** Water supplies for the new GGS/Drainage Canal, rice fields, and field crops will be provided by NCMWC under existing landowner/shareholder rights acquired by SAFCA or under a long-term water purchase contract negotiated between SAFCA and NCMWC. Funding for this agreement will be provided annually from CCAD assessments through 2037 and thereafter from assessments collected as part of SAFCA's Operation and Maintenance Assessment District. To ensure timely payment for the services rendered under these agreements, SAFCA will maintain reserve accounts with balances sufficient to support annual funding for 2 years of the agreement.

**Management Agreement for Third Party Entity:** SAFCA biologists or a third party entity will monitor the non-airport GGS/Drainage Canal and RD 1000 operations and maintenance for the GGS/Drainage Canal. Funding for this agreement will be provided annually from CCAD assessments through 2037 and thereafter from assessments

collected as part of SAFCA's Operation and Maintenance Assessment District. To ensure timely payment for the services rendered under these agreements, SAFCA will maintain reserve accounts with balances sufficient to support annual funding for 2 years of the agreement.

**Management Agreement for TNBC:** TNBC would hold the conservation easement for several of the habitat mitigation components, including rice fields, agricultural field crops, landside woodlands, and managed marsh. In addition, TNBC may oversee, monitor, and assist in administering the components of the grasslands on the flood damage reduction footprint. SAFCA, through a management agreement with TNBC, will make annual appropriations from CCAD assessments to cover TNBC's management costs through 2037, and will make a single lump-sum payment into a non-wasting endowment fund in 2009, funded by CCAD assessment.

## 9.3 FUNDING ESTIMATES

Appendix H provides a summary of cost estimates for annual maintenance and management costs for mitigation lands. A preliminary Property Analysis Record (PAR) was prepared to determine estimated costs for maintenance and management of the GGS/Drainage Canal by RD 1000, SAFCA, and possibly by a third party entity. A preliminary financial analysis performed by Economic & Planning Systems, Inc. (EPS) was prepared to estimate management costs for all mitigation components, and incorporates the PAR. Other EPS estimates are based on ongoing TNBC costs for managing and administering the NBHCP, and include payments to NCMWC for irrigation water. The irrigation water delivery costs were estimated by NCMWC, based on its experience in providing irrigation water to similar habitat areas being managed as part of the NBHCP. This cash flow analysis calculated annual TNBC site management costs for 2009 through 2037 and the estimated endowment fund amount required for annual site management costs in perpetuity commencing in 2038. Upon completion of the LTMP, a final (PAR) will be performed to more accurately define maintenance and management costs of the GGS/Drainage Canal, and a final financial analysis will be performed by EPS to determine more accurate management costs and a corresponding endowment amount for all TNBC management obligations.

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**RESOLUTION 09-022**

Adopted by the Sacramento Area Flood Control Agency

**CERTIFICATION OF THE SUPPLEMENT TO THE ENVIRONMENTAL IMPACT REPORT ON THE NATOMAS LEVEE IMPROVEMENT PROGRAM LANDSIDE IMPROVEMENTS PROJECT – PHASE 2 PROJECT; ADOPTION OF FINDINGS AND A STATEMENT OF OVERRIDING CONSIDERATIONS, MITIGATION MEASURES, AND A MITIGATION MONITORING AND REPORTING PROGRAM; AND APPROVAL OF MODIFICATIONS TO THE NATOMAS LEVEE IMPROVEMENT PROGRAM LANDSIDE IMPROVEMENTS PROJECT - PHASE 2 PROJECT**

WHEREAS, Section 20 (c) of the SAFCA Act {Stats.1990, c. 510 (S.B.46), §1.}, finds and declares that a purpose of SAFCA is to coordinate a regional effort to finance, provide, and maintain facilities and works necessary to ensure a reasonable and prudent level of flood protection, as determined by the Agency, in developed and urbanizing areas which are designated for residential, commercial, or industrial uses within its boundaries and to provide local assurances and participate in cost sharing for Federal flood control projects; and

WHEREAS, Section 52 of the SAFCA Act states that SAFCA shall have as its highest priority the protection of life, property, watercourses, watersheds, and public highways within its boundaries from damage from flood and storm waters; and

WHEREAS, Section 52 of the SAFCA Act further mandates that SAFCA carry out its (flood control) responsibilities in ways which provide for the optimum protection of the natural environment, especially riparian habitat and natural stream channels suitable for native plant and wildlife habitat and public recreation; and

WHEREAS, the Natomas Levees Improvement Program Landside Improvements Project ("NLIP Landside Improvements Project") consists of improvements to the levee system in the Natomas Basin and related landscape modifications and drainage and infrastructure improvements to reduce the risk of flooding in a significant portion of the Sacramento metropolitan area, thereby implementing a portion of the flood control program known as Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area (State Clearinghouse No. 2006072098) ("Local Funding EIR"); and

WHEREAS, the NLIP Landside Improvements Project is fully described in Chapter 2 of the Environmental Impact Report on the NLIP Landside Improvements Project (State Clearinghouse No. 2007062016) ("2007 Landside EIR"), and consists of project elements originally proposed for commencement of construction in 2008 that are analyzed at a project level (formerly the "2008 Construction Projects," renamed the "Phase 2 Project"),

which consist of the "Natomas Cross Canal South Levee Phase 2 Improvement Project" and the "Sacramento River East Levee Phase 1 Improvement Project (Reaches 1 Through 4B)," and elements originally proposed for commencement of construction in 2009 through 2010 that are analyzed at a program level (formerly the “2009 Construction Project” and the “2010 Construction Project,” renamed the “Phase 3 Project” and the “Phase 4 Project,” respectively); and

WHEREAS, the 2007 Landside EIR is tiered from the Local Funding EIR; and

WHEREAS, the Phase 1 Project, originally referred to as the 2007 Construction Project, has been substantially completed; and

WHEREAS, the SAFCA Board of Directors certified the 2007 Landside EIR and approved the Phase 2 Project on November 29, 2007; and

WHEREAS, the Phase 2 Project would involve levee raising; seepage remediation; improvements to major irrigation and drainage infrastructure; habitat development and management; encroachment management and bridge crossing modifications; right-of-way acquisition within the area of the proposed features, at borrow sites, and to prevent encroachment and provide for maintenance access along the land side of the flood control facilities; and

WHEREAS, since certification of the 2007 Landside EIR in November 2007, SAFCA has proposed modifications to the Phase 2 Project, and has determined that a supplement to the 2007 Landside EIR that focuses on the significant effects on the environment that would potentially result from the proposed modifications to the Phase 2 Project is appropriate, and has prepared the Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project – Phase 2 Project (State Clearinghouse No. 2007062016) (“Phase 2 Project SEIR” or “SEIR”); and

WHEREAS, the proposed modifications to the Phase 2 Project, which are fully described in Chapter 2 of the November 2008 Draft SEIR, as amended by the January 2009 Final Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project – Phase 2 Project (together, the “Final SEIR”) consist of the following: between Reaches 1 and 4A along the Sacramento River east levee, construction of cutoff walls in place of seepage berms in several areas and construction of cutoff walls in addition to seepage berms in others; cutoff wall construction on a 24-hour-per day/seven-day-per week basis in some areas; a change in the baseline condition of the Sacramento International Airport north bufferlands from active rice cultivation to idle conditions; additional details regarding new storm drainage collection facilities to convey surface water beneath Garden Highway to the Sacramento River; and the

addition of 90 acres of high quality foraging habitat through acquisition and reclamation of land used for borrow material; and

WHEREAS, SAFCA desires the Phase 2 Project to provide at least 100-year flood protection as quickly as possible while laying the groundwork to achieve at least "200-year" flood protection over time; to use flood control projects in the vicinity of Sacramento International Airport to facilitate better management of Airport lands that reduce hazards to aviation safety; and to use flood control projects to enhance habitat values by increasing the extent and connectivity of the lands in Natomas being managed to provide habitat for giant garter snake, Swainson's hawk, and other special-status species; and

WHEREAS, the Draft SEIR describing the modifications in the Phase 2 Project has been circulated for public review, comments have been received and responses issued, and a Final SEIR has been prepared; and

WHEREAS, the Final SEIR has been presented to the Board and the Board has reviewed and considered the information contained in the Final EIR.

NOW, THEREFORE, BE IT RESOLVED BY THE SACRAMENTO AREA FLOOD CONTROL AGENCY BOARD OF DIRECTORS:

1. The Board hereby certifies that the Final SEIR for the Phase 2 Project has been completed in compliance with the California Environmental Quality Act, Public Resources Code Section 21000 *et seq.*, and reflects the independent judgment of SAFCA.

2. The Board hereby adopts the Findings and Statement of Overriding Considerations for the modifications to the Phase 2 Project, attached hereto as Exhibit A, including the Statement of Overriding Considerations set forth therein.

3. The Board hereby adopts and incorporates into the Phase 2 Project all of the mitigation measures within the responsibility and jurisdiction of SAFCA that are identified in the Findings.

4. The Board hereby adopts the revised Mitigation Monitoring and Reporting Program for the NLIP Landside Improvements Project, attached hereto as Exhibit B.

5. The Board hereby approves the modifications to the Phase 2 Project.

ON A MOTION BY Director _____, seconded by Director _____, the foregoing resolution was passed and adopted by the Board of Directors of

the Sacramento Area Flood Control Agency, this 29th day of January 2009, by the following vote, to wit:

AYES: Directors:

NOES: Directors:
ABSTAIN: Directors:
ABSENT: Directors:

_____
Chair of the Board of Directors of the
Sacramento Area Flood Control Agency

(SEAL)

ATTEST:

_____
Clerk of the Board of Directors

# EXHIBIT A

## FINDINGS AND STATEMENT OF OVERRIDING CONSIDERATIONS FOR NATOMAS LEVEE IMPROVEMENT PROGRAM LANDSIDE IMPROVEMENTS PROJECT – MODIFICATIONS TO PHASE 2 PROJECT

### I. ENVIRONMENTAL REVIEW PROCESS

The Final Environmental Impact Report on the Natomas Levee Improvement Program ("NLIP") Landside Improvements Project (State Clearinghouse No. 2007062016) ("2007 Landside EIR"), prepared by the Sacramento Area Flood Control Agency ("SAFCA"), analyzes the landside components of the NLIP that were originally proposed for construction during the years 2008 through 2010 ("NLIP Landside Improvements"). These components consist of improvements to the levee system in the Natomas Basin and related landscape modifications and drainage and infrastructure improvements.

The 2007 Landside EIR is a combined program-level EIR pursuant to Section 15168 of the State CEQA Guidelines (14 CCR § 15000 et seq.) and a project-level EIR pursuant to Section 15161 of the CEQA Guidelines. The project elements originally proposed for construction in 2008 (now referred to as the "Phase 2 Project") are analyzed at a project level, and consist of the "NCC South Levee Phase 2 Improvements" and the "Sacramento River East Levee Phase 1 Improvements (Reaches 1 through 4B)." The Board certified the 2007 Landside EIR and approved the Phase 2 Project on November 29, 2007.

The 2007 Landside EIR is tiered from the analysis in SAFCA's Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area ("Local Funding EIR") (February 2007, State Clearinghouse No. 2006072098). Consistent with CEQA Guidelines Section 15152, the second-tier 2007 Landside EIR incorporates by reference general discussions from the Local Funding EIR as appropriate, and focuses on the significant effects on the environment that were not adequately addressed in that EIR.

As stated in the Local Funding EIR, the overall project objectives of SAFCA's flood control improvement program, including the NLIP Landside Improvements, are: to complete the projects necessary to provide 100-year flood protection for developed areas in the major floodplains of the Sacramento metropolitan area (Sacramento) as quickly as possible; to provide urban-standard ("200-year") flood protection for developed areas in Sacramento's major floodplains over time; and to ensure that new development in the undeveloped areas of Sacramento's major floodplains does not substantially increase the expected damage of an uncontrolled flood. The specific objectives of the NLIP Landside Improvements project are: to provide at least 100-year flood protection as quickly as possible while laying the groundwork to achieve at least "200-year" flood protection over time; to use flood control projects in the vicinity of Sacramento International Airport to

facilitate better management of Airport lands that reduce hazards to aviation safety; and to use flood control projects to enhance habitat values by increasing the extent and connectivity of the lands in Natomas being managed to provide habitat for giant garter snake, Swainson's hawk, and other special-status species.

Since the certification of the 2007 Landside EIR and approval of the Phase 2 Project, SAFCA proposed modifications to the Phase 2 Project consisting of following: between Reaches 1 and 4A along the Sacramento River east levee, construction of cutoff walls in place of seepage berms in several areas and construction of cutoff walls in addition to seepage berms in others; cutoff wall construction on a 24-hour-per day/seven-day-per week basis in some areas; a change in the baseline condition of the Sacramento International Airport north bufferlands from active rice cultivation to idle conditions; additional details regarding new storm drainage collection facilities to convey surface water beneath Garden Highway to the Sacramento River; and the addition of 90 acres of high quality foraging habitat through acquisition and reclamation of land used for borrow material.

The Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project – Phase 2 Project (State Clearinghouse No. 2007062016) ("SEIR"), prepared by SAFCA, analyzes the modifications to the Phase 2 Project, which are fully described in Chapter 2 of the November 2008 Draft SEIR, as amended by the January 2009 Final Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project – Phase 2 Project (together, the "Final SEIR"). A supplement to the 2007 Landside EIR is appropriate because the modifications to the Phase 2 Project will involve new or substantially more severe significant environmental effects, but only minor additions or changes are necessary to make the 2007 Landside EIR adequate to apply to the modified Project. (CEQA Guidelines §§ 15162 and 15163.)

On October 2, 2008, SAFCA issued a Notice of Preparation ("NOP") indicating that a Supplement to the 2007 Landside EIR ("SEIR") would be prepared for the modifications to the Phase 2 Project. The NOP was filed with the State Clearinghouse and circulated to governmental agencies and the public for 30 days for review and comment. Comment letters were received. The Draft EIR was published on November 18, 2008, for a 45-day public review period that ended on January 2, 2009. During that time, the Draft SEIR was reviewed by various governmental agencies, as well as by interested individuals and organizations. In addition, members of the public were invited by formal public notice to submit comments on the Draft EIR in testimony at a public hearing held for that purpose on December 11, 2008. Additional public comments were received at this hearing.

The Final SEIR includes, among other components, the Draft SEIR published in November 2008, as well as comments on the Draft EIR, responses to those comments, and revisions to the Draft EIR. The Final SEIR, published in January 2009, was presented to the Board, and the Board has reviewed the Final SEIR. The analysis and conclusions contained in the Final SEIR reflect the independent judgment of SAFCA.

Based on all of the information and evidence in the record, the Board hereby makes the following Findings with respect to the modifications to the modifications to Phase 2 of the NLIP Landside Improvements Project.

## II. SIGNIFICANT AND UNAVOIDABLE ADVERSE IMPACTS AND DISPOSITION OF RELATED MITIGATION MEASURES

The Final SEIR identifies the following changes in the significant and unavoidable adverse impacts associated with the modifications to the Phase 2 Project, and it identifies related mitigation measures. It is hereby determined that these significant and unavoidable adverse impacts are acceptable for the reasons specified in Section V, below.

### A. Impact 3.4-b. Potential Construction Impacts on Cultural Resource CA-SAC-485/H

This prehistoric resource consists of an extremely rich deposit that contains midden, features, debitage, faunal bone and bone tools, habitation structures, and numerous human interments. The site occurs just east of the Sacramento River east levee Reach 4B. This reach has an existing, serious risk of underseepage and levee failure. SAFCA proposes construction of a seepage berm that could abut the Sacramento River east levee and would cover this resource. The width of this berm has been expanded compared to the original design; therefore, the impact of placing the berm on CA-SAC-485/H was not analyzed in the 2007 Landside EIR. This impact would be significant. Implementation of Mitigation Measure 3.4-b, set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would reduce the impact on CA-SA-485/H caused by the modifications to the Phase 2 Project. Nonetheless, construction of a seepage berm may affect the site through operation of equipment and construction of a massive feature over the site. Therefore, this impact would be significant and unavoidable.

**Mitigation Measure 3.4-b**: **Avoid Ground Disturbance near Known Archeological Site CA-Sac-485/H to the Extent Feasible and Prepare and Implement a Historic Properties Treatment Plan.**

*SAFCA shall implement the following measures required by the PA (Appendix C) to address potential significant impacts on CA-SAC-485/H associated with Phase 2 Project construction impacts:*

- *Prior to start of construction, SAFCA shall prepare an HPTP as required under the PA (Stipulation V[A]).*
- *The HPTP shall address the effect of construction of a seepage berm on CA-SAC-485/H, including the effects of operating heavy equipment on the site during construction and of the placement of a seepage berm over the resource.*

- *To the extent possible, SAFCA shall minimize or avoid direct impacts on the site by carefully selecting equipment with consideration given to the pressure the construction equipment will place on the site and the capability of the assemblage to withstand these impacts. SAFCA shall also minimize the impact of the weight of the berm on the site through engineering and design to the maximum extent possible.*

- *The HPTP shall recommend an appropriate program of research and analysis for any portion of the assemblage removed from the site during test excavations. SAFCA shall then consult with USACE, the SHPO, and appropriate Native American individuals and entities regarding the recommendations of the HPTP.*

- *Upon concurrence from USACE and the SHPO, SAFCA shall implement the HPTP. The HPTP shall account for and incorporate the concerns of all consulting parties, to the extent possible, given project goals, as required under Section 106.*

- *During construction, SAFCA shall monitor construction at this location and within an appropriate radius. This monitoring shall be governed by a plan for monitoring and response to inadvertent discoveries that has been approved by USACE, as required in the PA (Stipulation V[B]).*

*The construction of a wide seepage berm and preparation and execution of an HPTP shall minimize impacts on this resource by avoiding or reducing disturbance and conducting research on the excavated portions of the assemblage. The HPTP shall minimize these impacts to the maximum extent possible and disclose the projected magnitude of these impacts.*

B. Impact 3.4-c. Damage to or Destruction of Other Identified Prehistoric Cultural Resources

Two prehistoric resources, NLIP-7 and NLIP-22, were identified within the project footprint after preparation of the 2007 Landside EIR. Construction of the seepage berm in Reaches 4A and 4B has the potential to affect these resources. This potential impact would be potentially significant. Implementation of Mitigation Measure 3.4-c, set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would reduce the impact on prehistoric cultural resources caused by the modifications to the Phase 2 Project. Nonetheless, it may not be possible to avoid all impacts to the deposits at these resources. Therefore, this impact would be significant and unavoidable.

**Mitigation Measure 3.4-c: Evaluate NLIP-7 and NLIP-22. If the Resources are Eligible, Avoid Disturbance to the Extent Feasible, and Prepare and Implement a Historic Properties Treatment Plan.**

*SAFCA shall implement the following measures prior to start of construction:*

- *Complete an evaluation of NLIP-7 and NLIP-22 resources, and determine the effect of Phase 2 work on all eligible or listed resources in accordance with Stipulation IV(A) of the PA.*

- *Consult with USACE, the SHPO, and other consulting parties such as Native American individuals and organizations, to develop appropriate treatment or mitigation in an HPTP, as required by Stipulation V(A) of the PA, if the project would result in adverse effects on eligible resources.*

- *If the resources are deemed to be eligible, document the sites and avoid or reduce adverse effects by minimizing disturbance from construction of the berm. Where physical impacts cannot be avoided and such physical impacts could damage the data these sites may contain, further excavation shall be conducted in order to support documentation of the resource as required under Section 110(b) of the NHPA, or, in the alternative, data recovery excavations to retrieve those values and mortuary assemblages that contain significance for archaeology and Native American culture after consultation with and the agreement of the Native American MLD tribe.*

- *Monitor all construction in the vicinity of documented and eligible resources, as required under the pending construction monitoring and inadvertent discovery plan.*

*Implementation of these management steps would lead to a determination as to the eligibility of these resources, and if eligible, minimize impacts on qualities that make these resources significant. While data recovery excavation is usually performed in instances where significant resources may be affected by a project, consultation under Section 106 may require alternate treatment, such as minimal investigation other than documentation. Minimization of any disturbance is an expressed desire of the Native American individuals and organizations that were consulted. To the extent possible, SAFCA shall minimize the impact of operating equipment over the resources and the impact caused by placement of a berm on these sites, through engineering and equipment selection.*

C. Impact 3.4-d. Damage to or Destruction of Previously Undiscovered Cultural Resources

Previously unknown cultural resources could be present in areas that would be subject to construction disturbance and could be damaged or destroyed by project construction. This potential impact would be potentially significant. Implementation of Mitigation Measure 3.4-d (updating previously adopted Mitigation Measure 3.8-d from the 2007 Landside EIR), set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would reduce the impact on prehistoric cultural resources caused by the modifications to the Phase 2 Project. Because SAFCA does not control the final selection of inventory and treatment methods under Section 106, SAFCA can only suggest these methods to USACE and other consulting parties to the Section 106 process. Furthermore, because these methods will result in a sample data set rather than an exhaustive excavation of the entire footprint of ground disturbing work, the possibility remains that previously undiscovered cultural resources will be inadvertently damaged or destroyed during construction. Therefore, this impact would be significant and unavoidable.

**Mitigation Measure 3.4-d: Conduct Additional Backhoe and Canine Forensic Investigations As Appropriate**

*To increase the data set for identifying buried sites under the existing levee, SAFCA shall recommend that the following additional mitigation measures be adopted by USACE during Section 106 consultation:*

- *Additional inventory should be conducted at appropriate intervals along the Sacramento River east levee for the Phase 2 Project, using a backhoe excavator, to increase the sample of information at depths below six feet, which cannot be reached with conventional shovel test methods.*

- *Where this process or additional inventory efforts reveal other resources, SAFCA recommends the use of canine forensic investigations as a way of identifying interred human remains with minimal disturbance, and for further refinement of and understanding of the constituents of identified resources.*

- *If previously undiscovered resources are encountered during excavation of the inspection trench they will be treated in accordance with Mitigation Measure 3.4-c.*

D. Impact 3.4-e. Damage to or Destruction of Previously Undiscovered Interred Human Remains

Because SAFCA does not control the final selection of inventory and treatment methods under Section 106, SAFCA can only suggest these methods to USACE and other consulting parties to the Section 106 process. Furthermore, because these methods will result in a sample data set rather than an exhaustive excavation of the entire footprint of ground disturbing work, the possibility remains that previously undiscovered cultural resources will be inadvertently damaged or destroyed during construction. This impact would be significant. Implementation of previously Mitigation Measure 3.4-e (updating previously adopted Mitigation Measure 3.8-e from the 2007 Landside EIR), set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would reduce impact on previously undiscovered interred human remains caused by the modifications to the Phase 2 Project. Nonetheless, even though measures would be implemented to avoid human remains or, if found, to dispose of the remains with appropriate dignity, future disturbance to additional archaeological material at the site could still occur after the initial discovery and management of human remains. Therefore, this impact would be significant and unavoidable.

**Mitigation Measure 3.4-e: Halt Work Within 50 Feet of the Find, Notify the County Coroner and Most Likely Descendant, and Implement Appropriate Treatment of Remains**

*SAFCA and its primary construction contractors shall ensure that the following measures are implemented to address the potential discovery of human remains during construction.*

- *If human remains are uncovered during ground-disturbing activities, all ground-disturbing activities shall cease within a 50-foot radius of the find, and SAFCA or its designated representative shall be notified. In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, SAFCA and/or the contractor shall notify the county coroner of the county in which the remains are uncovered (Sutter or Sacramento) and a professional archaeologist to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). The NAHC shall designate a Most Likely Descendant (MLD) to dispose of the remains with appropriate dignity.*

- *After a determination that the remains are of prehistoric Native American origin, SAFCA shall coordinate with the MLD for reburial of the remains and associated grave goods in an appropriate location. If the MLD fails to make a recommendation or reinter the remains, further treatment shall conform to PRC Section 5097 et seq. and other appropriate authorities.*

- *The discovery of prehistoric burials often reveals locations sensitive for the occurrence of additional archaeological material. Newly discovered prehistoric resources associated with human remains shall be evaluated, and if the resource is eligible for the CRHR or the NRHP and the project would result in adverse effects to those eligible resources, Mitigation Measure 3.4-c shall be implemented.*

E. Impact 3.5-a. Generation of Temporary, Short-Term Construction Noise

Construction of proposed cutoff walls on a 24-hours-per-day, 7-days-per-week ("24/7") basis could generate noise levels that exceed the local noise standards for stationary sources at nearby sensitive receptors. In addition, because this construction would occur during the noise-sensitive evening and nighttime hours, it would have the potential to cause sleep disturbance at nearby residential land uses. This impact would be significant. Since publication of the Draft SEIR, the area in which cutoff walls would be constructed, in addition to other Phase 2 Project construction that would be taking place, was expanded to include the entirety of Reach 4A. Pursuant to the modifications to the Phase 2 Project, cutoff wall construction could be conducted 24/7; however, at the request of the USACE pursuant to the Phase 2 Project's NEPA compliance, Mitigation

Measure 3.5-a was revised to state that 24/7 construction of cutoff walls would not be conducted in Reaches 1 and 4A due to the proximity of residences in those reaches. Implementation of Mitigation Measure 3.5-a (updating previously adopted Mitigation Measure 3.12-a from the 2007 Landside EIR), set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would reduce the noise impact from construction of the modifications to the Phase 2 Project. These measures would reduce interior and exterior noise levels at noise-sensitive receptors located near construction sites. However, standards applicable to local exterior noises would not be reduced to a less-than-significant level at every nearby receptor. Therefore, the impact of temporary, short-term construction noise on sensitive receptors would be significant and unavoidable.

**Mitigation Measure 3.5-a: Implement Noise-Reducing Construction Practices, Prepare and Implement a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors.**

*SAFCA and its primary contractors for engineering design and construction shall ensure that the following measures are implemented at each work site in any year of project construction to avoid and minimize construction noise effects on sensitive receptors. These measures are consistent with SAFCA's standard contract specifications for noise control.*

*SAFCA and its primary construction contractors shall employ noise-reducing construction practices and other measures to reduce exposure of sensitive receptors to construction noise. Measures that shall be used to reduce noise impacts shall include the following:*

- *Equipment shall be used as far away as practical from noise-sensitive uses.*
- *All construction equipment shall be equipped with noise-reduction devices such as mufflers to minimize construction noise and all internal combustion engines shall be equipped with exhaust and intake silencers in accordance with manufacturers' specifications.*
- *Equipment that is quieter than standard equipment shall be used, including electrically powered equipment instead of internal combustion equipment where use of such equipment is a readily available substitute that accomplishes project tasks in the same manner as internal combustion equipment.*
- *Construction site and haul road speed limits shall be established and enforced.*
- *The use of bells, whistles, alarms, and horns shall be restricted to safety warning purposes only.*
- *Noise-reducing enclosures shall be used around stationary noise-generating equipment (e.g., compressors and generators).*

- *Fixed construction equipment (e.g., compressors and generators), construction staging and stockpiling areas, and construction vehicle routes shall be located at the most distant point feasible from noise-sensitive receptors.*

- *When noise sensitive uses are within close proximity and subject to prolonged construction noise, where feasible noise-attenuating buffers such as structures, truck trailers, or soil piles shall be located between noise generation sources and sensitive receptors.*

- *Before construction activity begins within 500 feet of one or more residences, written notification shall be provided to the potentially affected residents, identifying the type, duration, and frequency of construction activities. Notification materials shall also identify a mechanism for residents to register complaints with the appropriate jurisdiction if construction noise levels are overly intrusive. The distance of 500 feet is based on the 60-dBA) contour of the loudest anticipated construction activity other than pile driving (as listed in Table 3.12-4 of the 2007 Landside EIR).*

- *When construction of cutoff walls takes place during nighttime hours (between 10 p.m. and 6 a.m.), SAFCA shall honor requests from affected residents to provide reasonable reimbursement of local hotel or short-term rental stays for the period of time that cutoff wall construction takes place within 500 feet of the residents requesting reimbursement.*

- *If noise-generating activities are conducted within 100 feet of noise-sensitive receptors (the 70-dBA noise contour of construction noise), the primary contractor shall continuously measure and record sound generated as a result of the proposed work activities. Sound monitoring equipment shall be calibrated before taking measurements and shall have a resolution within 2 dBA. Monitoring shall take place at each activity operation adjacent to sensitive receptors. The recorded noise monitoring results shall be furnished weekly to SAFCA.*

- *The primary contractor shall prepare a detailed noise control plan based on the construction methods proposed. This plan shall identify specific measures to ensure compliance with the noise control measures specified above. The noise control plan shall be submitted to and approved by SAFCA before any noise-generating construction activity begins.*

- *Construction of cutoff walls in Reaches 1 and 4A of the Sacramento River east levee shall be limited to the hours of 6 a.m. to 8 p.m., Monday through Saturday, with only maintenance activities on Sunday.*

## III. SIGNIFICANT ADVERSE IMPACTS IDENTIFIED IN THE EIR THAT ARE REDUCED TO A LESS-THAN-SIGNIFICANT LEVEL BY MITIGATION MEASURES INCORPORTED INTO THE PROPOSED PROJECT

The Final SEIR identifies the following significant impacts associated with the modifications to the Phase 2 Project. These impacts are reduced to a less-than-significant level by mitigation measures identified in the Final SEIR and incorporated into the project. It is hereby determined that the impacts addressed by these mitigation measures will be mitigated to a less-than-significant level or avoided by incorporation of these mitigation measures into the project. To the extent that these mitigation measures will not mitigate or avoid all significant effects on the environment, it is hereby determined that any remaining significant and unavoidable adverse impacts are acceptable for the reasons specified in Section VI, below.

### A. Impact 3.2-a. Possible Effects on Water Quality from Stormwater Runoff from Garden Highway Drainage Outlets to the Sacramento River

Drainage outlets would convey surface water toward the Sacramento River through subsurface laterals and waterside drainage outfalls. Stormwater runoff from Garden Highway could degrade the water quality of the Sacramento River by discharging contaminants through two proposed drainage outlets. This potential impact would be significant. Implementation of Mitigation Measure 3.2-a, set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would reduce the potential impact on water quality from stormwater runoff associated with drainage from Garden Highway caused by Phase 2 Project modifications to a less-than-significant level.

**Mitigation Measure 3.2-a: Implement Standard Best Management Practices and Comply With NPDES Permit Conditions.**

*SAFCA and its engineering consultants shall implement a suite of stormwater quality best management practices (BMPs) designed to remove contaminants from water discharging through the Garden Highway outlets. These BMPs shall be based on the Stormwater Quality Design Manual for Sacramento and South Placer Regions (May 2007), meet "maximum extent practicable" and "best conventional technology/best available technology" requirements, and comply with NPDES permit conditions.*

### B. Impact 3.3-a. Loss of Sensitive Habitats

The proposed modifications to the Phase 2 Project include construction of new drainage outfalls in Reaches 1–4B of the Sacramento River east levee. Placement of these outfalls would result in fill of waters of the United States and potential removal of some riparian vegetation. This impact would be significant. Implementation of Mitigation Measure 3.3-a (updating previously adopted Mitigation Measure 3.7-a from the 2007 Landside EIR), set forth below, which is hereby adopted and incorporated into the Phase

2 Project, would ensure that an overall performance standard of no net loss in acreage, function, and value of sensitive habitats is met, thereby reducing the impact on sensitive habitats caused by the Phase 2 Project modifications to a less-than-significant level.

**Mitigation Measure 3.3-a**: **Minimize Effects on Sensitive Habitats; Develop and Implement a Habitat Management Plan to Ensure Compensation for Unavoidable Adverse Effects; Comply with Section 404, Section 401, and Section 1602 Permit Processes; and Implement all Permit Conditions.**

*SAFCA and its primary contractors for engineering design and construction shall ensure that the following measures are implemented to avoid, minimize, and compensate for potential project effects on sensitive habitats.*

*Areas of sensitive habitat shall be identified and the primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that staging areas and access routes are designed to minimize disturbance of canals and ditches, seasonal wetlands, and woodland patches. Trees within the Sacramento County portion of the project area that qualify as Native Oaks or Heritage Trees under Sacramento County's tree preservation ordinance shall be identified. All sensitive habitats and protected trees that are located adjacent to construction areas, but can be avoided, shall be protected by temporary fencing during construction.*

*SAFCA shall develop and implement a Mitigation and Monitoring Plan (MMP) to address establishment and management of aquatic (i.e., GGS/Drainage Canal and marsh/seasonal wetland habitat) and woodland habitats that are created as part of the proposed project in order to ensure that the performance standard of no net loss of sensitive habitat is met. The shall identify the measures and performance criteria during the initial mitigation monitoring period (8 years) and shall be submitted to federal and state agencies for review and approval prior to project construction.*

*<u>GGS/Sensitive Aquatic Habitats</u>*

*Mitigation for impacts to aquatic habitat include the construction of a new GGS/Drainage canal, relocation of the Elkhorn Irrigation Canal, and preservation of rice fields. The GGS Canal shall create jurisdictional waters of the United States, and include banks that are designed to facilitate shoreline growth of freshwater marsh plants, plantings of native perennial grasses on the upper canal banks for better giant garter snake cover, and creation of giant garter snake hibernacula (rock piles keyed into the bank). This habitat shall be protected in perpetuity through an easement. In addition, to the extent practicable the Phase 2 Project Elkhorn Irrigation Canal shall be relocated in an alignment near the new GGS/Drainage Canal alignment to provide the potential for additional aquatic habitat (its main function would still be irrigation).*

*A monitoring program with performance criteria shall be developed to determine the progress of the GGS/Drainage canal towards achieving the performance standard of no net loss of aquatic habitat. The criteria for measuring performance shall be used to*

*determine if the habitat is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in mitigation design or maintenance revisions). These criteria must be met in order for the mitigation site to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria, which shall be developed in consultation with DFG and USFWS, shall include, but are not limited to:*

- *percent total cover (from 85–90%),*
- *percent relative cover by wetland species (from 85–90%),*
- *percent relative cover by native species (from 50–85%), and*
- *water level controlled to within +/- 6 inches of design water level.*

*Vegetation assessments of the GGS/Drainage Canal shall be conducted annually for native perennial grasses (during the appropriate peak flowering period). The presence of giant garter snakes shall be monitored and recorded along this canal, consistent with monitoring methods currently conducted for SAFCA and TNBC elsewhere in the Natomas Basin.*

*All monitoring shall occur for the full monitoring period or until the performance criteria are met, whichever period is longer. Waterline plug plantings (sedges and rushes) may not be mowed once established. All areas seeded with perennial grasses shall be mowed to a height of between 6–12 inches above ground.*

*The primary function and service of the Elkhorn Canal is to deliver irrigation water to users throughout the Natomas Basin. The water supply within the Elkhorn Canal shall vary depending on the needs of those users. Therefore, the performance standard for the Elkhorn Canal is the delivery of irrigation water.*

*<u>Woodlands</u>*

*To mitigate impacts to woodland habitats, woodland corridors and groves shall be established. In addition, existing woodlands, located outside of the flood control and canal improvement footprints but within project acquisition areas adjacent to the new groves, shall be preserved. Generally, the size of the woodland mitigation areas shall vary somewhat depending on the characteristics of their unique locations. Trees under 10 inches diameter at breast height (dbh) located within the project footprint (mostly valley oaks), that can be feasibly relocated shall be transplanted into woodland mitigation areas. Elderberry shrubs located within the project footprint that can be feasibly relocated shall be transplanted into woodland mitigation areas. The botanical species composition of individual clusters and rows shall mimic vegetation types commonly found along the Sacramento River, including:*

- *Valley oak woodland*
- *Mixed riparian forest, cottonwood-dominant*

- *Shallow scrub (at moist soil sites or depressions)*
- *Sycamore and oak savanna (with native perennial grassland)*
- *Elderberry shrub/scrub*

*A monitoring plan with performance criteria shall be developed to determine the progress of the woodland habitats towards providing adequate mitigation. The criteria for measuring performance shall be used to determine if the mitigation is trending toward sustainability (reduced human intervention) and to assess the need for adaptive management (e.g., changes in mitigation design or maintenance revisions). These criteria must be met in order for the mitigation site to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria, which shall be developed in consultation with DFG and USFWS, shall include, but are not limited to:*

- *Percent survival of planted trees (from 65–85%)*
- *Percent survival of transplanted trees (from 60–85%)*
- *Percent relative canopy cover (from 5–35%)*

*Field assessments of woodland planting areas shall be conducted once per year. The timing of these assessments shall be adjusted according to annual site-specific conditions, but assessments shall generally occur in late summer. To measure percent survival of trees and shrubs, each plant shall be inspected and the species of each live plant shall be recorded. Qualitative assessments shall be recorded to track the health and vigor of each species for adaptive management of the mitigation sites.*

*To determine the success of the woodland plantings as a functioning ecosystem, percent canopy shall be estimated each fall by recording the extent of woodland habitat on aerial photographs, or using repeat transects or fixed radius plots at ground level. The timing of these assessments shall be adjusted according to annual site-specific conditions, but assessments shall generally occur in late summer or early fall while trees are still in full foliage. The results of these assessments shall also be used to determine where replanting should occur to maintain suitable Swainson's hawk habitat. All monitoring shall occur for the full monitoring period or until the performance criteria are met, whichever is longer.*

*A Long-Term Management Plan (LTMP) shall be implemented by SAFCA in connection with the NLIP Landside MMP. The LTMP shall establish the long-term management practices (post establishment period success criteria) and land protection mechanisms that shall be implemented as each phase of the NLIP is approved and permitted. Land ownership and management responsibilities shall be held by SAFCA, RD 1000, NCMWC, TNBC, and the SCAS.*

*Applicable permits, including a Section 404 permit from the USACE, Section 401 certification from the Central Valley Regional Water Quality Control Board (RWQCB),*

*and a Section 1602 streambed alteration agreement from DFG, shall be obtained before any impact on the relevant resources occurs. All permit terms and conditions adopted through these permitting processes shall be implemented.*

C. Impact 3.3-b. Disturbance and Loss of Giant Garter Snake Habitat

Implementation of the Phase 2 Project with proposed modifications would result in disturbance and loss of aquatic and upland habitat for giant garter snake. The project would also result in creation of habitat for the snake, but specific requirements have not been established to ensure that appropriate habitat conditions are provided to adequately replace the habitat values that would be lost. Project construction also has the potential to result in direct take of giant garter snake individuals. This impact would be significant. Implementation of Mitigation Measure 3.3-b (previously adopted Mitigation Measure 3.7-d from the 2007 Landside EIR), set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would ensure that an overall performance standard of no net loss in function and value of giant garter snake habitat is met, thereby reducing the impact on giant garter snake habitat caused by the Phase 2 Project modifications to a less-than-significant level.

**Mitigation Measure 3.3-b**: **Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Develop a Management Plan in Consultation with USFWS and DFG, and Obtain Incidental Take Authorization.**

*SAFCA and its primary contractors for engineering design and construction shall ensure that the following measures are implemented to avoid, minimize, and compensate for potential project effects on giant garter snakes.*

*The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that staging areas and access routes are designed to minimize disturbance of giant garter snake habitat. All aquatic and adjacent upland habitat that is located adjacent to construction areas, but can be avoided, shall be protected by temporary fencing during construction.*

*Additional measures consistent with the goals and objectives of the NBHCP shall be implemented to minimize the potential for direct injury or mortality of individual giant garter snakes during project construction. Such measures shall be finalized in consultation with DFG and USFWS, and are likely to include conducting worker awareness training, timing initial ground disturbance to correspond with the snake's active season (as feasible in combination with minimizing disturbance of nesting Swainson's hawks), dewatering aquatic habitat before fill operations are commenced, conducting preconstruction surveys, and conducting biological monitoring during construction.*

*SAFCA shall develop and implement an MMP to address management of aquatic (i.e., GGS/Drainage Canal and marsh/seasonal wetland habitat) and adjacent upland habitats that are created and rice fields that are preserved as part of the project in order to ensure that the performance standard of no net loss in function and value of giant*

*garter snake habitat is met. This plan shall be completed and submitted to state and federal agencies for review prior to project construction.*

*The management plan for the giant garter snake habitat creation and preservation components of the project shall be reviewed and approved by USFWS and DFG before project implementation. Authorization for take of giant garter snake under the ESA and CESA shall be obtained. Any additional avoidance, minimization, or compensation measures subsequently adopted through the permitting process shall be implemented prior to or during project construction, as appropriate. A Long-Term Management Plan (LTMP) shall be implemented by SAFCA in connection with the NLIP's MMP. The LTMP shall describe the management practices and land protection mechanisms that shall be implemented as each phase of the NLIP is approved and permitted. Land ownership, management responsibilities, and protection obligations shall be held by SAFCA, RD 1000, NCMWC, TNBC, and the SCAS.*

D. Impact 3.3-c. Loss of Swainson's Hawk Habitat and Potential Disturbance of Nests

Implementation of the Phase 2 Project would result in loss of suitable foraging and potential nesting habitat. Creation of suitable foraging and nesting habitat would also occur, but specific requirements have not been established to ensure that appropriate habitat conditions are provided to adequately replace the habitat values that would be lost. Project construction could also result in disturbance and potential failure of active nests for Swainson's hawk. This impact would be significant. Implementation of Mitigation Measure 3.3-c (updating previously adopted Mitigation Measure 3.7-f from the 2007 Landside EIR), set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would ensure that an overall performance criterion of no net loss in acreage, function, and value of Swainson's hawk foraging habitat is met, thereby reducing the impact on Swainson's hawk habitat and nests caused by the Phase 2 Project modifications to a less-than-significant level.

**Mitigation Measure 3.7-f**: **Minimize Potential Impacts on Swainson's Hawk, Monitor Active Nests during Construction, Develop a Management Plan in Consultation with DFG, and Obtain Incidental Take Authorization.**

*SAFCA and its primary contractors for engineering design and construction shall ensure that the following measures are implemented to avoid, minimize, and compensate for potential project effects on Swainson's hawks.*

*The primary engineering and construction contractors shall ensure, through coordination with a qualified biologist retained by SAFCA, that staging areas and access routes are designed to minimize disturbance of known Swainson's hawk nesting territories. The biologist shall conduct preconstruction surveys to identify active nests within 0.25 mile of construction areas, in accordance with DFG guidelines. Surveys shall be conducted in accordance with NBHCP requirements and Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000). If an active nest is found, an*

*appropriate buffer that minimizes the potential for disturbance of the nest shall be determined by the biologist, in coordination with DFG. No project activities shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active or the birds are not dependent on it. Monitoring shall be conducted by a qualified biologist to determine whether project activity results in detectable adverse effects on the nesting pair or their young. The size of the buffer may vary, depending on the nest location, nest stage, construction activity, and monitoring results. If implementation of the buffer becomes infeasible or construction activities result in an unanticipated nest disturbance, DFG shall be consulted to determine the appropriate course of action.*

*SAFCA shall develop and implement an MMP to address management of grassland habitats that are created as part of the proposed project in order to ensure that the performance standard of no net loss of sensitive habitat is met. To mitigate impacts on cropland and grassland suitable for Swainson's hawk foraging habitat, SAFCA shall create managed native perennial grassland habitats on the new levee slopes, seepage berms, access right-of-ways, and canal embankments. This grassland shall provide moderate-quality Swainson's hawk foraging habitat. In addition, grasslands on and adjacent to canal banks shall provide basking and aestivation habitat for giant garter snake.*

*The MMP shall include methods to create the grasslands, including native grass mixes which shall be seeded along new levee slopes and seepage berms, staging areas, and adjacent maintenance and utility rights-of-way. Seed material shall be purchased from a reputable nursery and must be from local genetic stock within 200 miles of the project site unless otherwise approved by a qualified ecologist. The native grass mix shall include the following:*

- *Purple needlegrass (Nassella pulchra)*
- *Creeping wildrye (Leymus triticoides)*
- *Six weeks grass (Vulpia microstachys)*
- *Slender wheatgrass (Elymus trachycaulus)*
- *Meadow barley (Hordeum brachyantherum)*

*An initial baseline assessment of grassland mitigation sites shall be conducted following the initial drill seeding program, and then a monitoring program with performance criteria shall be developed to determine the progress of the grassland habitats towards providing adequate mitigation. The criteria for measuring performance shall be used to determine how well the mitigation is being established and to assess the need for adaptive management (e.g., changes in mitigation design or maintenance revisions). These criteria must be met in order for the mitigation site to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance criteria, which shall be developed in consultation with USACE, DFG and USFWS, shall include, but are not limited to:*

- *Percent cover of invasive species (<1%)*
- *Percent cover of non-native herbaceous plants (<10–25%)*
- *Percent absolute cover of native species (>50–80%)*

*The management plan for the grassland habitat creation components of the project shall be provided to the USFWS and DFG for review before project implementation. Authorization for take of Swainson's hawk under CESA shall be obtained. Any additional avoidance, minimization or compensation measures subsequently adopted through the permitting process shall be implemented.*

E. Impact 3.4-a. Changes to Elements of RD 1000, which Consists of a Rural Historic Landscape District That is Eligible for Listing on the NRHP

This district consists of the levees, drainage features, roads, and large-scale patterns of land use that form a distinct rural landscape surrounding and including the physical features of RD 1000 flood control infrastructure. Activities associated with several of the Phase 2 Project modifications, including construction of drainage infrastructure under Garden Highway and expansion of a seepage berm in Reach 4B of the Sacrament River east levee, could disturb contributing elements of RD 1000. These impacts would be significant. Implementation of Mitigation Measure 3.4-a (updating previously adopted Mitigation Measure 3.8-a from the 2007 Landside EIR), set forth below, which is hereby adopted and incorporated into the Phase 2 Project, would reduce this impact to a less-than-significant level.

**Mitigation Measure 3.4-a**: **Incorporate Mitigation Measures to Documents Regarding Any Elements Contributing to RD 1000 and Distribute the Information to the Appropriate Repositories.**

*The management of the cultural resources that constitute the contributing elements of RD 1000 is governed by the PA (Appendix C). Because the elements of the RD 1000 historic landscape district have already been recorded, a new inventory of these resources is not required under Stipulation IV(A) of the PA. After an APE has been determined per Stipulation III(C), a qualified architectural historian shall determine if contributing elements of the district are present in the APE. If contributing elements are present, the architectural historian shall update records for these resources and evaluate those elements to determine if they still retain integrity. Because much of the Natomas Basin has been developed, it is possible that changes to the setting have diminished the integrity and thus eligibility of contributing elements in the APE. If the elements in the APE retain eligibility, the architectural historian shall make a finding of effect.*

*If there is an adverse effect to a contributing element (under Section 106) or a significant impact on the resource's integrity as an historical resource (under CEQA) the architectural historian shall review existing HAER documentation and determine whether any augmentation of this documentation is needed. The original documentation for the American River Watershed Project, completed in 1997, contemplated changes to*

*the setting of the district and thus provided comprehensive documentation to record the district before urbanization (Peak & Associates 1997). It is possible that this original documentation adequately recorded and preserved records of the elements that may be affected. If this documentation is not sufficient for adversely affected and contributing elements, SAFCA will prepare an HPTP stipulating additional HAER documentation, or other similar treatment as required under Stipulation V(A). After consultation with USACE and the SHPO, SAFCA shall implement the required documentation. Any additional documentation that is needed shall be prepared and distributed to appropriate public repositories.*

## IV. LESS-THAN-SIGNIFICANT IMPACTS

The Final SEIR identifies the following less-than-significant impacts. Mitigation to further reduce less-than-significant impacts is not required by CEQA.

### A. Impact 3.2-b. Possible Effects on Groundwater

Installation of the proposed cutoff walls along the Sacramento River east levee would potentially increase or decrease localized near-surface groundwater levels in areas immediately east and west of the cutoff wall. A study of the potential for a significant drop or increase in groundwater levels found that no measurable change in groundwater levels or well yields would be expected from cutoff walls proposed for the Phase 2 Project. This impact would be less than significant.

### B. Impact 3.2-c. Cumulative Effects on Groundwater

Implementation of all phases of the NLIP in combination with existing and projected land and water use changes in the Natomas Basin could adversely affect the groundwater budget for the Natomas Basin. Modeling found a negligible cumulative effect on both the groundwater budget for the Natomas Basin and on outflow to adjacent areas. The project modifications would not contribute considerably to a significant cumulative effect. This impact would be less than significant.

## V. STATEMENT OF OVERRIDING CONSIDERATIONS

The Board has balanced the benefits of the NLIP Landside Improvements Phase 2 Project against its unavoidable environmental risks in determining whether to approve the project, and has determined that the benefits of the project outweigh the unavoidable adverse environmental effects. The reasons set forth below are based on the Final SEIR, the 2007 Landside EIR, and other information in the record.

A. Because of unique topographical and meteorological features, the Sacramento River basin, including its major tributaries, the Feather and American Rivers, is capable of producing significantly higher peak flood discharge per square mile of drainage area than any other major river basin in the United States.

B. The 1986 flood, the largest flood ever recorded for the Sacramento and American Rivers, triggered a major reevaluation of Sacramento's flood control system by the United States Army Corps of Engineers, which identified deficiencies in the flood control system protecting Sacramento. Although substantial flood protection effort has been undertaken since 1986, large portions of the Sacramento metropolitan area remain at high risk (having less than 100-year flood protection) or at moderate risk (having greater than 100-year but less than 200-year flood protection) of flooding.

C. There is an immediate need to protect the people and property at risk in the project area. The Natomas Basin floodplain is occupied by over 83,000 residents and $10 billion in damageable property. This area is presently vulnerable to flooding in a less than 100-year flood event along the Sacramento River or American River. Uncontrolled flooding in the Natomas Basin floodplain in a flood exceeding a 100-year event could result in $7 billion in damage. Depending on the circumstances, flood depths in the Natomas basin could reach life-threatening levels. Flooding would also result in releases of toxic and hazardous materials, groundwater contamination, and possible damage to the metropolitan power grid. The disruption in transportation that would result from a major flood would affect the Sacramento International Airport, and interstate and state highways. The day-to-day functioning of the state capital also would be significantly affected.

D. In recognition of the significant flood risk still remaining in the Sacramento area, Congress authorized the most significant package of improvements to Sacramento flood control system since the construction of Folsom Dam in 1956 as part of the Water Resource Development Act of 1996 and 1999, including the improvements to the NCC south levee, the Sacramento River east levee, and the American River north levee in the Natomas basin.

E. The project will help maximize public safety along the lower American and Sacramento Rivers and their tributaries in the Sacramento region. Specifically, the project will improve the levee system in the Natomas Basin and make related landscape modifications and drainage and infrastructure improvements.

F. The project would significantly reduce the risk of an uncontrolled flood in the Natomas Basin that would result in a catastrophic loss of property (estimated at $7 billion) and a prolonged interruption of commercial activity, including the operation of Sacramento International Airport and closure of Interstate 5, State Route 99/70, and portions of Interstate 80.

G. By contributing to protection of existing housing stock from destruction due to flood damage, the project will contribute to the maintenance of affordable housing in the region.

H. Several of the significant and unavoidable impacts identified in the Final SEIR and the 2007 Landside EIR (including construction-related noise, traffic on local

roadways, emissions) are temporary in duration and will be limited to the construction period.

## VI. INCORPORATION BY REFERENCE

The Final SEIR is hereby incorporated into these Findings in its entirety. Without limitation, this incorporation is intended to elaborate on the scope and nature of the mitigation measures, the basis for determining the significance of impacts, the comparative analysis of alternatives, and the reasons for approving the NLIP Landside Improvements Phase 2 Project in spite of the potential for associated significant and unavoidable adverse impacts.

## VII. RECIRCULATION NOT REQUIRED

No significant new information was added to the Draft SEIR as a result of the public comment process. The Final SEIR responds to comments, and clarifies, amplifies and makes insignificant modifications to the Draft SEIR. The Final SEIR does not identify any new significant effects on the environment or a substantial increase in the severity of an environmental impact requiring major revisions to the SEIR. Therefore, recirculation of the SEIR is not required.

## VIII. RECORD OF PROCEEDINGS

Various documents and other materials constitute the record of proceedings upon which the Board bases its findings contained herein. The record of proceedings is located in the offices of the Clerk of the Sacramento Area Flood Control Agency, 1007 Seventh Street, 7th Floor, Sacramento, California 95814.

## IX. SUMMARY

A. Based on the foregoing Findings and the information contained in the record, the Board has made one or more of the following Findings with respect to each of the significant environmental effects of the NLIP Landside Improvements Phase 2 Project:

1. Changes or alterations have been required in, or incorporated into, the NLIP Landside Improvements Phase 2 Project that avoid or substantially lessen the significant environmental effects identified in the Final SEIR.

2. To the extent that such changes or alterations are within the responsibility and jurisdiction of another public agency and not SAFCA, those changes or alterations have been, or can and should be, adopted by that other agency.

3. Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities

for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report.

B. Based on the foregoing Findings and the information contained in the record, it is determined that:

1. All significant effects on the environment due to the approval of the NLIP Landside Improvements Phase 2 Project have been eliminated or substantially lessened where feasible.

2. Any remaining significant effects on the environment found to be unavoidable are acceptable due to the factors described in the Statement of Overriding Considerations in Section V, above.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
CENTRAL VALLEY FLOOD PROTECTION BOARD

RESOLUTION NO. 2009-07

FINDINGS AND DECISION AUTHORIZING ISSUANCE OF
ENCROACHMENT PERMIT NO. 18159-2
NATOMAS CROSS CANAL SOUTH LEVEE PHASE II IMPROVEMENTS
AND
ENCROACHMENT PERMIT NO. 18159-3
SACRAMENTO RIVER EAST LEVEE PHASE I IMPROVEMENT PROJECT
REACHES 1 THROUGH 4A
SACRAMENTO AREA FLOOD CONTROL AGENCY
SUTTER AND SACRAMENTO COUNTIES

**WHEREAS,** the Sacramento Area Flood Control Agency ("SAFCA") has begun a multi-year Natomas Levee Improvement Program; and

**WHEREAS**, SAFCA as lead agency under the California Environmental Quality Act, Public Resources Code sections 21000 *et seq*. ("CEQA") prepared an Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project ("EIR") (incorporated herein by reference and available at the Central Valley Flood Protection Board offices or SAFCA offices); and

**WHEREAS**, SAFCA, as lead agency, certified the EIR, adopted mitigation measures and a Mitigation Monitoring Reporting Plan ("MMRP") (incorporated herein by reference and available at the Central Valley Flood Protection Board or at SAFCA), approved findings and a statement of overriding considerations pursuant to CEQA and the CEQA Guidelines (incorporated herein by reference); and approved the Project as identified in Alternative 1of the EIR; and

**WHEREAS**, SAFCA submitted Application No. 18159-2 to the Reclamation Board on November 7, 2007, and submitted an updated application to the Central Valley Flood Protection Board on January 13, 2009. The application proposes to place fill to raise and realign approximately 28,750 linear feet of levee and to construct approximately 19,050 linear feet of seepage cutoff wall along the left (south) project levee.

**WHEREAS,** SAFCA submitted Application No. 18159-3 to the Reclamation Board on November 7, 2007, and submitted an updated application to the Central Valley Flood Protection Board on January 13, 2009. The application proposes to construct approximately 11,000-linear-feet of seepage cutoff wall at 20 to 63-feet in depth, construct approximately 8,100-linear-feet of seepage berm varying in width from 100 to 300-feet-wide, and construct a 18,800-linear-foot setback levee 3-foot-higher than the existing levee on the landside slope of the existing left (east) bank levee.

**WHEREAS,** on January 1, 2008, the new Central Valley Flood Protection Board came into being, and succeeded to all of the responsibilities of the former Reclamation Board; and

**WHEREAS,** on January 18, 2008, the Central Valley Flood Protection Board held a hearing on Application 18159-2, adopted CEQA Findings and a Statement of Overriding Considerations, and conditionally approved the proposed permit subject to 33 U.S.C. 408 approval by the U.S. Army Corps of Engineers.

**WHEREAS,** on March 21, 2008, the Central Valley flood Protection Board held a hearing on Application 18159-3, adopted CEQA Findings and a Statement of Overriding Considerations, and conditionally approved the proposed permit subject to 33 U.S.C. 408 approval by the U.S. Army Corps of Engineers.

**WHEREAS,** since the events above, SAFCA proposed modifications to the Phase 2 Project.

**WHEREAS,** SAFCA prepared a Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project – Phase 2 Project (State Clearinghouse No. 2007062016) ("SEIR"), which analyzes the modifications to the Phase 2 Project, which are fully described in Chapter 2 of the November 2008 Draft SEIR, as amended by the January 2009 Final Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project – Phase 2 Project (together, the "Final SEIR"). The SEIR is available at http://www.safca.org/Programs_Natomas.html and http://www.cvfpb.ca.gov/meetings/2009/03-27-2009.cfm or at SAFCA and Board offices.

**WHEREAS,** the Draft SEIR was published on November 18, 2008, for a 45-day public review period that ended on January 2, 2009. In addition, members of the public were invited by formal public notice to submit comments on the Draft SEIR in testimony at a public hearing held for that purpose on December 11, 2008. Additional public comments were received at this hearing.

**WHEREAS,** the Final SEIR was published in January, 2009. SAFCA also prepared a Mitigation Monitoring and Reporting Program (MMRP). On January 29, 2009, the SAFCA Board certified the Final SEIR, made CEQA Findings, and adopted a Statement of Overriding Considerations and approved the modifications to the Phase 2 project (Exhibit A to SAFCA Resolution 09-022).

**WHEREAS,** the Director of Civil Works for the U.S. Army Corps of Engineers, based on his review of the 33 U.S.C. 408 recommendation package, the Final Environmental Impact Statement, the views of other Federal, State, and local agencies, and input from the public, found that the recommended Natomas Levee Improvement Program Phase 2 project to be technically adequate and not an impairment to the usefulness of existing Federal project; to be in accordance with environmental statutes; to be without significant adverse hydraulic impacts; and to not be injurious to the public interest.

**WHEREAS,** the Director of Civil Works for the U.S. Army Corps of Engineers approved the request under 33 U.S.C. 408 made by the State of California Central Valley Flood Protection Board on behalf of SAFCA to alter the Sacramento River Flood Control Project by construction of the Natomas Levee Improvement Program Phase 2 Project.

**WHEREAS,** the Central Valley Flood Protection Board has conducted a hearing and has reviewed the updated applications, the Reports of its staff, the documents and correspondence in its file, and the environmental documents prepared by SAFCA;

NOW, THEREFORE, BE IT RESOLVED THAT,

**Findings of Fact.**

1. The Central Valley Flood Protection Board hereby adopts as findings the facts set forth in the Staff Report.

2. The Board has reviewed the Figures, Attachments, and References listed in the Staff Report.

**CEQA Findings.**

3. The Central Valley Flood Protection Board, as a responsible agency, has independently reviewed the analysis in the SEIR, MMRP, and the findings prepared by the lead agency, SAFCA, and has reached its own conclusions regarding them.

4. The Central Valley Flood Protection Board, after consideration of the SEIR, and SAFCA findings, adopts the project description, analysis and findings in the SEIR and SAFCA Findings which are relevant to activities authorized by issuance of final encroachment permits consistent with Draft Permit No. 18159-2, Natomas Cross Canal South Levee Phase II Improvements, and Draft Permit No. 18159-3, the Sacramento River East Levee Phase I Improvement Project, Reaches 1 Through 4A.

5. **Findings regarding significant impacts**. Pursuant to CEQA Guidelines sections 15096(h) and 15091, the Central Valley Flood Protection Board determines that the SAFCA Findings, attached to the Staff Report, and incorporated herein by reference, summarize the SEIR's determinations regarding impacts of the modifications to the Phase 2 Project before and after mitigation. Having reviewed the SEIR and the SAFCA Findings, the Central Valley Flood Protection Board makes its findings as follows:

a. **Findings regarding Significant and Unavoidable Impacts.**

The Central Valley Flood Protection Board finds that the modifications to the Phase II Project may have the following significant, unavoidable impacts, as more fully described in the SEIR and the SAFCA Findings. Mitigation has been adopted for each of these impacts,

although it does not reduce the impact to less than significant. The impacts and mitigation measures are set forth in more detail in the SEIR and SAFCA Findings.

A. Impact 3.4-b. Potential Construction Impacts on Cultural Resource CA-SAC-485/H

**Mitigation Measure 3.4-b: Avoid Ground Disturbance near Known Archeological Site CA-Sac-485/H to the Extent Feasible and Prepare and Implement a Historic Properties Treatment Plan.**

B. Impact 3.4-c. Damage to or Destruction of Other Identified Prehistoric Cultural Resources

**Mitigation Measure 3.4-c: Evaluate NLIP-7 and NLIP-22. If the Resources are Eligible, Avoid Disturbance to the Extent Feasible, and Prepare and Implement a Historic Properties Treatment Plan.**

C. Impact 3.4-d. Damage to or Destruction of Previously Undiscovered Cultural Resources

**Mitigation Measure 3.4-d: Conduct Additional Backhoe and Canine Forensic Investigations As Appropriate**

D. Impact 3.4-e. Damage to or Destruction of Previously Undiscovered Interred Human Remains

**Mitigation Measure 3.4-e: Halt Work Within 50 Feet of the Find, Notify the County Coroner and Most Likely Descendant, and Implement Appropriate Treatment of Remains**

E. Impact 3.5-a. Generation of Temporary, Short-Term Construction Noise

**Mitigation Measure 3.5-a: Implement Noise-Reducing Construction Practices, Prepare and Implement a Noise Control Plan, and Monitor and Record Construction Noise Near Sensitive Receptors.**

**Finding**: The Board finds that changes or alterations have been required in, or incorporated into, the project which substantially lessen such impacts, as set forth more fully in the SAFCA Findings, but that each of the above impacts remains significant after mitigation. Such mitigation measures are within the responsibility of another agency, SAFCA, and SAFCA can and should implement the described mitigation measures. Specific economic, legal, social, technological or other considerations, rendered infeasible mitigation or alternatives that would have reduced these impacts to less than significant.

**b. Findings regarding significant impacts that can be reduced to less-than significant.**

The Final SEIR identifies the following significant impacts associated with the modifications to the Phase 2 Project. These impacts are reduced to a less-than-significant level by mitigation measures identified in the Final SEIR and incorporated into the project. It is hereby determined that the impacts addressed by these mitigation measures will be mitigated to a less-than-significant level or avoided by incorporation of these mitigation measures into the project.

A. Impact 3.2-a. Possible Effects on Water Quality from Stormwater Runoff from Garden Highway Drainage Outlets to the Sacramento River

**Mitigation Measure 3.2-a: Implement Standard Best Management Practices and Comply With NPDES Permit Conditions.**

B. Impact 3.3-a. Loss of Sensitive Habitats

**Mitigation Measure 3.3-a: Minimize Effects on Sensitive Habitats; Develop and Implement a Habitat Management Plan to Ensure Compensation for Unavoidable Adverse Effects; Comply with Section 404, Section 401, and Section 1602 Permit Processes; and Implement all Permit Conditions.**

C. Impact 3.3-b. Disturbance and Loss of Giant Garter Snake Habitat

**Mitigation Measure 3.3-b: Minimize the Potential for Direct Loss of Giant Garter Snake Individuals, Develop a Management Plan in Consultation with USFWS and DFG, and Obtain Incidental Take**

D. Impact 3.3-c. Loss of Swainson's Hawk Habitat and Potential Disturbance of Nests

**Mitigation Measure 3.7-f: Minimize Potential Impacts on Swainson's Hawk, Monitor Active Nests during Construction, Develop a Management Plan in Consultation with DFG, and Obtain Incidental Take Authorization.**

E. Impact 3.4-a. Changes to Elements of RD 1000, which Consists of a Rural Historic Landscape District That is Eligible for Listing on the NRHP

**Mitigation Measure 3.4-a: Incorporate Mitigation Measures to Documents Regarding Any Elements Contributing to RD 1000 and Distribute the Information to the Appropriate Repositories.**

**Finding.** The Board finds that changes or alterations have been required in, or incorporated into, the project which substantially lessen such impacts, as set forth more fully in the

SAFCA Findings, which describe the mitigation measures for each impact in detail. With such mitigation, each of the significant impacts will be reduced to less-than-significant. Such mitigation measures are within the responsibility of another agency, SAFCA, and SAFCA can and should implement the described mitigation measures.

6. As a responsible agency, the Central Valley Flood Protection Board has responsibility for mitigating or avoiding only the direct or indirect environmental effects of those parts of the Project which it decides to carry out, finance, or approve. The Board confirms that it has reviewed the MMRP, and confirmed that SAFCA has adopted and committed to implementation of the measures identified therein. The Board agrees with the analysis in the MMRP and confirms that there are no feasible mitigation measures within its powers that would substantially lessen or avoid any significant effect the project would have on the environment. None of the mitigation measures in the MMRP require implementation by the Board directly, although continued implementation of the MMRP shall be made a condition of issuance of the Encroachment Permit. However, the measures in the MMRP may be modified to accommodate changed circumstances or new information not triggering the need for subsequent or supplemental analysis under CEQA Guidelines sections 15062 or 15063.

7. **Statement of Overriding Considerations.** Pursuant to CEQA Guidelines sections 15096(h) and 15093, the Board has balanced the economic, social, technological and other benefits of the Project described in application Nos. 18159-2 and 18159-3, against its significant and unavoidable impacts, listed in paragraph 5 (a) above, and finds that the benefits of the Project outweigh these impacts and they may, therefore, be considered "acceptable".

The Central Valley Flood Protection Board finds that there is an immediate need to protect the people and property at risk in the project area. The Natomas Basin floodplain is occupied by over 83,000 residents and $10 billion in damageable property. The area is presently vulnerable to flooding in a less than 100-year flood event along the Sacramento River or American River. The Natomas Basin is a deep floodplain and depending on the circumstances, flood depths in the Natomas Basin could reach life-threatening levels. The disruption in transportation that would result from a major flood would affect the Sacramento International Airport, interstate and state highways, and rail service.

The health and safety benefits of the project, which would significantly reduce the risk of an uncontrolled flood in the Natomas Basin that would result in a catastrophic loss of property and threat to residents of the area, outweigh the remaining unavoidable environmental impacts.

8. **Custodian of Record**. The custodian of the CEQA record for the Board is its Executive Officer, Jay Punia, at the Central Valley Flood Protection Board Offices at 3310 El Camino Avenue, Room LL40, Sacramento, California 95821.

**Findings pursuant to Water Code section 8610.5**

9. **Evidence Admitted into the Record.** The Board has considered all the evidence presented in this matter, including the original and updated applications, past and present Staff Reports and attachments, the original Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project (Draft and Final Versions), the Supplement to the NLIP EIR (SEIR) (Draft and Final versions), the original and supplemental MMRP, the SAFCA Findings, the Corps of Engineers' Investigation Results on the Natomas Levees, transcripts of evidentiary hearings on permit applications 18159-2 and 18159-3 held at the Central Valley Flood Protection Board meetings on December 21, 2007, January 18, 2008, March 21, 2008 and March 27, 2009. The Board has also considered evidence from the U.S. Army Corps of Engineers presentation at the January 2008 meeting, and all letters and other correspondence received by the Board and in the Board's files related to this matter.

The custodian of the file is Executive Officer Jay Punia at the Central Valley Flood Protection Board.

10. **Best Available Science.** In making its findings, the Board has used the best available science relating to the issues presented by all parties. On the important issue of hydraulic impacts and the computed water surface profiles, SAFCA used the UNET one-dimensional unsteady flow model developed by the USACE for the Sacramento-San Joaquin Comprehensive Study. The model is considered by many experts as one of the best available scientific tools for the purpose of modeling river hydraulics, including flood control system simulations and water surface profile computations.

11. **Effects on State Plan of Flood Control.** This project has positive effects on the State Plan of Flood Control as it includes features that will provide 200-year protection to the Natomas Basin. The Board found (through prior Resolutions 2008-2 and 2008-4) that the hydraulic impacts of the proposed Natomas Cross Canal and Sacramento River East Levee Improvements, as computed using the UNET model, on the entire State Plan of Flood Control, are not significant. Those findings included landside levee raises, adjacent setback levees, seepage berms, and drainage collection systems. The Board now also finds that no changes in project design from the 60 percent to 100 percent levels result in negative hydraulic impacts on the entire State Plan of Flood Control.

On January 21, 2009 the U.S. Army Corps of Engineers issued "Record of Decision, 408 Permission and Department of the Army 404 Permit to Sacramento Area Flood Control Agency for the Natomas Levee Improvement Project". This approval, pursuant to U.S.C. Title 33, Chapter 9, Subchapter 1, Section 408 included the Natomas Cross Canal South Levee Phase 2 project (included in encroachment permit 18159-2) and the Sacramento River East Levee Phase 1 project (included in encroachment permit 18159-3). This permission was granted based upon Corps determination that such alterations will not be injurious to the public interest and will not impair the usefulness of the Sacramento River Flood Control Project.

In California Statutes of 2007, Chapter 641 (SB276), the Legislature found and declared that "The projects authorized in Section 12670.14 of the Water Code [which includes the Natomas Cross Canal South Levee Phase II Improvements and the Sacramento River East Levee Phase I Improvement Project, Reaches 1 Through 4A work] will increase the ability of the existing flood control system in the lower Sacramento Valley to protect heavily urbanized areas within the City of Sacramento and the Counties of Sacramento and Sutter against very rare floods without altering the design flows and water surface elevations prescribed as part of the Sacramento River Flood Control Project or impairing the capacity of other segments of the Sacramento River Flood Control Project to contain these design flows and to maintain water surface elevations. Accordingly, the projects authorized in that section will not result in significant adverse hydraulic impacts to the lands protected by the Sacramento River Flood Control Project and neither the Central Valley Flood Control Board nor any other state agency shall require the authorized projects to include hydraulic mitigation for these protected lands."

12. **Effects of reasonably projected future events.** The impact of climate change on future hydrology and floodplain conditions is discussed in the original Draft EIR at pages 3.11-12 to 3.11-13. An increase in precipitation due to climate change "could lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring could flow into the Central Valley concurrently with winter storm events" thus placing more pressure on California's levee/flood control system. The impact of greenhouse gases is acknowledged and discussed in the DEIR in Section 4.2.5.6 at page 4-18. Proposed development projects in the Natomas Basin are discussed beginning on page 4-11 of the DEIR. In addition, the DEIR discusses the Master Plan for the Sacramento International Airport., beginning on page 4-9 of the DEIR. Thus, improved levees will not only benefit existing residents, they will permit additional planned development, and airport expansion.

**Other Findings/Conclusions regarding Issuance of the Permit.**

13. Based on the foregoing, and particularly on the evidence that the condition of the existing Natomas levees poses an unacceptable risk to life and property, the Board finds and concludes that the issuance of the Encroachment Permits Nos. 18159-2 and 18159-3 for the Natomas Cross Canal South Levee Phase II Improvements and Sacramento River East Levee Phase I Improvement Project, Reaches 1 Through 4A, as modified, is in the public interest.

14. This resolution shall constitute the written decision of the Central Valley Flood Protection Board in the matter of Permits Nos. 18159-2 and 18159-3.

**Approval of Permits.**

15. Based on the foregoing, the Central Valley Flood Protection Board hereby approves the modifications to the NLIP Phase II Project and approves issuance of Encroachment Permits in substantially the form provided as Attachments A and B of the Staff Report.

16. The Board directs the Executive Officer to take the necessary actions to prepare and execute the permits and related documents and to prepare and file a Notice of Determination under the California Environmental Quality Act for the Natomas Levee Improvement Program, Landside Improvements Project, Natomas Cross Canal South Levee Phase II Improvements and Sacramento River East Levee Phase I Improvement Project, Reaches 1 Through 4A.

DATED: 3-27-09

THE CENTRAL VALLEY FLOOD PROTECTION BOARD OF THE STATE OF CALIFORNIA

By _____
Benjamin F. Carter
President

By _____
Maureen R. Doherty
Secretary