

CALIFORNIA HIGH-SPEED TRAIN

DRAFT

Merced to Fresno Section Compensatory Mitigation Plan

February 2012



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Merced to Fresno Section
Draft
Compensatory Mitigation Plan

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Acronyms and Abbreviations

Authority	California High-Speed Rail Authority
BA	biological assessment
BNSF	Burlington Northern Santa Fe
CDFG	California Department of Fish and Game
CEHC	California Essential Habitat Connectivity
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CMP	Compensatory Mitigation Plan
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRAM	California Rapid Assessment Method
CWHR	California Wildlife Habitat Relationship
CWMW	California Wetlands Monitoring Workgroup
DOC	California Department of Conservation
ECA	environmental connectivity area
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
FRA	Federal Railroad Administration
GIS	geographic information system
HMLA	Habitat Management Land Acquisition
HST	High-Speed Train
HUC	hydrologic unit code
LEDPA	least environmentally damaging practicable alternative
MSIP	Mitigation Strategy and Implementation Plan
NEPA	National Environmental Policy Act

NHD	National Hydrography Dataset
NMFS	National Marine Fisheries Service
NRCS	Natural Resource Conservation Service
RWQCB	regional water quality control board
SR	state route
SWRCB	State Water Resources Control Board
TPSS	traction supply power stations
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WRAPP	Wetland and Riparian Area Protection Policy

1.0 Introduction

This Compensatory Mitigation Plan (CMP) provides the methods and a foundation for the mitigation options that are available to offset the loss of sensitive natural resources for the Merced to Fresno Section of the California High-Speed Train (HST) System. The CMP has been prepared in anticipation of the federal and state agency requirements of the United States Army Corps of Engineers (USACE), State Water Resources Control Board (SWRCB), U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFG). To accomplish this, the CMP summarizes the overall objectives of the mitigation plan, mitigation planning to date, field surveys conducted, and anticipated project-related effects on jurisdictional waters, including wetlands and special status plants and wildlife. The CMP discusses each agency's mitigation guidelines and requirements, particularly those related to the resources affected by the Merced to Fresno Section. A mitigation strategy is presented, with a more robust discussion provided in Section 5.0, which details the options and methods for considering mitigation/conservation banks, in-lieu fee programs, and permittee-responsible mitigation. The methods that are discussed include site selection, the use of the California Rapid Assessment Method (CRAM), field reconnaissance survey tools, and recommended mitigation options by resource. In addition, the CMP provides an inventory of banks and projects in the area that can provide compensatory mitigation for offsetting effects.

All proposed compensatory mitigation will be finalized through agency oversight and comment. Only mitigation projects and programs with agency approval will be used to fulfill mitigation requirements.

The next step is the preparation of a detailed and specific mitigation proposal, the Mitigation Strategy and Implementation Plan (MSIP), which will build upon information presented in this initial CMP. The MSIP will present the mitigation proposal for mitigating effects on sensitive habitats, plants, and wildlife resulting from construction of the preferred alternative and will provide a proposal detailing the location where mitigation is proposed to occur in accordance with regulatory agency requirements and standards. The MSIP will quantify the acres/credits used to offset project effects. The overall mitigation strategy will consider the structural requirements of the agencies, use of umbrella species to provide mitigation for other species with similar habitat requirements, and the mitigation commitments of the Merced to Fresno Section Environmental Impact Report/Environmental Impact Statement (EIR/EIS). The MSIP will also use land acquisition strategies that consider watershed-level effects when proposing mitigation, giving priority to areas that provide habitat connectivity and those areas with upland and wetland restoration and creation potential. In addition, onsite mitigation for temporary effects will be employed to offset those effects that occur within the construction footprint; the previous biological functions and values of these sites will be restored with proper landscape treatment and protective measures. The measure of restoration success, which is highlighted more thoroughly in Section 5.0 of the MSIP, will be through the use of measurable and applicable performance standards that help in the assessment of the success of restoration efforts over time. In addition, preparation of a site implementation plan, long-term monitoring and maintenance plan, incorporation of adaptive management measures, and contingency measures will be included in the overall mitigation proposal.

The remainder of Section 1.0 of the CMP describes the purpose, content, and next steps for the Merced to Fresno Section of the California HST Project, as well as the project objectives and organization of this CMP. This section also describes the proposed project, the project history, and the project's consultation history.

1.1 Draft Compensatory Mitigation Plan Objectives

The primary objective of this CMP is to identify mitigation options to offset environmental losses resulting from unavoidable effects on sensitive natural resources from the Merced to Fresno Section of the HST System. In accordance with agency guidance, such as from USACE, USFWS, CDFG, and SWRCB, this mitigation plan has been prepared with the intent of maximizing available mitigation and conservation credits and opportunities for mitigation; providing for regional variations in resource conditions, functions, and values; and applying equivalent standards to each type of compensatory mitigation. The

compensatory mitigation options under consideration will be evaluated based on their likelihood for ecological success and sustainability, their location relative to the impact site, their significance within the local and/or regional landscape of the Central Valley, and their anticipated costs. The compensatory mitigation requirements will be commensurate with the amounts and types of effects on resources that are associated with their specific permits and permitting agencies.

The components of this Draft CMP are under development conceptually at this early stage in the compensatory mitigation planning process and present the methods for mitigation of resources effects. As additional compensatory mitigation opportunities are identified and following publication of the Final EIR/EIS, selection of the Least Environmentally Damaging Practicable Alternative (LEDPA), and continued agency coordination, these components will be further refined for the MSIP.

1.2 Project Description

The Merced to Fresno Section of the HST System would vary in length from 74 to 95 miles (California High-Speed Rail Authority and Federal Railroad Administration [Authority and FRA 2011a), depending on the alternative and design option. This includes consideration for the wyes. To comply with the Authority's policy to use existing transportation corridors where feasible, the Merced to Fresno Section would be primarily adjacent to the existing State Route (SR) 99 and UPRR or BNSF Railway right-of-way. Alternative alignments are being considered where engineering constraints require deviation from the existing railroad corridor and to avoid environmental effects.

The Merced to Fresno Section would cross both urban and rural lands and include a station in both Merced and Fresno, and traction power facilities along the alignment. The HST alignment would be entirely grade-separated, meaning that crossings with roads, railroads, and other transport facilities would be at different heights (overpasses or underpasses) so that the HST would neither interrupt nor interface with other modes of transport. The Merced to Fresno Section would include at-grade, below-grade, and elevated track segments.

1.3 Project Elements

This section discusses the physical elements of the Merced to Fresno Section. These include the trainsets that may be used, HST stations (the Downtown Merced and Fresno stations), the electrical system, and control and maintenance facilities.

1.3.1 Trainsets

The HST System would be designed for the operation of trainsets ranging from 8 to 16 cars, 660 to 1,320 feet in length, designed to operate at a top speed of 220 miles per hour. The current design preference is for a single-level train.

1.3.2 Rail Line

The Merced to Fresno Section would consist of a fully dedicated rail line, constructed from continuous welded steel rail. The Merced to Fresno Section would use four different track profiles: low, near-the-ground tracks are at-grade; higher tracks are elevated or on retained earth; and below-grade tracks are in a retained cut. Types of bridges that might be built include full channel spans, large box culverts, or, for some larger river crossings, piers within the ordinary high-water channel.

1.3.3 High-Speed Train Stations

Stations would be sited and designed to allow for connection to local transit, airports, and highways; to maximize the use of existing transportation corridors and rights-of-way; and to develop a practical and economically viable transportation system. The Downtown Merced and Downtown Fresno station areas would each occupy several blocks that would contain station plazas, drop-offs, a multimodal transit center, and parking structures. The areas would include the station platform and associated building and

access structure, as well as lengths of platform tracks to accommodate local and express service at the stations. As currently proposed, both the Downtown Merced and Downtown Fresno stations would be at-grade, including all trackway and platforms, passenger services and concessions, and back-of-house functions.

All stations would contain the following elements:

- Station buildings of 40,000 to 60,000 square feet that are two to three stories high and contain passenger boarding platforms, ticketing, waiting areas, passenger amenities, employee areas, and baggage and freight handling areas.
- Parking structures of 5 to 8 acres in Merced and Fresno.
- Waiting areas and queuing space for taxis and shuttle buses.
- Pedestrian connections.

The HST stations in Downtown Merced and Fresno are described in more detail in Section 1.4.2.

1.4 HST Alternatives

This section describes the Merced to Fresno Section HST alternatives, starting with the north-south alignments of the UPRR/SR 99, BNSF, and Hybrid alternatives. Discussion of the HST alternatives begins with a single continuous alignment (the UPRR/SR 99 Alternative) from Merced to Fresno. Descriptions of the additional two alternatives that deviate from the UPRR/SR 99 Alternative for portions of the route then follow. The alternative alignments that deviate from the UPRR/SR 99 Alternative were selected to avoid environmental, land use or community issues identified for portions of the UPRR/SR 99 Alternative (Figure 1-1). The Downtown Merced and Downtown Fresno HST stations are described in Section 1.4.2.

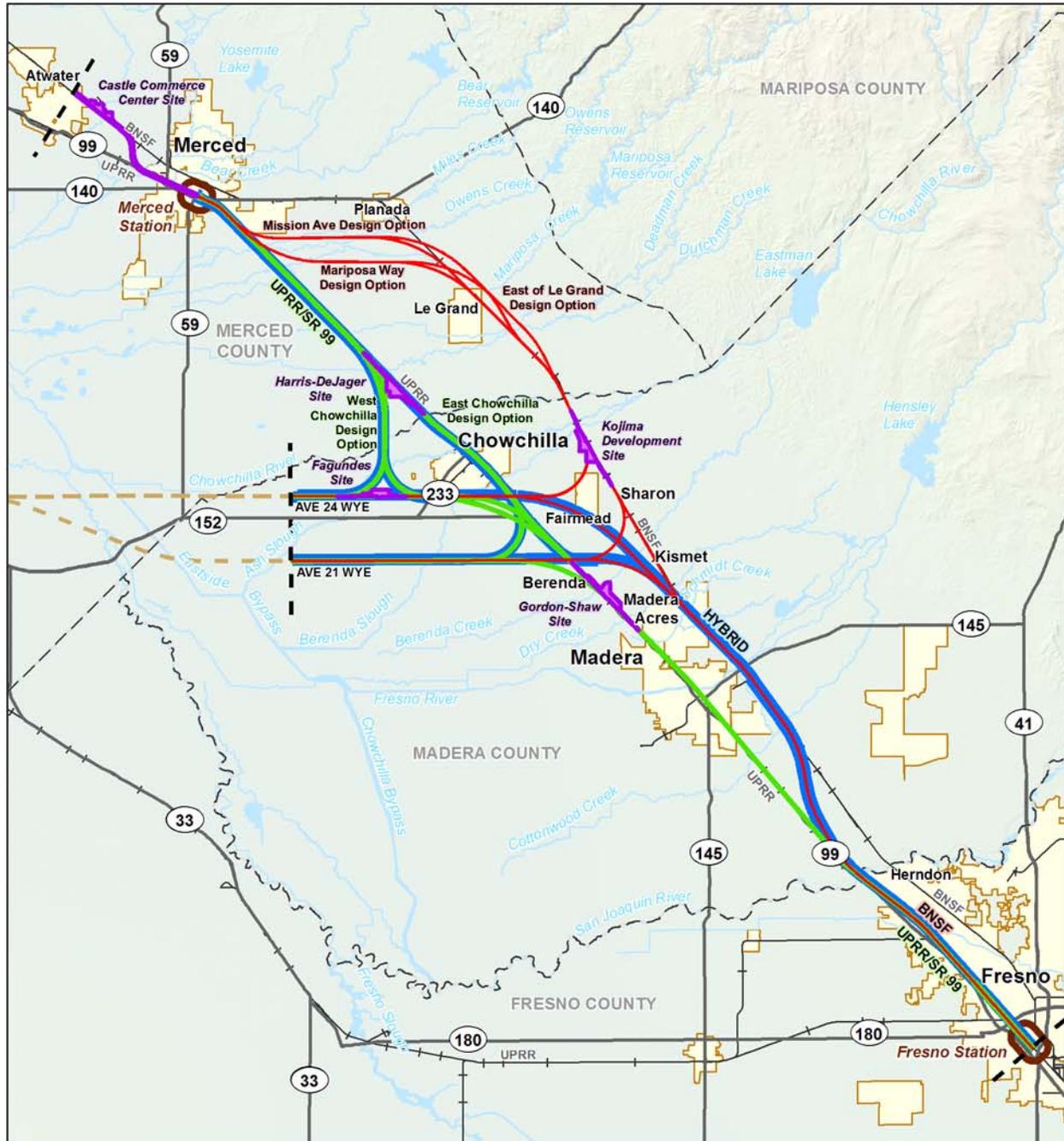
1.4.1 North-South Alignments

1.4.1.1 UPRR/SR 99 Alternative

The UPRR/SR 99 Alternative alignment would extend approximately 88 miles from Merced to Fresno and would lie adjacent to the UPRR Railway and SR 99 route to the extent feasible (Figure 1-1). The UPRR/SR 99 Alternative would have more guideway adjacent to existing transportation corridors than the other alternatives, and would provide the shortest potential (West Chowchilla design option) guideway length and fastest travel (Ave 21 Wye) as part of the Phase 1 San Francisco to Los Angeles travel time requirements. The UPRR/SR 99 Alternative would extend through Chowchilla and Madera, where stations are not proposed. As shown in Figure 1-1, this alternative would require several crossings of UPRR and SR 99, some of which would require modification of SR 99 interchanges.

Generally, the UPRR/SR 99 Alternative would have more elevated structures crossing the UPRR and SR 99 than the other alternatives. Because this alignment closely parallels UPRR and SR 99, a series of straddle bents would support several difficult and lengthy UPRR and SR 99 crossings. The UPRR/SR 99 Alternative would be the most expensive to build as a result. The West Chowchilla design option would reduce the number of elevated structures compared to other options within the UPRR/SR 99 Alternative.

The West Chowchilla design option would also reduce the cost of the UPRR/SR 99 Alternative because of the substantially shorter length of at-grade guideway and elevated guideway. The UPRR/SR 99 Alternative would have fewer road closures than the BNSF Alternative or the Hybrid Alternative because of its extensive elevation adjacent to UPRR and SR 99.



MF_PERMIT_CMP_01 Oct 03, 2011



Figure 1-1
 Merced to Fresno Section
 HST Alignments

1.4.1.2 BNSF Alternative

The BNSF Alternative would be adjacent to existing transportation corridors (BNSF railroad tracks) for a portion of its alignment; however, as shown on Figure 1-1, it would deviate from the BNSF railway between Merced and Le Grand and then again south of Madera Acres to rejoin the UPRR/SR 99 Alternative. Generally following the BNSF railway from Merced to Madera, where the alternative diverges from the UPRR/SR 99 Alternative, this alternative would travel in an alignment ranging from 2 to 5 miles west of SR 99. This would be approximately 2 to 9 miles longer than the UPRR/SR 99 Alternative (with the East Chowchilla design option, depending on the wye connection associated with each alternative), and result in a longer travel time. In addition, the HST alignments would require much larger radius curves than the existing BNSF railway. As a result, near BNSF railway curves, the HST guideway would veer away from the BNSF tracks to allow for larger curvatures before rejoining the BNSF corridor. The BNSF Alternative would pass through rural areas and, therefore, would require fewer modifications to major roads, interchanges, or city businesses and industries in Chowchilla and Madera than the UPRR/SR 99 Alternative.

1.4.1.3 Hybrid Alternative

The Hybrid Alternative, like the BNSF Alternative, would be adjacent to existing transportation corridors for a portion of its alignment, but would deviate from these corridors between Chowchilla and Madera Acres and then again south of Madera Acres, as shown on Figure 1-1. Because it would follow the legs of the Ave 24 Wye, if that wye option were selected and would follow the portion of the BNSF corridor closest to the UPRR corridor under both the Ave 24 and Ave 21 wye connections, the Hybrid Alternative would be shorter than all other alternatives, except the UPRR/SR 99 Alternative with the West Chowchilla design option. The Hybrid Alternative would avoid effects on the community of Le Grand, the City of Chowchilla and its development plans, and Downtown Madera.

The Hybrid Alternative would have the shortest length of elevated guideway among the three alternatives and would be the least expensive. The Hybrid Alternative, similar to the BNSF Alternative, would pass through more rural areas.

1.4.2 HST Stations

1.4.2.1 Downtown Merced Station

The Downtown Merced Station would be between Martin Luther King Jr. Way to the northwest and G Street to the southeast. The station would be accessible from both sides of the UPRR, but the primary station house would front 16th Street. The major access points from SR 99 include V Street, R Street, Martin Luther King Jr. Way, and G Street. Primary access to the parking facility would be from West 15th Street and West 14th Street, just one block east of SR 99. The closest access to the parking facility from the SR 99 freeway would be R Street, which has a full interchange with the freeway. The site proposal includes a parking structure that would have the potential for up to 6 levels with a capacity of approximately 2,250 cars and an approximate height of 50 feet.

1.4.2.2 Downtown Fresno Station Alternatives

There are two station alternatives under consideration in Fresno: the Mariposa Street Station Alternative and the Kern Street Station Alternative.

Mariposa Street Station Alternative

The Mariposa Street Station Alternative is located in Downtown Fresno, less than 0.5 mile east of SR 99. The station would be centered on Mariposa Street and bordered by Fresno Street on the north, Tulare Street on the south, H Street on the east, and G Street on the west. The station building would be approximately 75,000 square feet, with a maximum height of approximately 60 feet. The two-level station would be at-grade, with passenger access provided both east and west of the HST guideway and the UPRR tracks, which would run parallel with one another adjacent to the station. Entrances would be

located at both G and H Streets. The eastern entrance would be at the intersection of H Street and Mariposa Street, with platform access provided via the pedestrian overcrossing. The main western entrance would be located at G Street and Mariposa Street.

The majority of station facilities would be located east of the UPRR tracks. The station and associated facilities would occupy approximately 18.5 acres, including 13 acres dedicated to the station, bus transit center, surface parking lots, and kiss-and-ride accommodations. A new intermodal facility would be included in the station footprint on the parcel bordered by Fresno Street to the north, Mariposa Street to the south, Broadway Street to the east, and H Street to the west. The site proposal includes the potential for up to three parking structures occupying a total of 5.5 acres. Two of the three potential parking structures would each sit on 2 acres, and each would have a capacity of approximately 1,500 cars. The third parking structure would have a slightly smaller footprint (1.5 acres), with 5 levels and a capacity of approximately 1,100 cars. Surface parking lots would provide approximately 300 additional parking spaces.

Kern Street Station Alternative

The Kern Street Station Alternative for the HST station would also be in Downtown Fresno and would be centered on Kern Street between Tulare Street and Inyo Street. This station would include the same components and acreage as the Mariposa Street Station Alternative, but the station would not encroach on the historic Southern Pacific Railroad depot just north of Tulare Street and would not require relocation of existing Greyhound facilities. Two of the 3 potential parking structures would each sit on 2 acres and each would have a capacity of approximately 1,500 cars. The third structure would have a slightly smaller footprint (1.5 acres) and a capacity of approximately 1,100 cars. Like the Mariposa Street Station Alternative, the majority of station facilities under the Kern Street Station Alternative would be east of the HST tracks.

1.5 Power

To provide power for the HST, high-voltage electricity at 115 kilovolts and above would be drawn from the utility grid and transformed down to 25,000 volts. The voltage would then be distributed to the trains via an overhead catenary system. The project would not include the construction of a separate power source, although it would include the extension of power lines to a series of power substations positioned along the HST corridor. The transformation and distribution of electricity would occur in three types of stations:

- Traction power supply stations (TPSSs) transform high-voltage electricity supplied by public utilities to the train operating voltage. TPSSs would be sited adjacent to existing utility transmission lines and the HST right-of-way, and would be located approximately every 30 miles along the route. Each TPSS would be 200 feet by 160 feet.
- Switching stations connect and balance the electrical load between tracks, and switch power on or off to tracks in the event of a power outage or emergency. Switching stations would be located midway between, and approximately 15 miles from, the nearest TPSS. Each switching station would be 120 feet by 80 feet and located adjacent to the HST right-of-way.
- Switching and Paralleling stations, or autotransformer stations, provide voltage stabilization and equalize current flow. Paralleling stations would be located every 5 miles between the TPSSs and the switching stations. Each paralleling station would be 100 feet by 80 feet and located adjacent to the HST right-of-way.
- Back-up and emergency power supply sources include an emergency standby generator, an uninterruptable power supply, and/or a direct current battery system. For the Merced to Fresno Section HST project, permanent emergency standby generators are anticipated to be located at passenger stations and terminal layup/storage and maintenance facilities. These standby generators are required to be tested (typically once a month for a short duration) in accordance with National

Fire Protection Association 110/111 to ensure their readiness for back-up and emergency use. If needed, portable generators could also be transported to other trackside facilities to reduce the effect on system operations.

- Signaling and train control elements include small signal huts/bungalows within the right-of-way that house signal relay and microprocessor components, cabling to the field hardware and track, signals, and switch machines on the track. These would be located in the vicinity of track switches, and would be grouped with other power, maintenance, station, and similar HST facilities where possible.

1.6 Project Construction

Specific construction elements would include at-grade, below-grade, and elevated track, track work, grade crossings, and installation of a positive train control system. At-grade track sections would be built using conventional railroad construction techniques. A typical sequence includes clearing, grubbing, grading, and compacting of the rail bed; application of crushed rock ballast; laying of track; and installation of electrical and communications systems.

The precast segmental construction method is proposed for elevated track sections. In this construction method, large concrete bridge segments would be mass-produced at an onsite temporary casting yard. Precast segments would then be transported atop the already completed portions of the elevated track and installed using a special gantry crane positioned on the aerial structure. Although the precast segmental method is the favored technique for aerial structure construction, other methods may be used, including cast-in-place, box girder, or precast span-by-span techniques.

Pre-construction activities would be conducted during final design and include geotechnical investigations, identification of staging areas, initiation of site preparation and demolition, relocation of utilities, and implementation of temporary, long-term, and permanent road closures. Additional studies and investigations to develop construction requirements and worksite traffic control plans would be conducted as needed.

Major construction activities for the Merced to Fresno Section would include earthwork and excavation support systems construction, bridge and aerial structure construction, railroad systems construction (including trackwork, traction electrification, signaling, and communications), and station construction. During peak construction periods, work is envisioned to be underway at several locations along the route, with overlapping construction of various project elements. The Authority intends to build the project using sustainable methods that would:

- Minimize the use of nonrenewable resources.
- Minimize the effects on the natural environment.
- Protect environmental diversity.
- Emphasize the use of renewable resources in a sustainable manner.

The construction sequence and preliminary schedule for construction are provided in Table 1-1 and Table 1-2.

Table 1-1
 Construction Sequence

Activity	Tasks	Average Durations (months)
Right-of- Way Acquisition	Per Assembly Bill 3034, proceed with right-of-way acquisitions once State Legislature appropriates funds in the annual budget.	18 to 24
Survey & Preconstruction	Locate utilities, establish right-of-way and project control points and centerlines, establish or relocate survey monuments.	6 to 8
Mobilization and Site Preparation	Relocate utilities and clear and grub right-of-way (demolition); establish detours and haul routes; erect safety devices and mobilize special construction equipment; prepare construction equipment yards and stockpile materials; establish precast concrete segment casting yard.	8 to 12
Heavy Construction	Construct aerial structures, grade separations, highway realignments, surface streets; major facilities (maintenance, stations, etc.).	30 to 36
Medium Construction	Lay tracks, install drainage facilities, conduct backfilling operations, and perform street paving.	6 to 9
Light Construction	Systems installation and testing (train control systems, overhead contact system, communication system); traffic signals, street lighting, striping, closing of detours, and site clean-up.	12 to 18

Table 1-2
 Preliminary Construction Schedule

Activity	Estimated Schedule
Mobilization	July to October 2013
Site Preparation	July to August 2013
Earth Moving	August 2013 to August 2015
Construct Road Crossings	July 2013 to December 2018
Construct Elevated Structures	July 2013 to December 2017
Lay Track	January 2014 to August 2017
Systems	July 2016 to November 2018
Demobilization	August 2017 to December 2019
Merced Station	October 2014 to August 2019
Fresno Station	December 2014 to October 2019

1.7 Mitigation Planning History

1.7.1 Consultation History

The Authority and FRA coordinated with cooperating or participating federal, state, and local agencies under the National Environmental Policy Act (NEPA) and with trustee and responsible agencies under the California Environmental Quality Act (CEQA). To date, the Authority and FRA have held four statewide agency meetings. On June 13, 2007, and April 8, 2008, the Authority and FRA held statewide agency group meetings to discuss agency participation and coordination efforts for the project-level documents for the HST project. On July 29, 2009, the Authority and FRA held a statewide agency group meeting to provide an update on the project environmental review process, the status of project EIR/EIS reports, and project-level scoping comments from state and federal agencies. At this meeting, the Authority also requested agency review and comment on the Project EIR/EIS methodologies posted on the Authority web site. On December 13, 2010, the Authority held a statewide meeting to provide an update on the Central Valley sections of the HST System, including the Merced to Fresno Section. Federal and state representatives from the following agencies attended these meetings:

- Federal agencies:
 - Bureau of Land Management
 - Bureau of Reclamation
 - Federal Highway Administration
 - National Marine Fisheries Service
 - USACE
 - U.S. Environmental Protection Agency (EPA)
 - USFWS

- State agencies:
 - Air Resources Board
 - Caltrans
 - California Environmental Protection Agency
 - Central Valley Flood Protection Board
 - Coastal Commission
 - California Department of Conservation (DOC)
 - CDFG
 - Department of Parks and Recreation
 - Department of Water Resources
 - Natural Resources Agency
 - Office of Planning and Research/Strategic Growth Council
 - Public Utilities Commission
 - State Historic Preservation Office
 - Transportation Commission
 - State Lands Commission
 - SWRCB

1.7.1.1 Federal/State Endangered Species Act Consultation Summary

Coordination with the USFWS has been ongoing to discuss issues related to habitat assessment and protocol-level survey areas and methodology, wildlife corridors and passage design, conservation measures, mitigation banks, and future meeting schedules. Project biologists met on September 23 and November 5, 2009, and on February 10 and June 9, 2010. Initial meetings with the CDFG discussed methodology for studies. The biologists subsequently met with CDFG on June 7, 2010, to discuss listed species, streambed alteration, survey timelines, and mitigation strategies.

On March 14, 2011, the FRA sent a letter to USFWS and National Marine Fisheries Service (NMFS) advising that the Authority has been designated as the FRA's non-federal representative for the purposes of conducting informal Section 7 consultation on FRA activities associated with the California HST System.

On November 22, 2011, an agency coordination meeting was held at the CDFG Yolo Basin Wildlife Area office in Davis to discuss compensatory mitigation opportunities for the Merced to Fresno and Fresno to Bakersfield sections of the HST Project. The Authority presented information on potential permittee-responsible mitigation sites and approved conservation banks. Agencies in attendance or participating by phone included USACE, NMFS, EPA, CDFG, California Department of Parks and Recreation, and SWRCB.

On December 2, 2011, an agency coordination meeting took place in Sacramento to brief USFWS on compensatory mitigation opportunities for the Merced to Fresno and Fresno to Bakersfield sections of the HST Project. This meeting was scheduled by the Authority because USFWS was not able to participate in the November 22, 2011, agency coordination meeting.

1.7.1.2 Federal Fisheries Consultation Summary

The Authority initiated informal consultation with NMFS on September 23, 2009, to discuss potential effects from the Merced to Fresno Section of the HST project on special-status anadromous fishes pursuant to Section 7 of the federal Endangered Species Act (ESA), as well as the Magnuson-Stevens Fishery Conservation and Management Act.

On January 5, 2010, the Authority met with NMFS to discuss the Merced to Fresno Section of the HST project and agreed that additional information on the project should be gathered prior to determining whether proposed actions could potentially affect special-status anadromous fish. However, based on the current understanding of the types and extent of potential effects, it was initially determined that three fish species may need to be analyzed for potential effects: Central Valley steelhead (*Oncorhynchus mykiss*), Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), and Central Valley fall/late fall-run Chinook salmon.

On November 17, 2010, the Authority submitted a letter to NMFS that described the Merced to Fresno Section of the HST project and requested a list of species under NMFS jurisdiction that may be affected by the project or confirmation that no such species would be affected and that further consultation with NMFS is not required.

On February 11, 2011, a species list was received advising that Central Valley steelhead may occur in or downstream of the Merced to Fresno Section of the HST project. In addition, the letter indicated that Central Valley spring-run Chinook salmon will be introduced to the San Joaquin River no later than December 31, 2012, and that the project may affect their essential fish habitat.

On June 14, 2011, an agency coordination meeting took place that included representatives from USFWS, NMFS, CDFG, and EPA with the primary purpose of discussing the line of communication, time frame, and approach for preparing and submitting a Biological Assessment (BA).

On September 2, 2011, an agency coordination meeting took place to brief USFWS and NMFS on the content of the *Merced to Fresno Section Biological Resources and Wetlands Technical Report* (Authority and FRA 2011c), the BA approach, the summary of direct effects determination, and the overall schedule. Both USFWS and NMFS species were addressed and shared with USFWS and NMFS coordinating biologists.

1.7.2 Field Surveys

The potential for project effects on biological resources depends largely on the presence of suitable habitat in and adjacent to areas that would be affected by the project. Project biologists conducted field surveys to determine the presence or absence of biological resources and to document the location of any biological resources through habitat characterization and mapping. Habitat characterization and mapping were conducted throughout the study area where access was granted and where properties

were accessible. Where permission to enter was not granted, field crews used public roads and adjacent parcels to characterize and map biological resources. Visual surveys were conducted to compare background information with existing data and aerial signatures identified in high-resolution aerial imagery. The primary field surveys were conducted in 2011.

The *Merced to Fresno Section Biological Resources and Wetlands Technical Report* (Authority and FRA 2011c) provides detailed descriptions of the various methods employed during the field surveys for biological resources. The various field surveys were conducted according to the methodologies described in the *Central Valley Biological Resources and Wetlands Survey Plan* (Authority and FRA 2011b), which was prepared, in part, for the Merced to Fresno Section of the HST project.

1.7.2.1 Botanical Surveys

Field surveys for special-status plants were conducted during the growing season (March, April, and May) in accordance with the *California Native Plant Society (CNPS) Botanical Survey Guidelines* (CNPS 2001), the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996a), and the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009).

1.7.2.2 Special-Status Wildlife Species

Field surveys were conducted to map and identify the habitats (i.e., biological communities and land use cover types) in the Habitat Study Area in accordance with *A Guide to Wildlife Habitats of California* and the California Wildlife Habitat Relationship (CWHR) System (CDFG 1988; CDFG 2008). The CWHR System is a biological community-based model that associates California's wildlife species with standard habitats (e.g., biological communities that support plant and wildlife species) and rates suitability for reproduction, cover, and feeding. The field surveys were conducted to identify potentially suitable wildlife habitat for special-status wildlife species. Key habitat constituents mapped during field surveys included topography and the presence or absence of vegetative cover, foraging habitat, and migration barriers (i.e., canals and roadways). Focused surveys were not conducted. Detailed information, including recommendations for focused surveys, is presented in the *Merced to Fresno Section Biological Resources and Wetlands Technical Report* (Authority and FRA 2011c).

1.7.2.3 Jurisdictional Delineations

Jurisdictional delineations were conducted, consistent with the USACE protocol, during the summer of 2010 and winter of 2011 where land owners had granted access. The *Merced to Fresno Section Wetlands Delineation Report* (Authority and FRA 2011d) includes a complete discussion of the methods used in conducting the wetland delineation study.

Rivers, creeks, sloughs, and other aquatic features in the wetland study area were characterized and mapped using 1:4800 scale aerial photographs. Where access was granted, these surveys were conducted by walking the portion of the aquatic feature occurring within the wetland study area. Data recorded at each aquatic feature included information on channel characteristics and vegetation as well as adjacent riparian habitat.

1.7.2.4 Permit Status

The Merced to Fresno Section of the HST Project is in consultation with regulatory agencies on applicable federal and state applications.

2.0 Effects

This section describes the unavoidable temporary and permanent effects on biological resources, including jurisdictional waters, special-status plant species, special-status wildlife species, and habitats of concern, as well as agricultural resources in the project footprint. All effects reported represent the potential effect anticipated as a result of the proposed project activities. For a more detailed definition and description of the methods used to calculate effects on each resource, refer to Chapter 5 of the *Merced to Fresno Section Biological Resources and Wetlands Technical Report* (Authority and FRA 2011c).

The effects presented in this section pertain to those biological and agricultural resources that require offsite mitigation (described in further detail in Section 5.0). All effects are presented as either temporary¹ or permanent² and direct or indirect³, depending on the affected resource. Definitions of each type of effect are presented in each biological resource section below.

2.1 Jurisdictional Waters

For purposes of this discussion, wetlands, waters of the U.S., and waters of the state regulated by the federal government (USACE) and the State of California (SWRCB and CDFG) are collectively termed jurisdictional waters; however, the jurisdictional status of all water features will be confirmed by the USACE, SWRCB, and CDFG during the regulatory permitting process. Jurisdictional waters are expected to be verified through a Preliminary Jurisdictional Determination in the fall of 2011.

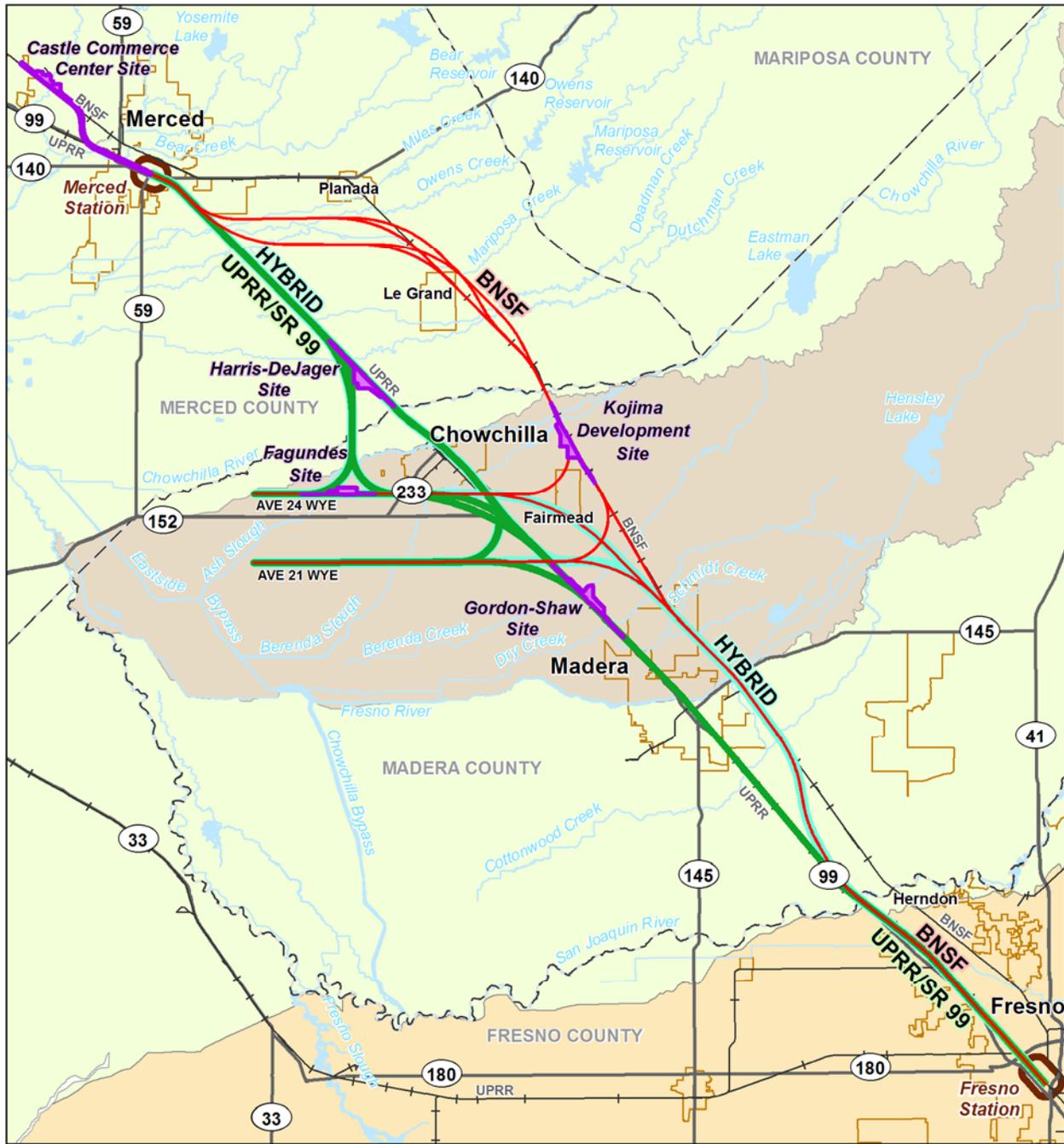
2.1.1 Hydrological Setting

The project is located in the San Joaquin River Basin, which drains to the Sacramento-San Joaquin Delta via the San Joaquin River and its major tributaries, the Fresno, Merced, Tuolumne, and Stanislaus rivers (California DWR 2004). Most watercourses in the San Joaquin Valley drain from east to west and eventually join the San Joaquin River. They include improved flood control or drainage channels, river and stream channels, and sloughs. Figure 2-1 shows the regional hydrology (river and stream system). The Fresno River is controlled upstream by the Bureau of Reclamation's John Franchi Diversion Dam, which is operated by the Madera Irrigation District to support the Madera Canal. The Bureau's Friant Dam, which forms Millerton Lake, controls the San Joaquin River. Millerton Lake provides irrigation of the San Joaquin Valley, distributed by the Madera and Friant-Kern-Canals, as well as power generation, flood control, and recreation.

¹ Construction Period Effects – Temporary (short-term and long-term) effects associated with the construction of the HST alternative. The construction period includes testing of the HST System prior to passenger service.

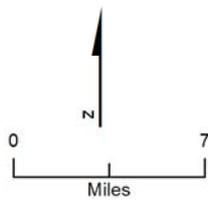
² Project Effects – Permanent impacts related to the project, including operation and maintenance of the HST alternative. Project operations include HST System operations and related project improvements, such as roadway modifications, maintenance of power supply components, and maintenance of the HST. Some permanent effects initially occur during construction, but because they are permanent, they are associated with the project effects (for example, conversion of habitat to transportation uses).

³ Direct effects are changes caused by and immediately related to the project. Indirect effects are changes in the environment which are not immediately related to the project but which are caused indirectly by the project.



Source: USDA/NRCS (1999-2010)

MF_PERMIT_CMP_03 Oct 03, 2011



- UPRR/SR 99 Alternative
 - BNSF Alternative
 - Hybrid Alternative
 - Station Study Area
 - Potential Heavy Maintenance Facility
 - City Limit
 - County Boundary
 - Railroad
- | Watershed Subbasin | |
|---|-------------------------------------|
| | Middle San Joaquin-Lower Chowchilla |
| | Fresno River |
| | Upper Dry |

Figure 2-1
 Watersheds

Table 2-1 provides definitions of direct permanent, direct temporary, and indirect permanent effects. Table 2-2a lists the acreages by watershed within a 250-foot wetland study area. The study area was selected to address direct permanent, direct temporary, indirect permanent, and cumulative effects. Table 2-2b lists the anticipated direct permanent, direct temporary, and indirect permanent effects on jurisdictional waters as a result of project activities categorized by watershed and feature type.

Table 2-1
 Effect Terminology and Definitions

Effect Terminology	Definition
Direct Permanent Effect	<p>This type of effect describes the area where a permanent facility would be situated. Direct effects on jurisdictional waters would be those effects that occur at the same time and place as the proposed action. Direct effects on jurisdictional wetlands would include direct fill or other removal of wetland features within the construction footprint that would effectively remove all the functions and services of that feature. For purposes of the proposed project, all waters within the construction footprint for sections of track constructed at grade would be considered directly and permanently affected. For elevated sections of track, all features within the 60 feet of centerline would be considered direct permanent effects and any features beyond 60 feet of centerline would be considered direct temporary effects. Temporarily affected features would be fully restored after construction.</p> <p>Direct effects on federally listed species are the effects of the proposed action that would immediately remove or destroy suitable habitat for the species, or would kill or injure individuals of the species during construction and operation of the proposed project. Similar to effects on waters of the United States, any vernal pool feature that provides potentially suitable habitat for federally listed species located wholly or partially within the construction footprint is considered to be directly affected.</p>
Direct Temporary Effect	<p>This type of effect describes the area where construction would occur in order to build a permanent facility. These temporary effects, although within the construction footprint, would be restored to pre-existing conditions after construction is completed.</p>
Indirect Permanent Effect	<p>This type of effect occurs outside of the construction footprint, yet within a particular buffer area (100, 250, or 1,000 feet) depending on the resource.</p> <p>The extent of indirect effects on wetland features is the area within 250 feet of the construction footprint. If any portion of a feature would be located within 250 feet of the construction footprint the entire feature is considered to be indirectly affected, even where a portion of the wetland feature extends beyond 250 feet from the construction footprint. Indirect effects would include altered hydrology associated with construction elements, spread of invasive weeds that results from ground disturbance, or effects on the water quality from erosion or sedimentation resulting from runoff within the construction footprint. Some functions and services of features within the area of indirect effect would remain; however, those functions and services would potentially be reduced as a result of project construction and operation. These effects are permanent because they are caused by a permanent structure present in the landscape.</p> <p>Indirect effects on habitat for species listed under the ESA would include noise effects within remaining adjacent habitat during construction and operation of the proposed project, increased traffic volume during construction and operation, increased lighting during construction and operation, and habitat fragmentation and impedance of wildlife movement from construction of the tracks and associated fencing. For vernal pool plant and invertebrate habitat, indirect effects would also include altered hydrology, spread of invasive weeds, and effects on the water quality from erosion or sedimentation resulting from runoff within the construction footprint. Ground compaction and dust deposition associated with construction and operation activities would be indirect effects on valley elderberry longhorn beetle habitat (elderberry shrubs).</p>

Effect Terminology	Definition
	For purposes of calculating indirect effects, vegetation communities that contain elderberry shrubs or habitat suitable for special-status plants within 100 feet of the construction footprint are considered to be within the area of indirect effect. For vernal pool crustacean species and California tiger salamander, any suitable habitat within 250 feet of the construction footprint is considered within the zone of indirect effect. Similar to effects on jurisdictional waters, vernal pools located wholly or partially within 250 feet of the construction footprint were considered to be within the zone of indirect effect. For San Joaquin kit fox, the zone of potential indirect effect is any suitable habitat within 1,000 feet of the construction footprint (Authority and FRA 2011a).
No Effect	This area is situated beyond the area of indirect effect, and represents an area beyond which any direct or indirect effects are assumed to occur.

2.2 Special-Status Plant Species

Special-status plant species are those species that are protected under the federal ESA, the California ESA, or other regulations, such as those species that meet the definitions of rare, threatened, or endangered under CEQA Guidelines Sections 15380 and 15125. Focused botanical surveys were conducted in 2010 to determine whether special-status species occur within the project footprint.

No federally or state-listed plant species were found during botanical surveys; however, habitat that could support special-status plant species may occur within areas where field surveys could not be conducted due to lack of permission to enter from property owners. These areas will be surveyed prior to construction.

2.3 Special-Status Wildlife Species

Special-status wildlife species are animals that are protected under the federal ESA (federally listed), the California ESA (state listed), or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. A focused wildlife habitat assessment was conducted in 2010 to determine whether special-status species and suitable special-status wildlife habitat occur within the project footprint. For further details about this survey, refer to the *Merced to Fresno Section Biological Resources and Wetlands Technical Report* (Authority and FRA 2011c).

All effects on special-status wildlife species were determined using a habitat-based approach, where the presence of the species was assumed in suitable habitat. Habitats in the project footprint and vicinity were determined through a combination of background review, habitat mapping during field surveys, and aerial photograph interpretation, and were classified using the wildlife habitat descriptions presented in *A Guide to Wildlife Habitats of California* (CDFG 1988) and the CWHR (CDFG 2008).

Table 2-2a
 Wetlands and Other Waters of the U.S. Located Within Wetland Study Area Per Watershed

Watersheds Identified in Project Vicinity	Wetlands					Other Waters			Total
	Vernal Pools	Other Seasonal Wetlands	Freshwater Marsh	Forested Wetlands	Open Water	Constructed Basin	Constructed Watercourses	Natural Watercourses	
Middle San Joaquin - Lower Chowchilla Watershed									
Acres of Individual Wetlands/Other Waters	64.60	2.65	0.81	30.13	3.56	22.83	56.76	58.97	
Acres of Combined Wetlands/Other Waters	101.75					138.56			240.31
Percentage of Total Wetlands/Other Waters	42.34%					57.66%			
Upper Chowchilla – Upper Fresno Watershed									
Acres of Individual Wetlands/Other Waters	22.57	4.31	4.22	2.02	4.51	29.81	59.12	66.72	
Acres of Combined Wetlands/Other Waters	37.63					155.65			193.28
Percentage of Total Wetlands/Other Waters	19.47%					80.53%			
Upper Dry Watershed									
Acres of Individual Wetlands/Other Waters	0.05	--	--	--	3.20	17.25	2.87	--	
Acres of Combined Wetlands/Other Waters	3.25					20.12			23.37
Percentage of Total Wetlands/Other Waters	13.91%					86.09%			
Total									
Acres of Individual Wetlands/Other Waters	87.22	6.96	5.03	32.15	11.27	69.89	118.75	125.69	
Acres of Combined Wetlands/Other Waters	142.63					314.33			456.96

Effects on special-status wildlife species are described in terms of direct and indirect effects (Table 2-3). Direct effects are defined as effects that have lasting effects beyond the project construction period, or cannot be fully restored following construction. Indirect effects, such as noise, motion, and startle, and any potential hydrologic issues, such as erosion and sedimentation. For listed plants, direct effects are defined as effects within the construction footprint and indirect effects are within a 100-foot buffer of the edge of the construction footprint. For vernal pool branchiopods and California tiger salamander, direct effects are defined as effects within the construction footprint and indirect effects are within a 250-foot buffer. For the valley elderberry longhorn beetle, direct and indirect effects are quantified as the number of potentially affected elderberry shrubs (*Sambucus* sp.). Direct effects on elderberry shrubs are defined as shrub removal within the project footprint, and indirect effects are defined as shrub disturbance due to noise or vibration, dust and particulate matter, root exposure/compaction due to erosion and soil compaction, or changes in site hydrology (alterations in water flow patterns, inundation patterns, groundwater, or water quality) within 100 feet of the edge of the project footprint. For San Joaquin kit fox, direct effects are defined as effects to suitable habitat that occur within the project footprint. Indirect impacts are defined as effects that occur to suitable habitat within 1,000 feet of the edge of the project footprint.

Table 2-2b
Effects (Direct Permanent vs. Direct Temporary vs. Indirect Permanent in Acres^a) on Wetlands and Other Waters of the U.S.
by Alternative/Design Option Combinations within the Construction Footprint

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative								Kern Street Design Option	Mariposa Street Design Option
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options					
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Vernal Pools															
Direct Permanent (acres)															
North-South Alignment	0.93	0.87	1.02	4.12	3.78	15.45	11.66	15.35	11.56	16.17	15.88	16.07	15.77	0.00	0.00
Ave 24 Wye	NA	0.00	0.03	NA	0.03	NA	NA	0.39	0.39	NA	NA	0.39	0.39	NA	NA
Ave 21 Wye	0.51	NA	NA	0.04	NA	0.23	0.23	NA	NA	0.23	0.23	NA	NA	NA	NA
Total Direct Permanent (acres)	1.44	0.87	1.05	4.16	3.81	15.69	11.90	15.74	11.95	16.41	16.11	16.46	16.16	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	2.38	1.39	1.18	11.27	6.92	35.73	38.84	35.63	38.74	33.00	39.76	32.90	39.66	0.00	0.00
Ave 24 Wye	NA	0.23	0.00	NA	0.00	NA	NA	0.83	0.83	NA	NA	0.83	0.83	NA	NA
Ave 21 Wye	0.25	NA	NA	0.35	NA	2.53	2.53	NA	NA	2.53	2.53	NA	NA	NA	NA
Total Indirect Permanent (acres)	2.64	1.62	1.18	11.62	6.92	38.26	41.37	36.46	39.57	35.53	42.29	33.73	40.49	0.00	0.00
Seasonal Wetlands															
Direct Permanent (acres)															
North-South Alignment	1.08	1.08	1.08	1.45	1.45	1.64	1.54	1.64	1.54	1.64	1.62	1.64	1.62	0.00	0.00
With Ave 24	NA	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA
With Ave 21	0.00	NA	NA	0.00	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA	NA	NA
Total Direct Permanent (acres)	1.08	1.08	1.08	1.45	1.45	1.64	1.54	1.64	1.54	1.64	1.62	1.64	1.62	0.00	0.00
Indirect Permanent (acres)															
North-South Alignment	0.34	0.29	0.29	1.46	1.46	1.81	1.87	1.67	1.73	1.81	1.98	1.67	1.84	0.00	0.00
With Ave 24	NA	0.00	0.00	NA	0.00	NA	NA	0.47	0.47	NA	NA	0.47	0.47	NA	NA
With Ave 21	0.00	NA	NA	0.00	NA	0.47	0.47	NA	NA	0.47	0.47	NA	NA	NA	NA
Total Indirect Permanent (acres)	0.34	0.29	0.29	1.46	1.46	2.28	2.34	2.14	2.20	2.28	2.45	2.14	2.31	0.00	0.00

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative									
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options				Kern Street Design Option	Mariposa Street Design Option
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Freshwater Marsh															
Direct Permanent (acres)															
North-South Alignment	0.00	0.00	0.00	0.04	0.00	0.26	0.26	0.26	0.26	0.26	0.24	0.26	0.24	0.00	0.00
With Ave 24	NA	0.00	0.00	NA	0.00	NA	NA	0.14	0.14	NA	NA	0.14	0.14	NA	NA
With Ave 21	0.00	NA	NA	0.00	NA	0.04	0.04	NA	NA	0.04	0.04	NA	NA	NA	NA
Total Direct Permanent (acres)	0.00	0.00	0.00	0.04	0.00	0.30	0.30	0.39	0.39	0.30	0.28	0.40	0.38	0.00	0.00
Direct Temporary (acres)															
North-South Alignment	0.00	0.00	0.00	0.00	0.00	0.03	0.26	0.04	0.03	0.03	0.03	0.03	0.03	0.00	0.00
With Ave 24	NA	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA
With Ave 21	0.00	NA	NA	0.00	NA	0.01	0.01	NA	NA	0.01	0.01	NA	NA	NA	NA
Total Direct Temporary (acres)	0.00	0.00	0.00	0.00	0.00	0.04	0.27	0.04	0.03	0.04	0.04	0.03	0.03	0.00	0.00
Indirect Permanent (acres)															
North-South Alignment	0.00	0.00	0.00	0.22	0.00	1.40	1.40	1.39	1.39	1.90	1.38	1.89	1.37	0.00	0.00
With Ave 24	NA	0.00	0.00	NA	0.00	NA	NA	0.14	0.14	NA	NA	0.13	0.13	NA	NA
With Ave 21	0.00	NA	NA	0.00	NA	0.15	0.15	NA	NA	0.15	0.15	NA	NA	NA	NA
Total Indirect Permanent (acres)	0.00	0.00	0.00	0.22	0.00	1.55	1.55	1.53	1.53	2.05	1.53	2.02	1.50	0.00	0.00
Palustrine Forested Wetlands															
Direct Permanent (acres)															
North-South Alignment	3.94	3.94	3.89	3.59	3.64	0.80	1.77	0.80	1.77	0.36	1.53	0.37	1.53	0.00	0.00
With Ave 24	NA	0.17	0.00	NA	0.00	NA	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA
With Ave 21	0.00	NA	NA	0.00	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA	NA	NA
Total Direct Permanent (acres)	3.94	4.11	3.89	3.59	3.64	0.80	1.77	0.80	1.77	0.36	1.53	0.37	1.53	0.00	0.00
Direct Temporary (acres)															
North-South Alignment	2.04	2.04	2.01	1.64	1.50	0.28	1.77	0.28	0.33	0.06	0.27	0.06	0.27	0.00	0.00

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative									
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options				Kern Street Design Option	Mariposa Street Design Option
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Palustrine Forested Wetlands (continued)															
Direct Temporary (acres) (continued)															
With Ave 24	NA	0.01	0.00	NA	0.00	NA	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA
With Ave 21	0.02	NA	NA	0.00	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA	NA	NA
Total Direct Temporary (acres)	2.06	2.05	2.01	1.64	1.50	0.28	1.77	0.28	0.33	0.06	0.27	0.06	0.27	0.00	0.00
Indirect Permanent (acres)															
North-South Alignment	3.45	3.45	3.75	3.08	3.37	8.80	9.32	8.80	9.32	2.18	3.23	2.18	3.23	0.00	0.00
With Ave 24	NA	1.20	0.00	NA	0.00	NA	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA
With Ave 21	0.29	NA	NA	0.00	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA	NA	NA
Total Indirect Permanent (acres)	3.75	4.65	3.75	3.08	3.37	8.80	9.32	8.80	9.32	2.18	3.23	2.18	3.23	0.00	0.00
Natural Watercourses															
Direct Permanent (acres)															
North-South Alignment	2.79	2.78	5.12	3.86	5.32	4.58	5.59	4.89	5.90	4.94	5.18	5.25	5.49	0.00	0.00
With Ave 24	NA	3.29	2.65	NA	2.41	NA	NA	1.88	1.88	NA	NA	1.88	1.88	NA	NA
With Ave 21	0.97	NA	NA	0.93	NA	1.09	1.09	NA	NA	1.09	1.09	NA	NA	NA	NA
Total Direct Permanent (acres)	3.76	6.08	7.76	4.79	7.74	5.67	6.68	6.76	7.77	6.03	6.27	7.12	7.37	0.00	0.00
Direct Temporary (acres)															
North-South Alignment	6.12	6.12	5.82	5.98	5.81	5.31	5.59	5.26	5.49	4.88	4.89	4.83	4.84	0.00	0.00
With Ave 24	NA	0.24	0.18	NA	0.18	NA	NA	0.36	0.36	NA	NA	0.36	0.36	NA	NA
With Ave 21	0.08	NA	NA	0.04	NA	0.05	0.05	NA	NA	0.05	0.05	NA	NA	NA	NA
Total Direct Temporary (acres)	6.20	6.36	6.00	6.02	6.00	5.36	5.64	5.62	5.85	4.93	4.94	5.19	5.21	0.00	0.00
Indirect Permanent (acres)															
North-South Alignment	14.32	14.16	21.17	17.45	19.27	23.65	23.12	20.53	19.99	17.57	17.98	14.45	14.85	0.00	0.00
With Ave 24	NA	13.87	8.28	NA	8.51	NA	NA	1.88	1.88	NA	NA	7.81	7.81	NA	NA

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative									
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options				Kern Street Design Option	Mariposa Street Design Option
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Natural Watercourses (continued)															
Indirect Permanent (acres) (continued)															
With Ave 21	7.00	NA	NA	6.65	NA	7.92	7.92	NA	NA	7.92	7.92	NA	NA	NA	NA
Total Indirect Permanent (acres)	21.32	28.02	29.45	24.10	27.78	31.57	31.04	22.40	21.87	25.50	25.90	22.26	22.67	0.00	0.00
Constructed Watercourses															
Direct Permanent (acres)															
North-South Alignment	4.99	5.05	8.80	6.37	10.64	4.44	4.23	4.55	4.34	7.67	8.12	7.78	8.24	0.00	0.00
With Ave 24	NA	6.97	5.75	NA	6.01	NA	NA	6.56	6.56	NA	NA	6.56	6.56	NA	NA
With Ave 21	13.35	NA	NA	12.75	NA	6.11	6.11	NA	NA	6.11	6.11	NA	NA	NA	NA
Total Direct Permanent (acres)	18.35	12.02	14.54	19.12	16.65	10.55	10.34	11.11	10.90	13.78	14.24	14.34	14.79	0.00	0.00
Direct Temporary (acres)															
North-South Alignment	3.49	3.46	2.96	3.52	2.77	0.81	4.23	0.81	0.82	1.05	1.21	1.05	1.21	0.00	0.00
With Ave 24	NA	0.23	0.09	NA	0.04	NA	NA	0.95	0.95	NA	NA	0.95	0.95	NA	NA
With Ave 21	0.38	NA	NA	0.34	NA	0.12	0.12	NA	NA	0.12	0.12	NA	NA	NA	NA
Total Direct Temporary (acres)	3.87	3.69	3.05	3.86	2.82	0.93	4.35	1.75	1.76	1.17	1.33	1.99	2.16	0.00	0.00
Indirect Permanent (acres)															
North-South Alignment	9.82	9.97	17.99	12.05	22.05	10.46	12.16	10.42	12.12	12.21	13.80	12.17	13.76	0.00	0.00
With Ave 24	NA	7.24	4.51	NA	4.77	NA	NA	6.56	6.56	NA	NA	8.74	8.74	NA	NA
With Ave 21	10.24	NA	NA	8.84	NA	11.25	11.25	NA	NA	11.25	11.25	NA	NA	NA	NA
Total Indirect Permanent (acres)	20.06	17.21	22.50	20.89	26.82	21.71	23.41	16.98	18.68	23.45	25.04	20.91	22.50	0.00	0.00
Constructed Basins															
Direct Permanent (acres)															
North-South Alignment	4.23	4.23	6.17	3.71	4.74	5.33	5.78	5.33	5.78	5.65	5.58	5.65	5.58	0.00	0.00
With Ave 24	NA	2.47	1.64	NA	1.83	NA	NA	1.36	1.36	NA	NA	1.36	1.36	NA	NA

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative									
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options				Kern Street Design Option	Mariposa Street Design Option
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Constructed Basins (continued)															
Direct Permanent (acres) (continued)															
With Ave 21	0.56	NA	NA	0.36	NA	1.21	1.21	NA	NA	1.21	1.21	NA	NA	NA	NA
Total Direct Permanent (acres)	4.80	6.70	7.81	4.07	6.56	6.54	6.99	6.69	7.14	6.86	6.80	7.01	6.94	0.00	0.00
Direct Temporary (acres)															
North-South Alignment	0.93	0.93	0.95	0.42	0.87	0.14	5.78	0.14	0.11	0.24	0.24	0.24	0.24	0.00	0.00
With Ave 24	NA	0.71	0.25	NA	0.36	NA	NA	0.54	0.54	NA	NA	0.54	0.54	NA	NA
With Ave 21	0.19	NA	NA	0.04	NA	0.04	0.04	NA	NA	0.04	0.04	NA	NA	NA	NA
Total Direct Temporary (acres)	1.12	1.64	1.19	0.47	1.22	0.18	5.83	0.68	0.65	0.29	0.29	0.78	0.78	0.00	0.00
Indirect Permanent (acres)															
North-South Alignment	19.22	19.26	25.51	19.61	23.03	18.49	20.54	17.65	19.70	24.10	23.47	23.26	22.62	0.00	0.00
With Ave 24	NA	3.72	1.95	NA	1.75	NA	NA	1.36	1.36	NA	NA	5.55	5.55	NA	NA
With Ave 21	6.30	NA	NA	2.36	NA	2.40	2.40	NA	NA	2.40	2.40	NA	NA	NA	NA
Total Indirect Permanent (acres)	25.53	22.99	27.46	21.97	24.78	20.89	22.94	19.01	21.05	26.50	25.87	28.82	28.18	0.00	0.00
Open Water															
Direct Permanent (acres)															
North-South Alignment	1.50	1.50	1.03	1.59	1.21	2.38	1.70	2.40	1.72	2.40	2.33	2.42	2.35	0.00	0.00
With Ave 24	NA	0.14	0.28	NA	0.38	NA	NA	0.34	0.34	NA	NA	0.34	0.34	NA	NA
With Ave 21	0.16	NA	NA	0.16	NA	0.16	0.16	NA	NA	0.16	0.16	NA	NA	NA	NA
Total Direct Permanent (acres)	1.65	1.64	1.30	1.75	1.59	2.54	1.86	2.75	2.07	2.57	2.49	2.77	2.69	0.00	0.00
Indirect Permanent (acres)															
North-South Alignment	3.68	3.68	3.46	3.68	3.37	3.22	3.21	3.22	3.21	3.32	3.30	3.32	3.30	0.00	0.00
With Ave 24	NA	0.07	0.02	NA	0.04	NA	NA	0.13	0.13	NA	NA	0.13	0.13	NA	NA
With Ave 21	0.21	NA	NA	0.18	NA	0.07	0.07	NA	NA	0.07	0.07	NA	NA	NA	NA

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative									
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options				Kern Street Design Option	Mariposa Street Design Option
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Open Water (continued)															
Indirect Permanent (acres) (continued)															
Total Indirect Permanent (acres)	3.89	3.75	3.48	3.86	3.41	3.29	3.28	3.35	3.34	3.39	3.37	3.45	3.43	0.00	0.00
^a All non-zero values are rounded to the nearest one-hundredth acre. NA = not applicable															

Table 2-3
Effects on Special-Status Species

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative								Kern Street Design Option	Mariposa Street Design Option
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options					
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Colusa Grass															
Direct Permanent Effect (acres)															
North-South Alignment	0.14	0.14	0.14	0.14	0.14	0.01	0.07	0.01	0.07	0.13	0.13	0.13	0.13	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	0.14	0.14	0.14	0.14	0.14	0.01	0.07	0.01	0.07	0.13	0.13	0.13	0.13	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	0.07	0.07	0.07	0.07	0.07	1.24	1.37	1.24	1.37	0.74	0.74	0.74	0.74	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.00	0.00	NA	NA	0.00	0.00	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	0.07	0.07	0.07	0.07	0.07	1.24	1.37	1.24	1.37	0.74	0.74	0.74	0.74	0.00	0.00
San Joaquin Valley Orcutt Grass															
Direct Permanent Effect (acres)															
North-South Alignment	1.92	1.85	1.53	5.40	4.69	17.72	13.14	17.63	13.06	18.46	18.07	18.38	17.98	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.40	0.40	NA	NA	0.40	0.40	NA	NA
Ave 21 Wye	0.53	NA	NA	0.07	NA	0.27	0.27	NA	NA	0.27	0.27	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	2.45	1.85	1.53	5.47	4.69	17.99	13.41	18.04	13.46	18.73	18.33	18.78	18.38	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	2.03	1.32	1.50	5.53	4.67	16.84	17.38	16.81	17.36	17.05	20.50	17.03	20.48	0.00	0.00
Ave 24 Wye	NA	0.23	0.00	NA	0.00	NA	NA	0.54	0.54	NA	NA	0.54	0.54	NA	NA
Ave 21 Wye	0.29	NA	NA	0.00	NA	0.73	0.73	NA	NA	0.73	0.73	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	2.32	1.54	1.50	5.53	4.67	17.57	18.11	17.36	17.90	17.79	21.24	17.57	21.02	0.00	0.00

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative								Kern Street Design Option	Mariposa Street Design Option
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options					
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Hairy Orcutt Grass															
Direct Permanent Effect (acres)															
North-South Alignment	1.95	1.95	1.95	5.61	5.47	7.20	7.20	7.22	7.22	7.32	7.32	7.35	7.35	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.25	0.25	NA	NA	0.25	0.25	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.24	0.24	NA	NA	0.24	0.24	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	1.95	1.95	1.95	5.61	5.47	7.44	7.44	7.47	7.47	7.57	7.57	7.60	7.60	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	0.62	0.62	0.62	4.85	4.15	6.87	6.87	6.84	6.84	6.37	6.37	6.35	6.35	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.51	0.51	NA	NA	0.51	0.51	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.47	0.47	NA	NA	0.47	0.47	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	0.62	0.62	0.62	4.85	4.15	7.34	7.34	7.35	7.35	6.84	6.84	6.86	6.86	0.00	0.00
Greene's Tuctoria															
Direct Permanent Effect (acres)															
North-South Alignment	1.19	1.19	0.86	3.94	3.47	16.29	11.71	16.31	11.73	17.03	16.64	17.05	16.66	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.40	0.40	NA	NA	0.40	0.40	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.24	0.24	NA	NA	0.24	0.24	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	1.19	1.19	0.86	3.94	3.47	16.53	11.96	16.71	12.14	17.27	16.88	17.45	17.06	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	0.65	0.65	0.62	3.12	2.58	14.70	15.24	14.72	15.26	14.91	18.36	14.94	18.39	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.54	0.54	NA	NA	0.54	0.54	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.47	0.47	NA	NA	0.47	0.47	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	0.65	0.65	0.62	3.12	2.58	15.17	15.71	15.26	15.81	15.38	18.84	15.48	18.93	0.00	0.00

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative								Kern Street Design Option	Mariposa Street Design Option
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options					
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Succulent Owl's-Clover															
Direct Permanent Effect (acres)															
North-South Alignment	1.88	1.82	1.50	2.62	2.05	13.21	8.64	13.10	8.53	13.95	13.56	13.84	13.45	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.15	0.15	NA	NA	0.15	0.15	NA	NA
Ave 21 Wye	0.53	NA	NA	0.07	NA	0.03	0.03	NA	NA	0.03	0.03	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	2.42	1.82	1.50	2.69	2.05	13.24	8.66	13.25	8.68	13.98	13.58	14.00	13.60	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	2.00	1.28	1.47	2.82	2.68	13.30	13.84	13.30	13.84	13.51	16.97	13.52	16.97	0.00	0.00
Ave 24 Wye	NA	0.23	0.00	NA	0.00	NA	NA	0.03	0.03	NA	NA	0.03	0.03	NA	NA
Ave 21 Wye	0.29	NA	NA	0.00	NA	0.26	0.26	NA	NA	0.26	0.26	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	2.29	1.51	1.47	2.82	2.68	13.56	14.10	13.33	13.88	13.78	17.23	13.55	17.00	0.00	0.00
Conservancy Fairy Shrimp															
Direct Permanent Effect (acres)															
North-South Alignment	7.39	7.39	7.06	22.78	16.15	50.17	46.24	50.12	46.19	47.22	52.01	47.17	51.96	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.80	0.80	NA	NA	0.80	0.80	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.54	0.54	NA	NA	0.54	0.54	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	7.39	7.39	7.06	22.78	16.15	50.71	46.79	50.92	46.99	47.77	52.56	47.97	52.76	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	1.21	1.17	0.82	5.61	5.34	24.46	24.06	24.46	24.06	24.20	23.26	24.20	23.26	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.23	0.23	NA	NA	0.23	0.23	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.39	0.39	NA	NA	0.39	0.39	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	1.21	1.17	0.82	5.61	5.34	24.85	24.45	24.69	24.29	24.58	23.65	24.42	23.49	0.00	0.00

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative								Kern Street Design Option	Mariposa Street Design Option
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options					
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Vernal Pool Fairy Shrimp															
Direct Permanent Effect (acres)															
North-South Alignment	10.28	9.94	9.80	25.75	18.59	53.11	49.18	52.83	48.91	50.16	54.95	49.88	54.68	0.00	0.00
Ave 24 Wye	NA	0.37	0.31	NA	0.41	NA	NA	1.16	1.16	NA	NA	1.16	1.16	NA	NA
Ave 21 Wye	0.90	NA	NA	0.44	NA	0.83	0.83	NA	NA	0.83	0.83	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	11.18	10.31	10.10	26.20	18.99	53.94	50.01	53.99	50.06	50.99	55.78	51.04	55.83	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	5.39	4.51	4.28	10.47	8.71	28.35	27.94	28.35	27.94	28.08	27.15	28.08	27.15	0.00	0.00
Ave 24 Wye	NA	0.02	0.02	NA	0.04	NA	NA	0.27	0.27	NA	NA	0.27	0.27	NA	NA
Ave 21 Wye	0.50	NA	NA	0.68	NA	2.57	2.57	NA	NA	2.57	2.57	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	5.89	4.54	4.30	11.14	8.75	30.92	30.52	28.61	28.21	30.65	29.72	28.35	27.41	0.00	0.00
Vernal Pool Tadpole Shrimp															
Direct Permanent Effect (acres)															
North-South Alignment	7.15	7.15	6.82	20.00	13.36	47.38	43.46	47.33	43.40	44.43	49.23	44.38	49.17	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.80	0.80	NA	NA	0.80	0.80	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.54	0.54	NA	NA	0.54	0.54	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	7.15	7.15	6.82	20.00	13.36	47.93	44.00	48.13	44.21	44.98	49.77	45.18	49.98	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	1.21	1.17	0.82	2.25	1.98	21.10	20.70	21.10	20.70	20.83	19.90	20.83	19.90	0.00	0.00
Ave 24 Wye	NA	0.00	0.00	NA	0.00	NA	NA	0.23	0.23	NA	NA	0.23	0.23	NA	NA
Ave 21 Wye	0.00	NA	NA	0.00	NA	0.39	0.39	NA	NA	0.39	0.39	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	1.21	1.17	0.82	2.25	1.98	21.49	21.08	21.33	20.93	21.22	20.29	21.06	20.13	0.00	0.00

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative								Kern Street Design Option	Mariposa Street Design Option
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options					
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Valley Elderberry Longhorn Beetle															
Direct Permanent Effect (acres)															
North-South Alignment	1.50	1.49	1.79	1.22	1.31	2.92	2.92	2.96	2.96	2.17	2.17	2.21	2.21	0.00	0.00
Ave 24 Wye	NA	4.26	4.15	NA	3.95	NA	NA	1.00	1.00	NA	NA	1.00	1.00	NA	NA
Ave 21 Wye	0.42	NA	NA	0.42	NA	0.45	0.45	NA	NA	0.45	0.45	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	1.91	5.74	5.94	1.63	5.26	3.38	3.38	3.96	3.96	2.62	2.62	3.21	3.21	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	1.63	1.57	2.64	1.15	2.39	4.07	4.07	4.03	4.03	2.10	2.10	2.06	2.06	0.00	0.00
Ave 24 Wye	NA	7.96	4.94	NA	5.12	NA	NA	1.54	1.54	NA	NA	1.54	1.54	NA	NA
Ave 21 Wye	1.40	NA	NA	0.97	NA	1.53	1.53	NA	NA	1.53	1.53	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	3.03	9.53	7.59	2.12	7.51	5.59	5.59	5.57	5.57	3.62	3.62	3.60	3.60	0.00	0.00
California Tiger Salamander															
Direct Permanent Effect (acres)															
North-South Alignment	45.20	46.45	38.60	82.12	72.19	168.81	131.98	167.78	130.94	158.93	145.24	157.89	144.20	0.00	0.00
Ave 24 Wye	NA	0.15	0.31	NA	0.41	NA	NA	10.85	10.85	NA	NA	10.85	10.85	NA	NA
Ave 21 Wye	2.39	NA	NA	1.93	NA	1.09	1.09	NA	NA	1.09	1.09	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	47.58	46.59	38.91	84.05	72.60	169.90	133.06	178.62	141.79	160.01	146.33	168.74	155.05	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	93.52	93.86	72.73	167.67	128.41	340.85	352.42	337.16	348.73	339.12	329.84	335.42	326.15	0.00	0.00
Ave 24 Wye	NA	0.30	0.02	NA	0.04	NA	NA	15.31	15.31	NA	NA	15.31	15.31	NA	NA
Ave 21 Wye	2.65	NA	NA	2.72	NA	3.11	3.11	NA	NA	3.11	3.11	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	96.16	94.16	72.75	170.38	128.45	343.96	355.53	352.47	364.04	342.22	332.95	350.73	341.46	0.00	0.00

North-South Alignment Isolated and with Wye Design Option	HST Alternatives and Design Options													Station Alternative	
	UPRR/SR 99 Alternative			Hybrid Alternative		BNSF Alternative								Kern Street Design Option	Mariposa Street Design Option
	East Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	East Chowchilla Design Option	West Chowchilla Design Option	Mariposa Way Design Options				Mission Ave Design Options					
						Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand	Le Grand	East of Le Grand		
Ave 21	Ave 24	Ave 24	Ave 21	Ave 24	Ave 21		Ave 24		Ave 21		Ave 24		Ave 21	Ave 24	
Kit Fox															
Direct Permanent Effect (acres)															
North-South Alignment	48.19	49.74	48.38	113.22	111.48	188.19	153.56	187.11	152.48	180.06	164.67	178.97	163.58	0.00	0.00
Ave 24 Wye	NA	8.66	2.91	NA	2.92	NA	NA	17.99	17.99	NA	NA	17.99	17.99	NA	NA
Ave 21 Wye	17.82	NA	NA	13.56	NA	9.53	9.53	NA	NA	9.53	9.53	NA	NA	NA	NA
Total Direct Permanent Effect (acres)	66.01	58.39	51.28	126.79	114.40	197.72	163.09	205.09	170.46	189.58	174.19	196.96	181.57	0.00	0.00
Indirect Permanent Effects (acres)															
North-South Alignment	424.81	465.60	430.93	1109.16	1052.36	1880.24	1872.89	1875.66	1868.31	1846.78	1849.39	1842.21	1844.82	0.00	0.00
Ave 24 Wye	NA	34.91	9.62	NA	9.61	NA	NA	33.26	33.26	NA	NA	33.26	33.26	NA	NA
Ave 21 Wye	29.50	NA	NA	30.91	NA	40.72	40.72	NA	NA	40.72	40.72	NA	NA	NA	NA
Total Indirect Permanent Effect (acres)	454.31	500.51	440.55	1,140.07	1,061.97	1,920.95	1,913.60	1,908.92	1,901.57	1,887.50	1,890.11	1,875.47	1,878.08	0.00	0.00
Notes:															
Data presented are effects on acreage of potentially suitable habitat mapped during 2009-2011 field surveys.															
"Maximum Impact Acreage" determinations are based on the largest amount of acreage covered by any continuous combination of the HST alternatives.															
Effects on all federally listed plant species were based on suitable CWHR habitats and wetlands and other waters features within the project footprint.															
Effects on all federally listed wildlife species are based on the CWHR determinations of habitats and range, except as noted below:															
Vernal pool tadpole shrimp and vernal pool fairy shrimp: Disturbances based on vernal pools/seasonal wetland habitat in the regional study area.															
San Joaquin kit fox: Recovery areas based on the 5-year review of the San Joaquin kit fox (USFWS 2010). Natural lands include annual grasslands, barren, and pasture. Agricultural lands include grain crop, deciduous orchard, row crop, hayfield, vineyard, etc.															

Direct effects on the San Joaquin kit fox (*Vulpes macrotis mutica*) include effects on habitat linkages that could potentially function as wildlife movement corridors. A total of seven linkages that intersect the project footprint and that could serve as movement corridors for San Joaquin kit fox and other wildlife species will be directly affected at the following general locations:

- Flat Top Mountain – Hunter Valley Mountain Environmental Connectivity Area (ECA)
- Eastman Lake – Bear Creek ECA
- Ash Slough – Merced National Wildlife Refuge ECA
- Lone Willow – Ash Slough ECA
- Fresno River – Lone Willow ECA.
- Gravelly Ford Canal – Lone Willow ECA
- Gravelly Ford Canal – Fresno River ECA

Of these, only the Eastman Lake – Bear Creek ECA is intersected by the Merced to Fresno Section. The Eastman Lake – Bear Creek ECA occurs in association with the corridors of Deadman Creek and Dutchman Creek, from their headwaters in the Sierra Nevada Range east of Plañada and Le Grand, westward to their confluence points with the Eastside Bypass. The Eastman Lake – Bear Creek ECA also largely follows the spatial arrangement of the Madera-Merced Linkage reported by Penrod et al. (2001), along Sandy Mush Road. To date, there has been no focused management plan developed for the Eastman Lake – Bear Creek ECA.

3.0 Resource Agency Mitigation Guidelines and Requirements

This section provides agency guidelines and requirements for compensatory mitigation. Where applicable, it presents the accepted compensation ratios and compensation acreages for each resource.

3.1 Summary of Agency Requirements

Compensatory mitigation will be required in accordance with agency guidance to offset the environmental losses resulting from unavoidable effects on sensitive natural resources by the Merced to Fresno Section of the HST project. Compensatory mitigation measures for the HST are based on publically available agency mitigation guidance and protocols and industry-standard mitigation requirements that have established an appropriate precedent for species-specific mitigation programs for projects with similar potential effects on the project being considered and habitat mitigation ratios determined through previous agency consultation and negotiations.

This CMP goes beyond the level of detail described in Section 3.7, Biological Resources and Wetlands, of the Merced to Fresno Section Draft Project EIR/EIS (Authority and FRA 2011a) and in the Draft BA (Authority and FRA 2011e). This CMP is intended to provide more guidance toward the implementation of the compensatory mitigation.

Depending on the resource, each agency requests that compensatory mitigation be met through a particular prioritization (order) of mitigation options. These mitigation options, which are described in detail in Section 5.0, include mitigation banking (existing bank credits), in-lieu fee programs, and permittee-responsible mitigation (turnkey strategies, fee-title acquisition, conservation easement). Each agency has a mitigation policy statement. However, each of the agencies discussed in the sections below, in practice, reviews mitigation proposals case by case as an individual package including a suite of options for applicability. The following agencies review the mitigation proposals:

- USACE
- SWRCB
- USFWS
- CDFG

3.1.1 U.S. Army Corps of Engineers

USACE has published guidelines for compensatory mitigation requirements (33 Code of Federal Regulations [CFR] Part 332, Volume 73: 19670) and *Habitat and Mitigation Monitoring Proposal Guidelines* (USACE 1996). These guidelines provide general instructions for compensatory mitigation; however, final mitigation requirements are determined through consultation with the district engineer in coordination with state and federal resource agencies and may vary depending on the nature of project effects.

Compensatory mitigation can be accomplished through restoration, enhancement, establishment, and preservation. Restoration is the preferred mitigation method because it is typically most successful, has fewer upland effects than establishment, and adds greater value in terms of aquatic resource function compared to enhancement or preservation. Preferably, compensatory mitigation should follow a watershed approach.

In California, the state and federal agencies that comprise the California Wetlands Monitoring Workgroup (CWMW) are promoting the use of rapid assessment methods as one of the core tools for project evaluation to inform regulatory decisions (such as Section 401 and 404 permits). The CWMW is a subcommittee of the California Water Quality Monitoring Council.

The CRAM is a tool for performing wetland condition assessments. Using CRAM provides a uniform approach to assessing wetland health and watershed needs that is consistent with the USACE and EPA Mitigation Rule (33 CFR Parts 325 and 332). CRAM is considered a Level 2 approach, one of three levels of the EPA's Level 1-2-3 Framework for monitoring and assessment of wetland resources (Stein et al. 2009). Levels 1 and 2 are being conducted for the Merced to Fresno Section, Level 3 is not being conducted. The fundamental elements of this framework are as follows:

- Level 1 consists of wetland and riparian inventories and answers questions about wetland extent and distribution.
- Level 2 consists of rapid assessment, which uses cost-effective, field-based diagnostic tools to assess the condition of wetland and riparian areas. Level 2 assessments answer questions about general wetland health (or condition).
- Level 3 consists of an intensive assessment to provide data to validate rapid methods, characterize reference condition, and diagnose the causes of wetland condition observed in Levels 1 and 2. Level 3 assessments can be used to test hypothesis and provide insight into functions and processes.

Generally, three methods are available for fulfilling compensatory mitigation requirements, as listed below.

- Mitigation bank credits may be applied to the mitigation requirement if permitted effects are within the service area of an approved mitigation bank, and the bank has the appropriate available acreage and resource type of credits. Agencies will sometimes accept mitigation bank credits that are outside of the service area covered by the project if the agency considers bank credits to be superior to other mitigation alternatives and the bank has credits appropriate for the resource affected.
- In-lieu fee program credits may be applied to the mitigation requirement if permitted effects are within the service area of an approved in-lieu fee program and the bank has the appropriate available acreage and resource type of credits.
- Permittee-responsible mitigation must be applied when mitigation bank credits or in-lieu fee program credits cannot satisfy the mitigation requirement.

Permittee-responsible mitigation should be accomplished preferably through onsite and in-kind mitigation; however, if this is not practicable or compatible with the proposed project, offsite and/or out-of-kind mitigation may be used. A minimum one-to-one acreage or linear foot compensation ratio must be used; however, the USACE district engineer may require a larger ratio to account for the type of mitigation, the proximity to the project site, the likelihood of success, or the ability of the mitigation to replace the lost functions and values of the affected area.

3.1.2 State Water Resources Control Board

The SWRCB, as directed in Resolution No. 2008-0026, is working with the CDFG to develop and implement the Wetland and Riparian Area Protection Policy (WRAPP) to conserve California's aquatic resources. The resolution provides a policy to protect wetlands and riparian areas and to restore and maintain the water quality and beneficial uses of the state. The WRAPP will include regulatory guidelines for mitigating effects on waters of the state. These guidelines are still under development and, therefore, cannot currently be applied to the project. The planned implementation of the WRAPP is outlined in the *Five Year Coordinated Work Plan for Wetlands Conservation Program Development* (CDFG and SWRCB 2011). When available, the WRAPP guidelines will be applied to the project, where feasible. Since these guidelines will be modeled after the USACE compensatory mitigation guidelines, compensatory mitigation obligations under the SWRCB will be addressed in the same manner as obligations to USACE.

The scheduled implementation of the WRAPP and the objectives of each phase are described below:

- Phase 1 is in progress and scheduled to be implemented in late 2012. It includes development of the following:
 - A wetland definition that reliably defines the diverse array of California wetlands and incorporates the USACE delineation methodology to the extent feasible;
 - A regulatory mechanism for the discharge of dredge and fill material to all state waters, including wetlands, based on Clean Water Act, Section 404 (b)(1) Guidelines (40 CFR Parts 230–233), and the federal rule on Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Parts 325 and 332; 40 CFR Part 230);
 - An assessment method for collecting water quality and wetland data to monitor progress toward water quality and wetland protection and to evaluate program development.
- Phase 2, scheduled for adoption in 2015, will expand the scope of the policy to protect wetlands from all other activities potentially affecting water quality, and will include the following:
 - New and/or revised beneficial use definitions;
 - Water quality objectives to support those beneficial uses;
 - A program of implementation to apply the water quality objectives, as necessary, to protect all waters, including wetlands, and their water quality functions for all waste discharges (e.g., wastewater, stormwater).
- Phase 3, also scheduled for adoption in 2015, will identify, protect, and promote the restoration of riparian areas and their functioning to support water quality and beneficial uses, and will include the following:
 - A definition for riparian areas;
 - New and/or revised beneficial use definitions;
 - Water quality objectives to support those beneficial uses;
 - A program of implementation to achieve the water quality objectives to protect riparian area water quality–related functions.

3.1.3 U.S. Fish and Wildlife Service

Although the objective of the Section 7 incidental take analysis is minimization, not mitigation, reasonable and prudent measures may include some form of offsite mitigation to minimize effects on federally listed species and designated critical habitat. To compensate for permanent effects on federally listed species, USFWS will allow offsite compensation by establishing or purchasing the following:

- Conservation bank credits (CDFG and USFWS approved).
- In-lieu fee.
- Fee-title acquisition.
- Conservation easement.
- Turnkey mitigation strategies (permittee-responsible mitigation).

To guide the process, the Sacramento Fish and Wildlife Office revised and issued a *Review Criteria for Section 7 Off-Site Compensation* on July 28, 2011 (Sacramento Fish and Wildlife Office 2011a; provided in Appendix A of this CMP). This checklist outlines the information, reports, and management needs that will need to be addressed for approval of suitable offsite compensation.

USFWS has published compensatory mitigation guidelines for a limited number of species. Of the species that have potential to be affected by the project, guidelines are only available for the valley elderberry longhorn beetle. Additionally, although specific guidelines are not available, a programmatic biological opinion was issued to address effects on vernal pool branchiopods (USFWS 1996b) and provide recommendations for mitigation that would be applicable to the HST project. The requirements established in these documents are summarized below.

3.1.3.1 Valley Elderberry Longhorn Beetle

Where it is not practicable to avoid elderberry shrubs with a 100-foot (or wider) buffer, shrubs that feature stems measuring 1 inch or greater in diameter at ground level must be transplanted and mitigated with supplemental plantings according to USFWS guidelines. All shrubs that are adversely affected must be mitigated at a ratio ranging from 1:1 to 8:1, depending on the presence or absence of exit holes and the habitat (riparian or nonriparian) in which the shrub is found.

- Elderberry shrubs must be transplanted if they cannot be avoided by the project. All elderberry shrubs with one or more stems measuring 1 inch or greater in diameter (at ground level) will be will be transplanted to a USFWS-approved conservation area during the dormancy period (November 1 to February 15). A USFWS-approved conservation area will be established that provides at least 1,800 square feet for each transplanted elderberry shrub and associated plantings.
- Compensatory mitigation ratios will be based on the characteristics of the various elderberry shrubs and stems removed. These characteristics include the habitat in which the shrub is located (riparian or nonriparian), number of stems at least 1 inch in diameter, stem diameter at ground level, and presence or absence of exit holes. Compensatory mitigation includes both elderberry seedlings/cuttings and planting of associated native plants. Table 3-1 summarizes the compensatory mitigation ratios identified in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a). It should be noted that the beetle is currently being considered for delisting by the USFWS. If it is delisted prior to project implementation, then mitigation for effects on elderberry shrubs would be considered unnecessary.

Table 3-1
 Summary of Compensatory Mitigation Ratios for Effects on Suitable Habitat for the Valley Elderberry Longhorn Beetle^a

Habitat	Stem Size Class (maximum diameter at ground level, in inches)	Exit Holes on Shrub ^b	Elderberry Seedling/Cutting Ratio ^c	Associated Native Plant Ratio ^d
Riparian	Stems 1" to 3"	Yes	4:1	2:1
		No	2:1	1:1
	Stems 3" to 5"	Yes	6:1	2:1
		No	3:1	1:1
	Stems > 5"	Yes	8:1	2:1
		No	4:1	1:1

Habitat	Stem Size Class (maximum diameter at ground level, in inches)	Exit Holes on Shrub ^b	Elderberry Seedling/ Cutting Ratio ^c	Associated Native Plant Ratio ^d
Non-riparian	Stems 1" to 3"	Yes	2:1	2:1
		No	1:1	1:1
	Stems 3" to 5"	Yes	4:1	2:1
		No	2:1	1:1
	Stems > 5"	Yes	6:1	2:1
		No	3:1	1:1

^a Mitigation ratios were determined following the guidelines in USFWS' *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* established in July 1999 (USFWS 1999a).

^b All stems measuring at least 1 inch in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

^c Ratios in this column correspond to the number of cuttings or seedlings to be planted per elderberry stem (at least 1 inch in diameter at ground level) affected by the proposed project.

^d Ratios in this column correspond to the number of associated native species to be planted per elderberry (seedling or cutting) planted.

Source: USFWS (1999a)

3.1.3.2 Vernal Pool Branchiopods

As described earlier, the 1996 programmatic biological opinion issued by the Sacramento Fish and Wildlife Service Office to address effects on vernal pool branchiopods cannot be applied to the project; however, it does provide guidance for mitigation. As stated in the document, compensatory mitigation for the loss of vernal pool fairy shrimp and vernal pool tadpole shrimp includes both a preservation component and a creation component (USFWS 1996b).

- Preservation Component: For every acre of habitat directly and indirectly affected, at least two vernal pool credits will be dedicated within a USFWS-approved ecosystem preservation bank (2:1 ratio) or, based on USFWS evaluation of site-specific conservation values, 3 acres of vernal pool habitat may be preserved on the project footprint or at a non-bank site as approved by the USFWS (3:1 ratio). The USFWS generally considers any vernal pool within 250 feet of the project footprint to be potentially affected. This buffer can sometimes be reduced at the discretion of the USFWS.
- Creation Component: For every acre of habitat directly affected, at least one vernal pool creation credit will be dedicated within a USFWS-approved habitat mitigation bank (1:1 ratio) or, based on USFWS evaluation of site-specific conservation values, 2 acres of vernal pool habitat will be created and monitored on the project footprint or at a non-bank site as approved by the USFWS (2:1 ratio).

3.1.3.3 Other Special-Status Species

Mitigation ratios for the remaining federally listed special-status species—Colusa grass, San Joaquin Valley Orcutt grass, hairy Orcutt grass, Greene’s tuctoria, succulent owl’s clover, Central Valley steelhead, Central Valley Chinook salmon, California tiger salamander, and San Joaquin kit fox—are based on industry standards determined through previous consultation and negotiations with USFWS and CDFG, and preliminary compensatory mitigation ratios identified in Section 3.7, Biological Resources and Wetlands, in the *Merced to Fresno Section Draft Project EIR/EIS* (Authority and FRA 2011a).

3.1.4 California Department of Fish and Game

3.1.4.1 Statutes

California Endangered Species Act

The California ESA (California Fish and Game Code, Section 2050 et seq.) establishes the policy of the state to conserve, protect, restore, and enhance candidate, threatened and endangered species and their habitats by protecting all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation. Animal species are listed by the CDFG as threatened, endangered, or fully protected, while plants are listed as rare, threatened, or endangered. However, only those plant species listed as threatened or endangered receive protection under the California ESA.

The California ESA mandates that state agencies do not approve a project that would jeopardize the continued existence of these species if reasonable and prudent alternatives are available that would avoid a jeopardy finding. Section 2081(b)(2) prescribes that “the effects of the authorized take shall be minimized and fully mitigated” and that “the measures required to meet this obligation shall be roughly proportional in extent to the effect of the authorized taking on the species.” Section 2081(c) states the issuance of the permit cannot jeopardize the continued existence of a state-listed species. In accordance with Section 2081(b)(4) and California Administrative Code Title 14, Sections 783.2 and 783.4(a), adequate funding in an amount approved by CDFG will be provided to ensure that the mitigation will be successfully implemented and that monitoring will be conducted to verify that the mitigation site complies with established performance standards.

For projects that would affect a species that is federally and state listed, compliance with ESA satisfies the California ESA if the CDFG determines that the federal incidental take authorization is consistent with the California ESA under Section 2080.1 and meets the fully mitigated standard for effects on state-listed species. For projects that would result in take of a species that is state listed only, the project sponsor must apply for a take permit in accordance with Section 2081(b).

Lake and Streambed Alteration

Lake and Streambed Alteration (California Fish and Game Code, Section 1600 et seq.) requires notifying the CDFG prior to any project activity that would do any of the following:

- Substantially divert or obstruct the natural flow of any river, stream, or lake.
- Substantially change or use any material from the bed, channel, or bank of any river, stream, or lake.
- Deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken in the floodplain of a body of water. Preliminary notification and project review generally occur during the environmental process.

When an existing fish or wildlife resource might be substantially adversely affected, the CDFG is required to propose reasonable modifications to the project to protect the resources. These modifications, or conditions, are formalized in a Lake or Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project.

3.1.4.2 Agency Guidelines

Compensatory mitigation may be required for effects on two types of resources under CDFG jurisdiction: state-listed species protected under the California ESA (California Fish and Game Code, Sections 2050 et seq.) and riparian areas protected under the Lake and Streambed Alteration (California Fish and Game Code, Section 1600 et seq.). No compensatory mitigation guidelines for mitigation requirements are prescribed under the California ESA; however, guidance provided by CDFG representatives is presented below. CDFG is currently working with the SWRCB to produce regulatory guidelines for mitigation of riparian areas as a part of the WRAPP (as described in Section 3.1.2); however, these guidelines are not yet available.

To compensate for effects on state-listed species, CDFG may accept the following methods of mitigation, even though existing bank credits based on initial conversions are not preferred:

- Conservation bank (CDFG approved).
- Fee-title acquisition.
- Conservation easement.
- Turnkey mitigation strategies (permittee-responsible mitigation).
- Existing USFWS-approved conservation bank (banking instrument would need to be opened and revised to meet CDFG requirements).

In general, as with USFWS and in contrast to USACE, CDFG prioritizes preservation of existing habitat rather than habitat creation; however, CDFG does not accept in-lieu fees as compensation for state-listed species.

CDFG has published compensatory mitigation guidelines for several listed and special-status species. Of the species that have potential to be affected by the proposed project, guidelines are available for two species, Swainson's hawk and burrowing owl. It should be noted that the mitigation program for burrowing owl is a guideline provided by CDFG. Burrowing owls are considered a species of special concern by CDFG and therefore not subject to the California ESA. However, project-related effects on this species are potentially significant under CEQA. Mitigation guidelines for these species are summarized below.

Swainson's Hawk

Mitigation ratios for Swainson's hawk are based on the distance from the project footprint to the closest active nest site (which for this species is defined as a nest used one or more times in the last 5 years), as follows (CDFG 1994):

- Where effects on foraging habitat occur within 1 mile of an active nest tree, compensation will occur at a 1:1 ratio on agricultural lands or other suitable foraging habitat; or at a 0.5:1 ratio where habitat can be managed for prey production (e.g., managed to support prey species consisting of small mammals, etc.).
- Where effects on foraging habitat occur within 5 miles but greater than 1 mile from an active nest tree, compensation will occur at a 0.75:1 ratio.
- Where effects on foraging habitat occur within 10 miles but greater than 5 miles from an active nest tree, compensation will occur at a 0.5:1 ratio.

Burrowing Owl

Burrowing owl is not a state-listed species. However, CDFG does currently recommend mitigation for project-related effects on this species. The recommended mitigation ratio for burrowing owl is 6.5:1 (6.5 acres of foraging habitat per pair or unpaired resident bird affected) (CDFG 1995). If the destruction of occupied burrows is unavoidable, compensatory mitigation by enhancing existing unsuitable burrows or creating artificial burrows at a 2:1 ratio (two burrows enhanced or created for every occupied burrow destroyed) on a protected land site is recommended. Burrow enhancement includes enlarging or clearing debris from burrows to be preserved. New burrows would be created by installing artificial burrows as specified in the guidelines.

Other Special-Status Species

Mitigation ratios for the remaining state-listed special-status species—Colusa grass, San Joaquin valley Orcutt grass, hairy Orcutt grass, succulent owl's clover, Central Valley Chinook salmon, California tiger salamander, and San Joaquin kit fox—are based on industry standards determined through previous consultation and negotiations with USFWS and CDFG. Ratios depend on the likelihood of the species occurring on the project site and the nature of the effect. To date, no state-listed plant species have been found within the various alternative alignments. However, not all areas have been surveyed and potential habitat for these species does occur within portions of the various alternatives.

4.0 Overall Compensatory Mitigation Strategy

As previously described, the overall compensatory mitigation strategy will be more thoroughly developed in the MSIP. Based on previous discussions with the permitting agencies, the MSIP will focus on utilization of permittee-responsible mitigation sites for the mitigation of effects on biological resources rather than on approved mitigation banks or other potential mitigation mechanisms. Use of approved mitigation banks is currently being considered only for mitigation of any small, residual effects on biological resources that remain after all available mitigation from permittee-responsible mitigation sites has been exhausted.

The overall mitigation strategy will consider the structural requirements of the agencies, use of umbrella species to provide mitigation for other species with similar habitat requirements, and the EIR/EIS mitigation commitments. The MSIP will also use land acquisition strategies that consider watershed-level effects when proposing mitigation, giving priority to areas that provide habitat connectivity and those areas with upland and wetland restoration and creation potential. In addition, onsite restoration for temporary effects will be employed to offset those effects that occur within the construction footprint but have their previous biological functions and values restored with proper landscape treatment and protective measures. The measure of restoration success is highlighted more thoroughly in Section 5.0 through the use of measurable and applicable performance standards, which help in the assessment of the success of restoration efforts over time. In addition, preparation of a site implementation plan, long-term monitoring and maintenance plan, incorporation of adaptive management measures, and contingency measures will be included in the overall mitigation proposal.

An overview of the mitigation strategies for affected resources, including jurisdictional waters and special-status plant and wildlife species is provide below.

4.1 Jurisdictional Waters

CRAM data can be used for determining which assessment areas could benefit from restoration or enhancement. The use of CRAM data will also be key in determining the appropriate amounts of compensatory mitigation provided to replace or compensate for the loss of wetlands or natural habitat areas (e.g., an effect on a wetland feature with a high CRAM score would require a higher mitigation ratio to compensate for unavoidable effects on the wetland feature). CRAM is a tool developed for a condition assessment, rather than a functional assessment, of wetlands based on a scoring methodology that considers existing conditions associated with metrics such as land connectivity, buffers, and hydrological conditions, as well as physical and biotic structures. The wetland condition relates to the health of a wetland in reference to all other wetlands in the state (per the same wetland type). As such, the purpose of conducting this survey is to assess and document the condition and overall wetland health of USACE jurisdictional features, as identified in the February 2011 *Merced to Fresno Section Biological Resources and Wetlands Technical Report* (FRA and Authority 2011c). Information collected will be used to determine future mitigation, restoration, performance monitoring, and management needs to assure existing wetland values and functions are maintained or improved as a result of project implementation.

Because the LEDPA has not been determined, mitigation obligations to assure no-net-loss of aquatic functions or values are not currently known. Final mitigation ratios will be determined on a site-by-site basis through a watershed approach using a CRAM Level 2 rapid assessment of the affected features (completed) and the proposed mitigation features (to be completed in 2012). The level 2 assessment is used by the USACE to determine the relative functions and values of affected features to those being proposed for mitigation.

4.2 Special-Status Species

Proposed mitigation to offset effects on state- and federally listed plant and wildlife species will be based on the available agency guidance and protocols, and industry-standard mitigation requirements and ratios determined through previous consultation and negotiations with USFWS and CDFG. In the event that effects and offsite compensation acreages for a given resource cannot be determined until preconstruction surveys have been performed (i.e., valley elderberry longhorn beetle [based on elderberry shrubs/stem size class], Swainson's hawk [based on active nest trees], and western burrowing owl [based on active burrows]), final compensation acreages will be sought in accordance with agency guidelines after actual effects on resources have been identified. This is particularly relevant due to the limitation of the surveys and right-of-entry constraints.

5.0 Proposed Offsite Mitigation

This section describes the potential offsite compensatory mitigation measures proposed for Merced to Fresno Section effects, primarily through permittee-responsible mitigation and some limited utilization of approved mitigation/conservation banks. In-lieu fee programs may be presented as an option when resource agencies are in concurrence. This section is organized by mitigation measures and resource (i.e., jurisdictional waters, special plant species, etc.).

5.1 Mitigation/Conservation Banks

A conservation or mitigation bank is privately or publicly owned land that is permanently protected through the sale of habitat or species credits for mitigation purposes. A mitigation bank provides credits for wetland restoration, creation, and enhancement to mitigate for effects on jurisdictional waters. A conservation bank focuses on the protection of special-status species habitat, with credits established to provide specific species that occur on the site.

Mitigation bank credits are an option for fulfilling compensatory mitigation requirements. If feasible, the purchase of bank credits may be used to satisfy the project-specified mitigation prior to applying other mitigation options. To fulfill mitigation requirements using mitigation bank credits, one or more banks must be identified that meet the following criteria:

- The bank's service area overlaps with project effects.
- The bank has credits for the resource types affected by the Merced to Fresno Section.
- The bank has an agency-approved instrument.

The time frame necessary to fulfill compensatory mitigation requirements through mitigation/conservation banks would depend on the availability of existing banks. Thus, the time frame could be as little as several weeks or months to purchase established mitigation/conservation bank credits.

5.1.1 Jurisdictional Waters

No USACE-approved mitigation banks currently exist that meet the criteria identified above. If a suitable mitigation bank becomes available, a mitigation plan will be submitted to USACE for approval. The plan must describe the existing ecological baseline at the construction activity site and explain how the available number of credits will mitigate for project-specific effects. Per USACE approval, appropriate credits will be purchased from the bank operator.

5.1.2 Plant Species

Effects on plant species are only anticipated if plants under USFWS or CDFG jurisdiction are found during preconstruction surveys within areas of potential suitable habitat. If mitigation is required, conservation bank credits will be considered the method for fulfilling compensatory mitigation requirements for effects on plant species. If all mitigation needs cannot be met through conservation bank credits, a plant re-establishment program will be combined, where possible, with any of the other mitigation options for biological resources presented in this section. The options include re-establishment of plant species on temporarily disturbed areas and commensurate restoration in areas of suitable habitat through fee-acquisition or conservation easements.

5.1.3 Wildlife Species

Both USFWS and CDFG will require compensatory mitigation for effects on listed species under their jurisdiction; therefore, it is necessary that a real estate instrument be approved by one or both of these agencies. Banks that are approved by both agencies are preferred.

5.2 In-Lieu Fee Programs

In a combined statement issued in the Federal Register (FR) on November 7, 2000 (65 FR 66915), the USACE, EPA, and USFWS stated guidelines for the use of in-lieu fees for compensatory mitigation. An in-lieu-fee program is a compensatory mitigation option whereby, instead of either completing project-specific mitigation or purchasing credits from an approved mitigation bank, the permittee instead provides funds to an in-lieu-fee sponsor who may use the funds pooled from multiple sources to establish a mitigation site(s) to satisfy permittee mitigation requirements. In-lieu fees may be used to compensate for effects authorized per specific permit if the in-lieu fee arrangement is developed, reviewed, and approved using the process established for mitigation banks in the November 28, 1995 *Federal Guidance on the Establishment, Use and Operation of Mitigation Banks* (EPA 1995). In general, in-lieu-fee mitigation should only be used to compensate for effects on jurisdictional waters authorized by a Section 404 general permit when onsite mitigation or mitigation banks are not available or when a mitigation bank does not provide "in-kind" mitigation or wetland restoration, creation, or enhancement. For wildlife species, in-lieu fee programs are an acceptable form of mitigation through USFWS; however, in-lieu fee programs are typically not an acceptable form of mitigation through CDFG, nor is there an approved in-lieu fee program within the Sacramento District of USACE. In-lieu fee programs have been identified through informal consultation as a least preferred alternative to mitigation banks and permittee-responsible mitigation.

An in-lieu fee program should include the following:

- Be administered by a qualified organization;
- Identify the resources present and supply the necessary information to agencies in a timely manner;
- Work within a watershed planning effort;
- Give careful consideration to site selection, including the ecological and aquatic suitability of the site;
- Consider technical feasibility; the site should be self-sustaining to the extent possible;
- Describe the role of preservation;
- Ensure collection of funds and ensure that contingency measures are made; and
- Plan for continued monitoring and management of the mitigation site.

5.3 Permittee-Responsible Mitigation

An alternative to pursuing existing mitigation/conservation bank credits is to develop a turnkey mitigation strategy. This may allow the permittee to fulfill its compensatory mitigation requirements by tailoring the selection of the constituent mitigation properties to best mitigate project effects. Through a turnkey mitigation strategy, lands would be identified and secured by a land trust or other agency-approved third-party in a manner similar to those steps outlined below for other permittee-responsible mitigation approaches. Turnkey projects would be developed in coordination with agency personnel and in accordance with agency guidelines to fulfill the necessary compensatory mitigation requirements. If the full development and completion of a turnkey project cannot be achieved in the time frame necessary to receive agency approval, an endowment may be established as an assurance.

The time frame necessary to fulfill compensatory mitigation requirements through a turnkey mitigation strategy would depend on such factors as the availability of suitable lands for turnkey strategies; sufficient time to perform a preliminary jurisdictional delineation and a functions and services analysis (as necessary); sufficient time to prepare a mitigation work plan, maintenance plan, long-term management

plan, and adaptive management plan; and agency coordination and approval of turnkey options. The credits developed will require appropriate federal and state approvals for banks and other mitigation.

5.3.1 Jurisdictional Waters

Once permittee-responsible mitigation options have been identified and implemented, the remaining mitigation requirements for jurisdictional waters may be satisfied through suitable mitigation bank credits and in-lieu fee program options. For permittee-responsible mitigation, suitable mitigation lands must be identified for restoration, enhancement, creation, establishment, or preservation of jurisdictional waters. The specific method used to identify suitable mitigation lands is outlined in Section 5.3.3, as determined through a Level 2 rapid assessment. These lands must either be purchased through fee-title acquisition or protected under a conservation easement through the methods described below in Section 5.4.2. To gain approval for permittee-responsible mitigation for affected aquatic resources, a mitigation plan that provides the following information must be submitted to USACE:

1. *Objectives.* A description of the biological resource type(s) and amount(s) that will be provided, the method of compensation (i.e., restoration, establishment, enhancement, and/or preservation), and the manner in which the resource functions in the compensatory mitigation project will address the needs of the watershed, ecoregion, physiographic province, or other geographic area of interest.
2. *Site selection.* A description of the factors considered during the site selection process. This description should include consideration of watershed needs; onsite alternatives where applicable; and the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the compensatory mitigation project site.

Other factors in site selection include the following:

- Use “umbrella” species to cover other species with fewer acreage effects but similar requirements.
 - Apply species-specific mitigation measures for resources as specified in the EIR/EIS.
 - Attempt to acquire properties with the following characteristics:
 - Within watershed or adjacent to a watershed where the effect occurs. Exceptions would be based on value of acquiring mitigation properties of higher value that are further away.
 - Properties that are adjacent to current preserves.
 - Properties that maintain or re-establish connectivity between preserved habitats.
 - Properties with wetland and upland habitat restoration or creation potential.
3. *Site protection instrument.* A description of the legal arrangements and instrument, including site ownership, that will be used to ensure the long-term protection of the compensatory mitigation project site.
 4. *Baseline information.* A description of the ecological characteristics of the proposed compensatory mitigation project site and, in the case of an application for a USACE permit, the impact site. The baseline information should include a delineation of waters of the U.S. on the proposed compensatory mitigation project site.
 5. *Mitigation description.* An explanation of how the compensatory mitigation project will provide the required compensation for unavoidable effects on aquatic resources resulting from the permitted activity.

6. *Mitigation work plan.* Detailed written specifications and work descriptions for the compensatory mitigation project, including, but not limited to, the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water, including connections to existing waters and uplands; methods for establishing the desired plant community; plans to control invasive plant species; the proposed grading plan, including elevations and slopes of the substrate; soil management; and erosion control measures.
7. *Maintenance plan.* A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.
8. *Performance standards.* Ecologically based standards that will be used to determine whether the compensatory mitigation project is achieving its objectives.
9. *Monitoring requirements.* A description of parameters to be monitored to determine if the compensatory mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting on monitoring results to the district engineer must be included.
10. *Long-term management plan.* A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.
11. *Adaptive management plan.* A management strategy to address unforeseen changes in site conditions or other components of the compensatory mitigation project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success.
12. *Financial assurances.* A description of financial resources and their allocation that will be provided to ensure confidence by the regulatory agencies that the compensatory mitigation project will be completed in accordance with specified performance standards.

The time frame necessary to fulfill compensatory mitigation requirements through permittee-responsible mitigation will depend on such factors as the availability of suitable natural/disturbed lands with restoration, enhancement, establishment, and preservation opportunities whose owners are willing to establish conservation easements or fee-title acquisition; sufficient time to perform a preliminary jurisdictional delineation and a functions and services analysis (as necessary); sufficient time to prepare a mitigation work plan, maintenance plan, long-term management plan, and adaptive management plan; and agency coordination and approval of lands for permittee-responsible mitigation options.

5.3.2 Wildlife and Plant Species

Permittee-responsible mitigation includes the compensatory mitigation for effects on state- and federally listed wildlife and plant species. The primary step for permittee-responsible mitigation is to identify suitable lands that can either be purchased through fee-title acquisition or can be preserved under a conservation easement. The approach used to identify suitable properties is detailed in Section 5.3.4.

Both CDFG and USFWS require compensatory mitigation for effects on state- and federally listed wildlife and plant species, and each agency provides similar guidelines for the process required to complete permittee-responsible mitigation successfully. The requirements for each agency, as outlined in USFWS' *Review Criteria for Section 7 Off-Site Compensation* (Sacramento Fish and Wildlife Office 2011a) (see

Appendix A of this CMP) and CDFG's *Habitat Management Land Acquisition (HMLA) Process Overview for Applicants* (CDFG, no date) (see Appendix B of this CMP), are summarized below.

5.3.2.1 U.S. Fish and Wildlife Service

The USFWS requires the following information to initiate the approval process for permittee-responsible mitigation:

1. *Property assurances and conservation easement.* To ensure that the property is legally suitable as a mitigation property, the following documents must be prepared or collected and submitted:
 - a. The title report (a Preliminary Title Report at the proposal stage and final title insurance at recordation) shall be no older than 6 months.
 - b. Property assessment and warranty.
 - c. Subordination agreement (if there is any outstanding debt on the property).
 - d. Legal description and parcel map.
 - e. Conservation easement (a template is available from USFWS).
2. *Site assessment and development.* To ensure that the site is suitable from an environmental perspective, the following must be provided:
 - a. A Phase I Environmental Site Assessment.
 - b. A Restoration or Habitat Development Plan for the site; not required for preservation.
 - c. Construction security: Letter of credit or cashier's check to cover construction on the site, if required.
 - d. Performance security: Letter of credit or cashier's check for 20% of construction security in case remedial actions are required.
3. *Site management.* The following must be prepared for site management:
 - a. Interim Management Plan: The plan identifies the short-term management, monitoring, and reporting activities to be conducted from the time construction ends until the endowment fund has been fully funded for 1 year and all the performance standards in the development plan have been met. This plan may be the same as the Long-Term Management Plan.
 - b. Interim management security analysis and schedule: The purpose of the interim management security is to allow the endowment to grow for at least 1 year without any disbursements, a safeguard to ensure that enough funds will be available in the endowment to pay for future management costs.
 - c. Long-Term Management Plan: Identifies the long-term management, monitoring, and reporting activities to be conducted.
 - d. Endowment fund analysis and schedule: The analysis shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency, timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the management plan.

- e. Endowment funding agreement or trust agreement or declaration of trust: The agreement is between the endowment holder and the project applicant and shows how the endowment is to be funded, held, and disbursed.

5.3.2.2 California Department of Fish and Game

The CDFG requires the following information to initiate the approval process for permittee-responsible mitigation:

1. *Site evaluation.* For preliminary approval of a proposed site, CDFG requires or may request the following:
 - a. A completed Proposed Land for Acquisition Form.
 - b. A site location map that shows the proposed habitat management land/mitigation site(s).
 - c. A site visit by CDFG staff with project applicant and land owners (if land is not owned by applicant).
 - d. A biological resources survey.
 - e. A Preliminary Title Report.
2. *Preparation and submittal of HMLA package.* The project applicant must submit an HMLA package that contains the following components:
 - a. A Phase I Environmental Site Assessment.
 - b. A Preliminary Title Report (less than 6 months old) and a policy of title insurance.
 - c. Copies of documents supporting any title exceptions or title encumbrances.
 - d. Plot map of the property showing existing easements, structures, etc.
 - e. County assessor parcel map(s).
 - f. Copy of the current tax bill for the property.
 - g. Copy of final permit or agreement.
 - h. If the project applicant is a business, a copy of the document that specifies the names of the individuals who are legally authorized to sign the documents. For a corporation, trust, or partnership, the resolution document must be submitted on business letterhead.
 - i. A Final Management Plan.
 - j. A biological resources report.
 - k. A draft summary of transactions.
3. *Preparation of deed.* A Conservation Easement Deed or Grant Deed must be drafted to establish a conservation easement or fee-title acquisition, respectively. A conservation easement must be held by CDFG, another government organization, or a non-profit conservation organization.
 - a. *Approval of HMLA package.* CDFG must approve and process the final HMLA package.

The time frame necessary to fulfill compensatory mitigation requirements through permittee-responsible mitigation depends on such factors as the availability of suitable natural/disturbed lands that either have confirmed species records or provide connectivity between key natural areas (e.g., Pixley and Allensworth) whose owners are willing to sell the fee-title or a conservation easement; the seasonal limitations associated with presence surveys necessary to determine species presence; sufficient time to perform a preliminary jurisdictional delineation and a functions and services analysis (as necessary); sufficient time to prepare a mitigation work plan, maintenance plan, long-term management plan, and adaptive management plan; and agency coordination and approval of lands for permittee-responsible mitigation options.

5.3.3 Permittee-Responsible Mitigation Methodology

Select sites will be identified using the following methods: an internal analysis of mitigation sites and an external search for mitigation site recommendations. The latter includes contacting both public agencies and private organizations.. Contacting such groups, along with smaller non-profit organizations (e.g., local land trusts) may result in suitable leads for mitigation sites or potential easement sites. Other resources, such as local biologists and mitigation practitioners, who might know of land owners interested in placing conservation easements on their properties, will also be contacted. Some of this data collection has already been conducted (see Sections 5.3.3.3, 5.3.3.4 and 5.3.3.5). This CMP reflects coordination and communication with biologists, as well as mitigation banking programs and projects.

The analysis and selection of mitigation sites incorporates ecology, geography, and population genetics. Studies have incorporated everything from conservation area size, shape, and location to population viability analyses, measures of biodiversity, and threat of habitat degradation. Although these data and analyses may greatly enhance selection of appropriate lands for protection, they may be difficult to obtain and often assume that more land is available than can be protected. Given the extent of land converted to farming and urban development in the region, the search for potential compensatory mitigation sites focused on the identification of the remaining undeveloped/minimally developed properties and evaluation of their natural resources using existing data.

It is estimated that over 10,656 units (6,848,000 acres) of land have been converted from natural habitats to agriculture and urban use in the San Joaquin Valley, including 65% to 95% of the major habitat types represented in the San Joaquin Valley (Kelly et al. 2005). Much of the remaining natural lands were identified in the *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California* (CEHC) (Spencer et al. 2010), which was commissioned by the California Department of Transportation and the CDFG. This project roughly delineates the natural land blocks that have been determined to provide habitat for native ecosystems and the areas essential to connectivity between them. Conservation of these identified habitats and corridors in conjunction with existing protected areas was determined to be essential to the persistence of biodiverse natural resources in the state.

5.3.3.1 Mitigation Site Selection Approach

The lead agencies favor an approach that involves placing conservation easements on permittee-responsible mitigation properties and allowing suitable third-party property managers to hold fee title. Therefore, the forthcoming MSIP will emphasize placing conservation easements on mitigation lands with opportunities to create, restore, enhance, and preserve habitats with high conservation values. The MSIP will offer a synergistic approach to mitigation—that is, the approach will achieve greater benefits to biological resources because it involves combining mitigation for effects on individual resources into a comprehensive mitigation package. This approach should also streamline permit issuance by addressing the mitigation requirements of the permitting agencies and incorporating these required components into one comprehensive mitigation proposal.

5.3.3.2 Mitigation Site Selection Process

Both permittee-responsible mitigation sites and approved conservation banks will be considered during the evaluation of mitigation sites, although, as described previously, the MSIP will consider approved conservation banks only for mitigating relatively small residual effects on sensitive habitats and listed species.

A set of predetermined selection criteria will be developed and applied as part of a three-phase screening process that involves (1) a preliminary evaluation of potential mitigation sites, (2) a fatal-flaw analysis, and (3) an evaluation to identify sites with comparatively high conservation value that satisfy the requirements of the permitting agencies. Recommendations for permittee-responsible mitigation sites are based on relative conservation value, likelihood of meeting requirements of the permitting agencies, and potential to satisfy mitigation requirements consistent with the construction schedule for the Merced to Fresno Section.

Phase 1 of the selection process will consist of a preliminary evaluation of all potentially viable mitigation sites. Mitigation sites are considered potentially viable if it was reasonable to assume that the site could be secured before the start of the corresponding phase of construction and could potentially meet the mitigation requirements of the Merced to Fresno Section and the requirements of the permitting agencies. Permittee-responsible mitigation sites and approved conservation banks will both be included in the Phase 1 evaluation.

Phase 2 of the selection process will consist of the fatal-flaw analysis of the permittee-responsible mitigation sites and approved conservation banks identified in Phase 1. The criteria for the fatal-flaw analysis will be described in detail in the MSIP. Potential mitigation sites that are determined to be fatally flawed will not be carried forward to the Phase 3 evaluation.

In Phase 3 of the selection process, the remaining potential mitigation sites (i.e., sites with no fatal flaws) will be evaluated based on their relative conservation value, their potential to meet the requirements of the permitting agencies, and their potential to contribute to the restoration of sensitive biological resources affected by construction of the Merced to Fresno Section. This phase of the evaluation will include the use of geographic information system (GIS) data to support the conservation value analysis. The highest ranked sites based on overall conservation value and opportunities to fulfill mitigation requirements will be carried through as preliminary recommended sites in the MSIP.

5.3.3.3 CRAM Surveys for Proposed Mitigation Sites in Early 2012

CRAM surveys of potentially affected wetlands that were on accessible parcels were conducted in September 2011. The next step is to generate a CRAM report compiling survey results of current conditions and to generate an evaluation of potential indirect effects on wetlands under project conditions. In spring 2012, additional data will be collected for potential mitigation sites. For each parcel where entry is granted, one or more surveys will be conducted to ground-truth the parcel's value as a potential conservation candidate. These surveys may involve reconnaissance surveys and more involved efforts, including focused surveys for special-status species and delineation and evaluation of jurisdictional waters.

Jurisdictional Waters

For all properties where aquatic habitats have been documented or where the opportunity to preserve, enhance, or restore aquatic habitats may be present, a reconnaissance-level site assessment will be performed to ground-truth the suitability of each property as potential mitigation land.

The reconnaissance-level site assessment will include background data collection to identify the locations of aquatic features potentially present onsite, as determined using the NRCS's HUC Basins dataset (USDA and NRCS 1999) and a site visit. The background data collection will involve a review of the RWQCB

basin plans, the identification of watershed and subwatershed areas, surface water features, and the beneficial uses identified in *Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and San Joaquin River Basin* (Central Valley Regional Water Quality Control Board 2007). The background data collection will also include a review of existing data from the USFWS, U.S. Geological Survey (USGS), and CDFG to determine the locations, types, and potential extent of known waters of the U.S., waters of the state (including wetlands), and CDFG lakes and streambeds potentially present.

For all properties where riparian habitat has been documented or where suitable habitat for this habitat of concern may be or was historically present within creek riparian zones, a reconnaissance-level site assessment will be performed to ground-truth the suitability of each property as potential mitigation land.

After potential mitigation properties have been identified, CRAM will be used to inform the mitigation planning decisions, including final site selection; the ecological lift, or benefits, of mitigation; and mitigation ratios. Rapid assessment data will be used to determine which mitigation sites could benefit from restoration or enhancement.

A comparison of the baseline and mitigation site data will be used to determine the net ecological benefit associated with the mitigation activity. The net ecological lift will replace or compensate for the loss of wetlands or natural habitat areas. Mitigation ratios associated with specific mitigation activities will be determined through coordination with the regulatory agencies consistent with the *Standard Operating Procedure for Determination of Mitigation Ratios* currently under development (USACE 2011).

Wildlife Species

Where special-status plant and/or wildlife species have been documented or where suitable habitat for these species is present, a reconnaissance-level site assessment will be performed to ground-truth the suitability of each property as potential conservation land.

5.3.3.4 Agency Coordination

During the compensatory mitigation identification process, coordination will occur with agency personnel to determine which available mitigation opportunities would be suitable to partially or fully mitigate effects on biological and agricultural resources. Similarly, additional coordination will be initiated with agency personnel to determine which properties identified during reconnaissance-level site assessments would be suitable and capable of being approved by the appropriate agencies to partially or fully mitigate effects on biological .

Ongoing coordination with agency personnel will be critical in parcel identification and approval and to help identify what additional steps are necessary to approve potential properties and/or to partially or fully mitigate existing/remaining effects on biological resources.

5.3.3.5 Surveys

Jurisdictional Waters Surveys

If potential mitigation properties do not have an approved wetland delineation, teams of qualified biologists will walk meandering transects to visually survey appropriate candidate mitigation property for waters of the U.S., waters of the state, and CDFG lakes and streambeds.

After potential mitigation properties have been identified, CRAM will be used to inform the mitigation planning decisions, including final site selection; the ecological lift, or benefits, of mitigation; and mitigation ratios. Rapid assessment data will be used to determine which mitigation sites could benefit from restoration or enhancement.

A comparison of the baseline and mitigation site data will be used to determine the net ecological lift associated with the mitigation activity. Ecological lift is the increase or improved function and values of the mitigation program. The net ecological lift will replace or compensate for the loss of wetlands or natural habitat areas. Mitigation ratios associated with specific mitigation activities will be determined through coordination with the regulatory agencies consistent with the *Standard Operating Procedure for Determination of Mitigation Ratios* currently under development (USACE 2011).

Special-Status Wildlife Surveys

A special-status wildlife species preconstruction survey will consist of meandering pedestrian transects spaced to cover the property, per the quality, topography, and character of the habitat within the path of disturbance.

Wildlife surveys will consist of the following general activities:

- Map habitat that may be suitable for special-status wildlife species.
- Confirm, identify, map, and describe known or previously unreported occurrences of special-status species.
- Map relevant wildlife macro- or micro-habitat elements.
- Map and describe the primary constituent elements within areas of federally designated or proposed critical habitat units.

Focused protocol surveys (e.g., wet/dry season sampling for vernal pool branchiopods; raptor surveys for Swainson's hawk; breeding/wintering season surveys for burrowing owls; and determination of movement or use patterns for San Joaquin kit fox,) may be required to confirm species presence. Special-status wildlife species survey plans will be developed in accordance with agency protocols and guidance documents and submitted to USFWS and/or CDFG for approval.

5.4 Recommended Mitigation Options by Resource

Through careful consideration of the various mitigation opportunities available, agency-specific prioritization preferences for mitigation options, project funding considerations, and project timeline restrictions, individual mitigation options will be identified by resource to mitigate project effects. Where possible, mitigation/conservation banks and permittee-responsible mitigation options, which provide opportunities to receive credit for multiple species and/or resources (i.e., "nested" or "layered" mitigation), will be prioritized over options that provide limited species and/or resource overlap.

Several mitigation/conservation banks and permittee-responsible mitigation options have been identified that may be suitable to partially or fully mitigate potential effects on biological resources (Table 5-1). The locations of the mitigation/conservation banks are depicted on Figure 5-1. These options are described below. These available options will be narrowed down to a specific mitigation proposal in the MSIP based on the mitigation requirements of the Merced to Fresno Section and the three-step site screening methodology described previously.

5.4.1 Mitigation/Conservation Banks/Mitigation Projects

5.4.1.1 Deadman Creek Conservation Bank

The 710-acre Deadman Creek Conservation Bank in Merced County (Figure 5-1) provides conservation credits for vernal pool preservation and two species of interest: Swainson's hawk and San Joaquin kit fox. The Deadman Creek Conservation Bank is administered by Wildlands, Inc., and is a USFWS-approved conservation bank. This bank's service area for San Joaquin kit fox generally encompasses the northern

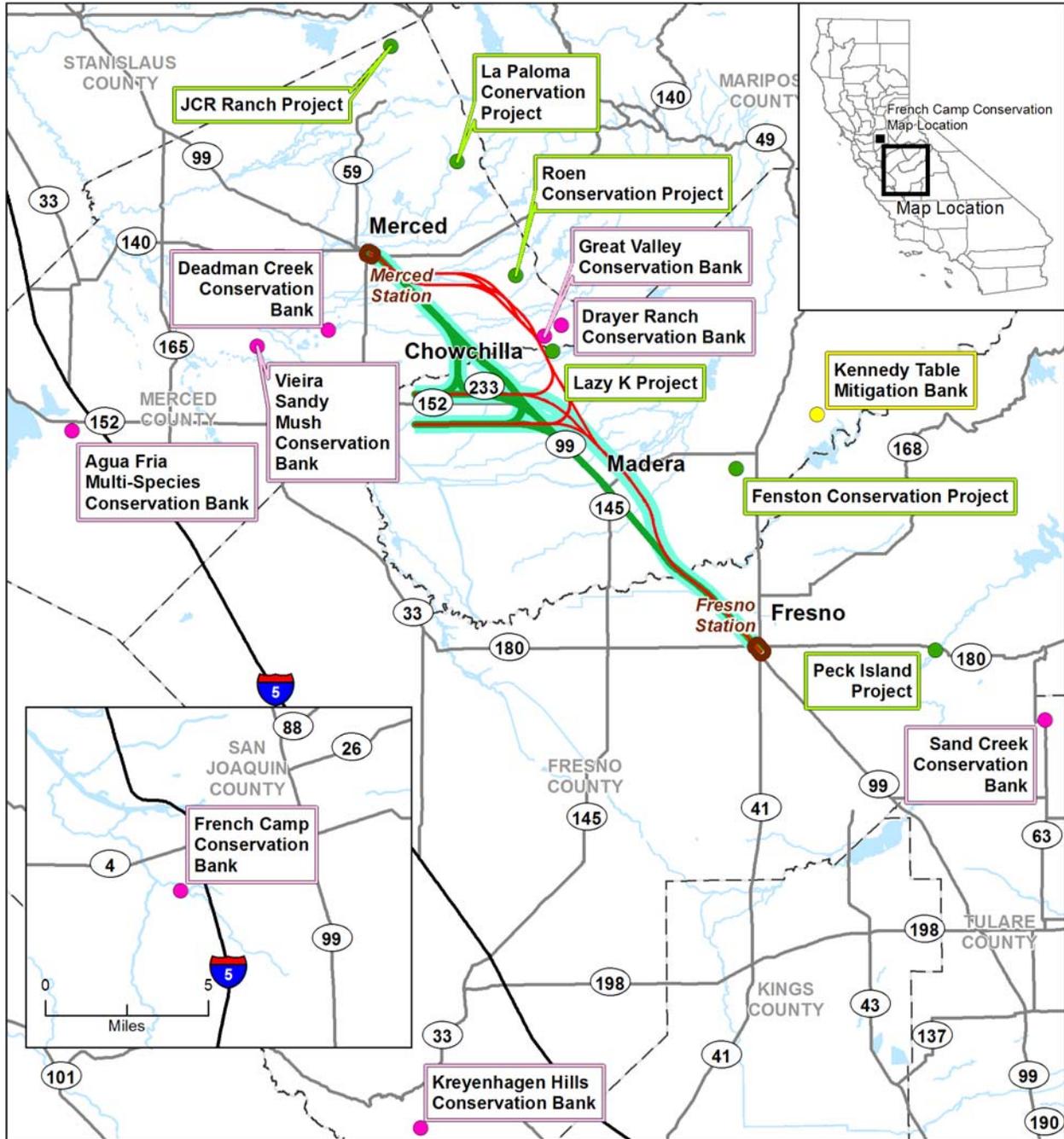
Table 5-1
Mitigation Options Identified to Date

MITIGATION SITE (total acreage) Agency Approval Status	Available Mitigation for Special-Status Species Habitats (acres) (Listing Status: Federal/State)															
	San Joaquin kit fox (FE/ST)	Western Spadefoot Toad	California tiger salamander [upland] (FT/ST)	Western burrowing owl (--/CSC)	Swainson's hawk (--/ST)	Valley elderberry longhorn beetle (FT/--)	Special Status Bats (--/SSC)	American Badger (--/SSC)	Western Pond Turtle (--/SSC)	Conservancy Fairy Shrimp (FE/--)	Vernal pool fairy shrimp (FT/--)	Vernal pool tadpole shrimp (FE/--)	Vernal pool preservation	Vernal pool restoration	Central Valley Steelhead (FT/)	Central Valley Spring- run Chinook Salmon (FT/)
DEADMAN CREEK CONSERVATION BANK (684 acres) USFWS: Approved CDFG: Not Approved	649	Yes, acreage unknown	619	649	649	--	Unknown	Unknown	Unknown	44	44	44	44	--	Unknown	Unknown
GREAT VALLEY CONSERVATION BANK AT FLYNN RANCH (1,067 acres) USFWS: Approved CDFG: Not Approved	950	--	950	950	950	--	Unknown	Unknown	Unknown	110	110	110	--	--	Unknown	Unknown
KREYENHAGEN HILLS CONSERVATION PROJECT (1,295 acres) USFWS: Approved CDFG: Not Approved	572	--	--	Unknown	Unknown	--	Unknown	Unknown	Unknown	--	--	--	--	--	Unknown	Unknown

MITIGATION SITE (total acreage) Agency Approval Status	Available Mitigation for Special-Status Species Habitats (acres) (Listing Status: Federal/State)															
	San Joaquin kit fox (FE/ST)	Western Spadefoot Toad	California tiger salamander [upland] (FT/ST)	Western burrowing owl (--/CSC)	Swainson's hawk (--/ST)	Valley elderberry longhorn beetle (FT/--)	Special Status Bats (--/SSC)	American Badger (--/SSC)	Western Pond Turtle (--/SSC)	Conservancy Fairy Shrimp (FE/--)	Vernal pool fairy shrimp (FT/--)	Vernal pool tadpole shrimp (FE/--)	Vernal pool preservation	Vernal pool restoration	Central Valley Steelhead (FT/)	Central Valley Spring- run Chinook Salmon (FT/)
LAZY K RANCH MITIGATION PROJECT (749 acres) USFWS: Pending – Under Review CDFG: Pending – Under Review USACE: Pending – Under Review	541	--	541	541	541	--	Unknown	Unknown	Unknown	--	26	12	26	29	Unknown	Unknown
DRAYER RANCH CONSERVATION BANK (254 acres) USFWS: Approved CDFG: Approved USACE: Not Approved	97	--	Yes, acreage unknown	200	200	--	Unknown	Unknown	Unknown	Unknown	40	40	40	--	Unknown	Unknown
FRENCH CAMP CONSERVATION BANK (84 acres) USFWS: Approved CDFG: Not Approved	--	--	--	--	--	84	Unknown	Unknown	Unknown	--	--	--	--	--	Unknown	Unknown
KENNEDY TABLE MITIGATION BANK (600 acres) USFWS: Approved CDFG: Approved USACE: Not Approved	--	--	--	--	--	--	Unknown	Unknown	Unknown	--	Yes, acreage unknown	--	Yes, acreage unknown	--	Unknown	Unknown

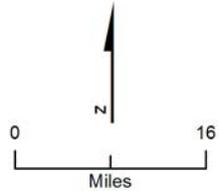
MITIGATION SITE (total acreage) Agency Approval Status	Available Mitigation for Special-Status Species Habitats (acres) (Listing Status: Federal/State)															
	San Joaquin kit fox (FE/ST)	Western Spadefoot Toad	California tiger salamander [upland] (FT/ST)	Western burrowing owl (--/CSC)	Swainson's hawk (--/ST)	Valley elderberry longhorn beetle (FT/--)	Special Status Bats (--/SSC)	American Badger (--/SSC)	Western Pond Turtle (--/SSC)	Conservancy Fairy Shrimp (FE/--)	Vernal pool fairy shrimp (FT/--)	Vernal pool tadpole shrimp (FE/--)	Vernal pool preservation	Vernal pool restoration	Central Valley Steelhead (FT/)	Central Valley Spring- run Chinook Salmon (FT/)
SAND CREEK MITIGATION BANK (498 acres) USFWS: Approved CDFG: Not Approved	397	--	Yes, acreage unknown	Unknown	Unknown	--	Unknown	Unknown	Unknown	--	--	--	12	--	Unknown	Unknown
VIEIRA – SANDY MUSH ROAD CONSERVATION BANK (333 acres) USFWS: Approved CDFG: Approved USACE: Approved	20	--	Yes, acreage unknown	Unknown	Unknown	--	Unknown	Unknown	Unknown	20	20	20	20	--	Unknown	Unknown
JCR RANCH (CONSERVATION EASEMENT) PROJECT (2,500 acres) USFWS: Proposed	Yes, acreage unknown	--	Yes, acreage unknown	Unknown	Unknown	--	Unknown	Unknown	Unknown	Yes, acreage unknown	Yes, acreage unknown	Yes, acreage unknown	--	70	Unknown	Unknown
AGUA FRIA MULTI-SPECIES CONSERVATION BANK (3,234 acres) USFWS: Approved CDFG: Approved	Yes, acreage unknown	--	--	Unknown	--	--	Unknown	Unknown	Unknown	--	--	--	--	--	Unknown	Unknown
LA PALOMA CONSERVATION PROJECT (2,926 acres) USFWS: Proposed CDFG: Proposed	YES, acreage unknown	YES, acreage unknown	YES, acreage unknown	Possibly, acreage unknown	Possibly, acreage unknown	Unknown	YES, acreage unknown	YES, acreage unknown	YES, acreage unknown	Possibly, acreage unknown	Possibly, acreage unknown	Possibly, acreage unknown	67.5	--	--	--

MITIGATION SITE (total acreage) Agency Approval Status	Available Mitigation for Special-Status Species Habitats (acres) (Listing Status: Federal/State)															
	San Joaquin kit fox (FE/ST)	Western Spadefoot Toad	California tiger salamander [upland] (FT/ST)	Western burrowing owl (--/CSC)	Swainson's hawk (--/ST)	Valley elderberry longhorn beetle (FT/--)	Special Status Bats (--/SSC)	American Badger (--/SSC)	Western Pond Turtle (--/SSC)	Conservancy Fairy Shrimp (FE/--)	Vernal pool fairy shrimp (FT/--)	Vernal pool tadpole shrimp (FE/--)	Vernal pool preservation	Vernal pool restoration	Central Valley Steelhead (FT/)	Central Valley Spring- run Chinook Salmon (FT/)
ROEN CONSERVATION PROJECT (1,925 acres) USFWS: Proposed CDFG: Proposed USACE: Proposed	YES, acreage unknown	YES, acreage unknown	YES, acreage unknown	Possibly, acreage unknown	YES, acreage unknown	--	Possibly, acreage unknown	Possibly, acreage unknown	Possibly, acreage unknown	Possibly, acreage unknown	Possibly, acreage unknown	Possibly, acreage unknown	206	--	--	--
FENSTON CONSERVATION PROJECT (2,016 acres) USFWS: Unknown CDFG: Unknown USACE: Unknown	YES, acreage unknown	YES, acreage unknown	YES, acreage unknown	Possibly, acreage unknown	YES, acreage unknown	--	YES, acreage unknown	YES, acreage unknown	--	Possibly, acreage unknown	Possibly, acreage unknown	Unknown	Possibly, acreage unknown	Possibly, acreage unknown	--	--
PECK ISLAND PROJECT (187 acres) USFWS: Unknown CDFG: Unknown	--	--	--	--	YES, acreage unknown	Possibly, acreage unknown	YES, acreage unknown	--	YES, acreage unknown	--	--	--	--	--	--	--
Notes: CSC = California species of concern FE = Federally endangered FT = Federally threatened SSC = Species of special concern ST = State threatened																



ESR, Inc. (2010), KV Mitigation Partners (2009), S.JVC (2011), Vollmar Consulting (2010), Wildlands, Inc. (2010), Sacramento Fish and Wildlife Office (2011b), Speciesbanking.com (2008).

MF_PERMIT_CMP_04 Jan 04, 2012



- UPRR/SR 99 Alternative
- BNSF Alternative
- Hybrid Alternative
- Station Study Area
- County Boundary
- Mitigation Bank
- Conservation Bank
- Project

Figure 5-1
 Mitigation/Conservation
 Banks and Projects

portion of the project, extending along the central and east side of the valley floor from Fresno as far south as Visalia (portions of Fresno, Kings, and Tulare counties); the service area for vernal pool preservation generally encompasses the central and southern portions of the project, extending along the valley floor from north of Visalia as far south as Rosedale (portions of Fresno, Kings, Tulare, and Kern counties). The Deadman Creek Conservation Bank may provide opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat for these species overlap. No service areas have been established for this bank for Swainson’s hawk, but CDFG can approve them on a case-by-case basis.

5.4.1.2 Great Valley Conservation Bank

Great Valley Conservation Bank at Flynn Ranch is a 1,067-acre site located in Merced County (Figure 5-1) that provides conservation credits for vernal pool branchiopods and four other species of interest: Swainson’s hawk, California tiger salamander, western burrowing owl, and San Joaquin kit fox. The Great Valley Conservation Bank, which is a USFWS-approved conservation bank, may provide opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat for these species overlap.

5.4.1.3 Drayer Ranch Conservation Bank

Drayer Ranch Conservation Bank is a 254-acre site located in Merced County (Figure 5-1) that provides conservation credits for vernal pool preservation, vernal pool branchiopods, and four other species of interest: Swainson’s hawk, California tiger salamander, western burrowing owl, and San Joaquin kit fox. The Drayer Ranch Conservation Bank is a USFWS-, CDFG-, and USACE-approved conservation bank.

5.4.1.4 Kreyenhagen Hills Conservation Bank

The 1,600-acre Kreyenhagen Hills Conservation Bank in Fresno County (Figure 5-1) provides conservation credits for San Joaquin kit fox. The Kreyenhagen Hills Conservation Bank is administered by Wildlands, Inc., and is a USFWS-approved conservation bank. This bank’s service area for San Joaquin kit fox is limited to the east side of the valley floor (portions of Fresno, Kings, and Kern counties). A portion of this bank’s service area is located adjacent to the southwest end of the Merced to Fresno Section at the San Joaquin River. Suitable foraging habitat is present for burrowing owl, which provides opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat for these species overlaps. No service areas have been established for this bank for burrowing owl, but CDFG can approve these areas on a case-by-case basis.

5.4.1.5 Lazy-K Ranch Mitigation Project

The proposed 1,552-acre Lazy-K Ranch Mitigation Project in Merced and Madera counties (Figure 5-1) provides conservation and mitigation credits for seasonal wetlands (vernal pool restoration and preservation), riparian wetlands, streams, and six species of interest: vernal pool tadpole shrimp, vernal pool fairy shrimp, California tiger salamander, burrowing owl, Swainson’s hawk, and San Joaquin kit fox. The Lazy-K Ranch Mitigation Project is administered by the Conservation Land Group, and is currently pending approval by USFWS, CDFG, USACE, and EPA. The Lazy-K Mitigation Project would provide suitable foraging habitat for Swainson’s hawk and burrowing owl, providing opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat for these species overlap. No service areas have been established for either Swainson’s hawk or burrowing owl, but CDFG can approve them on a case-by-case basis.

5.4.1.6 French Camp Conservation Bank

The 84-acre French Camp Conservation Bank in Merced County (Figure 5-1) provides conservation credits for valley elderberry longhorn beetle. The French Camp Conservation Bank, which is a USFWS-approved conservation bank, may provide opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat exists for special-status bat species, American badgers, or western pond turtles.

5.4.1.7 Kennedy Table Mitigation Bank

The 600-acre Kennedy Table Mitigation Bank in Merced County (Figure 5-1) provides conservation credits for vernal pool preservation and vernal pool branchiopods. The Kennedy Table Mitigation Bank, which is a USFWS-approved conservation bank, may provide opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat exists for special-status bat species, American badgers, or western pond turtles.

5.4.1.8 Sand Creek Conservation Bank

The 498-acre Sand Creek Conservation Bank in Merced County (Figure 5-1) provides 397 conservation credits for San Joaquin kit fox and 12 credits towards vernal pool preservation. The Sand Creek Conservation Bank is a USFWS-approved conservation bank that may provide opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat exists.

5.4.1.9 Vieira-Sandy Mush Conservation Bank

The 333-acre Vieira-Sandy Mush Conservation Bank in Merced County (Figure 5-1) provides 20 conservation credits for San Joaquin kit fox, as well as 20 credits for vernal pool branchiopods and vernal pool preservation. California tiger salamander is confirmed present but does not yet have a confirmed number of conservation credits. The Vieira-Sandy Mush Road Conservation Bank is a USFWS-approved conservation bank that may provide opportunities to “nest” or “layer” mitigation for multiple species where suitable habitat exists for western burrowing owls, Swainson’s hawk, special-status bat species, American badgers, or western pond turtles.

5.4.1.10 JCR Ranch (Conservation Easement) Project

The 2,500-acre JCR Ranch (Conservation Easement) Project in Merced County (Figure 5-1), which is a USFWS-proposed conservation bank, may provide opportunities to “nest” or “layer” mitigation for multiple species where they are verified to occur and suitable habitat exists for San Joaquin kit fox, California tiger salamander, and vernal pool branchiopods.

5.4.1.11 Agua Fria Multi-Species Conservation Bank

The 3,234-acre Agua Fria Multi-Species Conservation Bank in Merced County (Figure 5-1) is a USFWS and CDFG-approved conservation bank. The Agua Fria Multi-Species Conservation Bank may provide opportunities to “nest” or “layer” mitigation for multiple species where they are verified to occur and suitable habitat exists for San Joaquin kit fox, special-status bat species, American badgers, or western pond turtles.

5.4.1.12 La Paloma Conservation Project

The proposed 2,926-acre La Paloma Conservation Project in Merced County (Figure 5-1) provides 67.5 conservation credits for vernal pool preservation. The La Paloma Conservation Project, which is a USFWS and CDFG proposed conservation bank, may provide opportunities to “nest” or “layer” mitigation for multiple species where species are verified to occur and suitable habitat exists for succulent owl’s clover, San Joaquin kit fox, western spadefoot toad, California tiger salamander, special-status bat species, American badgers, or western pond turtles. Future surveys may confirm the presence of conservancy fairy shrimp, vernal pool tadpole shrimp, San Joaquin Valley Orcutt grass, and Greene’s tuctoria.

5.4.1.13 Roen Conservation Project

The proposed 1,925-acre Roen Conservation Project in Merced County (Figure 5-1) provides conservation credits for vernal pool preservation, vernal pool branchiopods, and other species of interest: succulent

owl's clover, San Joaquin Valley Orcutt grass, Swainson's hawk, California tiger salamander, western burrowing owl, and San Joaquin kit fox. The Roen Conservation Project is a USFWS, CDFG and USACE proposed conservation bank that may provide opportunities to "nest" or "layer" mitigation for multiple species where suitable habitat for these species overlap.

5.4.1.14 Fenston Conservation Project

The proposed 2,016-acre Fenston Conservation Project in Madera County (Figure 5-1) may provide conservation credits for a variety of species and habitats but more data collection is needed. There may be some potential for vernal pool restoration and preservation, vernal pool branchiopods, and other species of interest: succulent owl's clover, San Joaquin Valley Orcutt grass, Swainson's hawk, California tiger salamander, and western burrowing owl. The Fenston Conservation Project may provide opportunities to "nest" or "layer" mitigation for multiple species where suitable habitat for these species overlap.

5.4.1.15 Peck Island Project

The proposed 187-acre Peck Island Project is understood to provide conservation opportunities for Valley elderberry longhorn beetle. Peck Island, which is located east of Fresno in Fresno County (Figure 5-1), may provide opportunities to "nest" or "layer" mitigation for multiple species where suitable habitats for these species overlap; however, more data collection is needed.

5.4.2 Conservation Easement/Fee-Title Acquisition

Considerations for conservation easements and fee-title acquisition will be prioritized based on the location of the site, ownership status, and jurisdictional areas present, as well as aquatic functions, hydrology and topography, soils/substrate, vegetation communities, presence and historical uses and proposed uses for adjacent uses, and overall landscape permeability/connectivity. The resources that are available for restoration and creation are very important as well as the endowment and potential easement parameters. Opportunities for adaptive management should be considered based on mitigation objectives and associated performance standards.

5.4.3 Recommended Mitigation Options: Jurisdictional Waters

The USACE recommends mitigation of jurisdictional waters using a watershed approach to the extent appropriate and practicable. The ultimate goal of a watershed approach is to maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites (73 FR 19670). Where feasible, using this watershed approach is sensible guidance for mitigation of in-kind wetlands and will be used wherever possible. However, where watersheds have been highly modified and potential mitigation sites are small and highly fragmented, as many are in the San Joaquin Valley, the function and value of wetlands may be better represented if sites are chosen on the basis of quality, location, size, and connectivity, even if this means mitigating outside a given watershed.

For example, the effects on seasonal wetlands in the Merced to Fresno Section could occur in more than one watershed. To mitigate for these seasonal wetlands within their respective watersheds is likely possible, but greater function and value of offsite mitigation may be achieved by restoring, creating, or enhancing wetlands in the vicinity of the effects with less regard to strict watershed boundaries. Some of the wetland effect may include mitigation for jurisdictional waters outside of watershed boundaries, but within a particular region. In all cases, the team will weigh the watershed approach with other factors to evaluate the best choices for mitigation sites in accordance with management guidance provided by USACE and/or SWRCB and in coordination with the Central Valley Regional Water Quality Control Board.

5.4.4 Recommended Mitigation Options: Plants/Wildlife Species

The USFWS and CDFG recommend that mitigation of special-status wildlife species to offset any permanent effects of the proposed activity on federally and state-listed species be emphasized by preserving habitat rather than creating habitat. Where feasible, habitat preservation will be used through the use of conservation banks, fee-title acquisition, and conservation easements. However, in-lieu fees will not be pursued as compensation for state-listed species as CDFG does not allow the application of in-lieu fees for effects on state-listed species.

Mitigation sites will be chosen by quality, location, size, connectivity, and other ecological values within the greater Central Valley region. Where possible, mitigation sites that provide “layered” or “nested” mitigation opportunities to protect more than one species will be prioritized over sites that provide mitigation for individual species since the presence of multiple special-status species is one indicator of habitat quality. In all cases, the team will consider several factors in the mitigation site selection process to evaluate the best choices for mitigation sites.

5.5 Mitigation Obligation and Schedule Options

Mitigation obligations are required to be met prior to issuance of Section 404, Section 401, and CDFG Section 2081 and 1600 permits unless otherwise specified by the permitting regulatory agency. At a minimum, all mitigation obligations should be in place prior to any construction or ground disturbance because of the project construction schedule and the limited time frame to identify, acquire, design, and obtain agency approval for mitigation sites. Further investigations and agency coordination will be required before recommendations can be made regarding the final mitigation package.

The next step is the preparation of a detailed mitigation proposal, the MSIP. This document will build upon information presented in this initial CMP. The MSIP will present the mitigation proposal for the preferred alternative and will provide a blueprint for where the mitigation/compensation program will be implemented and the quantity of acres/credits to be used to offset project effects, by resource, and the required ratios. The MSIP will include all elements necessary to satisfy related state and federal permit requirements for compensatory mitigation.

Below is the milestone summary of the MSIP schedule:

- Present preliminary mitigation strategy to resource agencies – November 21 and 22, 2011.
- Submit Draft MSIP to resource agencies in support of the Section 7 consultation and issuance of the Biological Opinion – February 13, 2012.
- Submit Revised MSIP based on agency comments for Section 7 Consultation to resource agencies (USFWS, NMFS) in support of the Section 7 consultation and issuance of the Biological Opinion – April 13, 2012.
- Submit Final MSIP to resource agencies (USACE, CDFG, USFWS, and NMFS) in support of the Section 404 permit application and state-level permits and for final approval – May 18, 2012.

6.0 Mitigation Plans and Assurances

As part of the MSIP, several plans and assurances are required as part of the preparation and approval process. These include the preparation of a mitigation work plan, a maintenance plan, performance standards/success criteria, monitoring requirements, a long-term management plan, an adaptive management plan, and financial assurances. These components will be developed conceptually early in the conceptual mitigation planning process (Draft CMP) and, as compensatory mitigation opportunities are identified, fleshed out in more detail for the MSIP. The details of these plans and assurances are described conceptually in more detail below.

6.1 Maintenance Work Plan

A mitigation work plan will be prepared for the compensatory mitigation project(s) that will include the following:

- Detailed written specifications and work descriptions including, but not limited to, the geographic boundaries of the project.
- Construction methods, timing, and sequence.
- Source(s) of water, plants, and/or wildlife.
- Connectivity to existing waters, vegetation communities, wildlife movement corridors, natural/protected lands.
- Methods for establishing the desired plant/wildlife community.
- Wildlife relocation and exclusion protocol.
- plans to control invasive plant/wildlife species.
- The proposed grading plan, including elevations and slopes of the substrate.
- Soil management.
- Erosion control measures, as appropriate.

For stream compensatory mitigation projects, the mitigation work plan may also include other relevant information, such as plan form geometry, channel form (e.g., typical channel cross sections), watershed size, design discharge, and riparian area plantings.

6.2 Maintenance Plan

A maintenance plan will be prepared for the compensatory mitigation project that will include a description and schedule of maintenance requirements to ensure the continued viability of the resource(s) once initial construction is completed. The maintenance plan would be tailored to site-specific needs, including fencing, invasive species removal, grazing, etc.

6.3 Performance Standards/Success Criteria

The approved MSIP will contain ecologically based performance standards that will be used to determine whether the project is achieving its objectives. Performance standards will relate to the objectives of the compensatory mitigation project so that the project can be objectively evaluated to determine if it is

developing into the desired resource type, providing the expected functions, supporting or sustaining the appropriate plant/wildlife species, and attaining any other applicable metrics (e.g., acres).

Performance standards will be based on attributes that are objective and verifiable (i.e., a Level 2 rapid assessment for jurisdictional waters). Ecological performance standards will be based on the best available science to establish levels and quantities that can be measured or assessed in a practicable manner. Performance standards may be based on variables or measures of functional capacity described in functional assessment methodologies, measurements of hydrology or other aquatic resource characteristics, plant and wildlife species presence/absence, and/or comparisons to reference resources of similar type and landscape position. The use of reference resources to establish performance standards will help ensure that those performance standards are reasonably achievable by reflecting the range of variability exhibited by the regional class of resources as a result of natural processes and anthropogenic disturbances. Performance standards based on measurements of hydrology, for example, should take into consideration the hydrologic variability exhibited by the reference aquatic resources, especially wetlands. Where practicable, performance standards should take into account the expected stages of the resource development process to allow early identification of potential problems and appropriate adaptive management.

6.4 Monitoring Requirements

Monitoring the compensatory mitigation project site(s) is necessary to determine if the project is meeting its performance standards, and to determine if measures are necessary to ensure that the compensatory mitigation project is accomplishing its objectives. Monitoring reports that assess the development and condition of the compensatory mitigation project at a level commensurate with the compensatory mitigation project type will be required and submitted to the responsible agencies.

The approved MSIP will identify the monitoring requirements for the compensatory mitigation project(s), including the parameters to be monitored, the length of the monitoring period, the party responsible for conducting the monitoring, the frequency for submitting monitoring reports to the responsible agencies, and the party responsible for submitting those monitoring reports to the responsible agencies.

The approved MSIP will provide for a monitoring period that is sufficient to demonstrate that the compensatory mitigation project has met performance standards, which typically occurs over a 5-year period. A longer monitoring period may be required for aquatic resources with slow development rates (e.g., forested wetlands, bogs). After the project is implemented, the responsible agencies may reduce or waive the remaining monitoring requirements upon a determination that the compensatory mitigation project has achieved its performance standards. Conversely, the responsible agencies may extend the original monitoring period upon a determination that performance standards have not been met or the compensatory mitigation project is not on track to meet them. The responsible agencies may also revise monitoring requirements when remediation and/or adaptive management are required.

The responsible agencies will determine the information to be included in the monitoring reports. This information will be sufficient for the responsible agencies to determine how the compensatory mitigation project is progressing towards meeting its performance standards, and may include plans (such as as-built plans), maps, and photographs to illustrate site conditions. Monitoring reports may also include the results of functional, condition, or other assessments used to provide quantitative or qualitative measures of the functions provided by the compensatory mitigation project site.

6.5 Long-Term Management Plan

Mitigation projects will be designed to ensure the long-term sustainability of the resource after performance standards have been achieved through the preparation and implementation of a long-term management plan that identifies the long-term financing mechanisms and the party responsible for long-term management.

The permit conditions or instrument will identify the party responsible for ownership and long-term management of the compensatory mitigation project(s). The permit conditions or instrument may contain provisions allowing the permittee or sponsor to transfer the long-term management responsibilities of the compensatory mitigation project site(s) to a land stewardship entity, such as a public agency, non-governmental organization, or private land manager, after review and approval by the responsible agencies. The land stewardship entity need not be identified in the original permit or instrument, as long as the future transfer of long-term management responsibility is approved by the responsible agencies.

The long-term management plan will describe long-term management needs and annual cost estimates for these needs, and will identify the funding mechanism that will be used to meet those needs. Any provisions necessary for long-term financing must be addressed in the original permit or instrument. The responsible agencies may require provisions to address inflationary adjustments and other contingencies, as appropriate.

Appropriate long-term financing mechanisms include non-wasting endowments, trusts, contractual arrangements with future responsible parties, and other appropriate financial instruments. In cases where the long-term management entity is a public authority or government agency, that entity must provide a plan for the long-term financing of the site. For permittee-responsible mitigation, any long-term financing mechanisms must be approved in advance of the activity causing the authorized effects.

The resources and buffers that comprise the overall compensatory mitigation project may provide long-term protection through real estate instruments or other available mechanisms, as appropriate. Long-term protection may be provided through real estate instruments such as conservation easements held by entities such as federal, tribal, state, or local resource agencies; non-profit conservation organizations; or private land managers, or through the transfer of title to such entities or by restrictive covenants.

For government property, long-term protection may be provided through federal facility management plans or integrated natural resources management plans. When approving a method for long-term protection of non-government property other than transfer of title, the responsible agencies shall consider relevant legal constraints on the use of conservation easements and/or restrictive covenants in determining whether such mechanisms provide sufficient site protection. To provide sufficient site protection, a conservation easement or restrictive covenant should, where practicable, establish in an appropriate third party (e.g., a governmental or non-profit resource management agency) the right to enforce site protections and provide the third party with the resources necessary to monitor and enforce these site protections.

The real estate instrument, management plan, or other mechanism providing long-term protection of the compensatory mitigation site must, to the extent appropriate and practicable, prohibit incompatible uses (e.g., clear cutting or mineral extraction) that might otherwise jeopardize the objectives of the compensatory mitigation project. Where appropriate, multiple instruments recognizing compatible uses (e.g., fishing or grazing rights) may be used.

The real estate instrument, management plan, or other long-term protection mechanism must contain a provision requiring 60-day advance notification to the responsible agencies before any action is taken to void or modify the instrument, management plan, or long-term protection mechanism, including transfer of title to, or establishment of any other legal claims over, the compensatory mitigation site.

For compensatory mitigation projects on public lands, where federal facility management plans or integrated natural resources management plans are used to provide long-term protection, and changes in statute, regulation, or agency needs or mission results in an incompatible use on public lands originally set aside for compensatory mitigation, the public agency authorizing the incompatible use is responsible for providing alternative compensatory mitigation that is acceptable to the responsible agencies for any loss in functions resulting from the incompatible use.

A real estate instrument, management plan, or other long-term protection mechanism used for site protection of permittee-responsible mitigation must be approved by the responsible agencies in advance of, or concurrent with, the activity causing the authorized effects.

Compensatory mitigation projects shall be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved. This includes minimization of active engineering features (e.g., pumps) and appropriate siting to ensure that natural hydrology and landscape context will support long-term sustainability.

Where active long-term management and maintenance are necessary to ensure long-term sustainability (e.g., prescribed burning, invasive species control, maintenance of water control structures, easement enforcement), the responsible party must provide for such management and maintenance. This includes the provision of long-term financing mechanisms where necessary. Where needed, the acquisition and protection of water rights must be secured and documented in the permit conditions or instrument.

6.6 Adaptive Management Plan

The compensatory mitigation project(s) will be designed to address unforeseen changes in site conditions or other of its components, including the party or parties responsible for implementing adaptive management measures, through the preparation and implementation of an adaptive management plan. This plan will serve to guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success.

If the compensatory mitigation project cannot be constructed in accordance with the approved mitigation plans, the permittee or sponsor must notify the responsible agencies. Those agencies must approve a significant modification of the compensatory mitigation project. If monitoring or other information indicates that the compensatory mitigation project is not progressing towards meeting its performance standards as anticipated, the responsible party must notify the responsible agencies as soon as possible. The responsible agencies will evaluate and pursue measures to address deficiencies in the compensatory mitigation project. Those agencies will consider whether the compensatory mitigation project is providing ecological benefits comparable to the original objectives of the compensatory mitigation project.

The responsible agencies, in consultation with the responsible party (and other federal, tribal, state, and local agencies, as appropriate), will determine the appropriate measures to be applied when a mitigation project is not meeting objectives. The measures may include site modifications, design changes, plant palette adjustments, revisions to maintenance requirements, and revised monitoring requirements. The measures must be designed to ensure that the modified compensatory mitigation project provides aquatic resource functions comparable to those described in the mitigation plan objectives.

Performance standards may be revised in accordance with adaptive management to account for measures taken to address deficiencies in the compensatory mitigation project. Performance standards may also be revised to reflect changes in management strategies and objectives if the new standards provide for ecological benefits that are comparable or superior to the approved compensatory mitigation project. Other revisions to performance standards may occur in the case of natural disasters.

6.7 Financial Assurances

The mitigation work plan will include a description of the financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project(s) will be successfully completed in accordance with approved performance standards.

In cases where an alternate mechanism is available to ensure a high level of confidence that appropriate compensatory mitigation will be provided and maintained (e.g., a formal, documented commitment from

a government agency or public authority), the responsible agencies may determine that financial assurances are not necessary.

The amount of the required financial assurances must be determined by the responsible agencies, in consultation with the project sponsor, and must be based on the size and complexity of the compensatory mitigation project(s), the degree of completion of the project at the time of project approval, the likelihood of success, the past performance of the project sponsor, and any other factors the responsible agencies deem appropriate. Financial assurances may be in the form of performance bonds, escrow accounts, casualty insurance, letters of credit, legislative appropriations for government-sponsored projects, or other appropriate instruments, subject to the approval of the responsible agencies. The rationale for determining the amount of the required financial assurances must be documented in the administrative record for either the Department of the Army permit or the instrument. In determining the assurance amount, the responsible agencies shall consider the cost of providing replacement mitigation, including costs for land acquisition, planning and engineering, legal fees, mobilization, construction, and monitoring.

If financial assurances are required, the permit must include a special condition requiring the financial assurances to be in place before the permitted activity begins.

Financial assurances shall be phased out once the compensatory mitigation project has been determined by the responsible agencies to be successful in accordance with its performance standards. The permit or instrument must clearly specify the conditions under which the financial assurances are to be released to the permittee, sponsor, and/or other financial assurance provider, including, as appropriate, linkage to achievement of performance standards, adaptive management, or compliance with special conditions.

A financial assurance must be in a form that ensures that the responsible agencies will receive notification at least 120 days in advance of any termination or revocation. For third-party assurance providers, this may take the form of a contractual requirement for the assurance provider to notify the responsible agencies at least 120 days before the assurance is revoked or terminated.

Financial assurances shall be payable at the direction of the responsible agencies to his designee or to a standby trust agreement. When a standby trust is used (e.g., with performance bonds or letters of credit), all amounts paid by the financial assurance provider shall be deposited directly into the standby trust fund for distribution by the trustee in accordance with the responsible agencies' instructions.

7.0 Overview of Mitigation Implementation

Because of the large geographic extent of the Merced to Fresno Section construction and effects on various species and habitats, offsite compensatory mitigation will likely include a combination of mitigation/conservation banks, in-lieu fee programs, and permittee-responsible mitigation (i.e., turnkey mitigation strategies, fee-title acquisitions, conservation easements). In light of agency preferences, any available, approved existing bank credits may be purchased as a last step to meeting compensatory mitigation goals after available permittee-responsible mitigation has been exhausted. A number of available mitigation and conservation bank credits in the appropriate service area have been identified; biologists are consulting with agencies and mitigation banking firms to secure and purchase credits.

Additional mitigation requirements will be fulfilled by in-lieu fee programs, where applicable, approved, and available. Permittee-responsible mitigation will fulfill any remaining mitigation requirements.

7.1 Goals

Compensatory mitigation goals include the following:

- Offsetting permanent losses of waters of the U.S.
- Using a watershed approach, including consideration for landscape linkage opportunities.
- Creating, restoring, and enhancing waters of the U.S and aquatic resources.
- Preserving and restoring habitat for special-status species.
- Meeting or exceeding mitigation ratio estimates for compensation to wetlands and special-status wildlife and plants.

All compensatory mitigation will be sought with agency oversight; only mitigation projects and programs with agency approval will be used to fulfill goals. Once mitigation/conservation bank credits are secured, in-lieu fee programs are identified, and permittee-responsible mitigation sites are identified and procured, this section will include a table summarizing the mitigation acreages needed and how each compensatory mitigation option contributes to the final estimate.

7.2 Implementation and Mitigation Responsibilities

For all permittee-responsible mitigation, the Authority will ensure that each mitigation site has appropriate mitigation and monitoring plans in place. Funding shall be secured for initial restoration, if applicable, and continued monitoring. All plans will be based on adaptive management: plans will be rewritten to accommodate changing conditions or incorporate new data or technologies or better methods.

7.3 Mitigation Summary

Upon final completion of this CMP, this section will provide a discussion outlining the compensatory mitigation requirements and a full accounting of how these requirements have been met through mitigation/conservation banking, in-lieu fees, conservation easements, and fee-title acquisitions.

8.0 Preparer Qualifications

This section summarizes the AECOM and CH2M HILL employees who participated in this project and summarizes their qualifications, roles, and responsibilities in the preparation of this CMP.

Michael Benner

Michael Benner has 34 years of experience preparing environmental documentation and conducting natural resources planning. This experience includes overseeing the preparation of biological resource studies compliant with requirements of NEPA and CEQA and supporting regulatory compliance activities. Mr. Benner earned his Bachelor of Arts in Biological Sciences in 1976 and his Masters in Science in Environmental Studies in 1979 from California State University at Fullerton. He currently serves as a Vice President in AECOM's Orange Office.

Thomas Juhasz

Thomas Juhasz is a field biologist who has experience with endangered species in California, Hawaii, and the Caribbean. As a vernal pool specialist, Mr. Juhasz has USFWS protocol-level experience with California red legged frog, vernal pool branchiopods (fairy shrimp), and special-status vernal pool plants. His regulatory experience includes the implementation and coordination of federal and state compliance requirements such as Habitat Conservation Planning documents, general biological assessments, and focus species reports. Mr. Juhasz has experience planning and implementing rare plant salvage programs, propagation protocol and sourcing, and comprehensive restoration plans. Mr. Juhasz is experienced in writing and coordinating environmental regulatory documents for NEPA and CEQA compliance for special-status plant and animal species as well as wetland resources. Mr. Juhasz earned his Bachelor of Science in Biology at the University of Southern California and his Master of Environmental Sciences at the University of Manchester.

Erik Larsen

Dr. Larsen has 13 years of professional experience in regulatory issues related to water resources and environmental planning projects, with expertise in wetland delineation and functional assessment, wetland ecology, restoration, permitting (per Clean Water Act, Rivers and Harbors Act, California Fish and Game Code, Porter Cologne, Coastal Act), water quality issues, and watershed management. He has completed numerous permit application processes, ranging from Nationwide Permits to long-term, programmatic Standard Individual Permits. Dr. Larsen has extensive experience managing and preparing such environmental documentation as project-level and programmatic NEPA EIS and CEQA EIR documents; Environmental Assessments (EA) (NEPA EAs as well as Proponent's EAs); compliance with the Section 404(b)(1) Guidelines; and innovative, programmatic permitting solutions. Dr. Larsen is also one of the few regulatory specialists in California with extensive experience with Special Area Management Plans. Mr. Larsen earned his Bachelor of Science in Biology at Westmont College, his Master of Science in Biology at California State University at Long Beach, and his Doctorate of Environmental Science and Engineering at the University of California at Los Angeles.

Merrill Norrdin

Merrill Norrdin is a CEQA/NEPA Project Manager in the Environment Business Group in AECOM's Orange office. She has over 10 years of professional experience in the environmental field. Her specific expertise is planning, writing, and coordinating comprehensive environmental regulatory documents for NEPA and CEQA compliance, specifically EIRs and EISs. Specific expertise includes project management, tracking project budgets, preparing proposals and scopes of work, staffing projects, and maintaining client relationships. Ms. Norrdin has worked on various large-scale projects throughout California related to environmental planning and land management. Ms. Norrdin earned her Bachelor of Science at the University of California at Riverside in Anthropology with an emphasis in Archaeology.

Chris Powers

Chris Powers, Project Manager with AECOM, has over 8 years of experience in the environmental sciences and consulting fields. Mr. Powers' experience includes management of biological constraints analyses, biological resource surveys, habitat assessments, and land use planning studies throughout California. Mr. Powers is trained in GIS data collection, management, and analysis and Trimble Global Positioning System mapping techniques/applications, and he has instructed field crews in the use of such applications for large-scale survey efforts. Mr. Powers also has extensive experience conducting habitat assessments and protocol-level field surveys for listed vernal pool branchiopods (fairy/tadpole shrimp) throughout California.

Andrea Stassi

Andrea Stassi is an Environmental/Regulatory Analyst in the Transportation Business Group in AECOM's Orange office. She has over 4 years of experience in the environmental field, most recently 3 years related to fishery biological services. Her specific expertise includes mitigation and monitoring database management, GIS map development for environmental management projects, side-scan sonar and mobile GIS technology implementation in ecological field studies, and assessment of population dynamics at habitat restoration sites in biological field studies. Prior to her most recent experience, Ms. Stassi has worked on various international projects related to environmental planning and land management. Ms. Stassi earned her Bachelor of Arts in Environmental Studies at Sweet Briar College.

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APPENDIX A

Review Criteria for Section 7 Off-Site Compensation

Sacramento Fish and Wildlife Office
Review Criteria for Section 7 Off-Site Compensation
Revised July 28, 2011

Property Assurances and Conservation Easement

- Title Report (preliminary at proposal, and Final Title Insurance at recordation), shall be no older than six months;
- Property Assessment and Warranty;
- Subordination Agreement **[if there is any outstanding debt on the property]**;
- Legal Description and Parcel Map;
- Conservation Easement (should use the current SFWO standardized CE template); or
- Non-Template Conservation Easement;

Site Assessment and Development

- Phase I Environmental Site Assessment;
- Restoration or Habitat Development Plan;
- Construction Security *[if applicable]*;
- Performance Security *[if applicable]*;

Site Management

- Interim Management Plan;
- Interim Management Security Analysis and Schedule;
- Long-Term Management Plan;
- Endowment Fund Analysis and Schedule;
- Endowment Funding Agreement or Trust Agreement or Declaration of Trust

**Guidelines to assist in understanding what is required are detailed on pages 2–7.

Guidelines

Real Estate Assurances and Conservation Easement (CE)

Title Report

1. Who holds fee title to property? Should be the Project Applicant. If not, there may be liability and contracting issues.
2. Are there any liens or encumbrances (existing debts or easements) on the property?
 - a. Review Preliminary Title Report to evaluate liens and encumbrances (see Property Assessment and Warranty, below).
 - b. Could any of these liens or encumbrances potentially interfere with either biological habitat values or ownership? If existing easements can potentially interfere with the conservation values/habitat of the property, those portions of the land should be deducted from the total compensation acreage available on the site.

Property Assessment and Warranty

1. Property owner should submit a Property Assessment and Warranty, which discusses every exception listed on the Preliminary Title Report and Final Title Insurance Policy, evaluating any potential impacts to the conservation values that could result from the exceptions (see below).
2. The Property Assessment and Warranty should include a summary and full explanation of all exceptions remaining on the title, with a statement that the owner/Grantor accepts responsibility for all lands being placed under the CE as available for the primary purposes of the easement, as stated in the easement, and assures that these lands have a free and clear title and are available to be placed under the CE.

Subordination Agreement

1. A Subordination Agreement is necessary if there is any outstanding debt on the property. Review Subordination Agreement language for adequacy—the lending bank or other lien holder must agree to fully subordinate each lien or encumbrance under the CE.

Legal Description and Parcel Map

1. Ensure accuracy of map, and location and acreage protected under the CE.
2. Both the map and the legal description should explain the boundaries of the individual project compensation site. The site should *not* have ‘leftover’ areas for later use.
3. Ask for an easement map to be prepared (if applicable), showing all easements on the property.

Conservation Easement from Template

1. Who will hold the easement?

- a. Must have third-party oversight by a qualified non-profit or government agency. Qualifications include:
 - i. Organized under IRS 501(c)(3);
 - ii. Qualified under CA Civil Code § 815;
 - iii. Bylaws, Articles of Incorporation, and biographies of Board of Directors on file at, and approved, by SFWO.
 - 1. Must meet requirements of SFWO, including 51% disinterested parties on the Board of Directors;
 - b. Must be accredited by the Land Trust Accreditation Commission <http://www.landtrustaccreditation.org/home>.
2. Project Applicant should submit a redline version showing all of their proposed revisions in track changes, along with an explanation of all deviations from the template

Non-Template Conservation Easement

1. If not using the CE template, the Project Applicant should specify objections they have to the template. This may substantially delay processing as the non-template CE will require review by the Solicitor's Office. Alternate CEs must be approved by the SFWO prior to recording.
2. The Project Applicant must either 1) add SFWO as a third-party beneficiary, or 2) add language throughout the document, in all appropriate places, that will assure SFWO the right to enforce, inspect, and approve any and all uses and/or changes under the CE prior to occurrence (including land use, biological management or ownership).
3. Include, at a minimum, language to:
 - a. Reserve all mineral, air, and water rights under the CE as necessary to maintain and operate the site in perpetuity;
 - b. Ensure all future development rights are forfeited;
 - c. Ensure all prohibited uses contained in the CE template are addressed; and
 - d. Link the CE, Management Plan, and the Endowment Trust Fund within the document (e.g., note that each exists to support the others, and where each of the documents can be located if a copy is required).
4. Insert necessary language, particularly, but not exclusively, per: (can compare to CE template)
 - a. Rights of Grantee
 - b. Grantee's Duties
 - c. Reserved Rights
 - d. Enforcement
 - e. Remedies
 - f. Access
 - g. Costs and Liabilities
 - h. Assignment and Transfer
 - i. Merger
 - j. Notices

Site Assessment and Development

Phase I Environmental Site Assessment

1. The Phase I ESA must show that the compensation site is not subject to any recognized environmental conditions as defined by the American Society for Testing and Materials (ASTM) Standard E1527-05 “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, available at <http://www.astm.org/Standards/E1527.htm>, (i.e., the presence or likely presence of any Hazardous Substances or petroleum products).
2. If the Phase I ESA identifies any recognized environmental conditions, the Project Applicant must represent and warrant to the SFWO that all appropriate assessment, clean-up, remediation, or removal action has been completed.
3. Phase II ESA may be required to investigate subsurface conditions.

Restoration or Habitat Development Plan [not required if doing preservation only]

1. The overall plan governing construction and habitat establishment activities required to be conducted on the Property, including, without limitation, creation, restoration, and enhancement of habitat.
 - a. This plan should include the baseline conditions of the Property including biological resources, geographic location and features, topography, hydrology, vegetation, past, present, and adjacent land uses, species and habitats occurring on the property, a description of the activities and methodologies for creating, restoring, or enhancing habitat types, a map of the approved modifications, overall habitat establishment goals, objectives and Performance Standards, monitoring methodologies required to evaluate and meet the Performance Standards, an approved schedule for reporting monitoring results, a discussion of possible remedial actions, and any other information deemed necessary by the SFWO.
2. Any permits and other authorizations needed to construct and maintain the site shall be included and in place prior to the start of construction of the habitat.
3. Full construction plans for any habitat construction must be *SFWO-approved* prior to the start of construction of the habitat.

Construction Security

1. The Project Applicant shall furnish a Construction Security in the amount of 100% of a reasonable third party estimate or contract to create, restore, or enhance habitats on the property in accordance with the Restoration or Habitat Development Plan.
2. Construction Security can be drawn on should the project proponent default.
3. The Construction Security shall be in the form of an irrevocable standby letter of credit or a cashier’s check.
 - a. The letter of credit, if chosen, shall be issued for a period of at least one year, and shall provide that the expiration date will be automatically

- extended for at least one year on each successive expiration date unless, until extension is no longer necessary.
- b. Construction Security shall be in favor of a third party approved by the SFWO.
- c. Language in a draft letter of credit to be approved by the SFWO.

Performance Security [only necessary if habitat is being restored, enhanced, or constructed]

1. The Project Applicant shall furnish a Performance Security in the amount of 20% of the Construction Security.
2. Performance Security can be drawn on should the Performance Standards not be met, if remedial action becomes necessary.
3. The Performance Security shall be in the form of an irrevocable standby letter of credit or a cashier's check.
 - a. The letter of credit, if chosen, shall be issued for a period of at least one year, and shall provide that the expiration date will be automatically extended for at least one year on each successive expiration date unless, until extension is no longer necessary.
 - b. Construction Security shall be in favor of a third party approved by the SFWO.
 - c. Language in a draft letter of credit to be approved by the SFWO.

Site Management

Interim Management Plan

1. The Interim Management Plan should identify the short-term management, monitoring, and reporting activities to be conducted from the time construction ends until the Endowment Fund has been fully funded for one year and all the Performance Standards in the Development Plan have been met. This may be the same as the Long-term Management Plan.

Interim Management Security Analysis and Schedule

The purpose of the Interim Management Security is to allow the endowment to grow for at least one year without any disbursements, and is a safeguard to ensure that there will be enough funds in the endowment to pay for future management costs. The period can be longer than one year, and is often 3 years for Conservation Banks. Many endowments have recently experienced losses in principal.

1. The Project Applicant shall furnish an Interim Management Security (in the form of a standby letter of credit) in the amount equal to the estimated cost to implement the Interim Management Plan during the first year of the Interim Management Period, as set for in the Interim Management Security Analysis and Schedule.
2. The Interim Management Security Analysis and Schedule shall consist of a table and/or spreadsheet that shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency,

timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the Interim Management Plan. The total annual expenses should include administration and contingency costs.

3. The Interim Management Security must:
 - a. Be held by a qualified, SFWO-approved, non-profit organization or government agency [see requirements under CE above], and
 - b. Be held according to minimum standards for assuring maximum success in earning potential, and will assurances for no loss of principle.
 - c. Disbursements or releases from the fund must be for documented expenditures, as they occur.

Long-Term Management Plan (LTMP)

1. The LTMP template identifies the long-term management, monitoring and reporting activities to be conducted.
2. The LTMP should include at minimum:
 - a. Purpose of the Project and purpose of the LTMP;
 - b. A baseline description of the setting, location, history, and types of land use activities, geology, soils, climate, hydrology, habitats present (once project meets Performance Standards), and species descriptions;
 - c. Overall management, maintenance and monitoring goals; specific tasks and timing of implementation; and discussion of any constraints, which may affect goals;
 - d. The Endowment Fund Analysis and Schedule (see below);
 - e. Discussion of Adaptive Management actions for reasonably foreseeable events and possible thresholds for evaluating and implementing Adaptive Management;
 - f. Rights of access to the Property and prohibited uses of the Property as provided in the CE; and
 - g. Procedures for Property transfer, land manager replacement, amendments, and notices.
3. The LTMP must be incorporated by reference in the CE.
4. The LTMP is considered a living document and may be revised as necessary upon agreement of the land manager, easement holder, and SFWO.

Endowment Fund Analysis and Schedule

1. Can use a PAR or PAR-like analysis and must be based upon the final, approved LTMP.
 - a. The analysis should be reviewed by the land manager.
2. The analysis and schedule shall consist of a table and/or spreadsheet that shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency, timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the Management Plan. The total annual expenses should include administration and contingency costs (contingency

can be included on each line item). Unless there is a separate endowment for the purpose of monitoring and reporting on the CE conditions, then, the analysis should also include costs of

- Monitoring and reporting CE conditions;
 - Defending the CE; and
 - Liability insurance.
3. The Endowment Fund must:
 - a. Be held by a qualified, SFWO-approved, non-profit organization or government agency [see requirements under CE above], and
 - b. Be held according to minimum standards for assuring maximum success in earning potential, and will include assurances for no loss of principle.
 - c. Disbursements or releases from the fund must be for documented expenditures, as they occur.

Endowment Funding Agreement

1. This is the agreement between the endowment holder and the Project Applicant, as to how the endowment is to be funded, held and disbursed;
2. USFWS is not signatory to this agreement, but should be made a third-party beneficiary of the agreement;
3. USFWS has approval authority over the language in the document, and it must state that modifications or transfer of the endowment to another holder are only allowed with USFWS approval;
4. This agreement can also be called: “Trust Agreement”, “Declaration of Trust”
5. When the National Fish and Wildlife Foundation (NFWF) holds the endowment, they call this a “Recipient Agreement”, and may have an additional MOA with the Project Applicant.

APPENDIX B

**CDFG's Habitat Management Land
Acquisition (HMLA) Process Overview
for Applicants**

Habitat Management Land Acquisition (HMLA) Process Overview for Project Applicants

This document describes for Project Applicants the process the Department of Fish and Game (DFG) follows for reviewing habitat management land acquisitions (HMLA). It reflects information needed from the Project Applicant as listed in the Habitat Management Land Acquisition Checklist for Project Applicants. The review process is generally the same whether the DFG will be grantee for an easement, will accept fee title or another party holds the easement and DFG is a third party. Please direct all questions about the HMLA process to your Region Contact.

1. HMLA Site Evaluation
 - a. Permit or mitigation agreement development is initiated.
 - b. Project Applicant (PA) contacts Region Contact (RC) about potential mitigation sites.
 - c. RC provides HMLA process information, templates and forms to PA:
 - Proposed Land for Acquisition Form (PLFAF)
 - HMLA Process Overview for Project Applicants (this document)
 - HMLA Package Checklist for Project Applicants.
 - d. Areas potentially suitable for acquisition can be discussed by the PA and RC. The PA proposes the habitat management lands/mitigation sites by submitting documents to RC:
 - Completed Proposed Land for Acquisition Form (PFLAF) (one form for each site)
 - Site location map showing the proposed habitat management land/mitigation site(s).
 - e. RC reviews documents, coordinates with other agencies involved in approving the mitigation, and conducts site visit(s) with PA (and landowner(s) if the PA does not own the property).

RC may ask for a biological resources survey and preliminary title report for the property.

2. Conceptual Approval

- Permit or mitigation agreement is finalized/approved.
- RC and PA reach agreement on selection of land and land conservation mechanism. If the land will be conserved by a conservation easement, RC and PA should discuss who will hold the easement¹.
- RC gives conceptual approval by signing the PLFAF and sending it to the PA along with additional HMLA process information/forms/templates:
 - DFG Conservation Easement Deed template
 - A Guide and Annotated Outline for Writing Land Management Plans, March 2002
 - Summary of Transactions example
- PA:
 - opens escrow account
 - proceeds with preparing or obtaining the documents required in the HMLA Package Checklist for Project Applicants for submission to DFG:
 - Phase I Environmental Site Assessment,
 - Preliminary Title Report (less than 6 months old) and Policy of Title Insurance,
 - Copies of documents supporting any title exceptions or title encumbrances,
 - Plat map of the property showing existing easements, structures, etc.,
 - County Assessor Parcel Map(s),
 - Copy of the current tax bill for the property,
 - Copy of final permit or agreement,

¹ Per Civil Code Section 815.3, the conservation easement can only be held by 1) a tax-exempt non-profit organization qualified to do business in the State of California and whose primary purpose is conservation activities; or 2) a State or local agency or entity.

- If the PA is a business, a copy of the document specifying the names of the individuals that are the legally authorized to sign the documents. For a corporation, trust, or partnership, provide a resolution document on business letterhead,
 - Final Management Plan (if the Grant Deed or Conservation Easement deed will incorporate a Management Plan by reference or if the permit or mitigation agreement requires a Management Plan),
 - Biological resources report,
 - Draft Summary of Transactions.
- The PA may work with the RC on preliminary review of items in the HMLA package to discuss/ resolve any issues or red flags prior to submission of the complete HMLA package.
 - PA works with RC to prepare the Conservation Easement or Grant Deed.

3. Project Applicant Submittal of the HMLA Package

Once the Conservation Easement or Grant Deed is drafted and the rest of the HMLA package is complete, PA submits two complete sets of the HMLA package to the RC. PA should also submit a copy of the HMLA package to other agencies involved in approving the mitigation site.

4. Review of the HMLA Package

The HMLA package submitted to the RC must be complete. The package will be returned to the PA if it is not complete.

RC coordinates with the other agencies to review the package for completeness and content and works with the other agencies and the PA to gather more information or revise the Conservation Easement deed if necessary.

RC works with the PA to resolve issues or red flags that arise during review of the HMLA package.

5. Revised Drafts of Documents in the HMLA Package

Revised documents will be reviewed by DFG and the other agencies. There may be several rounds of revisions before all parties are satisfied with the form and content of the documents.

6. Final Region Review of the HMLA Package

Once all the reviewing agencies are satisfied with the contents of the HMLA package, the Region does a final check to ensure the HMLA package is complete.

7. Final HMLA Package Submission

The HMLA package and the final draft Conservation Easement Deed are submitted to the Land and Facilities Branch (LFB)² - Realty Services Coordinator (RSC).

*Final processing may take two to four months.

8. Conservation Easement Approved as to Form

a. The final draft Conservation Easement deed is sent to the DFG Office of the General Counsel (OGC) for review. The Easement or Grant Deed must be approved as to form by OGC and U.S. Fish and Wildlife Service (FWS) if necessary). “Approved-as-to-form” means that the document content and form formally meets approval of all the reviewers. OGC must be satisfied that the form and content of the document is legally sound before they will approve (sign) the Conservation Easement deed. The FWS (if involved in the mitigation) may require their approval-as-to-form and include their

² LFB's role in the Department of Fish and Game is to work with Department Branches and Regions to:

- ▶ develop and implement statewide policies relative to the acquisition, protection, maintenance, and enhancement of Fish and Game lands and facilities
- ▶ develop and implement guidelines for the preparation of land management plans that focus on fish and wildlife needs
- ▶ seek cooperative relationships with landowners of properties adjacent to Fish and Game lands maintain an inventory of Fish and Game lands.

signature page for this purpose. OGC coordinates with the FWS to get their approval-as-to-form on the Conservation Easement (before it is approved as to form by OGC).

b. Once the Conservation Easement (or Grant Deed) form and content is acceptable to OGC, OGC sends the Conservation Easement to the PA for signature.

c. The PA signs and notarizes the Conservation Easement (or Grant Deed) and sends it back to OGC.

1) If DFG will hold the easement, OGC signs the Conservation Easement deed and forwards it to LFB.

2) If DFG will not hold the easement (i.e., it will be held by another government agency or a non-profit conservation organization), OGC sends the Conservation Easement to the Region. Region sends the Conservation Easement to the PA with instructions to record the easement and send copies of the recorded easement to the Region and the other agencies. The PA's mitigation obligations will not be considered final until a copy of the recorded easement is returned to the Region.

10. LFB Review of HMLA Package and Final Acceptance

RSC conducts review of the HMLA package. The RSC may need to work with the PA on concerns/issues with the status of the title. Once the HMLA package meets the RSC's approval, the HMLA package is processed to get final approvals for acceptance of the proposed habitat management land/mitigation site.

When final processing for acceptance is complete, the Wildlife Conservation Board (WCB)³ signs the Certificate of Acceptance. The County Recorder cannot record the Conservation Easement or Grant Deed without a Certificate of Acceptance attached. The Conservation Easement is sent to the title company holding the escrow account. When escrow closes, the Conservation Easement is recorded and the title company sends a copy

³ WCB is responsible for authorizing the acquisition of land and waters suitable for the preservation, protection, and restoration of wildlife habitat. Acquisition of land simply means acquiring an interest in real property. Agencies acquire property interests such as fee title interest, easements (conservation/habitat, agriculture, roads, etc.), license, or lease. The interest can be acquired by purchase, donation, or transfer. All Department of Fish and Game acquisitions must be approved by WCB. WCB's authority is mandated in Fish and Game Code 1300, et seq.

of the recorded easement to the Wildlife Conservation Board (WCB). LFB and the Region receive a copy of the recorded easement from WCB.

Potential Fees or Expenses Associated with HMLA transactions

This list includes many of the possible fees or expenses the PA may encounter in the HMLA transaction. This list is informative only, and the fees or expenses are not restricted by or limited to those listed.

The GRANTOR shall pay for all land acquisition costs including:

Preliminary Title Report(s) for subject property. Additional documents that may add to expense:

- document(s) to support title exceptions
- document(s) to explain title encumbrances
- a plot or map of easements/encumbrances on the property

Phase I Environmental Site Assessment Report

Final Title Report

Title Insurance Premiums

Final Permit or Agreement requiring land acquisition

- Financial Assurances – initial enhancement, expected property value security, fees for security types (ie. letters of credit)
- Management Endowment funds

Biological resources survey and report

Wetland delineation

Management Plan preparation

Mitigation monitoring plan preparation

DFG real estate review fees

Notary fee

Recording fees

Escrow fees

Reconveyance fees

Trustee's or forwarding fees for any reconveyance of deed of trust or release charge

Property taxes for the fiscal year in which this escrow closes

Property taxes remain the responsibility of Grantor

Subordination fees

Fees to request copies of records (e.g., current tax bill, copies of documents affecting title, etc.)

Special District fees

Permit fees

Water rights application fee

Property boundary survey/placement of survey markers

Re-zoning

Appraisal fee (the value of the land is needed for tax purposes)

Trash removal

Additional Environmental Site Assessments (e.g., Phase II or Phase III)

Hazardous materials removal

Fencing (if necessary for protection of the land)