ADVANCE MITIGATION PROGRAM
Great Valley Ecoregion Section
Regional Advance Mitigation Needs Assessment

Version 1.0

Establishing Caltrans' Need for Advance Mitigation for the Great Valley Ecoregion Section, forecast fiscal years 2017/2018 to 2026/2027

California Department of Transportation – District 6

December 2020

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LIST OF ACRONYMS

Acronym	Definition
ACE	Areas of Conservation Emphasis
AMA	Advance Mitigation Account
AMP	Advance Mitigation Program
AMP Guidelines	*Advance Mitigation Program Final Formal Guidelines*
BEI	Bank Enabling Instrument
BLM	Bureau of Land Management
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEHC	California Essential Habitat Connectivity
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNRA	California Natural Resources Agency
CO_2	carbon dioxide
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
CWSC	California Water Science Center
DPS	distinct population segment
EIR	environmental impact report
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FGC	California Fish and Game Code
FHWA	Federal Highway Administration
FWS	U.S. Fish and Wildlife Service
GAI	geographic area of interest
GAP	Gap Analysis Program
GIS	geographic information system
HCP	habitat conservation plan
HU	hydrologic unit

HUC	hydrologic unit code
ILF	In-Lieu Fee Program
IRWMP	Integrated Regional Water Management Plan
MCA	mitigation credit agreement
MPO	metropolitan planning organization
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
RAMNA	Regional Advance Mitigation Needs Assessment
RCIS	regional conservation investment strategy
RTPA	regional transportation planning agency
RWQCB	Regional Water Quality Control Board
SAMNA	Statewide Advance Mitigation Needs Assessment
SAMNA	Caltrans Statewide Advance Mitigation Needs Assessment
Reporting Tool	Reporting Tool
SHC	Streets and Highways Code
SHOPP	State Highway Operation and Protection Program
SHOPP Ten-Year Book	*State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2017/18—2026/27*
State Water Board	State Water Resources Control Board
STIP	State Transportation Improvement Program
SWAP	State Wildlife Action Plan
TMDL	total maximum daily load
UC	University of California
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WOTUS	waters of the U.S.

EXECUTIVE SUMMARY

California's State Highway System relies on long-range planning documents to guide its operation and maintenance. In this *Great Valley Ecoregion Section Regional Advance Mitigation Needs Assessment* ("RAMNA"), the California Department of Transportation ("Caltrans") District 6 evaluates its forecast of natural resource compensatory mitigation[1] needs for the Great Valley Ecoregion Section for a 10-year planning horizon. The RAMNA was developed with the goal of realizing the benefits of advance mitigation, which anticipates that unavoidable impacts will be identified in the future and consists of having mitigation available that has already been vetted and agreed upon by natural resource regulatory agencies as representing mitigation actions, before transportation projects are completely designed and funded. Credits are the usual currency of advance mitigation actions. When mitigation actions are independent of transportation project delivery timelines, there is an opportunity to (1) improve the schedule and cost predictability of complying with natural resource regulatory agency compensatory mitigation conditions on transportation projects and (2) consolidate the anticipated compensatory mitigation from multiple transportation projects into fewer and larger mitigation actions, establishing mitigation credits that provide ecological value greater than implementing multiple small project-by-project actions.

ES.1 Overview

In 2017, the California Streets and Highways Code ("SHC") § 800 et seq. was amended to create the Advance Mitigation Program ("AMP") within Caltrans and to provide the seed capital for an Advance Mitigation Account ("AMA"), to be operated by Caltrans as a revolving account. The stated intent of the legislation is for Caltrans, through the AMP, to realize the potential of advance mitigation to "accelerate transportation project delivery" and to "protect natural resources through transportation project [compensatory] mitigation" [SHC § 800(a)]. To this end, SHC § 800.6(a) identifies 11 specific activities as authorized allowable expenditures under the AMA and provides for the AMA to be replenished under specific conditions. Generally speaking, the 11 allowable expenditures consist of purchasing or establishing compensatory mitigation credits developed through an appropriate regulatory mechanism, which are then available for use by transportation projects to compensate for adverse impacts.

Approved at the end of 2019, the *Advance Mitigation Program Final Formal Guidelines* ("AMP Guidelines") describe how—through advance mitigation planning and advance mitigation project delivery—the Caltrans AMP will fulfill its intended purpose

[1] Compensatory mitigation is a mitigation strategy that is preferentially applied only after it has been determined that there will be unavoidable impacts and other efforts to minimize, rectify, and reduce the impact have been incorporated into a transportation project's design. Traditionally, this determination occurs late in a transportation project's development process, at which time, the compensatory mitigation action is both funded and implemented concurrently with the transportation project.

(Caltrans 2019a). The AMP Guidelines present a 10-step process, the first 5 of which are the advance mitigation planning phase (Figure ES-1) and the next 5 are the advance mitigation project delivery phase. Implementation of each step of the planning process improves the probability that advance mitigation projects undertaken by Caltrans in the project delivery phase will yield credits (or similar) that will be usable and comply with an appropriate established regulatory framework. The AMP Guidelines also describe how transportation projects will reimburse the AMA for advance mitigation project investments, thereby making the funds available to undertake the next advance mitigation project.

Figure ES-1. Advance Mitigation Planning Phase

Source: Caltrans 2019a

Caltrans' 5-step advance mitigation planning phase starts with modeled estimates of potential impacts on more than 600 wildlife and aquatic resources and, through successive steps, focuses and refines Caltrans' need for advance mitigation to inform advance mitigation project scopes to be approved by the Caltrans Director. At this time, Steps 1 and 2 of the AMP's 5-step advance mitigation planning phase are complete. The RAMNA provided here is intended to satisfy Step 3 and provides the results of a regional assessment of Caltrans advance mitigation needs in the Great Valley Ecoregion Section.

A planning-level document, this RAMNA:

- is a desktop analysis of relevant available information;
- covers fiscal years 2018 to 2027, a specific planning period, concurrent with the time period addressed by the *State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2017/18–2026/27* ("SHOPP Ten-Year Book") (Caltrans 2018a);
- applies to potential compensatory mitigation conditions that may be placed on future transportation projects by the seven natural resource regulatory agency signatories[2] to the *Master Process Agreement for Planning and Developing*

[2] Natural resource regulatory agency signatories are California Department of Fish and Wildlife ("CDFW"); California State Water Resources Control Board ("State Water Board"); U.S. Army Corps of Engineers ("Corps") Los Angeles District, Sacramento District, and San Francisco

Advance Mitigation throughout California for the California Department of Transportation Advance Mitigation Program (Caltrans et al. 2020);

- focuses on a geographic area of interest ("GAI"), an area with wildlife habitats and aquatic resources[3] that has a high probability of requiring transportation project mitigation between 2018 and 2027 in the Great Valley Ecoregion Section within Caltrans District 6;
- documents Caltrans' forecast of its potential wildlife and aquatic resource compensatory mitigation needs for GAI and planning period, as reported by the *Statewide Advance Mitigation Needs Assessment Report*, *State Highway Operation and Protection Program, Ten-Year Project Book, Second Quarter 2017/2018 Fiscal Year* (Caltrans 2019b);
- identifies information that will be important to Caltrans when scoping any of the AMP's authorized activities in the GAI in accordance with SHC § 800.6(a), including documenting the existing mitigation supply;
- incorporates information and feedback received from outreach to natural resource regulatory agencies, the Federal Highway Administration, metropolitan planning organizations, regional transportation planning agencies, other public agencies that implement transportation improvements, Native American Tribes, interested parties, and the public; and
- analyzes Caltrans' options to meet its forecast mitigation needs in the GAI through the AMP's authorized activities in accordance with SHC § 800.6(a).

A brief description of each section is provided below.

District; U.S. Environmental Protection Agency ("EPA"), U.S. Fish and Wildlife Service ("FWS"); National Marine Fisheries Service ("NMFS"); and California Coastal Commission.

[3] For the purposes of this document, aquatic resources include all wetlands and non-wetland waters regulated by CDFW, the State Water Board and the Regional Water Quality Control Boards ("RWQCBs"), Corps, and EPA.

ES.2 Geographic Area of Interest and Resource Focus

GAIs are established at a watershed or ecoregion scale to assist with appropriate planning areas for mitigation implementation and anticipated use areas that align with natural resource regulatory agency practices (Caltrans 2019a). Caltrans District 6, in communication with other transportation agencies, selected the Great Valley Ecoregion Section as the GAI (Figure ES-2) because State Advance Mitigation Needs Assessment ("SAMNA") results indicate that investing program funds to implement landscape-scale mitigation in this area is likely to maximize State Highway Operation and Protection Program ("SHOPP") and State Transportation Improvement Program ("STIP") funded transportation project acceleration while maximizing environmental benefits.

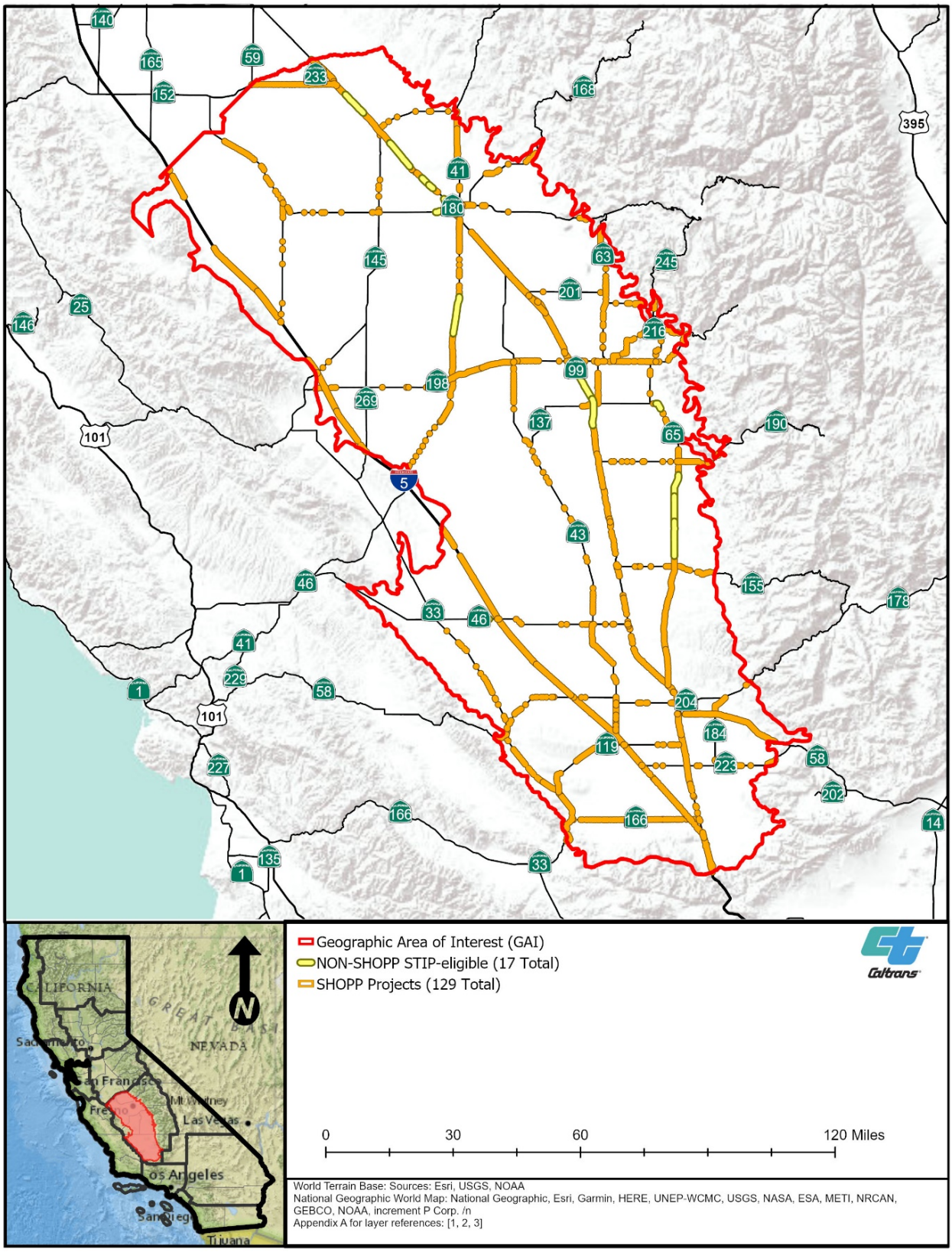
Caltrans District 6 also identified compensatory mitigation for wildlife resources in the GAI as both a historical transportation project compensatory mitigation need and an anticipated future transportation project compensatory mitigation need. Because the SAMNA forecasts impacts on hundreds of species' habitats, to further focus the planning effort, Caltrans District 6 selected the following species of mitigation need: the California tiger salamander (*Ambystoma californiense*), San Joaquin kit fox (*Vulpes macrotis mutica*), giant kangaroo rat (*Dipodomys ingens*), and two subspecies of San Joaquin kangaroo rat (*Dipodomys nitratoides*). The two subspecies of San Joaquin kangaroo rat identified as species of mitigation need are Fresno kangaroo rat (*D. nitratoides exilis*) and Tipton kangaroo rat (*D. nitratoides nitratoides*). Species of mitigation need were selected to focus the assessment. Other state and federal special-status species[4] occur in the GAI, and Caltrans intends for conservation benefits and values to be realized for other special-status species through the implementation of advance mitigation centered on the species of mitigation need identified in the GAI, given their reliance on similar habitats.

For the purposes of this document, aquatic resources include all wetlands and other waters[5] regulated by CDFW, the State Water Board and RWCBs, Corps, and EPA. Caltrans District 6 also identified nine hydrologic unit code (HUC) sub-basins within which mitigation for aquatic resources impacts is anticipated: Fresno River (HUC 18040007), Middle San Joaquin-Lower Chowchilla (HUC 18040001), Middle Kern-Upper Tehachapi-Grapevine (HUC 18030003), Upper Tule (HUC 18030006), Upper Kaweah (HUC 18030007), Tulare Lake Bed (HUC 18030012), Upper Deer-Upper White (HUC 18030005), Upper Dry (HUC 18030009), and Upper Poso (HUC 18030004).

[4] Special-status species include those that are considered federally and/or state threatened or endangered species, state candidate threatened or endangered species, state fully protected species, state species of concern, state rare species, and federal sensitive species (which includes species that are U.S. Forest Service sensitive and/or Bureau of Land Management sensitive).

[5] It should be noted that "other waters" is a general term that can apply to other waters of the United States, waters of the state, or both, but does not include wetlands.

Figure ES-2. Great Valley Ecoregion Section within Caltrans District 6



ES.3 Environmental Setting

The GAI coincides with the approximately 5.9-million-acre portion of the Great Valley Ecoregion Section located in the San Joaquin Valley, which is in the southern portion of California's Central Valley. Geospatial data from the SAMNA Reporting Tool, CDFW's BIOS, and other readily available information are summarized and presented in this RAMNA. Climate change resiliency, wildlife connectivity, biodiversity, and conserved lands are among the information presented. Additional information on the environmental setting of the GAI is provided in Chapter 2.

ES.4 Relevant Plans, Policies, and Regulations

Compensatory mitigation is informed by regulatory requirements, regulatory pathways for credit establishment, and conservation. Laws, regulations, comprehensive plans, conservation plans, and land management plans that are applicable and relevant to the GAI will be consulted by Caltrans to inform both regional understanding and advance mitigation project scoping. Caltrans identified 101 relevant documents for the RAMNA: 21 laws and regulations, 13 statewide and regional resource management plans, 23 plans and permits focused on species of mitigation need, 11 land management plans, 9 water resources plans and documents, 21 County and City general plans, and 3 nongovernmental organization conservation and management documents. A summary and links to all of these documents can be found in Chapter 3.

ES.5 Existing Mitigation Opportunities

SHC § 800.6(a) authorizes Caltrans to use AMA funds for purchasing compensatory mitigation credits from or paying fees to a conservation bank, mitigation bank, habitat conservation plan ("HCP"), natural community conservation plan ("NCCP"), in-lieu fee program, or mitigation credit agreement ("MCA") developed in accordance with a CDFW-approved regional conservation investment strategy ("RCIS"). In the GAI, Caltrans identified 3 HCPs (one is pending), 1 HCP/NCCP, 18 conservation or mitigation banks, 1 in-lieu fee program, and no MCAs. Credits established through the Caltrans SHOPP are also an existing credit option that, with agency approval, have the potential to satisfy transportation project mitigation conditions—the Caltrans SHOPP has one California tiger salamander bank establishment project underway. Existing mitigation opportunities can also inform both regional understanding and advance mitigation project scoping because they may be expressions of natural resource regulatory agency conservation goals and objectives[6] and may be suitable for concurrent transportation project mitigation. Chapter 4 provides a more in-depth discussion of existing mitigation opportunities in the GAI.

[6] For the purposes of this RAMNA, conservation goals and objectives are a broad set of regional natural resource sustainability goals and objectives that are consistent with both regulatory requirements and conservation science.

ES.6 Estimated Impacts

Caltrans undertakes SHOPP transportation projects to address maintenance, safety, operation, and rehabilitation of the state highway system, which do not add new capacity to the system.[7] Metropolitan planning organizations, regional transportation planning agencies, and other public agencies also undertake transportation projects to address non-SHOPP STIP-funded transportation improvements. Since the SHOPP Ten-Year Book is an early planning document, Caltrans must rely on modeling future impacts through the SAMNA, as well as qualitative assessments of STIP-eligible needs, to define the range of advance mitigation needs prior to developing a focused advance mitigation project scope to address anticipated needs.

For special-status terrestrial plant and wildlife species, potential impacts from 129 SHOPP and 17 STIP eligible transportation projects in their planning and conceptual phases for the GAI are presented and discussed in the RAMNA. For fiscal years 2018 to 2027, the following impacts were forecast:

- For special-status terrestrial plant and wildlife species, impacts from all 129 SHOPP transportation projects are forecast by the SAMNA to potentially affect 39 of the 141 special-status species evaluated, potentially affecting 1,405 acres of habitat in total (Table ES-1).
- For the four species of mitigation need, impacts from 42 SHOPP transportation projects are forecast by the SAMNA to potentially affect 72.5 acres of California tiger salamander habitat, 94 SHOPP transportation projects are forecast by the SAMNA to potentially affect 177.6 acres of San Joaquin kit fox habitat, 33 SHOPP transportation projects are forecast by the SAMNA to potentially affect 109.2 acres of giant kangaroo rat habitat, and 83 SHOPP transportation projects are forecast by the SAMNA to potentially affect 159.7 acres of Fresno kangaroo rat habitat (inclusive of Tipton and short-nosed kangaroo rat) (Table ES-1).
- Since they are near planned SHOPP transportation projects, additional mitigation need may be expected from the 17 STIP-eligible transportation projects.

As discussed in in Section ES.2, species of mitigation need were identified to focus this assessment on mitigation likely to be needed by future transportation projects. Nevertheless, other state and federal special-status species occur in the GAI. Caltrans intends for conservation benefits and values to be realized for other special-status species through the implementation of advance mitigation projects centered on the species of mitigation need identified in the GAI, given their reliance on similar habitats.

[7] https://catc.ca.gov/programs/state-highway-operation-and-protection-program

Table ES-1. Summary of Estimated SHOPP Wildlife Resource Impacts

GAI Wildlife Resource	Number of Caltrans SHOPP Projects	Number of Special-status Species Habitats	Number of Special-status Species	Estimated Impact (acres)
Special-status species, total count (all habitats, all species)	129	16	39	1,405.0
California tiger salamander[a]	42	3	1	72.5
San Joaquin kit fox[a]	94	7	1	177.6
Giant kangaroo rat[a]	33	3	1	109.2
Fresno/Tipton kangaroo rat[a,b]	83	5	1	160.0

[a] "Species of mitigation need" were identified for this RAMNA to help focus this effort. Species of mitigation need are species for which Caltrans anticipates a high probability of mitigation need.
[b] The SAMNA incorporates home ranges from the California Wildlife Habitat Relationship ("CWHR") program. Since the CWHR does not contain separate home ranges for Tipton kangaroo rat or short-nosed kangaroo rat, results are for the Fresno kangaroo rat.

For aquatic resources, potential impacts from 145 SHOPP and 13 STIP-eligible transportation projects in their planning and conceptual phases for watersheds that overlap the GAI are presented and discussed in the RAMNA. For fiscal years 2018 to 2027, the following impacts were identified:

- For wetland resources, quantitative impacts from 27 of the 145 SHOPP transportation projects are forecast by the SAMNA to potentially affect 10.4 acres of wetlands (Table ES-2).
- For non-wetland water resources, quantitative impacts from 114 of the 145 SHOPP transportation projects are forecast by the SAMNA to potentially affect 85.8 acres of other waters (Table ES-2).
- Since they are near planned SHOPP transportation projects, additional mitigation need may be expected from the 17 STIP-eligible transportation projects.

It should be noted that "non-wetland waters" is a general term that can apply to waters of the United States, waters of the state, or both, and does not include wetlands. These data are provided in Table ES-2 in tabular format for ease of reference. Refer to Chapter 5 for additional information regarding aquatic resources impacts analyzed in this RAMNA.

Table ES-2. Summary of Estimated SHOPP Aquatic Resource Impacts

GAI Sub-basin (HUC-8)	Number of Transportation Projects, Wetlands (HUC-8)[a]	Total Estimated Wetland Impacts (acres)	Number of Transportation Projects, Non-wetland Waters (HUC-8)[a]	Total Estimated Non-wetland Waters Impacts (acres)
Fresno River	5	0.52	8	2.3
Middle-Kern Upper Tehachapi Grapevine	13	2.87	28	44.6
Middle San Joaquin-Lower Chowchilla	8	5.03	13	3.6
Tulare Lake Bed	13	1.58	37	18.5
Upper Deer-Upper White	3	0.01	6	1.1
Upper Dry	2	0.02	19	8.8
Upper Kaweah	5	0.06	19	4.1
Upper Poso	1	0.01	7	1.0
Upper Tule	5	0.25	11	1.9
Aquatic resources, total counts	**27[b]**	**10.4**	**114[c]**	**85.8**

[a] Includes transportation projects located outside of GAI, but within a HUC-8 that overlaps the GAI.
[b] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one HUC-8.

ES.7 Benefiting Transportation Project Considerations

One intent of the AMP's founding legislation is for Caltrans to realize the potential of advance mitigation to accelerate transportation project delivery. At this time (December of fiscal year 2020/2021), Caltrans is 3 years into the SHOPP Ten-Year Book planning period. Hence, for the time period under consideration, 2017/2018 to 2026/2027, the District intends to prioritize purchasing or developing mitigation credits or values that are planned for the middle and end of the 10-year assessment period. Given the expected timing of mitigation need, at this time (December of fiscal year 2020/2021) credits or values that can be purchased or established by 2023/2024 (within the next 2 years) could address a subset of the impacts described above, approximately:

- 16 acres of California tiger salamander habitat, potentially contributing to the acceleration of 20 transportation projects
- 69.4 acres of San Joaquin kit fox habitat, potentially contributing to the acceleration of 37 transportation projects
- 35.3 acres of giant kangaroo rat habitat, potentially contributing to the acceleration of 16 transportation projects

- 61 acres of Fresno kangaroo rat (inclusive of Tipton and short-nosed kangaroo rat), potentially contributing to the acceleration of 30 transportation projects
- 7 acres of wetlands, potentially contributing to the acceleration of 22 transportation projects
- 39.7 acres of non-wetland waters, potentially contributing to the acceleration of 51 transportation projects

All or some of these needs could form the basis for Caltrans District 6 to develop an advance mitigation project scope.

ES.8 Wildlife Resources Conservation Goals and Objectives

To increase the probability that advance mitigation project scopes promoted within and/or undertaken by Caltrans will successfully meet natural resource regulatory agency goals and objectives, this RAMNA was reviewed by the natural resource regulatory agencies and their comments and suggestions were incorporated into the document, as appropriate.

When establishing wildlife resources mitigation credits in accordance with SHC § 800.6(a), Caltrans will seek to align advance mitigation project scopes with the conservation goals and objectives of the multiple natural resource regulatory agencies that have the authority to approve wildlife resource-related credit establishment, and have the authority to approve their application to offset transportation project-related impacts. At a broad scale, Caltrans' understanding of the wildlife resources goals and objectives presented in this RAMNA encompass protecting, preserving, and enhancing large-scale ecological processes, environmental gradients, biological diversity, and regional linkages. Informed by relevant plans, policies, and regulations, the goals and objectives presented here summarize how state and federal natural resource regulatory agencies, and other land-managing interested parties, have prioritized regional conservation that preserves intact habitat and provides habitat linkages and connectivity. In recognition of transportation project acceleration needs, wildlife goals and objectives place an emphasis on California tiger salamander, San Joaquin kit fox, giant kangaroo rat, Fresno kangaroo rat, and Tipton kangaroo rat in the GAI; however, advance mitigation for the benefit of the aforementioned species is anticipated to have broader benefits for multiple special-status species that rely on the same habitats. Caltrans' understanding of natural resource regulatory agency wildlife goals gathered for this RAMNA include:

- conserving and expanding habitat for the aforementioned species of mitigation need and the species that share their habitat
- preserving, enhancing, and increasing connectivity between blocks of habitat
- supporting resiliency of the landscape to climate change
- decreasing mortality of species of mitigation need
- providing multi-species benefits

Objectives and sub-objectives are provided under each of the above goals in Chapter 7 to guide Caltrans advance mitigation project scoping toward those actions that would

create the greatest functional lift for wildlife resources in the GAI. Sub-objectives capture more specific measures from conservation and land management plans that address threats to the aforementioned resources.

ES.9 Aquatic Resources Goals and Objectives

To increase the probability that advance mitigation project scopes promoted within and/or undertaken by Caltrans will successfully meet natural resource regulatory agency goals and objectives, this RAMNA was reviewed by the natural resource regulatory agencies and their comments and suggestions were incorporated.

When establishing aquatic resources mitigation credits in accordance with SHC § 800.6(a), Caltrans will seek to align advance mitigation project scopes with the conservation goals and objectives of the multiple natural resource regulatory agencies that have the authority to approve aquatic resource-related credit establishment and have the authority to approve their application to satisfy conditions on transportation projects. At a broad scale, Caltrans' understanding of aquatic resources goals and objectives presented in the RAMNA encompass restoring, maintaining, and enhancing large-scale ecological processes, environmental gradients, biological diversity, and regional linkages. Aquatic resources goals developed for this RAMNA prioritize:

- ensuring the overall net loss and long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property in accordance with State Water Board EO-W-59-93
- restoring and maintaining the chemical, physical, and biological integrity of waters
- supporting resiliency of aquatic resources to climate change
- providing multi-resource benefits

Sub-objectives are included for each goal to guide Caltrans project scoping toward those actions that would create the greatest functional lift for aquatic resources in the GAI. Sub-objectives also capture more specific measures from conservation and land management plans that address threats to the aforementioned resources.

ES.10 Authorized Activity Summary

Broadly speaking, the 11 SHC § 800.6(a) authorized activities can be divided into two groups: (1) purchasing compensatory mitigation that has been previously established and approved by the natural resource regulatory agencies through a conservation/mitigation bank, HCP/NCCP, in-lieu fee program, or MCA; or (2) establishing and receiving approval of compensatory mitigation credits, such as establishing a mitigation bank in accordance with existing laws, policies, procedures, templates, and guidance. The time it takes to perform each authorized activity varies; however, purchasing or paying fees for compensatory mitigation credits would likely take less time than establishing compensatory mitigation credits.

Caltrans District 6 will consider all feasible options when developing advance mitigation project scopes that could meet its mitigation needs. The feasibility of each authorized activity to meet the forecast mitigation need in time to accelerate transportation projects will depend on the availably of a regulatory and administrative pathway and other conditions. When establishing mitigation credits, Caltrans intends to scope projects that align with conservation goals and objectives, address multi-resource benefits, and address overlapping jurisdictions.

Caltrans District 6 will use the advance mitigation options identified in the RAMNA to inform advance mitigation project scoping, which will consider needs; conservation data and plans; input received from natural resource regulatory agencies, the Federal Highway Administration, metropolitan planning organizations, regional transportation planning agencies, other public agencies that implement transportation improvements, Native American tribes, interested parties, and the public; feasibility in consideration of mitigation need and timing; and other information presented here and that is publicly available to develop a high-level advance mitigation project scope to be included in an advance mitigation project's nomination materials. Once a nominated advance mitigation project is approved by the Caltrans Director, Caltrans District 6 will begin advance mitigation project delivery, which includes further scoping, stakeholder engagement, project alternative analysis, coordination with natural resource regulatory agency partners, and, finally, implementation.

As with all compensatory mitigation established through any advance mitigation process, the mitigation's suitability to address a specific transportation project's impact is determined in the future in collaboration with the appropriate natural resource regulatory agencies on a case-by-case basis, when transportation project mitigation requirements are known.

1. INTRODUCTION

California's State Highway System relies on long-range planning documents to guide its operation and maintenance. In this *Great Valley Ecoregion Section Regional Advance Mitigation Needs Assessment* ("RAMNA"), the California Department of Transportation ("Caltrans") District 6 presents its forecast of natural resource compensatory mitigation[1] needs for the Great Valley Ecoregion Section for a 10-year planning horizon. The RAMNA was developed with the goal of realizing the benefits of advance mitigation, which anticipates that unavoidable impacts will be identified in the future and consists of having mitigation available that has already been vetted and agreed upon by natural resource regulatory agencies as representing mitigation actions—before transportation projects are completely designed and funded. Credits are the usual currency of advance mitigation actions. When mitigation actions are independent of transportation project delivery timelines, there is an opportunity to (1) improve the schedule and cost predictability of complying with natural resource regulatory agency compensatory mitigation conditions on transportation projects and (2) consolidate the anticipated compensatory mitigation from multiple transportation projects into fewer and larger mitigation actions, establishing mitigation credits that provide ecological value greater than implementing multiple small project-by-project actions.

This document is intended to be both an internal communication tool between Caltrans' Functional Units[2] and an external communication tool for Caltrans to communicate with the Federal Highway Administration ("FHWA"), natural resource regulatory agencies, other transportation agencies (that is, metropolitan planning organizations ["MPOs"], regional transportation planning agencies ["RTPAs"], and other public agencies that implement transportation improvements), Native American tribes, interested parties, and the public. It will be posted on the Advance Mitigation Program ("AMP") website: http://www.dot.ca.gov/env/advancemitigation/.

1.1 AMP Overview

In 2017, the California Streets and Highways Code ("SHC") § 800 et seq. was amended to create the AMP within Caltrans and to provide the seed capital for an Advance Mitigation Account ("AMA"), to be operated by Caltrans as a revolving account. The stated

[1] Compensatory mitigation is a mitigation strategy that is preferentially applied only after it has been determined that there will be unavoidable impacts and other efforts to minimize, rectify, and reduce the impact have been incorporated into a transportation project's design. Traditionally, this determination occurs late in a transportation project's development process, at which time, the compensatory mitigation action is both funded and implemented concurrently with the transportation project.

[2] "Functional Unit" is a general term used by Caltrans to describe its organizational structure. Caltrans functional units include, but are not limited to, transportation planning, environmental, surveys, right-of-way, real property asset management, materials, traffic, structure design, hydraulics, construction, maintenance, landscape architecture, utilities, and engineering.

intent of the legislation is for Caltrans, through the AMP, to realize the potential of advance mitigation to both "accelerate transportation project delivery" and "protect natural resources through transportation project [compensatory] mitigation" [SHC § 800(a)]. To this end, the legislation identifies specific activities as authorized allowable expenditures under the AMA and provides for the AMA to be replenished under specific conditions. Generally speaking, the 11 allowable expenditures consist of purchasing or establishing mitigation credits developed through an appropriate regulatory mechanism, which are then available for use by transportation projects to compensate for adverse impacts. Natural resource regulatory agencies and Caltrans will determine the appropriateness of a credit's use on a case-by-case basis, when Caltrans proposes use of the credit to satisfy a specific condition placed on a transportation project.

1.1.1. AMP Guidelines

Approved at the end of 2019, the *Advance Mitigation Program Final Formal Guidelines* ("AMP Guidelines") describe how through advance mitigation planning and advance mitigation project delivery the Caltrans AMP will fulfill its intended purpose (Caltrans 2019a). Shown in Figures 1-1 and 1-2, the AMP Guidelines present a 10-step process, the first 5 of which are the advance mitigation planning phase and the next 5 are the advance mitigation project delivery phase. Implementation of each step of the planning process improves the probability that advance mitigation projects undertaken by Caltrans in the project delivery phase will yield credits (or similar) that will be usable and comply with an appropriate established regulatory framework. The AMP Guidelines also describe how transportation projects will reimburse the AMA for advance mitigation project investments, thereby making the funds available to undertake the next advance mitigation project.

Figure 1-1. Advance Mitigation Planning Phase

Source: Caltrans (2019a)

Figure 1-2. Advance Mitigation Project Delivery Phase

Source: Caltrans (2019a)

1.1.2. Advance Mitigation Planning Phase

Caltrans advance mitigation planning starts with modeled estimates of potential impacts on more than 600 wildlife and aquatic resources and, through successive steps, focuses and refines Caltrans' need for advance mitigation, in order to inform advance mitigation project scopes that will be approved by the Caltrans Director. As elaborated below, at this time, Steps 1 and 2 of the AMP's 5-step advance mitigation planning phase are complete. The RAMNA provided here satisfies Step 3 (Figure 1-1; Caltrans 2019a) and provides the results of a regional assessment of Caltrans' advance mitigation needs in the Great Valley Ecoregion Section.

Caltrans District 6 will first use the information and analysis presented in this RAMNA to inform Step 4 of the advance mitigation planning process. Step 4 is the point in the advance mitigation planning process when Caltrans justifies, proposes, and scopes an advance mitigation project based on its needs (Caltrans 2019a). Advance mitigation project scopes informed by this RAMNA will provide enough information, at the appropriate level of detail, for the Caltrans Director to approve the project for funding. The advance mitigation planning phase will conclude when the Caltrans Director approves a specific District 6 advance mitigation project for funding (Step 5; Caltrans 2019a). Thereafter, Caltrans District 6 will use the RAMNA as a reference (Caltrans 2019a).

1.1.3. Advance Mitigation Project Delivery Phase

Steps 6 through 10 consist of the AMP's Advance Mitigation Project Delivery phase. Advance mitigation project delivery is a different process undertaken after an advance mitigation project has been approved by the Caltrans Director and is meant to benefit from advance mitigation planning (Caltrans 2019a; see Figure 1-2). The phase consists of implementing the authorized activities under SHC § 800.6(a), which are primarily existing advance mitigation mechanisms or procedures under development.

1.1.4. Program Constraints

Implicit to the AMP, the AMP Guidelines, advance mitigation planning, and advance mitigation project delivery are a number of established laws, policies, and processes including, but not limited to, the following:

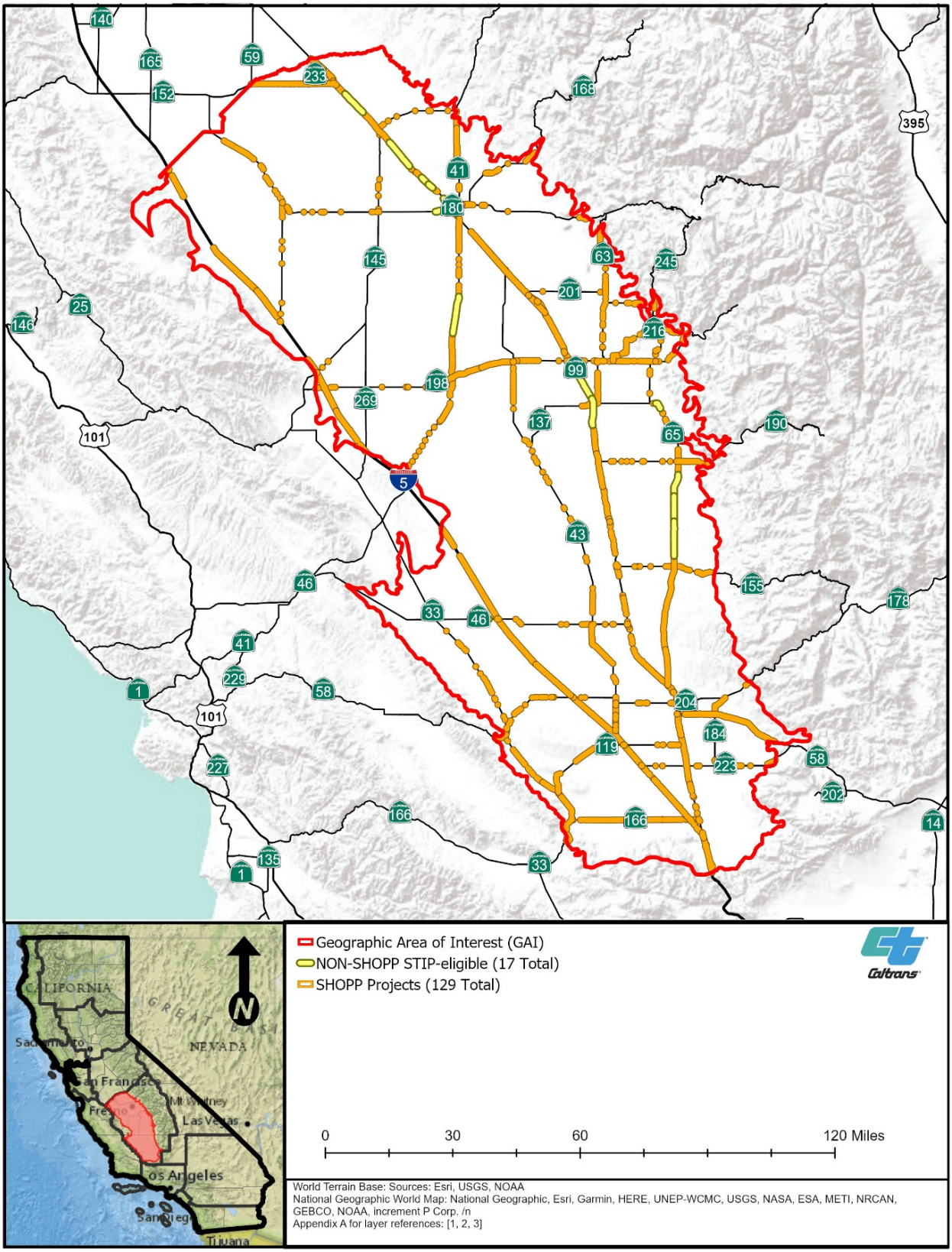
- Gas tax-derived funds may be used only to develop mitigation credits or values anticipated to be needed to fulfill the mitigation requirements of transportation improvements [California Constitution, Article XIX § 2(a)].
- AMA funds are likely not sufficient to address all of Caltrans' anticipated compensatory mitigation needs.
- Long-term transportation planning is dynamic, and compensatory mitigation needs may change over a 10-year planning horizon as funding sources and transportation project lists are refined and updated.
- Advance mitigation planning does not imply an endorsement of a transportation project alternative.
- Establishing compensatory mitigation in advance of transportation project impacts does not create any presumption or guarantee that a future transportation project impact will be authorized by a natural resource regulatory agency. Avoidance and minimization considerations continue to be required.
- Establishing compensatory mitigation in advance of transportation project impacts does not create any presumption or guarantee or that the advance compensatory mitigation will be considered adequate and/or suitable by a resource agency for a specific transportation project's impact. Appropriateness of use of advance mitigation credits developed will be assessed on a case-by-case basis.
- Advance mitigation projects should optimize their conservation benefit in such a way that the number and types of mitigation credits (or similar) are maximized.
- Advance mitigation projects, like transportation projects and conservation projects, have financial, technical, and strategic risks.
- Advance mitigation projects, like transportation projects and conservation projects, have a scope, schedule, and budget.
- Transportation projects must include mitigation costs in the scoping and programming of their budgets because they are required by law to reimburse the AMA for use of mitigation produced by the AMP [SHC § 800.6(b)].

The above list is not presented in any order or priority.

1.2 District 6 Transportation Infrastructure

Caltrans District 6 is headquartered in Fresno. This geographically diverse district is the second largest of the 12 Districts statewide, stretching from the southernmost part of Yosemite National Park in the north to the Mojave Desert in the south. It includes Madera, Fresno, Tulare, Kings, and Kern Counties (Figure 1-3).

Figure 1-3. District 6 Road Infrastructure



From mountain peaks to desert floor, District 6 consists of 476 miles of freeway and 1,554 miles of rural and urban highway. The District has the largest portion of road miles to maintain in the state highway system, with 2,030 miles. Interstate 5 and State Route 99 run the length of District 6, serving as the main north-to-south arteries for not just the Central Valley, but for the entire state as well. These two routes carry a significant amount of truck traffic that is vital to the region's agricultural base. A series of east-to-west highways (State Routes 140, 152, 180, 198, and 46) connect Interstate 5 to State Route 99 and form the backbone of a grid system of roads connecting the Valley's farming communities.

Other transportation agencies that implement transportation improvements eligible for State Transportation Improvement Program ("STIP") funding (MPOs, RTPAs, and other public agencies) within District 6's boundaries are Fresno County Transportation Authority, Fresno Council of Governments, Kings County Association of Governments, Madera County, Madera County Transportation Commission, and Tulare County Association of Governments.

1.3 Regulatory Framework Summary

Unavoidable natural resource impacts that could result from transportation projects are defined under environmental laws and regulations including, but not limited to:

- California Environmental Quality Act ("CEQA") (Public Resources Code § 21000 et seq.)
- National Environmental Policy Act ("NEPA") (42 U.S. Code ["USC"] § 4321 et seq.)
- federal Endangered Species Act of 1973 ("ESA") (16 USC § 1531–1543), as amended
- California Endangered Species Act ("CESA") (California Fish and Game Code ["FGC"] § 2050 et seq.)
- federal Clean Water Act ("CWA"), Sections 401 and 404 (33 USC § 1251–1376)
- Porter-Cologne Water Quality Control Act (California Water Code § 13000 et seq.)
- FGC § 1600 et seq.

Natural resource regulatory agencies that may need to be engaged for transportation projects that impact natural resources in the geographic area of interest ("GAI") are listed in Table 1-1.

Table 1-1. Natural Resource Regulatory Agencies that Regulate Natural Resources in the GAI

Partner	Web Address
California Department of Fish and Wildlife ("CDFW"), Central Region	https://wildlife.ca.gov/Regions/4
CDFW, Habitat Conservation Planning Branch	https://wildlife.ca.gov/Explore/Organization/HCPB
California Regional Water Quality Control Board ("RWQCB"), Central Valley	https://www.waterboards.ca.gov/centralvalley/
State Water Resources Control Board ("State Water Board")	https://www.waterboards.ca.gov/
U.S. Army Corps of Engineers ("Corps"), South Pacific Division, Sacramento District	https://www.spk.usace.army.mil/Missions/Regulatory//
U.S. Environmental Protection Agency ("EPA"), Region 9	http://www.epa.gov/region9/
U.S. Fish and Wildlife Service ("FWS"), Pacific Southwest Region, Sacramento Field Office	https://www.fws.gov/sacramento/
U.S. National Marine Fisheries Service ("NMFS") West Coast, Central Valley Office San Joaquin River Branch	https://www.westcoast.fisheries.noaa.gov/

Each of the natural resource regulatory agencies listed in Table 1-1 may include compensatory mitigation as a transportation project condition after it has been determined that there will be unavoidable permanent, adverse impacts and that other efforts to minimize, rectify, and reduce the impact have been incorporated in the transportation project's design and delivery. These natural resource regulatory agencies may also recognize the use or application of compensatory mitigation credit that was established through an instrument or other formal interagency agreement as satisfying a transportation project's compensatory mitigation condition(s). As a lead agency under CEQA and NEPA, Caltrans may also determine compensatory mitigation is required.

Some natural resource regulatory agencies also have procedures for establishing compensatory mitigation. These are defined under environmental laws, regulations, policies, and guidelines including, but not limited to:

- *Conservation Bank and Mitigation Bank Applications and Fees* (FGC § 1797 et seq.)
- *Advance Mitigation and Regional Conservation Investment Strategies,* mitigation credit agreements (FGC § 1856)
- *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* (33 Code of Federal Regulations ["CFR"] Parts 230, 325, and 332 and 40 CFR Part 230)
- *Final Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division* (Corps 2015)

- *Memorandum of Understanding Concerning Mitigation and Conservation Banking and In-Lieu Fee Programs in California* [California Natural Resources Agency ("CNRA") et al. 2011].

As discussed previously, credits are the usual currency of mitigation established through an advance mitigation project; however, other values may also be established. Establishing conservation banks, mitigation banks,[3] and in-lieu fee programs requires an instrument. Existing policies and regulations prescribe what an instrument must contain and address, as well as the terms of use for the credits generated by the mitigation bank, conservation bank, or in-lieu fee program. Similarly, establishing habitat conservation plans ("HCPs") and natural community conservation plans ("NCCPs") requires an agreement.

1.4 SAMNA

Predicting likely future transportation project effects on natural resources takes place at the intersection of transportation planning and conservation planning. In 2018, consistent with Step 1 of the advance mitigation planning process (Figure 1-1), the AMP forecast Caltrans' statewide compensatory mitigation needs for the transportation improvements conceptualized in the *State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2017/18—2026/27* ("SHOPP Ten-Year Book") for fiscal years 2018 to 2027 (Caltrans 2018a, 2019b). The forecast was performed using the Caltrans Statewide Advance Mitigation Needs Assessment Reporting Tool ("SAMNA Reporting Tool"), a geographic information system ("GIS") overlay model developed by Caltrans to support advance mitigation planning (Caltrans 2019b). Potential impacts for all 12 Caltrans Districts were estimated. Statewide, over 900 transportation projects and over 600 wildlife and aquatic resources were evaluated through the SAMNA Reporting Tool, yielding thousands of results (Caltrans 2019b). The District 6 results are provided on pages 178 to 209 of Caltrans 2019b.

For consistency and as appropriate, tables, figures, and information presented throughout this document, including Chapter 2, *Environmental Setting*, are consistent with the geospatial data within the SAMNA Reporting Tool. SAMNA Reporting Tool geospatial data and model assumptions are described more fully in Caltrans 2019b. Results are presented in four different reports: terrestrial and aquatic species and sub-species, special-status fish, waters, and wetlands. The unit of measure for impacts is acres.

SAMNA Caveats: The Statewide Advance Mitigation Needs Assessment ("SAMNA") is strictly and specifically intended to be used for Caltrans to justify, propose, and scope advance mitigation projects (Caltrans 2019b). The SAMNA results:

[3] The goal of conservation banks is, typically, to offset adverse impacts on a species, while the goal of mitigation banking is to replace the exact function and values of specific wetland habitats that will be adversely affected.

- Are not to be used to substitute for or preempt any requirements to conduct detailed transportation project-level environmental scoping and analysis to inform the programming of individual transportation projects;
- Do not relieve Caltrans project planners from first avoiding and then minimizing impacts;
- Do not preclude the requirements under CEQA and NEPA for environmental analysis of and permitting for individual transportation projects; and
- Do not constitute a commitment on the part of an individual transportation project to implement the estimated compensatory mitigation. A transportation project's actual impacts and compensatory mitigation commitments will be determined during its environmental and permitting processes.

Use of these methods shall not support the endorsement of or any other conclusion concerning any transportation project or transportation project alternative. Use or misuse of these methods and results for any purpose other than that which is intended shall be the sole responsibility of the individuals or entities conducting or supporting that use or misuse, who shall be fully liable, therefore.

1.5 GAI and Resource Focus

Given the quantity of resources evaluated through the SAMNA, limited AMA funding, and the need for the AMP to revolve the account, Caltrans District 6 focused on a geographic area with wildlife habitats and aquatic resources that have a high probability of requiring transportation project mitigation. Consistent with Step 2 of the advance mitigation planning process (Figure 1-1), in 2019, Caltrans District 6 subject matter specialists:

- Reviewed the entirety of District 6's SAMNA results and their associated future transportation project locations and activities anticipated for the State Highway Operation and Protection Program ("SHOPP");
- Reviewed non-SHOPP STIP-eligible transportation improvement plans for the next 10 years; and
- Identified the Great Valley Ecoregion Section as a location where Caltrans and other public agencies that implement transportation improvements could benefit from advance mitigation—hereafter called the GAI (Figure ES-1; Figure 1-3).

In addition, compensatory mitigation for wildlife resources in the GAI was specifically identified as both a historical transportation project compensatory mitigation need and an anticipated future transportation project compensatory mitigation need within District 6. Hence, to further focus the planning effort, District 6 identified the California tiger salamander (*Ambystoma californiense*), San Joaquin kit fox (*Vulpes macrotis mutica*), giant kangaroo rat (*Dipodomys ingens*), and two subspecies of San Joaquin kangaroo rat (*Dipodomys nitratoides*) as "species of mitigation need." The San Joaquin kangaroo rat subspecies identified as species of mitigation need are Fresno kangaroo rat (*D. nitratoides exilis*) and Tipton kangaroo rat (*D. nitratoides nitratoides*).

Compensatory mitigation for impacts on aquatic resources are also anticipated to be needed for the nine HUC-8 sub-basin resources in the Great Valley Ecoregion Section: Fresno River (hydrologic unit code ["HUC"] 18040007), Middle San Joaquin-Lower Chowchilla (HUC 18040001), Middle Kern-Upper Tehachapi-Grapevine (HUC 18030003), Upper Tule (HUC 18030006), Upper Kaweah (HUC 18030007), Tulare Lake Bed (HUC 18030012), Upper Deer-Upper White (HUC 18030005), Upper Dry (HUC 18030009), and Upper Poso (HUC 18030004).

Focusing this analysis improves the probability that advance mitigation projects undertaken by Caltrans will yield credits (or similar) that will be usable and comply with an appropriate established regulatory framework. Caltrans intends for any mitigation-related measures to support these environmental resources in the GAI to benefit other environmental resources as well.

1.6 RAMNA

This RAMNA is a planning-level document that:

- Provides a desktop analysis of relevant available information pertaining to the Great Valley Ecoregion Section, referred to as the GAI;
- Applies to fiscal years 2018 to 2027 (planning period), which is concurrent with the time period addressed by the SHOPP Ten-Year Book (Caltrans 2018a);
- Discusses potential compensatory mitigation conditions that may be placed on future transportation projects by the seven resource and regulatory agency signatories[4] to the *Master Process Agreement for Planning and Developing Advance Mitigation throughout California for the California Department of Transportation Advance Mitigation Program* (Caltrans et al. 2020);
- Focuses on wildlife habitats and aquatic resources that have a high probability of requiring transportation project-related compensatory mitigation in the GAI and planning period;
- Documents Caltrans' forecast of potential wildlife and aquatic resource[5] compensatory mitigation needs for the GAI and planning period, as reported by the SAMNA (Caltrans 2019b);
- Identifies information that will be important to Caltrans when scoping any of the AMP's authorized activities in the GAI, in accordance with SHC § 800.6(a), including documenting the existing compensatory mitigation supply;
- Incorporates information and feedback received from outreach to the natural resource regulatory agencies, FHWA, MPOs, RTPAs, other public agencies that

[4] Natural resource regulatory signatories are CDFW; State Water Board, Corps Los Angeles, Sacramento, and San Francisco Districts; EPA; FWS; NMFS; and California Coastal Commission.

[5] For the purposes of this document, aquatic resources include all wetlands and waters regulated by CDFW, RWQCBs, Corps, and EPA.

implement transportation projects, Native American tribes, interested parties, and the public; and
- Analyzes Caltrans' options to meet its compensatory mitigation needs in the GAI through the AMP's authorized activities.

Because early technical assistance and communication may increase the probability that advance mitigation projects promoted within and/or undertaken by Caltrans will successfully meet the AMP's purpose, in accordance with the AMP Guidelines, Caltrans has requested that this RAMNA be reviewed by FHWA, natural resource regulatory agencies, other transportation agencies (MPOs, RTPAs, and other public agencies that implement transportation improvements), Native American tribes, interested parties, and the public. Their reviews and any information they provide will also be consulted by Caltrans when it promotes and approves specific advance mitigation projects for development and funding (Caltrans 2019a).

1.7 Coordination History

With respect to external communications, the AMP Guidelines describe three communication milestones within the advance mitigation project planning process (Caltrans 2019a). Each is summarized in the following sections.

1.7.1. MPOs, RTPAs, and Other Transportation Agencies that Implement Transportation Improvements

The AMP Guidelines state that Caltrans will contact MPOs, RTPAs, and other public agencies that implement transportation improvements to request specific information about their potential STIP transportation projects, to help inform the potential demand for mitigation in that area (Section 7.2 of Caltrans 2019a). District 6 Transportation Planning conducted outreach and contacted the partners listed in Table 1-2.

Table 1-2. Regional Transportation Interaction and Outreach Summary

Date	Description
March 19, 2019	Quarter 2 Progress Meeting between Caltrans District 6 Transportation Planning and Kings County Association of Governments
March 20, 2019	Quarter 2 Progress Meeting between Caltrans District 6 Transportation Planning and Tulare County Association of Governments
March 23, 2019	Quarter 2 Progress Meeting between Caltrans District 6 Transportation Planning, Madera County, and Madera County Transportation Commission
April 8, 2019	Quarter 2 Progress Meeting between Caltrans District 6 Transportation Planning, Fresno County Transportation Authority, and Fresno Council of Governments
June 3, 2020	Transportation Technical Advisory Committee Meeting with Kern Council of Governments
June 8, 2020	Transportation Technical Advisory Committee Meeting with Madera County Transportation Commission

Date	Description
June 10, 2020	Transportation Technical Advisory Committee Meeting with Kings County Association of Governments
June 11, 2020	Transportation Technical Advisory Committee Meeting with Tulare County Association of Governments
June 12, 2020	Transportation Technical Advisory Committee Meeting with Fresno Council of Governments

1.7.2. RAMNA Review

The AMP Guidelines (Caltrans 2019a) state:

> *Before the RAMNA will be used to support advance mitigation project planning, Caltrans will, per 23 USC 169(a): consult with each natural resource regulatory agency with jurisdiction over the environmental resources considered in the RAMNA; make a draft of the RAMNA available for review and comment by applicable natural resource regulatory agencies, FHWA, Native American Tribes, local transportation agencies, local advance mitigation programs, local interested parties, and the public; request that, along with their review, natural resource regulatory agencies, Native American Tribes, FHWA, local transportation agencies, local advance mitigation programs, interested parties, and the public provide Caltrans any additional information relevant to and appropriate for the RAMNA; consider any comments and information received from natural resource regulatory agencies, FHWA, Native American Tribes, local transportation agencies, local advance mitigation programs, local interested parties, and the public on the draft RAMNA; and incorporate information and address such comments in the final RAMNA as appropriate.*

In August 2020, Caltrans distributed this RAMNA for review by FHWA, natural resource regulatory agencies, other transportation agencies (MPOs, RTPAs, and other public agencies that implement transportation improvements), Native American tribes, interested parties, and the public. Table 1-3 lists the commenters and the date of their communication. All comments received were considered, addressed, and incorporated into the document, as appropriate.

Table 1-3. Comments Received by Caltrans on the RAMNA

Commenter	Date of Comment Letter
CDFW[a]	October 19, 2020
California Coastal Commission[b]	August 19, 2020
Corps	October 14, 2020
EPA	October 20, 2020
FWS	October 23 and 25, 2020
NMFS	November 2, 2020
State Water Board	October 15, 2020

[a] SHC § 800 et seq. specifically directs Caltrans to consult with CDFW on all activities pursuant to the AMP.
[b] Signatory to the Process Agreement (Caltrans et al 2020). Advised no resources under its jurisdiction in the GAI.

1.7.3. Interagency Meeting

The Master Process Agreement states that prior to finalizing the RAMNA, "Caltrans will arrange and facilitate at least one … meeting [with natural resource regulatory agencies] to discuss the RAMNA, conservation goals and objectives, overlapping agency statutory and regulatory requirements, and other relevant topics" (Section IV, Subsection A, Provision 6). In accordance with the Master Process Agreement, a meeting between Caltrans and the natural resource regulatory agencies was held within 60 days of distribution of the RAMNA. The meeting participants and meeting dates are presented in Table 1-4. The discussion has informed this document.

Table 1-4. Meetings

Meeting Participants	Meeting Date
CDFW, FWS, EPA, Corps, State Water Board, California Coastal Commission, Caltrans	September 19, 2020
CDFW, Caltrans	November 3, 2020
Corps, Caltrans	November 3, 2020
State Water Board, Caltrans	November 4, 2020
FWS, Caltrans	November 10, 2020
EPA, Caltrans	November 12, 2020

1.8 Document Organization

This document is organized as shown in Table 1-5.

Table 1-5. Document Organization

Chapter	Title	Content
Chapter 1	Introduction	This chapter introduces the RAMNA, placing it in context of the AMP Guidelines, transportation network, and regulatory framework.
Chapter 2	Environmental Setting	This chapter describes the GAI analyzed in the RAMNA. It relies on geospatial data from the SAMNA Reporting Tool and other readily available information.
Chapter 3	Relevant Plans, Policies, and Regulations	This chapter briefly describes laws, regulations, comprehensive plans, conservation plans, and land management plans that are applicable and relevant to the GAI that can inform both regional understanding and advance mitigation scoping.
Chapter 4	Existing Mitigation Opportunities	This chapter summarizes the mitigation credits (or similar) currently available to Caltrans and/or pending that are applicable to the environmental resources discussed in the RAMNA and located within or in the vicinity of the GAI.
Chapter 5	Modeled Estimated Impacts	This chapter summarizes the SAMNA forecast and regional estimates of compensatory mitigation need for the GAI.
Chapter 6	Benefiting Transportation Project Considerations	This chapter summarizes relevant information about potentially benefiting transportation projects, including scheduling considerations and constraints. A time frame for the need for forecast mitigation is provided and analyzed. The potentially benefiting transportation projects' acceleration priorities are documented in this chapter.
Chapter 7	Wildlife Resources Conservation Goals and Objectives	This chapter presents Caltrans' understanding of the GAI's wildlife conservation goals and objectives, with which Caltrans seeks to align its advance mitigation projects.
Chapter 8	Aquatic Resources Conservation Goals and Objectives	This chapter presents Caltrans' understanding of the GAI's aquatic, wetland, and water resources conservation goals and objectives, with which Caltrans seeks to align its advance mitigation projects.
Chapter 9	Assessment of Authorized Activities	This chapter describes options and analyzes the feasibility of purchasing and/or establishing mitigation credits (or similar) in the GAI that have a high probability of successfully accelerating transportation project delivery and protect natural resources through transportation project mitigation.
Chapter 10	References	This chapter lists references cited in the RAMNA.
Appendices	Various	Appendices supporting this document: Appendix A – GIS Sources Appendix B – Ecoregion Subsection Descriptions Appendix C – Land Cover Types Appendix D – Complete SAMNA Species Results Appendix E – Hydrologic Units Appendix F – Aquatic Resource Locations Appendix G – SWAP Conservation Targets

2. ENVIRONMENTAL SETTING

The GAI coincides with the approximately 5.9-million-acre portion of the Great Valley Ecoregion Section located in the San Joaquin Valley and within Caltrans District 6, which is in the southern portion of the Central Valley in California. Ecoregion sections are defined as the largest ecological unit of the U.S. Department of Agriculture ("USDA") Forest Service ("USFS") National Hierarchical Framework of Ecological Units, which are nested within larger provinces (Cleland et al. 1997). The Great Valley Ecoregion Section is within the larger California Dry Steppe Province (McNab et al. 2007).

In this chapter, Caltrans describes the GAI in terms of land ownership, topography, climate, land cover types, invasive species, special-status species, wildlife movement, and aquatic resources in relation to the GAI boundary. Aquatic resources consist of fish, wetlands, and non-wetland water resources. Intended to inform advance mitigation project scoping, this assessment relies on readily available literature and GIS sources, including the vegetation and other geospatial data layers developed for the SAMNA Reporting Tool (Caltrans 2017a). Sources used for this assessment are cited throughout the chapter, and links to GIS sources are provided in Appendix A.

On each figure, Caltrans has provided the general location of planned SHOPP and STIP-eligible transportation projects that may require compensatory mitigation as a resource and/or regulatory agency transportation project condition, during the 10-year planning period addressed by this document. More information about the GAI's road infrastructure is provided in Section 1.2. Additional information about planned SHOPP and STIP-eligible transportation projects is provided in Chapter 5.

2.1 Great Valley Ecoregion Subsections

The GAI lies within the Central Valley and Sierra Nevada Province as defined in the California State Wildlife Action Plan ("SWAP") (CDFW 2015). Within this province, the GAI overlaps nine ecoregion subsections within the Great Valley Ecoregion Section (Table 2-1; Figure 2-1). Ecoregion sections and subsections in the GAI were excerpted from the SAMNA Reporting Tool (Caltrans 2019b). Brief ecoregion subsection descriptions are provided in Appendix B. Land cover is described by ecoregion subsection in Section 2.5, and is depicted on maps provided in Appendix C.

Table 2-1. Subsections of the Great Valley Ecoregion Section

Subsection Name	Code[a]	Acreage[b]	Subsection as Percentage of GAI
Antelope Plain	262Ax	310,247	5.3
Elk Hills and South Valley Terraces	262Az	248,377	4.2
Granitic Alluvial Fans and Terraces	262Au	1,664,750	28.4
Hardpan Terraces	262Ag	1,215,939	20.7
Panoche and Cantua Fans and Basins	262Aw	695,589	11.9
San Joaquin Basin	262At	38,946	0.7
South Valley Alluvium and Basins	262Ay	1,172,314	20.0
Tulare Basin	262Av	403,566	6.9
Westside Alluvial Fans and Terraces	262Aq	112,444	1.9
	Total	**5,862,172**	**100.0%**

Source: Caltrans 2017a
[a] USFS ecological unit subsection codes
[b] Numbers were rounded to the nearest whole number.

2.2 Land Ownership in the GAI

The GAI spans parts of Madera, Fresno, Kings, Tulare, and Kern Counties (Figure 2-2). Approximately 75.4 percent of land in the GAI consists of agricultural/rural (private) land. Approximately 3.3 percent is federally administered and managed by the U.S. Department of Interior, which manages the Bureau of Land Management ("BLM"), Bureau of Reclamation, and FWS; the U.S. Department of Defense, which manages U.S. military bases; USDA, which manages the Natural Resources Conservation Service; Corps; and other federal entities (Figure 2-2, Table 2-2). Approximately 1.5 percent of land in the GAI consists of state-managed lands. The GAI includes two of the nine largest cities in California—Fresno and Bakersfield (Caltrans 2018a). Other lands in the GAI are owned by Native American tribes, counties, cities, joint power authorities, and private entities (Figure 2-2, Table 2-2).

Figure 2-1. Great Valley Ecoregion Subsections

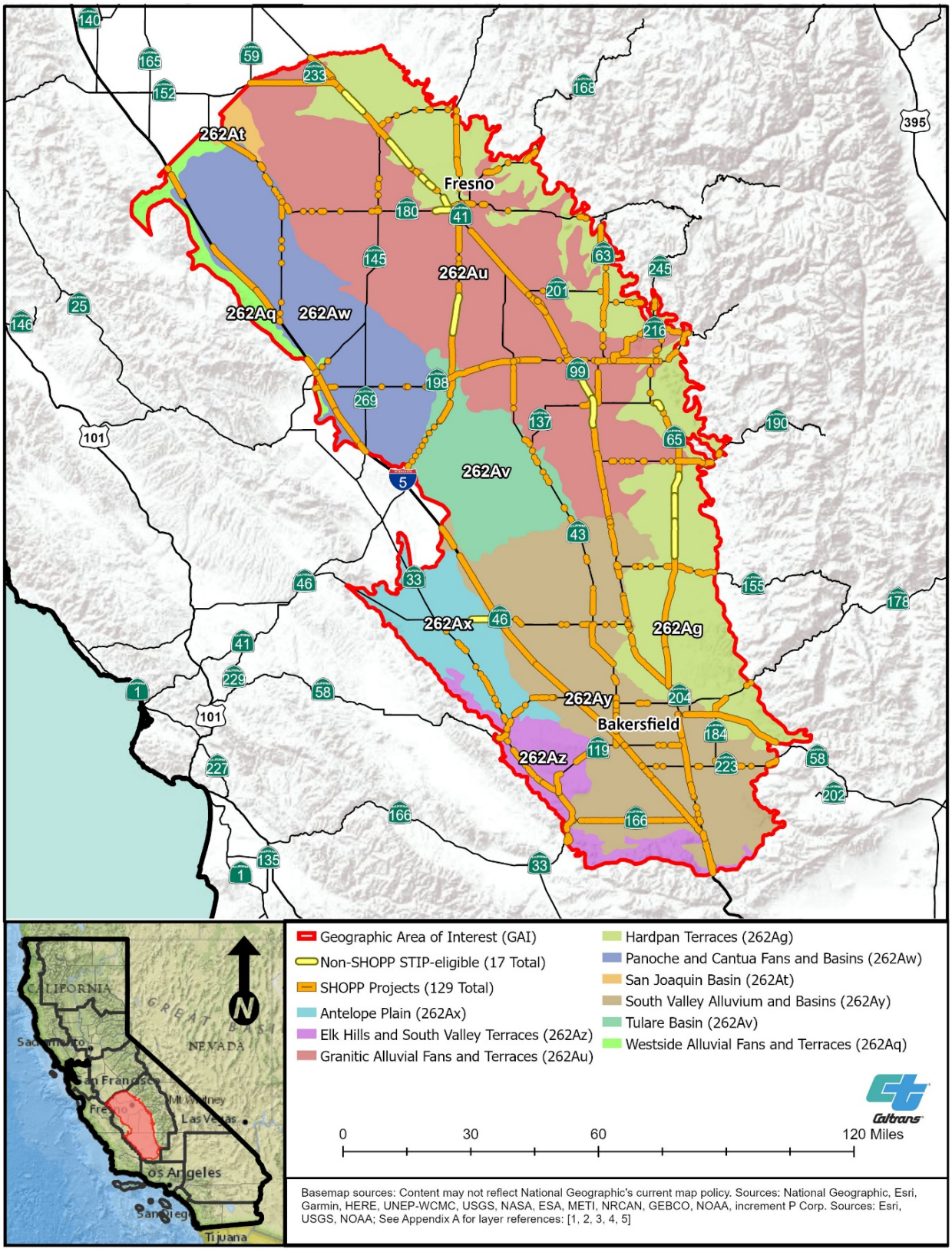


Figure 2-2. Land Ownership

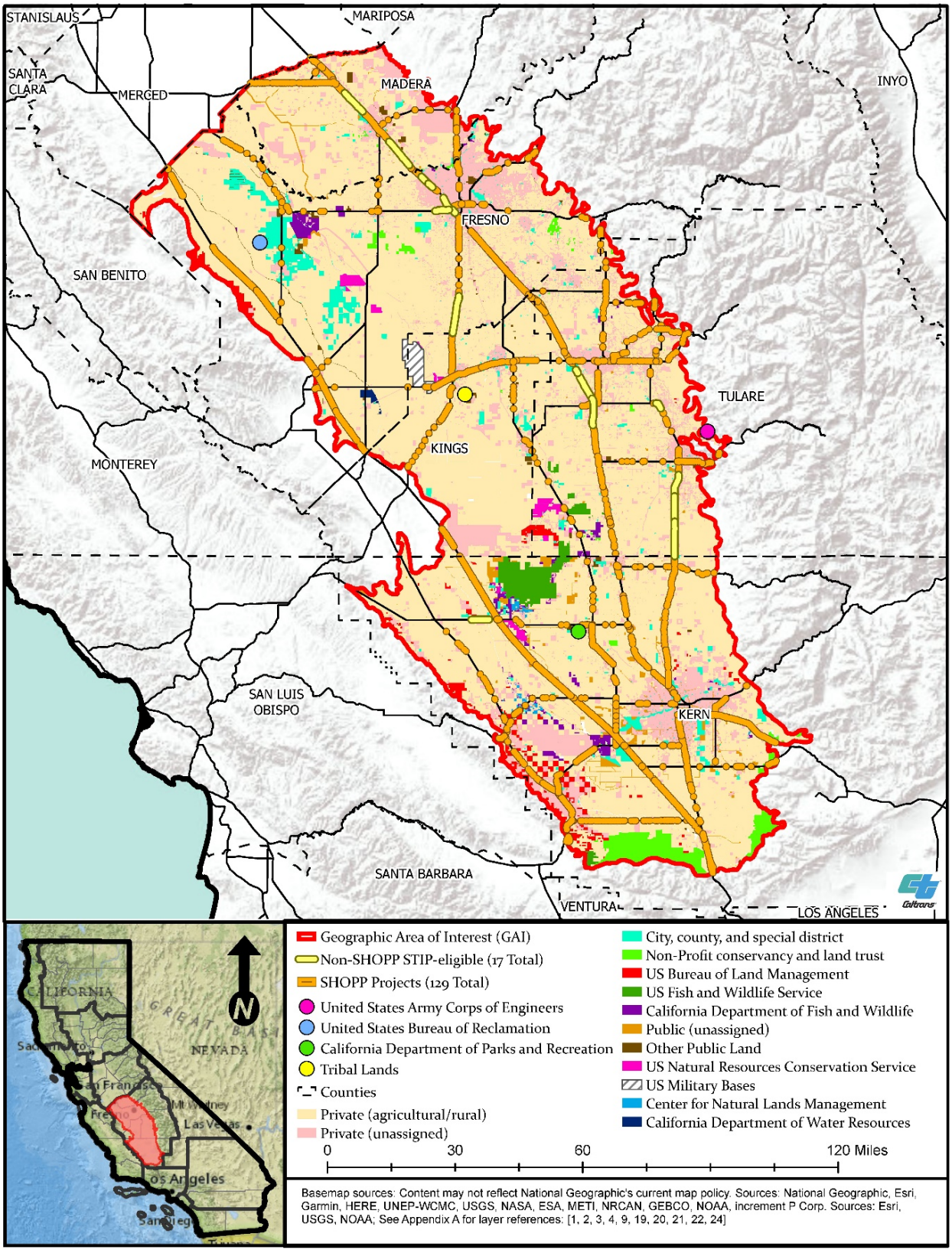


Table 2-2. Land Ownership in the GAI

Land Owner or Land Use	Number of Parcels	Total Acreage per Agency/Owner[a]	Ownership as Percentage of GAI
Private (agricultural/rural)	107,167	4,317,744	75.39
Private (unassigned)	690,094	806,297	14.08
City, county, and special district	44,399	169,962	2.97
Nonprofit conservancy and land trust	993	104,608	1.83
BLM	1,580	64,923	1.13
FWS	1,250	62,616	1.09
CDFW	2,536	58,050	1.01
Public (unassigned)	12,442	49,706	0.87
Other public lands	5,438	31,487	0.55
USDA Natural Resources Conservation Service	337	24,325	0.42
U.S. military bases	187	18,765	0.33
Center for Natural Lands Management	409	7,347	0.13
California Department of Water Resources	83	3,873	0.07
Corps	58	3,750	0.07
Bureau of Reclamation	101	1,965	0.03
California Department of Parks and Recreation	63	1,897	0.03
Tribal lands	8	59	<0.01
Total	**867,145**	**5,727,376**	**100%**

Sources: Bureau of Indian Affairs; California Protected Lands Database; California Conservation Easement Database; Caltrans 2017a; U.S. Census Bureau; USDA; and California Department of Technology for land parcels
[a] Numbers were rounded to the nearest whole number.

2.2.1. Protected Lands

The California Protected Areas Database, developed by GreenInfo Network, provides an inventory of lands that are owned in fee or protected for open space purposes, throughout California, by over 1,000 public and nonprofit organizations. These protected lands are managed for the preservation of biological diversity and other natural, recreational, and cultural uses. It is important to note, however, that these data are based on best available public information at the time of development and, as such, may not represent all protected lands in California.

Within the California Protected Areas Database, lands are assigned U.S. Geological Survey ("USGS") Gap Analysis Program ("GAP") status ranks that define the degree of protection for biodiversity conservation using a 1 to 4 coding system. Areas with a GAP

status of 1 are managed for biodiversity; areas with a GAP status of 2 are managed for biodiversity with disturbance events suppressed; areas with a GAP status of 3 are managed for multiple uses, potentially including mining or off-road vehicle use; and areas with a GAP status of 4 have no known mandate for biodiversity protection. The method of applying these California Protected Areas Database ranks is done in collaboration with the USGS' Protected Areas Database of the U.S.

Not all California Protected Areas Database lands have GAP status ranks, and some may be out of date. Nevertheless, available protected lands and their associated GAP status ranks are indicated on Figure 2-3. As Figure 2-3 shows, no GAP status 1 lands are identified in the database for the GAI and most of the planned SHOPP or STIP-eligible transportation projects are in areas with a GAP status of 2 or 4, although some of the projects occur in areas where no rank has been assigned. Lands with conservation easements are also identified in the California Protected Areas Database; some of the planned SHOPP or STIP-eligible transportation projects are proximate to conservation easements.

2.3 Topography

As noted in Section 2.1, the GAI is located primarily in the southern portion of the Central Valley (Figure 2-4). The area consists of alluvial fans, terraces, valley floor, and foothills. Divided by creeks and rivers, broad valleys extend from areas with elevations ranging from sea level to 4,600 feet above mean sea level in the foothills (Central Valley RWQCB 2018a, 2018b; USFS 1994). Topographical boundaries include the Sierra Nevada Mountains to the east, the Coastal Ranges to the west, and the Transverse Ranges to the south.

Figure 2-3. Protected Lands

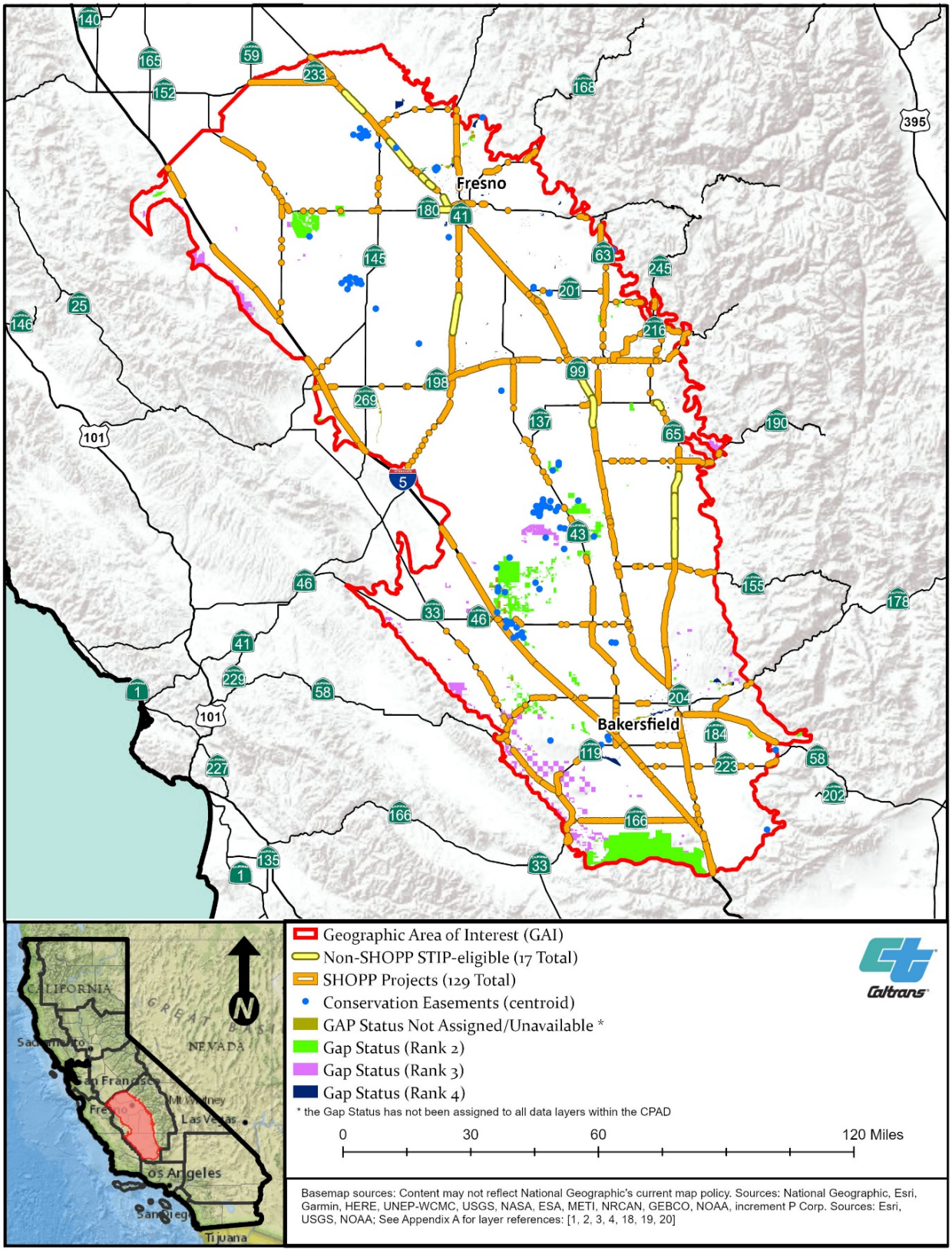
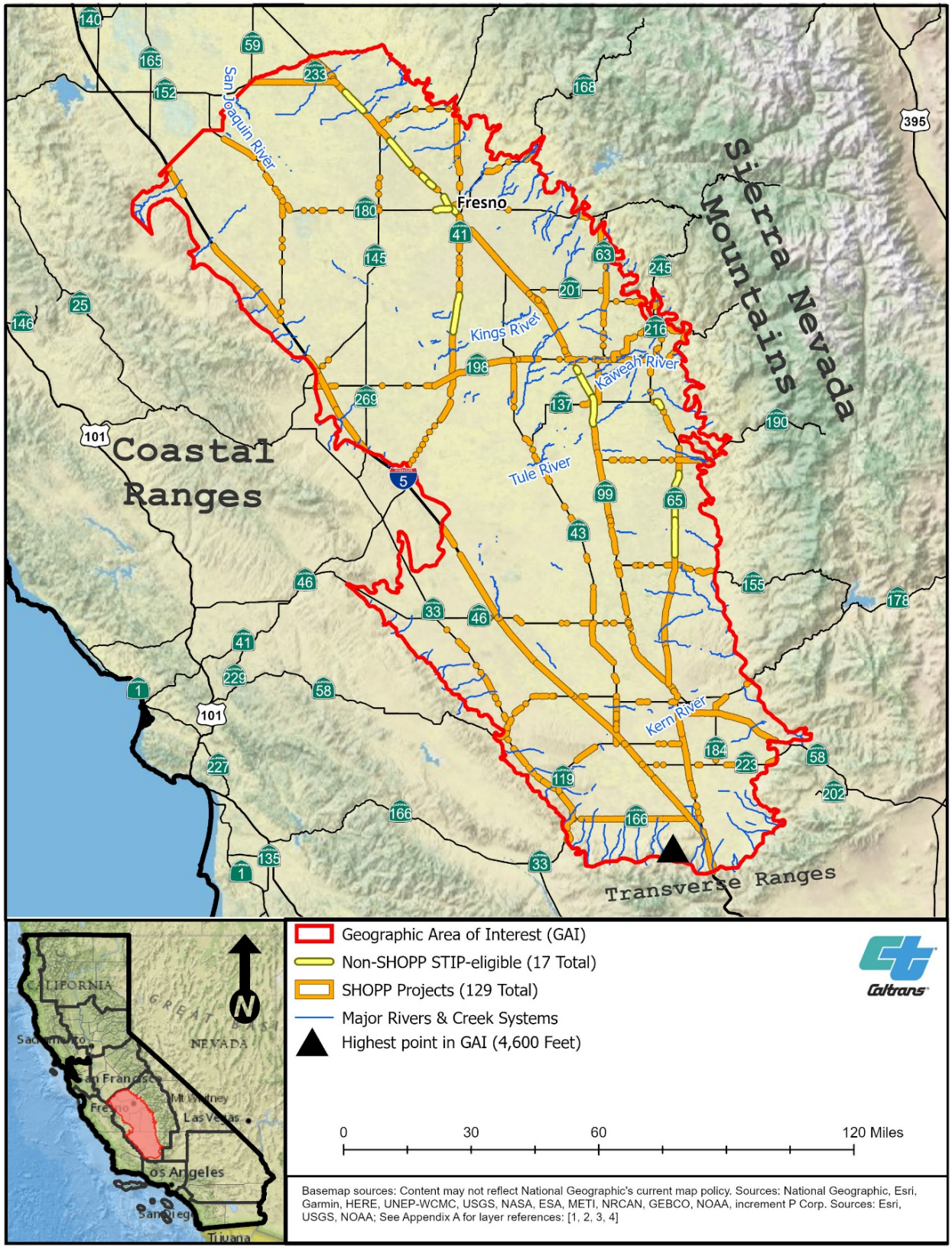


Figure 2-4. Topography



2.4 Climate

The GAI is characterized by a Mediterranean climate, with hot, dry summers and cool, rainy winters. Annual temperatures average from 55 to 66 degrees Fahrenheit (Caltrans 2018b; USFS 1994). Mean annual precipitation on the valley floor ranges from less than 5 inches in the south to 15 inches in the north (USGS 2011).

In the next 30 years, the climate is expected to change. Results of Caltrans' climate vulnerability assessment are summarized in Section 2.4.1. The predicted resilience of the GAI to effects resulting from climate change are summarized in Section 2.4.2.

2.4.1. Climate Vulnerability Assessment

Caltrans conducted a statewide climate vulnerability assessment to evaluate potential vulnerabilities of the State Highway System to climate change (Caltrans 2018b). The analysis provided in the Caltrans *Climate Change Vulnerability Assessments: District 6 Technical Report* (Caltrans 2018b) is based on global climate change data compiled by the Intergovernmental Panel on Climate Change. Caltrans applies three future emissions scenarios for greenhouse gas emission concentrations in the technical report—representative concentration pathway 2.6, which assumes global annual greenhouse gas emissions will peak in the next few years and then begin to decline substantially; representative concentration pathway 4.5, which assumes emissions will peak around 2040 and then begin to decline; and representative concentration pathway 8.5, which assumes that high emission trends continue to the end of the century—for three future 30-year periods centered on the years 2025 (2010 to 2039), 2055 (2040 to 2069), and 2085 (2070 to 2099).

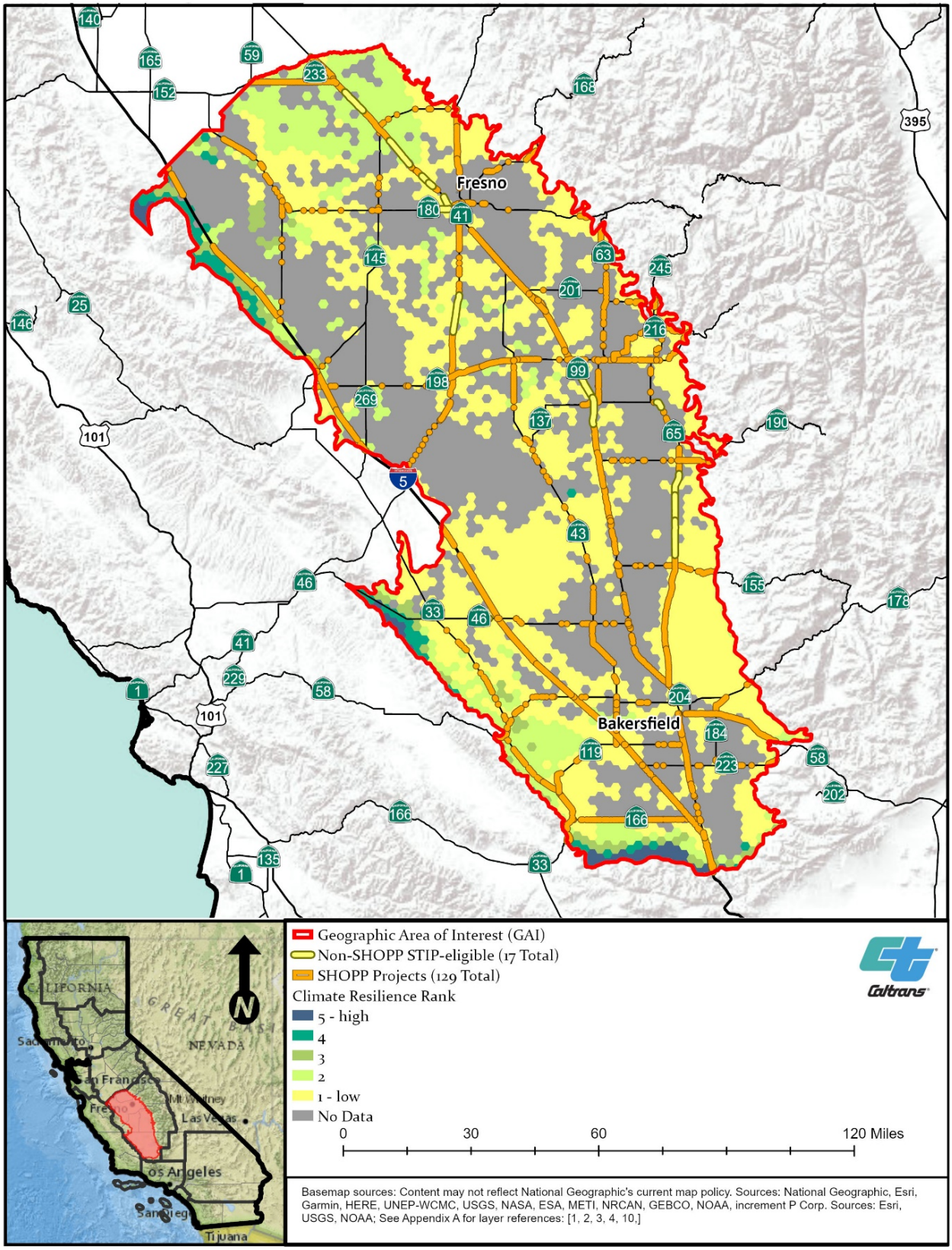
The effects of climate change in the GAI pose risks for transportation infrastructure, which consist of projected extended periods of higher temperatures in the summer; large fluctuations in precipitation, with dry years becoming drier and wet years becoming wetter; and an increased risk of wildfire and flooding (Caltrans 2018b). Climate change effects in the Central Valley during the three future 30-year periods are expected to diminish stream flows and groundwater supplies, result in overall lower precipitation, exacerbate land subsidence, increase flooding resulting from melting of winter snowpack in the Sierra Nevada Mountains, increase landslide and mudslide frequency, increase heat wave frequency, and worsen the severity of wildfires.

2.4.2. Climate Resiliency

A climate change-resilient natural community area is a terrestrial location expected to remain stable in the face of climate change (CDFW 2018a). The predicted resilience of the GAI to effects resulting from climate change was acquired from CDFW's Areas of Conservation Emphasis ("ACE," version 3) terrestrial climate change resilience dataset. This dataset consists of the modeled probability that a given terrestrial location may function as a plant or wildlife refugium from climate change, meaning that it would be relatively buffered from the effects of climate change, conditions would likely remain suitable for plants and wildlife currently residing in the area, and ecological functions would be more likely to remain intact. The ACE dataset combines climate refugia model results from eight future climate scenarios based on different combinations of global climate models, emissions scenarios, and time horizons. The eight scenarios assessed included two potential future climates—both a hotter and drier future and a warmer and wetter future; two future carbon dioxide ("CO_2") scenarios—one with no reductions in CO_2 emissions and one with a peak in 2040 followed by a significant decline in CO_2 emissions; and two 29-year time intervals—2040 to 2069 and 2070 to 2099. Terrestrial locations were assigned climate resilience ranks ranging from 1 (low resilience or low probability that the terrestrial location will contain climate refugia) to 5 (high resilience or high probability that the terrestrial location will contain climate refugia) (CDFW 2018b).

As shown on Figure 2-5, the predicted climate resilience of the GAI ranges from areas with low resilience or no data, located in the majority of the GAI, to areas with moderate to high resilience on the extreme western edge of the GAI along the base of the Diablo Range and on the southwestern portion of the GAI along the base of the Transverse Range. Most of the planned transportation SHOPP and STIP-eligible project locations do not coincide with terrestrial locations determined to have higher climate resilience value.

Figure 2-5. Terrestrial Climate Resilience Rankings



2.5 Land Cover Types

Land cover types in the GAI were excerpted from the SAMNA, which developed its vegetation data layer by merging CDFW's California Wildlife Habitat Relationships ("CWHR") Vegetation Classification and Mapping Program GIS database, the USFS Classification and Assessment with LandSat of Visible Ecological Groupings, and the California Department of Forestry and Fire Protection vegetation layer (Caltrans 2017b). Based on these data, developed habitats and non-vegetated habitats (barren areas) combined account for the largest habitat type in the GAI, encompassing 78.1 percent of the GAI, with irrigated row and field crops the most common (Table 2-3, Appendix C). Herbaceous-dominated habitats account for 17.9 percent of the GAI, with annual grassland the most common. Shrub-dominated habitats account for 4.1 percent of the GAI, with alkali desert scrub and desert scrub the most common. Aquatic habitats account for 0.8 percent of the GAI. Tree-dominated habitats account for 0.4 percent of the GAI, with valley foothill riparian the most common. Land cover is generally shown on Figure 2-6, while general habitat types and the subecoregions in which they occur are depicted on the maps provided in Appendix C.

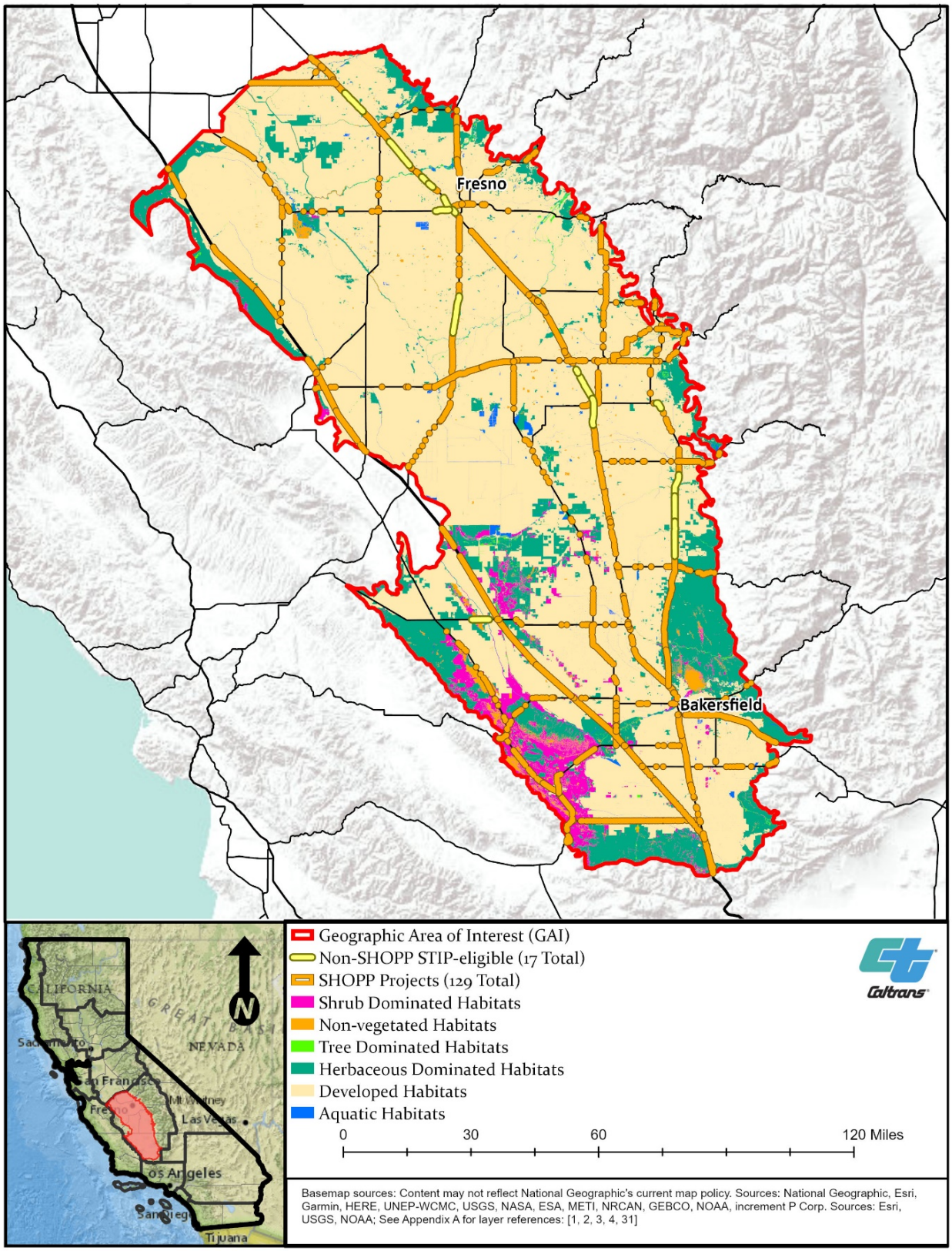
Table 2-3. Land Cover Types in the GAI

CWHR Habitat Type	Acreage[a]	Cover as Percentage of GAI[b]
Tree-dominated Habitats	**23,674**	**0.40**
Blue Oak Woodland	61	<0.01
Blue Oak-Foothill Pine; Blue Oak Woodland	2,269	0.04
Desert Riparian	393	0.01
Eucalyptus	566	0.01
Juniper	189	<0.01
Montane Hardwood	205	<0.01
Montane Riparian	47	<0.01
Ponderosa Pine	7	<0.01
Valley Foothill Riparian	19,699	0.34
Valley Oak Woodland	238	<0.01
Shrub-dominated Habitats	**238,080**	**4.06**
Alkali Desert Scrub	64,422	1.10
Alkali Desert Scrub; Desert Scrub	160,497	2.74
Bitterbrush	111	<0.01
Coastal Scrub	6,699	0.11
Desert Scrub	135	<0.01

CWHR Habitat Type	Acreage[a]	Cover as Percentage of GAI[b]
Desert Wash	4,656	0.08
Mixed Chaparral	1,554	0.03
Sagebrush	6	<0.01
Herbaceous-dominated Habitats	**1,049,764**	**17.91**
Annual Grassland	950,732	16.22
Annual Grassland; Perennial Grassland	1,459	0.02
Fresh Emergent Wetland	42,032	0.72
Pasture	36,595	0.62
Perennial Grassland	2,919	0.05
Saline Emergent Wetland	16,004	0.27
Wet Meadow	23	<0.01
Aquatic Habitats	**47,021**	**0.80**
Lacustrine	22,628	0.39
Riverine	24,393	0.42
Developed Habitats	**4,428,672**	**75.55**
Cropland	1,167,407	19.91
Deciduous Orchard	793,693	13.54
Irrigated Row and Field Crops	2,152,436	36.72
Rice	62	<0.01
Urban	314,997	5.37
Vineyard	77	<0.01
Non-vegetated Habitats	**74,974**	**1.28**
Barren	74,974	1.28
Total	**5,862,185**	**100%**

Source: Caltrans 2017b
[a] Numbers were rounded to the nearest whole number.
[b] Numbers were rounded to the hundredths.

Figure 2-6. Major Land Cover[a]



[a] For greater detail, see Appendix C.

2.6 Invasive Species

Both invasive plant and animal species are known to occur in the GAI. Invasive species include plants and animals that are not native to an ecoregion, typically have high growth and reproductive rates, and are able to outcompete native plants and animals, often because of a lack of natural predators or controls (FWS 2012; National Wildlife Federation 2019). Invasive species may affect native species, including special-status species, through direct competition for resources, preying on native species, parasitizing nests, introducing or spreading diseases, reducing the complexity and biodiversity of ecosystems, altering soil chemistry and water availability, and increasing wildfire potential (CDFW 2015; FWS 2005a). In the GAI, invasive plant species have been specifically identified as threats or stressors to terrestrial and aquatic biological resources. They can also increase fire hazards in a community that is not dependent on or adapted to large or frequent fires (CDFW 2018b).

Several entities maintain invasive species databases for California. The Invasive Species Council of California maintains a list of invasive plant and animal species throughout the state of California (California Invasive Species Advisory Committee 2010). The California Department of Food and Agriculture also maintains a list of noxious weeds for California (USDA Natural Resources Conservation Service 2003). The California Invasive Plant Council ("Cal-IPC") maintains a California invasive plant inventory that categorizes nonnative plant species based on the severity of their potential ecological impacts (Cal-IPC 2020).

Nonnative, invasive plant species with a high ranking by Cal-IPC are those that have the most severe ecological effects and are the most widely distributed geographically, although species with a moderate or limited ranking can also have negative local ecological effects. Invasive plant species that are identified as problematic for the Great Valley Ecoregion Section in terrestrial habitats include barb goatgrass (*Aegilops triuncialis*), tree of heaven (*Ailanthus altissima*), giant reed (*Arundo donax*), yellow starthistle (*Centaurea solstitialis*), pampasgrass (*Cortaderia selloana*), Scotch broom (*Cytisus scoparius*), Russian olive (*Eleagnus angustifolia*), medusahead (*Elymus caput-medusae*), eucalyptus (*Eucalyptus* spp.), edible fig (*Ficus carica*), French broom (*Genista monspessulana*), pennyroyal (*Mentha pulegium*), perennial pepperweed (*Lepidium latifolium*), fountain grass (*Pennisetum setaceum*), Himalayan blackberry (*Rubus armeniacus*), tamarisk or saltcedar (*Tamarix* spp.), and gorse (*Ulex europaea*) (CDFW 2015). Invasive plant species that are identified as problematic for the Great Valley Ecoregion Section in aquatic habitats include Brazilian waterweed (*Egeria densa*), water hyacinth (*Eichhornia crassipes*), hydrilla (*Hydrilla verticillata*), parrot feather (*Myriophyllum aquaticum*), and Eurasian watermilfoil (*Myriophyllum spicatum*). Additional invasive plant species that occur in the GAI include Sahara mustard (*Brassica tournefortii*), red brome (*Bromus madritensis* ssp. *rubens*), and cheatgrass (*Bromus tectorum*) (Cal-IPC 2019; California Native Plant Society 2012, 2013). Giant reed and tamarisk are particularly problematic in riparian areas because they compete with native plants for water and also increase soil salinity (McWilliams 2004; Zouhar 2003).

Nonnative animals that are/may be present in the GAI and that can negatively affect aquatic species include striped bass (*Morone saxatilis*), white catfish (*Ameiurus catus*), channel catfish (*Ictalurus punctatus*), American shad (*Alosa sapidissima*), black crappie (*Pomoxis nigromaculatus*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), nutria (*Myocastor coypus*), barred tiger salamander (*Ambystoma mavortium*), bullfrogs (*Lithobates catesbiana*), red-eared sliders (*Trachemys scripta elegans*), New Zealand mudsnails (*Potamopyrgus antipodarum*), quagga mussels (*Dreissena bugensis*), Asian clam (*Corbicula fluminea*), zebra mussels (*Dreissena polymorpha*), Chinese mitten crab (*Eriocheir sinensis*), mysid shrimp (*Mysida* spp.), and western mosquitofish (*Gambusia affinis*) (CDFW 2015). Nonnative animals that are/may be present in the GAI and that can negatively affect terrestrial wildlife through competition, predation, or parasitism include wild burros (*Equus asinus*), red fox (*Vulpes vulpes*), European starlings (*Sturnus vulgaris*), wild turkeys (*Meleagris gallopavo*), and brownheaded cowbirds (*Molothrus ater*). Invasive animal species that are/may be associated with urban areas include domestic dogs (*Canis lupus familiaris*), domestic cats (*Felis catus*), Argentine ants (*Linepithema humile*), and fire ants (*Solenopsis* sp.).

2.7 Special-status Species

Special-status species known to occur or with the potential to occur in the GAI were excerpted from the SAMNA Reporting Tool's species-attributed vegetation data layer, which was developed using the CWHR (CDFW 2019a), the Jepson Herbarium's floristic province layer, CDFW's RareFind 5 database (CDFW 2019b), and other information (Caltrans 2019b). Special-status species include those that are considered federally and/or state threatened or endangered species, state candidate threatened or endangered species, state fully protected species, state species of concern, state rare species, and federal sensitive species (which includes species that are USFS sensitive and/or BLM sensitive). The species-attributed list developed for the SAMNA Reporting Tool depends on a species having a defined geographic range or having occurrences documented in the California Natural Diversity Database (Caltrans 2019b).

The complete SAMNA results by habitat type are provided in Appendix D. Based on a search of the SAMNA Reporting Tool's species-attributed vegetation layer, 88 non-fish special-status species are known to occur or have the potential to occur in the GAI. The numbers of these special-status species by habitat type are shown in Table 2-4. For subspecies that do not have documented home ranges, the SAMNA results are provided at the species level and footnotes are included for those special-status subspecies that do not have potential to occur in the GAI. Special-status fish species are discussed in Section 2.15.4.

Note that although this information is suitable for advance mitigation project scoping, site-specific studies would be required to establish compensatory mitigation credits.

Table 2-4. Number of Potentially Occurring Special-status Species, by Land Cover Type (counts)

Land Cover Type	Cover as Percentage of GAI	Plants	Invertebrates	Amphibians	Reptiles	Birds	Mammals[a]
Tree-dominated Habitats	See below	See below	See below	See below	See below	See below	See below
Desert Riparian	0.01	0	0	0	1	7	7
Eucalyptus	0.01	0	0	1	4	10	8
Valley Foothill Riparian	0.34	0	1	1	6	12	15
Shrub-dominated Habitats	See below	See below	See below	See below	See below	See below	See below
Alkali Desert Scrub	1.10	0	0	1	4	6	12
Coastal Scrub	0.11	5	0	1	6	9	13
Desert Scrub	<0.01	0	0	0	4	7	10
Herbaceous-dominated Habitats	See below	See below	See below	See below	See below	See below	See below
Annual Grassland	16.22	31	3	5	7	18	18
Fresh Emergent Wetland	0.72	0	0	1	4	11	4
Pasture	0.62	0	0	0	1	4	12
Saline Emergent Wetland	0.27	0	0	0	0	5	1
Aquatic Habitats	See below	See below	See below	See below	See below	See below	See below
Lacustrine	0.39	0	0	2	1	9	2
Riverine	0.42	0	0	3	1	6	8

Land Cover Type	Cover as Percentage of GAI	Plants	Invertebrates	Amphibians	Reptiles	Birds	Mammals[a]
Developed Habitats	See below	See below	See below	See below	See below	See below	See below
Deciduous Orchard	13.54	0	0	1	0	4	7
Irrigated Row and Field Crops	36.72	0	0	1	1	7	9
Urban	5.37	0	0	0	1	9	8
Non-vegetated Habitats	See below	See below	See below	See below	See below	See below	See below
Barren	1.28	0	0	0	2	11	13

Source: Caltrans 2019b
[a] Two sensitive subspecies of kangaroo rat, the Fresno kangaroo rat and Tipton kangaroo rat, were counted as one species.

2.8 Critical Habitat

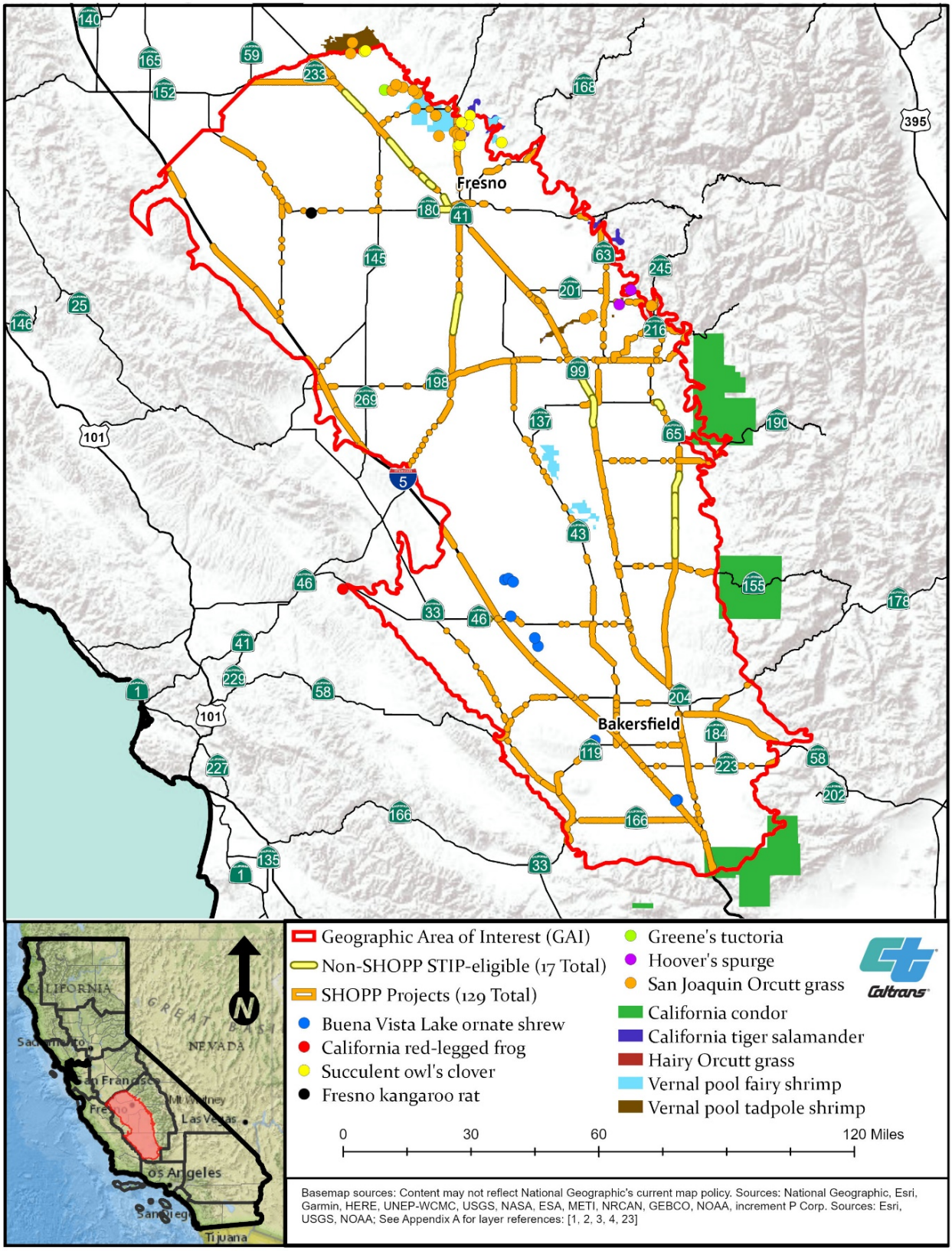
The Endangered Species Act of 1973 (16 USC § 1531–1544) defines critical habitat for a threatened or endangered species under Section 1532(5)(A) as (i) "the specific areas within the geographical area occupied by the species at the time it is listed … on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection;" and (ii) "specific areas outside the geographical area occupied by the species at the time it is listed … upon a determination by the Secretary that such areas are essential for the conservation of the species." Further, the Act clarifies that critical habitat "shall not include the entire geographical area which can be occupied by the threatened or endangered species." Critical habitat designations reflect a rigorous process. Before publishing the rule finalizing the critical habitat designation, FWS publishes proposals to designate critical habitat in the *Federal Register* and considers information received during the public comment period (FWS 2017a).

The GAI includes federally designated final critical habitat for seven vernal pool species and five other species (FWS 2019):

- Buena Vista Lake ornate shrew (*Sorex ornatus relictus*)
- California condor (*Gymnogyps californianus*)
- California red-legged frog (*Rana draytonii*)
- California tiger salamander
- Fresno kangaroo rat
- Greene's tuctoria (*Tuctoria greenei*)
- hairy Orcutt grass (*Orcuttia pilosa*)
- Hoover's spurge (*Euphorbia hooveri*)
- San Joaquin Orcutt grass (*Orcuttia inaequalis*)
- succulent owl's clover (*Castilleja campestris* ssp. *succulenta*)
- vernal pool fairy shrimp (*Branchinecta lynchi*)
- vernal pool tadpole shrimp (*Lepidurus packardi*)

Critical habitat for these species is indicated on Figure 2-7. Note that critical habitat represented by points on Figure 2-7 are critical habitat units too small to depict at the regional level assessed through this RAMNA. Several of the planned SHOPP or STIP-eligible transportation projects occur within or adjacent to areas with designated final critical habitat for California condor, vernal pool fairy shrimp, vernal pool tadpole shrimp, San Joaquin Orcutt grass, succulent owl's clover, Hoover's spurge, Buena Vista Lake ornate shrew, and Fresno kangaroo rat (Figure 2-7).

Figure 2-7. Critical Habitat



2.9 Wildlife Movement

Roads can be barriers to special-status wildlife species movement. Improving connectivity and permeability of the State Highway System may provide a mechanism for maintaining biodiversity in the face of California's human population growth and climate change (CDFW 2020a).

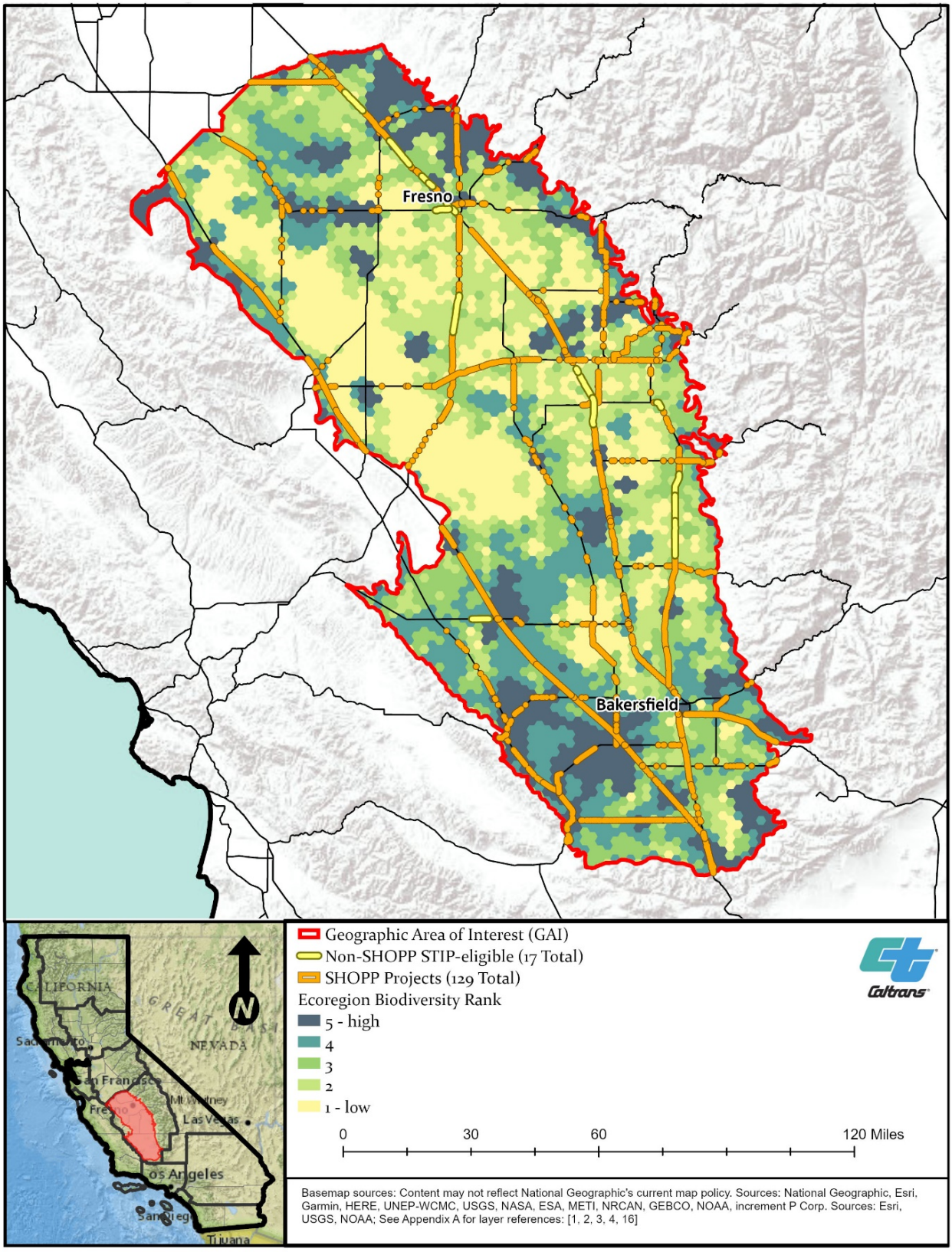
The California Essential Habitat Connectivity ("CEHC") Project, a statewide assessment commissioned by CDFW and Caltrans, identified large remaining blocks of intact habitat or natural landscape that support native biodiversity and modeled linkages or essential connectivity areas between them that need to be maintained, particularly as corridors for wildlife (CDFW 2018c; Spencer et al. 2010). These connectivity areas were broadly defined, focusing on ecological integrity rather than species-specific habitat needs, and also included potential riparian connections between landscape blocks. For instance, connectivity areas were selected to connect existing reserves across land that has been highly altered and fragmented by agriculture, urbanization, and roads, which typically constrain wildlife movement (Spencer et al. 2010).

CDFW's ACE version 3 terrestrial connectivity dataset builds on the CEHC Project and includes mapped corridors or linkages and where they occur in relation to large, contiguous natural areas (Figure 2-8). It also incorporates species-specific, fine-scale linkage information developed at a regional scale, where available, and includes areas that were not evaluated by the CEHC Project. Connectivity ranks in the terrestrial connectivity dataset were assigned as follows:

- Rank 5 (irreplaceable and essential corridors) – includes channelized areas and priority species movement corridors
- Rank 4 (conservation planning linkages) – habitat connectivity linkages mapped in the CEHC and fine-scale regional connectivity studies that are based on species-specific models and represent the best connections between core natural areas
- Rank 3 (connections with implementation flexibility) – areas with connectivity importance, including core habitat areas and areas on the periphery of mapped habitat linkages
- Rank 2 (large natural habitat areas) – large blocks of natural habitat (greater than 2,000 acres) with relatively intact connectivity
- Rank 1 (limited connectivity opportunity) – areas where land use limits connectivity, including some lakes

The GAI includes very limited areas with Rank 2, primarily in the southern half of the GAI. Areas with Rank 4 or Rank 5 provide some east-to-west movement and north-to-south movement in the northern and southern parts of the GAI, with more limited connectivity in the central part of the GAI. Most of the planned SHOPP or STIP-eligible transportation projects occur in areas with a connectivity rank of 1, followed by areas with a connectivity rank of 3 or 4. A few planned transportation projects occur in areas with a connectivity rank of 5 (Figure 2-8).

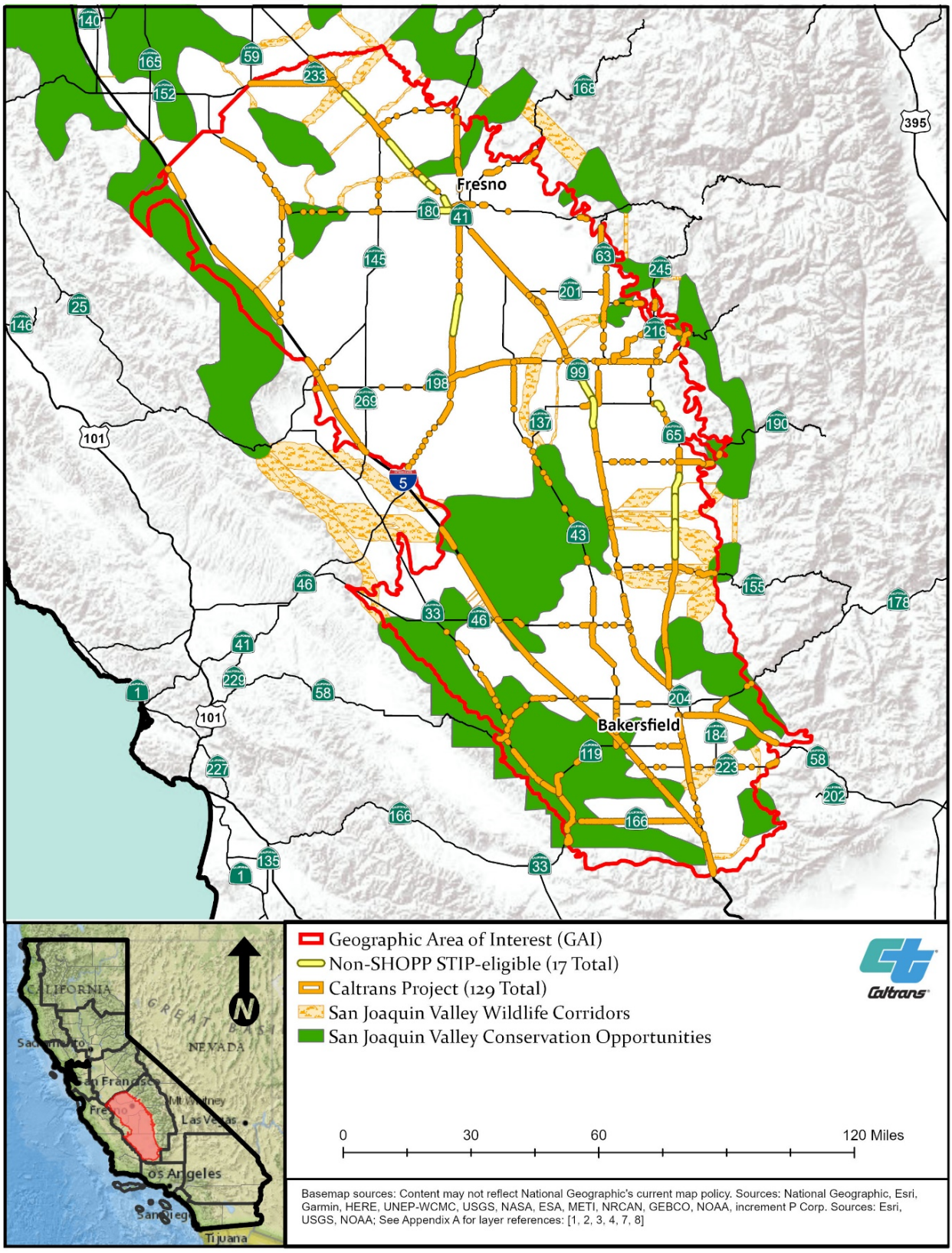
Figure 2-8. Terrestrial Connectivity



CDFW (2020a) identified priority wildlife movement barriers created by linear infrastructure across the state to focus financial resources to improve wildlife movement. In addition to impeding wildlife movement, these barriers act as sources of mortality and affect population demographics, gene flow, resilience, and persistence of California's wildlife. Barriers were identified using existing connectivity and road crossing studies, collared-animal movement data, roadkill observations, and professional expertise. Three priority wildlife movement barriers were identified in the GAI. These barriers and the target species for movement include: High Speed Rail Alpaugh (kit fox, blunt-nosed leopard lizard, Tipton kangaroo rat, and San Joaquin antelope squirrel), Hwy 5 Grapevine (mountain lion, mule deer, black bear, and kit fox), and Concrete Canal Los Banos (mule deer, elk, and badger) (CDFW 2020a).

In addition, CDFW, Caltrans, and the California Department of Parks and Recreation identified datasets with existing information on wildlife corridors in the San Joaquin Valley, including datasets from the Endangered Species Recovery Program and the Information Center for the Environment (CNRA 2015). The potential corridors that were identified connect conservation opportunity areas (Figure 2-9). Similar to the CEHC Project, wildlife corridors are primarily identified along riparian areas, and conservation opportunity areas are primarily identified in the southern half of the GAI, with additional areas along the GAI boundary and in the north.

Figure 2-9. San Joaquin Valley Wildlife Corridors and Conservation Opportunities



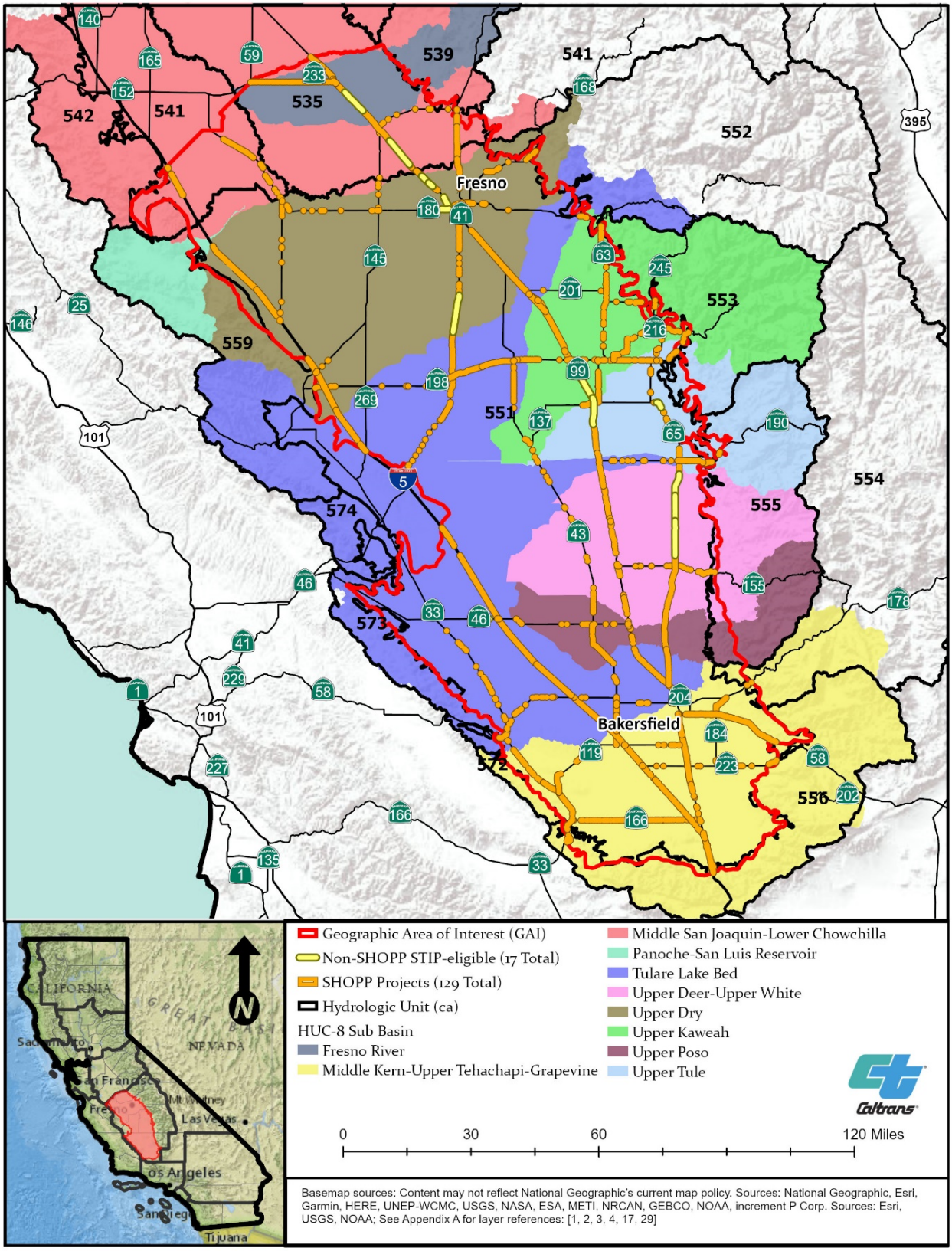
2.10 Sub-basins

The Watershed Boundary Dataset maps the areal extent of surface water drainage in the U.S. It consists of a hierarchical system of nesting hydrologic units at various scales, each with an assigned HUC that is georeferenced to USGS topographic maps. Eight-digit hydrologic unit codes ("HUC-8") map the sub-basin level (USGS 2014).

The SAMNA Reporting Tool expresses the landscape in terms of USGS HUC-8 sub-basins (Caltrans 2017a; USGS 2014). However, the California Department of Water Resources, and both the, State Water Board and the RWQCBs (collectively "Water Boards") do not exclusively use HUC-8 codes (California Department of Water Resources 2016). For example, the Water Boards use hydrologic units ("HUs") for state-level water-related purposes, such as identifying beneficial uses.

Appendix E provides a crosswalk between the HUC-8 and HU classification systems for the GAI. The GAI consists of the Middle Kern-Upper Tehachapi-Grapevine, Upper Poso, Upper Deer-Upper White, Upper Tule, Upper Kaweah, Upper Dry, Tulare Lake Bed, Middle San Joaquin-Lower Chowchilla, Fresno River, and Panoche-San Luis Reservoir sub-basins, which loosely correspond to the Ahwahnee, Coast Range, Delta-Mendota Canal, Fellows, Grapevine, Kaweah River, Kern River, Kings River, Middle West Side, San Joaquin River, San Joaquin Valley Floor, Southern Sierra, South Valley Floor, Sunflower Valley, and Temblor HUs (Appendix E). Figure 2-10 also shows the overlap between sub-basins and state-level HUs in the GAI. HUC-8s and HUs do not always coincide with topographic watersheds—they only do so when their boundaries include all of the source area contributing surface water to a single defined outlet point.

Figure 2-10. HUC-8 Sub-basins and HUs



2.11 Hydrology

The sub-basins of the GAI drain an area of approximately 11,056,281 acres (17,275 square miles) (Table 2-5). These sub-basins in the GAI include 55,314 rivers and streams that traverse 26,024 miles in the Central Valley RWQCB boundary (Table 2-5, Figure 2-10).

Table 2-5. Sub-basins in the Central Valley RWQCB Boundary within the GAI

Sub-basin Name	Sub-basin Code (HUC-8)	Drainage Area (acres)[a]	Rivers and Streams (count) [b]	Total Reach Length (miles)[a]
Fresno River	18040007	414,638	7,933	1,792
Middle Kern-Upper Tehachapi-Grapevine	18030003	1,675,078	8,057	5,190
Middle San Joaquin-Lower Chowchilla	18040001	2,256,113	23,497	7,958
Panoche-San Luis Reservoir	18040014	195,928	1,110	839
Tulare Lake Bed	18030012	2,423,676	5,298	3,918
Upper Deer-Upper White	18030005	782,940	2,049	1,448
Upper Dry	18030009	1,360,692	1,629	1,200
Upper Kaweah	18030007	974,567	2,828	1,747
Upper Poso	18030004	368,109	1,452	914
Upper Tule	18030006	604,540	1,461	1,018
	Total	**11,056,281**	**55,314**	**26,024**

Source: California Department of Water Resources
[a] Numbers were rounded to the nearest whole number.
[b] These numbers were estimated based on USGS hydrology stream layer].

Major rivers within the Great Valley Ecoregion Section include the Kings, Kaweah, Kern, and Tule Rivers in the Tulare Basin, and the San Joaquin, Chowchilla, and Fresno Rivers in the southern portion of the San Joaquin Basin (Central Valley RWQCB 2018a, 2018b). Flows from these rivers originate as snowmelt along the western face of the southern Sierra Nevada and are largely managed by dams. Portions of the flows are diverted for agricultural use (USGS 2017a, 2017b). Surface water from the rivers in the Tulare Basin and lesser streams generally flows from the Sierra foothills west across the Central Valley into the alluvial fans on the valley floor and the Tulare Basin's terminal lakes, which receive floodwater from the major rivers when heavy runoff occurs. Flood flows in the Kings River reach the San Joaquin River as surface outflow from the Fresno Slough, representing the only significant outflows from the Tulare Basin (USGS 2017b). Surface water from the rivers in the southern San Joaquin Basin flow west from the western slopes of the Sierra foothills and east from the eastern slopes of the coast range into alluvial fans

on the valley floor and then north to the Sacramento-San Joaquin Delta (Central Valley RWQCB 2018a, 2018b; USGS 2017a).

2.12 Flood Hazard Areas

Flood hazard areas (Figure 2-11) correspond to Special Flood Hazard Areas as designated by the Federal Emergency Management Agency. A Special Flood Hazard Area is defined as the area of land that is covered by the floodwaters of a 100-year base flood (Federal Emergency Management Agency 2019). According to Executive Order 11988, all federally approved projects that encroach into a 100-year base floodplain must make an effort to:

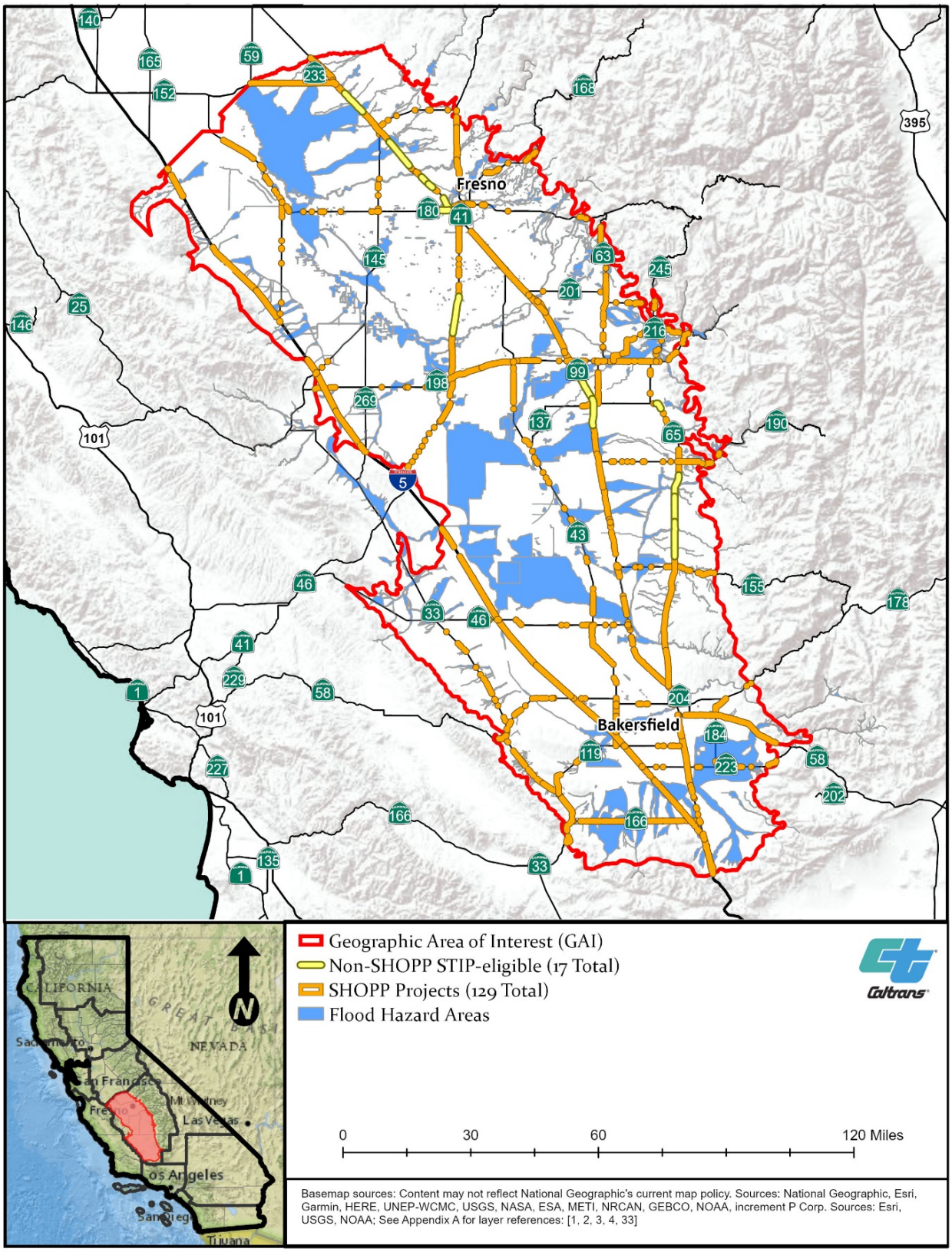
- Avoid support of incompatible floodplain development,
- Minimize the impact of highway actions that adversely affect the base floodplain,
- Restore and preserve natural and beneficial floodplain values, and
- Be consistent with the standards/criteria of the National Flood Insurance Program of the Federal Emergency Management Agency (Caltrans 2015).

As indicated on Figure 2-11, many of the planned SHOPP and STIP-eligible transportation projects cross flood hazard areas.

2.13 Water Quality

Water quality objectives and beneficial uses for surface waters and groundwater in the GAI are provided in the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Central Valley RWQCB 2018a) and the *Water Quality Control Plan for the Tulare Lake Basin* (Central Valley RWQCB 2018b). Water quality objectives identified in the basin plans can be numerical or narrative. For example, the “chemical constituents” water quality objective for the protection of aquatic life and human health consists of federal water quality criteria for toxic “priority pollutants” under the California Toxics Rule (40 CFR § 131.38) and National Toxics Rule (40 CFR § 131.36). In contrast, the water quality objective for turbidity is narrative and prohibits changes to turbidity that cause a nuisance or have an adverse effect on beneficial uses, which are also identified in the basin plans.

Figure 2-11. Flood Hazard Areas



Surface water and groundwater beneficial uses are also identified in the basin plans (Central Valley RWQCB 2018a, 2018b). If it cannot be avoided, a waterbody's beneficial uses may be affected by the construction, operation, and maintenance of highways and bridges. Impacts on wildlife and aquatic resources can be adverse or beneficial. An example of an adverse impact would be the introduction of a variety of pollutants, including sediments, heavy metals, hydrocarbons, and toxic substances (EPA 2005). An example of a beneficial impact would be repairs or retrofit that improve permeability or flows. Provided in Table 2-6, this RAMNA considers beneficial uses identified for waterbodies located in the GAI relevant to the RAMNA when they support the preservation and enhancement of wildlife habitat and aquatic resources and are consistent with the AMP's objective to protect natural resources through transportation project mitigation.

Table 2-6. Beneficial Uses in the GAI

Beneficial Use	Sacramento and San Joaquin River Basin Plan	Tulare Lake Basin Plan	Relevant to RAMNA?[a]
Agricultural supply	Applicable	Applicable	No
Cold freshwater habitat	Applicable	Applicable	Yes
Freshwater replenishment	Not applicable	Applicable	Yes
Groundwater recharge	Not applicable	Applicable	Yes
Hydropower generation	Applicable	Applicable	No
Industrial process supply	Applicable	Applicable	No
Industrial service supply	Applicable	Applicable	No
Migration of aquatic organisms	Applicable	Not applicable	Yes
Municipal and domestic supply	Applicable	Applicable	No
Navigation	Applicable	Not applicable	No
Non-contact water recreation	Applicable	Applicable	No
Preservation of rare, threatened, or endangered species	Not applicable	Applicable	Yes
Spawning, reproduction, and/or early development	Applicable	Applicable	Yes
Warm freshwater habitat	Applicable	Applicable	Yes
Water contact recreation	Applicable	Applicable	No
Wildlife habitat	Applicable	Applicable	Yes

Sources: Central Valley RWQCB 2018a, 2018b
[a] Beneficial uses are relevant to the RAMNA when they support the preservation and enhancement of wildlife habitat and aquatic resources and are consistent with the AMP's objective to protect natural resources through transportation project mitigation.

Through habitat and other improvements, advance mitigation projects have the potential to contribute to compliance with the State Water Board CWA Section 303(d) List of Total Maximum Daily Load ("TMDL") Priority Schedule. For example, fish passage projects in impaired watersheds that increase road/stream crossing capacity, improve the alignment of the crossing, or that implement weirs, baffles, or other grade/velocity control devices at undersized road/stream crossings will improve sediment transport and reduce scour, thereby improving water quality. Similarly, culvert replacement projects that increase flow and capacity would also reduce scour and improve sediment transport, resulting in improved channel function and flow and improved water quality.

Twenty-eight waterbodies in the GAI are included on the Section 303(d) list of impaired waters (State Water Board 2018). This RAMNA considers a waterbody's CWA Section 303(d) impairment designation as relevant to the RAMNA when it is indicative of a waterbody's loss of an aquatic resource-related beneficial use. These waterbodies, their impairments, and whether TMDLs have been established are indicated in Table 2-7. A RWQCB may need to consult with CDFW or other resource agencies to determine whether a beneficial use may be affected by a water quality-related decision.

2.14 Wild and Scenic Rivers

The purpose of the Wild and Scenic Rivers Act of 1968 (16 USC Chapter 28) is to protect and enhance the wild, scenic, and recreational values of designated rivers (National Wild and Scenic Rivers System 2019). Rivers designated under the Wild and Scenic Rivers Act are classified as wild, scenic, or recreational. Wild river areas include rivers or sections of rivers that are free of impoundments, inaccessible except by trail, and have unpolluted waters. Scenic river areas include rivers or sections of rivers that are free of impoundments, have relatively undeveloped shorelines, and are accessible in some places by roads. Recreational river areas include rivers or sections of rivers that are readily accessible by road or railroad, have some development along shorelines, and may have impoundments or diversions.

No rivers in the GAI are designated as wild and scenic rivers under the Wild and Scenic Rivers Act (National Wild and Scenic Rivers System 2019).

Table 2-7. Impaired Waters in the GAI

Sub-basin	Impaired Water	Impairment(s)	TMDL Status	Relevant to RAMNA?[a]
Tulare Lake Bed	Bates Slough (from Avenue 200 to Deep Creek, Tulare County)	Toxicity[b]	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Berenda Creek (Madera County)	Pesticides	Impairment being addressed by other action	Yes
Middle San Joaquin-Lower Chowchilla	Berenda Creek (Madera County)	Toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Berenda Slough (Madera County)	Nutrients, toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Berenda Slough (Madera County)	Pesticides	Impairment being addressed by other action	Yes
Middle San Joaquin-Lower Chowchilla	Cottonwood Creek (South Madera County)	Fecal indicator bacteria	Required, not established yet	No
Middle San Joaquin-Lower Chowchilla	Cottonwood Creek (South Madera County)	Diuron (pesticide)	Impairment being addressed by other action	Yes
Tulare Lake Bed	Cross Creek (Kings and Tulare Counties)	Toxicity	Required, not established yet	Yes
Upper Deer-Upper White	Deer Creek (Tulare County)	Toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Dry Creek (Madera County)	Toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Dry Creek (Madera County)	Pesticides	Impairment being addressed by other action	Yes
Tulare Lake Bed	Elbow Creek (from Mathews Ditch to Cottonwood Creek, Tulare County)	Chlorpyrifos	Required, not established yet	Yes
Elk Bayou	Elk Bayou (Tulare County)	Chlorpyrifos, dissolved oxygen, pH, toxicity	Required, not established yet	Yes

Sub-basin	Impaired Water	Impairment(s)	TMDL Status	Relevant to RAMNA?[a]
Tulare Lake Bed	Fresno Slough (from Graham Road to James Bypass, Fresno County)	Pesticides, toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Grasslands Marshes	Metals/ metalloids	Being addressed by EPA-approved TMDL	Yes
Middle San Joaquin-Lower Chowchilla	Grasslands Marshes	Salinity	Required, not established yet	Yes
Tulare Lake Bed	James Bypass (Fresno County)	Toxicity	Required, not established yet	Yes
Upper Kaweah	Kaweah Lake	Mercury	Required, not established yet	Yes
Tulare Lake Bed	Kaweah River (below Terminus Dam, Tulare County)	pH, toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Little Panoche Creek	Toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Lone Willow Slough (Madera County)	Toxicity	Required, not established yet	Yes
Tulare Lake Bed	Los Gatos Creek (Fresno County)	Lead, selenium	Required, not established yet	Yes
Tulare Lake Bed	Lower Kaweah River (includes St. Johns River)	Toxicity	Required, not established yet	Yes
Tulare Lake Bed	Lower Kings River (Island Weir to Stinson and Empire Weirs)	Molybdenum, salinity (electrical conductivity), toxicity	Required, not established yet	Yes
Tulare Lake Bed	Lower Kings River (Pine Flat Reservoir to Island Weir)	Alkalinity (as calcium carbonate), toxicity	Required, not established yet	Yes
Tulare Lake Bed	Lower Tule River	Toxicity	Required, not established yet	Yes
Tulare Lake Bed	Main Drain (Kern County)	Diuron	Impairment being addressed by other action	Yes

Sub-basin	Impaired Water	Impairment(s)	TMDL Status	Relevant to RAMNA?[a]
Tulare Lake Bed	Main Drain (Kern County)	Boron, dissolved oxygen, toxicity	Required, not established yet	Yes
Tulare Lake Bed	Mendota Pool	Selenium, mercury	Required, not established yet	Yes
Upper Kaweah	Mill Creek (Fresno County)	Toxicity	Required, not established yet	Yes
Tulare Lake Bed	Mill Creek (Tulare County)	Ammonia (unionized), toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	O'Neill Forebay	Mercury, polychlorinated biphenyls	Required, not established yet	Yes
Tulare Lake Bed	Outside Creek (Tulare County)	Toxicity	Required, not established yet	Yes
Tulare Lake Bed	Packwood Creek (Tulare County)	Toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Panoche Creek (Silver Creek to Belmont Avenue)	Mercury, sedimentation/ siltation, selenium, toxicity	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	Poso Slough	Toxicity	Required, not established yet	
Panoche-San Luis Reservoir	San Carlos Creek (downstream of New Idria Mine)	Mercury	Required, not established yet	Yes
Middle San Joaquin-Lower Chowchilla	San Joaquin River (Mendota Pool to Bear Creek)	Chlorpyrifos, diazinon	Being addressed by EPA-approved TMDL	Yes
Middle San Joaquin-Lower Chowchilla	San Joaquin River (Mendota Pool to Bear Creek)	Boron, DDT, Group A pesticides, toxaphene	Required, not established yet	Yes
Tulare Lake Bed	Success Lake	pH	Required, not established yet	Yes

Sources: Central Valley RWQCB 2018a, 2018b; State Water Board 2018
[a] TMDLs relevant to the RAMNA reflect impaired aquatic resource-related beneficial uses.
[b] Refers to toxicity to aquatic organisms

2.15 Aquatic Resources

A high-level view of major aquatic resources in the GAI is provided on Figure 2-12, and detailed maps of aquatic resources are provided in Appendix F. Generally speaking, aquatic resources in the GAI include wetlands, non-wetland waters, and riparian habitats that may be subject to Corps, EPA, RWQCB, and/or CDFW regulations, as well as special-status fish managed by CDFW, NMFS, or FWS. Groundwater is not addressed by this assessment. Corps and EPA jurisdiction includes any activity that may cause a discharge of dredged or fill material into waters of the U.S. ("WOTUS"), including wetlands. RWQCB jurisdiction includes any activity that may cause a discharge of waste to waters of the state, including wetlands. CDFW regulates any activity that may divert or obstruct the natural flow of a river, stream, or lake; change the bed, channel, or bank of any river, stream, or lake; use material from any river, stream, or lake; and deposit or dispose of material into any river, stream, or lake. Rivers, streams, and lakes include ephemeral, intermittent, and perennial watercourses. Effects on aquatic resources that extend to the outer limits of the riparian dripline, the outer limits of the floodplain of the aquatic resource, the top-of-bank on streams/rivers, or normal pool elevation on lakes may be regulated by CDFW. CDFW, NMFS, and FWS manage special-status fish species and regulate activities that may affect these species.

2.15.1. Historic

Historically, natural wetlands occupied more than 4 million acres in the Central Valley, with the majority consisting of freshwater emergent wetlands and seasonal wetlands created from overbank flooding of rivers and streams during the winter and spring (CNRA 2010; Frayer et al. 1989). Over the past century, there has been a marked decrease in the size and magnitude of natural wetlands, with over 95 percent of wetlands lost or modified because of urban expansion and agricultural conversion (Caltrans 2018a; CNRA 2010; Frayer et al. 1989). The building of dams, levees, and flood bypasses has affected historic flows and limited overbank flooding in the region (CNRA 2010; Frayer et al. 1989).

2.15.2. Wetlands

Wetland resources information for the GAI was excerpted from the SAMNA Reporting Tool, which relies on the FWS National Wetlands Inventory maps (FWS 2017b) and data from the San Francisco Estuary Institute (2018) California Aquatic Resource Inventory (Table 2-8; Appendix F; Caltrans 2017c). These data were used to estimate the extent of wetlands in the GAI; however, the data layers are largely based on aerial imagery, have not been ground-truthed, and provide no information on plant species associated with mapped areas. Although suitable for advance mitigation project scoping, site-specific wetland studies would be required for advance mitigation projects to establish compensatory mitigation credits.

Aquatic resource types outlined here follow the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). The SAMNA Reporting Tool wetlands data layer is separate from the land cover types discussed previously in

Section 2.5; therefore, total acreages of wetland land cover types presented in Table 2-3 may not align with those presented in Table 2-8 (Caltrans 2017c). All acreages in Table 2-8 are rounded to the nearest hundredth.

Vernal Pools. Vernal pools greater than 1 acre are mapped in Figure 2-13. While such pools are an important wetland resource in the Great Valley Ecoregion Section, the SAMNA Reporting Tool's wetland layer does not include vernal pools. In this case, vernal pool habitats can be inferred by proxy using species information. For example, critical habitat for seven vernal pool species is shown in Figure 2-7. Further, the SAMNA Reporting Tool's species-attributed vegetation data layer described in Section 2.7 includes habitat for vernal pool species (Appendix D) that would be indicative of vernal pools. Vernal pools mapped using the VegCAMP dataset [ds-2632] selected for the following: AGP – Alkaline grassland-playa/pool matrix, SVP – Sparsely vegetated playa/pool (these are individual pools), VPB – Freshwater vernal pools/swales, and VPG – vernal pool/grassland matrix are shown on the left side of Figure 2-13, and vernal pools mapped with the SAMNA Reporting Tool using the California Natural Diversity Database occurrence of vernal pool invertebrate species and a 4-mile buffer are shown on the right side of Figure 2-13.

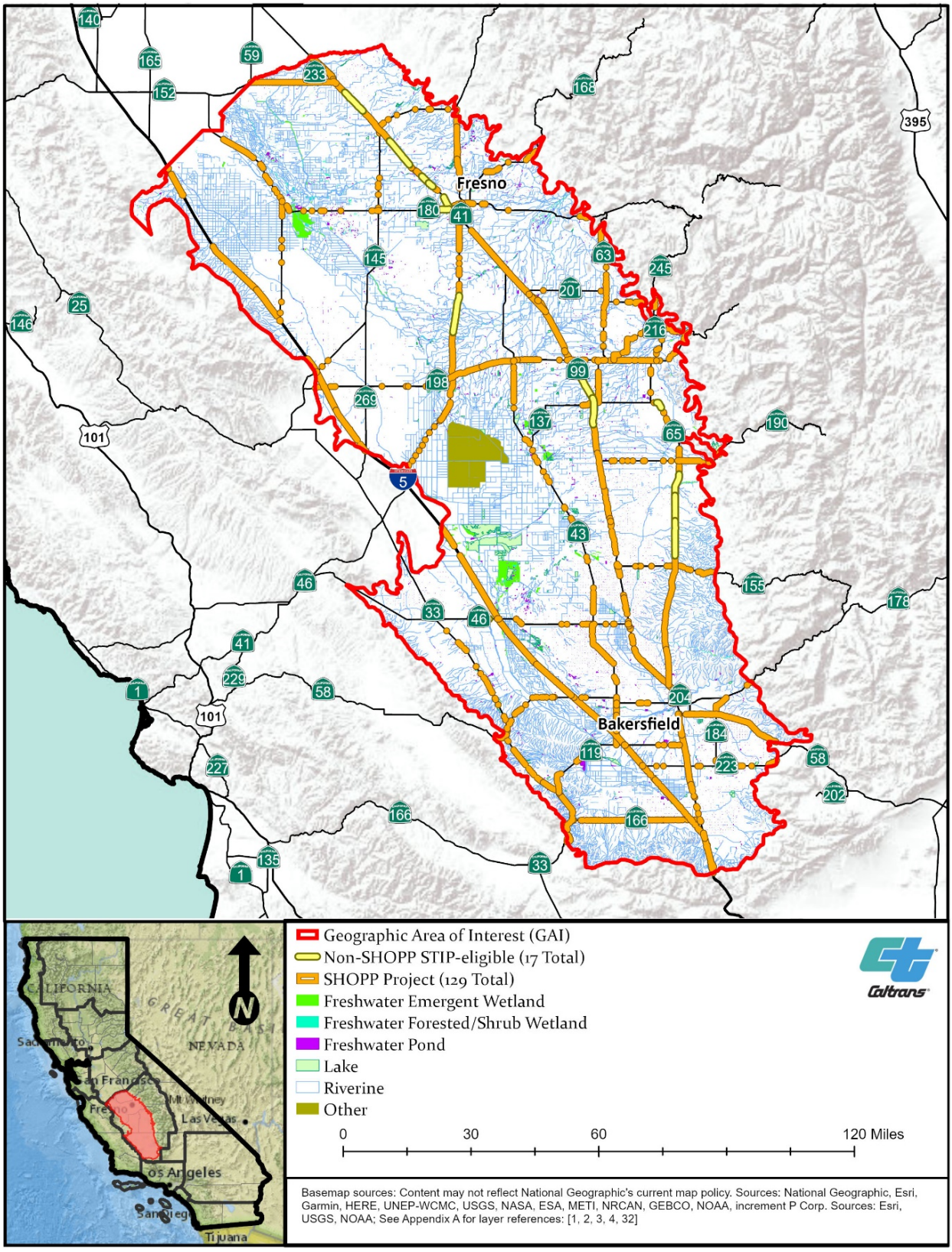
2.15.3. Non-wetland Waters

Other, non-wetland water resources information for the GAI were excerpted from the SAMNA Reporting Tool, which relies on the USGS National Hydrography Dataset (Table 2-9; Appendix F; Caltrans 2017c). Although suitable for advance mitigation scoping, site-specific studies would be required for advance mitigation projects to establish compensatory mitigation credits. Similar to the wetlands data, the waters data layer is separate from the land cover types discussed previously in Section 2.5; therefore, total acreages of water land cover types presented in Table 2-3 may not align with those presented in Table 2-9 (Caltrans 2017d).

2.15.4. Special-status Fish

Special-status fish species known to occur or with the potential to occur in the GAI were excerpted from the SAMNA Reporting Tool's fish habitat layer, which was developed using the USGS National Hydrography Dataset and other information (Caltrans 2017e, 2018b). Based on a search of the fish habitat layer, no special-status fish species are known to occur or have the potential to occur in the GAI (Caltrans 2017e, 2018b). However, according to CDFW (2020a) and NMFS (2016), the federally threatened California Central Valley Distinct Population Segment (DPS) steelhead may occur within the GAI. The GAI does not include federally designated critical habitat for this species.

Figure 2-12. Aquatic Resource Features and Major Stream Systems[a]



[a] For greater detail, see Appendix F.

Figure 2-13. Vernal Pools in the GAI

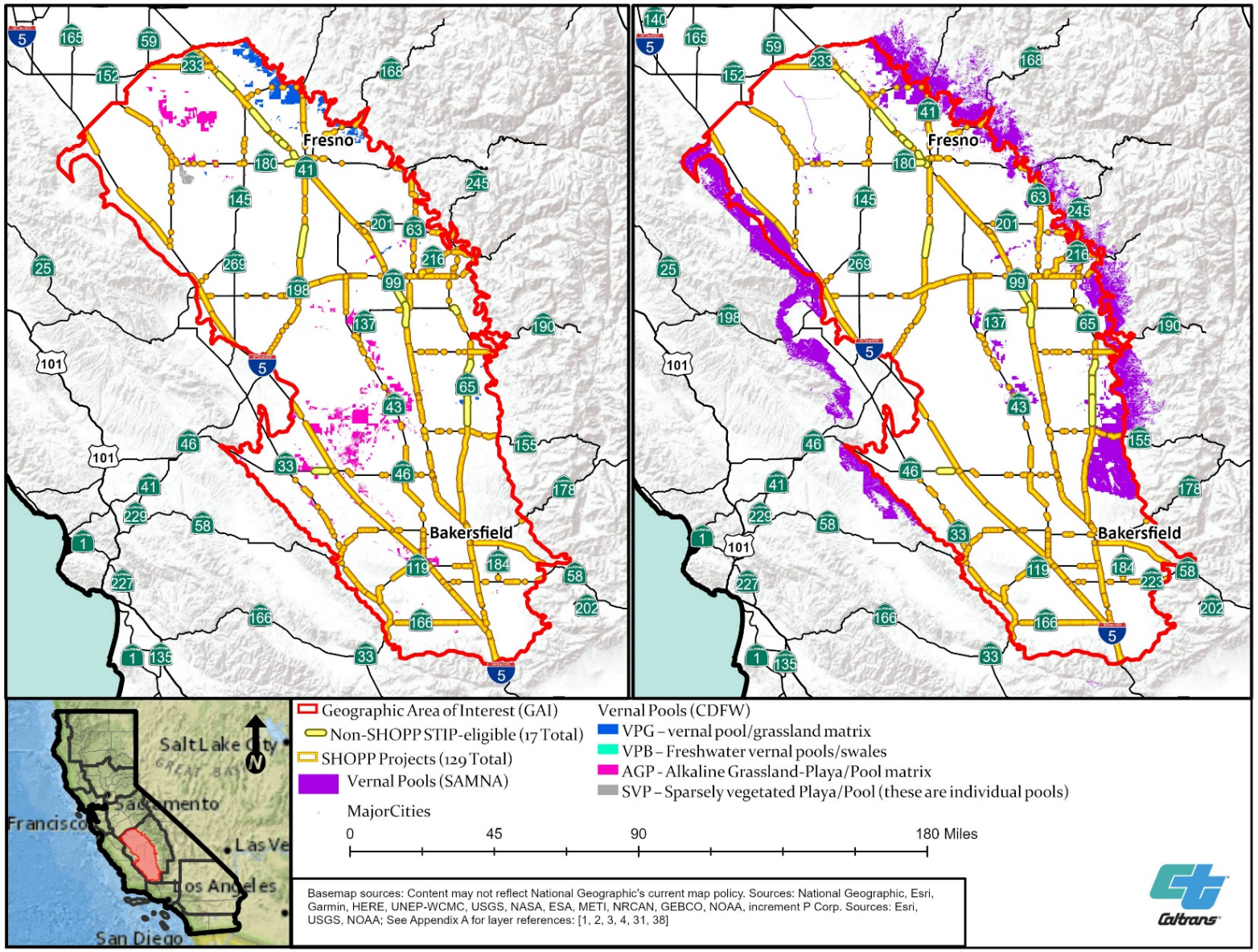


Table 2-8. Wetland Types in the GAI

Type	Middle Kern-Upper Tehachapi-Grapevine (acres) 18030003	Upper Poso (acres) 18030004	Upper Deer-Upper White (acres) 18030005	Upper Tule (acres) 18030006	Upper Kaweah (acres) 18030007	Upper Dry (acres) 18030009	Tulare Lake Bed (acres) 18030012	Middle San Joaquin-Lower Chowchilla (acres) 18040001	Fresno River (acres) 18040007	Panoche-San Luis Reservoir (acres) 08040014	Total (acres)
Depressional Perennial Natural Emergent	Not present	Not present	Not present	Not present	Not present	<0.01	Not present	3.73	<0.01	Not present	**3.73**
Depressional Perennial Unnatural Emergent	Not present	Not present	<0.01	<0.01	Not present	<0.01	Not present	1.11	Not present	Not present	**1.11**
Depressional Perennial Unnatural Non-vegetated	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	3.61	3.97	<0.01	Not present	**7.58**
Depressional Seasonal Natural Emergent	<0.01	<0.01	<0.01	<0.01	<0.01	7.87	<0.01	26.89	412.42	Not present	**447.18**
Depressional Seasonal Natural Forested	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	8.30	Not present	Not present	**8.30**
Depressional Seasonal Natural Shrub-Scrub	<0.01	<0.01	<0.01	<0.01	Not present	<0.01	<0.01	15.01	<0.01	<0.01	**15.01**
Depressional Seasonal Unnatural Non-vegetated	<0.01	<0.01	<0.01	<0.01	Not present	<0.01	0.43	2.35	<0.01	Not present	**2.78**
Freshwater Emergent Wetland	940.38	428.83	6,883.42	2,552.70	2,198.70	11,497.65	14,826.42	2,912.31	1,829.47	8.38	**44,078.26**
Freshwater Forested/ Shrub Wetland	817.79	529.51	286.07	388.03	321.36	2,070.30	2,602.73	3,731.79	363.20	108.85	**11,219.63**
Total	**1,758.17**	**958.34**	**7,169.49**	**2,940.73**	**2,520.06**	**13,575.82**	**17,433.19**	**6,705.46**	**2,605.09**	**117.23**	**55,783.58**

Source: Caltrans 2017c

Table 2-9. Non-wetland Water Types in the GAI

Type	Middle Kern-Upper Tehachapi-Grapevine (acres) 18030003	Upper Poso (acres) 18030004	Upper Deer-Upper White (acres) 18030005	Upper Tule (acres) 18030006	Upper Kaweah (acres) 18030007	Upper Dry (acres) 18030009	Tulare Lake Bed (acres) 18030012	Middle San Joaquin-Lower Chowchilla (acres) 18040001	Fresno River (acres) 18040007	Panoche-San Luis Reservoir (acres) 08040014	Total (acres)
Freshwater Pond	2,665.45	767.50	1,178.74	978.08	1,191.50	2,660.55	4,045.81	1,233.50	261.03	1.81	**14,983.97**
Lake	2,991.87	649.29	4,151.44	3,011.33	2,825.46	2,873.65	26,649.27	683.08	547.58	<0.01	**44,382.97**
Riverine	7,676.99	1,688.87	2,856.81	2,111.96	3,514.46	7,311.14	12,301.01	5,793.90	1,900.10	195.02	**45,350.26**
Other	<0.01	<0.01	<0.01	1.49	3,474.62	<0.01	58,153.73	<0.01	<0.01	<0.01	**58,153.73**
Total	**15,092.48**	**4,064.00**	**15,356.48**	**9,043.59**	**13,526.10**	**26,421.16**	**60,429.28**	**14,415.94**	**5,313.8**	**314.06**	**163,976.89**

Source: Caltrans 2017d

3. RELEVANT PLANS, POLICIES, AND REGULATIONS

This chapter summarizes the references applicable to the GAI that, when relevant, Caltrans will consult when conceptualizing advance mitigation projects. The table is organized by subject: laws and regulations, statewide and regional resource management plans, plans and permits focused on species of mitigation need, resource agency land management plans (separated by agency), water resources plans and documents, county and city general plans, and other organization conservation and management documents. HCPs, NCCPs, and regional conservation investment strategy ("RCIS") documents are discussed separately in Chapter 4 because they represent or support potential current compensatory mitigation opportunities for Caltrans.

Table 3-1 provides the following information for each reference identified:

- Reference document title
- Status:
  - Final: The reference is completed.
  - Draft: The reference is not complete, and changes may occur when it is finalized.
  - In progress: A formal draft version has not been completed, and the document is being written.
  - In litigation: The reference is subject to at least one lawsuit and is not being revised.
  - Updated periodically: The reference is updated with new information on a somewhat frequent basis.
  - Not publicly available: The reference is known to exist but does not appear to be publicly available.
- Spatial data – whether a map is provided with the document
- Reference purpose – a summary of information relevant to advance mitigation planning and/or a summary of reference intent
- Link – where the reference can be found
- Date – when the reference was published or last updated

The list in Table 3-1 is not exhaustive. Additional relevant resources may be consulted by Caltrans as advance mitigation planning progresses, advance mitigation project scopes are conceptualized, and advance mitigation projects are implemented.

3.1 Relationship to Goals and Objectives

As pointed out in Chapter 1, the GAI for this RAMNA was selected by Caltrans District 6 based on the SAMNA results and other information. District 6 specifically identified compensatory mitigation for the California tiger salamander, San Joaquin kit fox, giant kangaroo rat, Tipton kangaroo rat, Fresno kangaroo rat, and aquatic resources as a historical and anticipated mitigation need. Hence, Table 3-1 emphasizes documents

related to the specified wildlife and aquatic resources, which, in turn, form the basis for the goals and objectives presented in Chapters 7 and 8. It is expected that any mitigation-related measures to support these specific natural resources in this GAI would benefit other natural resources as well.

Table 3-1. Comprehensive Plans, Agreements, Resource Management Plans, Policies, and Regulations Relevant to the GAI

Title	Status	Spatial Data	Reference Purpose	Link	Date
State Laws, Guidelines, and Regulations	See below	See below	See below	See below	See below
CESA	Updated periodically (by California legislature)	No	Authorizes CDFW to protect State of California listed threatened and endangered species.	https://www.wildlife.ca.gov/Conservation/CESA	9/10/2018 (last amended)
Porter-Cologne Water Quality Control Act	Updated periodically (by California legislature)	No	Law that governs water quality in California, establishing the nine RWQCBs and their jurisdiction to protect California's surface water and groundwater through water quality objectives and the beneficial uses of water as outlined in a project's waste discharge requirements.	https://www.waterboards.ca.gov/laws_regulations/docs/portercologne.pdf	1/1/2019 (last amended)
California Water Boards 2010 Update to Strategic Plan 2008–2012	Final	No	Update to strategic plan from the State Water Board and RWQCB. Goals include implementing strategies to fully support beneficial uses for all water bodies listed in the 2006 report, improve and protect groundwater quality, increase sustainable local water supplies available for meeting beneficial uses by 1,725,000 acre-feet per year, comprehensively address water quality protection and restoration, improve transparency and accountability within the Water Boards, enhance consistency across the Water Boards, and ensure that the Water Boards have access to information and expertise.	https://www.waterboards.ca.gov/water_issues/hot_topics/strategic_plan/docs/2010/final_strategic_plan_update_report_062310.pdf	6/1/2010
FGC § 1602	Updated periodically (by California legislature)	No	Implemented by CDFW. Regulates activities that may substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or 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. Effects on aquatic resources that occur below the outer limits of riparian vegetation, the top-of-bank on streams/rivers, or normal pool elevation of lakes, whichever is greater, require a 1602 permit from CDFW.	https://www.wildlife.ca.gov/conservation/lsa	6/27/2017 (last amended)
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	Final	No	Implemented by the State Water Board. Creates a State of California wetland definition, a framework for determining jurisdiction of state wetlands, wetland delineation procedures, and application procedures for discharges of dredge and fill material to waters of the state.	https://www.waterboards.ca.gov/water_issues/programs/cwa401/wrapp.html	5/28/2020 (effective date)
Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin	Final	No	Implemented by Central Valley RWQCB. Establishes general and site-specific water quality objectives and general objectives in the Sacramento River Basin and the San Joaquin River Basin.	https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf	5/1/2018
Water Quality Control Plan for the Tulare Lake Basin	Final	No	Implemented by Tulare Lake RWQCB. Establishes general and site-specific water quality objectives and general objectives in the Tulare Lake Basin.	https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tlbp_201805.pdf	5/1/2018
Executive Order W-59-93	Final	No	Governor of California's directive for a no net loss policy on the quantity, quality, and permanence of wetland acreages and values.	https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/wrapp2008/executive_order_w59_93.pdf	8/23/1993
Caltrans Climate Change Vulnerability Assessment, District 6 Technical Report	Final	No	Caltrans' assessment of climate change vulnerabilities for the district.	https://dot.ca.gov/programs/transportation-planning/2019-climate-change-vulnerability-assessments	10/1/2019
Federal Laws, Guidelines, and Regulations	See below	See below	See below	See below	See below
CWA	Updated periodically (by Congress)	No	Authorized by EPA and delegated to the Corps and State Water Board, the CWA establishes the basic structure for regulating discharges of pollutants into WOTUS and regulating quality standards for surface waters.	https://www.law.cornell.edu/uscode/text/33/1344	2/4/1987 (last amended)

Title	Status	Spatial Data	Reference Purpose	Link	Date
CWA § 401	Updated periodically (by Congress)	No	Implemented by EPA and the State Water Board. Regulates discharge of pollutants into WOTUS.	https://www.law.cornell.edu/uscode/text/33/1341	12/27/1977 (last amended)
CWA § 404	Updated periodically (by Congress)	No	Implemented by EPA and the Corps. Regulates discharge of dredge or fill material into WOTUS.	https://www.epa.gov/cwa-404/section-404-permit-program	11/6/1986 (last amended)
Endangered Species Act ("ESA")	Updated periodically (by Congress)	No	Authorizes FWS and NMFS to protect federally listed threatened and endangered species.	https://www.fws.gov/endangered/laws-policies/	11/24/2003 (last amended)
Executive Order 11990, Protection of Wetlands	Final	No	Aims to minimize the destruction, loss, or degradation of wetlands and preserve and enhance the natural and beneficial values of wetlands.	https://www.epa.gov/cwa-404/protection-wetlands-executive-order-11990	3/24/1977
National Wetlands Mitigation Action Plan	Final	No	EPA and Corps comprehensive, interagency document to further the goal of no net loss of wetlands and to set forth the no net loss policy.	https://www.epa.gov/cwa-404/national-wetlands-mitigation-action-plan	12/26/2002
2008 Final Compensatory Mitigation Rule	Final	No	Corps' ruling to establish standards and criteria for the use of all types of compensatory mitigation, including on- and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts on WOTUS.	https://www.govinfo.gov/content/pkg/CFR-2012-title33-vol3/xml/CFR-2012-title33-vol3-part332.xml	7/9/2008
Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division	Final	No	Corps' guidelines for mitigation and monitoring in the South Pacific Division, including California.	https://www.spd.usace.army.mil/portals/13/docs/regulatory/mitigation/mitmon.pdf	12/19/2014 (last amended)
Wild and Scenic Rivers Act	Final	Yes	Reserves certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. All federal agencies must seek to avoid or mitigate actions that would adversely affect National River Inventory river segments.	https://www.law.cornell.edu/uscode/text/16/chapter-28	12/19/2014 (last amended)
40 CFR 131.12 California Anti-degradation Policy	Final	No	Implemented by the State Water Board. Required by federal law, the Anti-degradation Policy applies to the disposal of waste to high-quality surface water and groundwater.	https://www.waterboards.ca.gov/plans_policies/antidegradation.html	8/21/2015 (last amended)
303(d) List of Impaired Water Bodies	Final	No	EPA and the State Water Board's listing of regulated impaired water bodies.	https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml	4/11/2018 (last updated)
State Board Resolution No. 68-16	Final	No	Policy for maintaining high water quality.	https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf	10/28/1968
Statewide and Regional Resource Management Plans	See below	See below	See below	See below	See below
SWAP	Updated periodically (5-year intervals)	Yes	CDFW's plan for protection of species of greatest conservation need, in addition to habitats and other wildlife in California.	https://www.wildlife.ca.gov/SWAP/Final	9/1/2015
SWAP 2015 Transportation Companion Plan	Final	Yes	CDFW's companion document to SWAP for protection of species specific to transportation project planning.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=136128&inline	12/1/2016
Climate Change Vulnerability Assessment	Final	Yes	CDFW's companion document to SWAP to assess the vulnerability of habitats to projected end-of-century climates in California.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=116208&inline	1/1/2016
Water Management Companion Plan	Final	Yes	CDFW's companion document to SWAP to recommend water management practices throughout the state of California.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=136130&inline	12/1/2016

Title	Status	Spatial Data	Reference Purpose	Link	Date
CEHC Project	Final	Yes	CDFW and Caltrans assessment to identify large remaining blocks of intact habitat or natural landscape and model linkages between them that need to be maintained, particularly as corridors for wildlife.	https://www.wildlife.ca.gov/conservation/planning/connectivity/CEHC	2/1/2010
ACE Connectivity Project Version 3.0	Updated periodically	Yes	A CDFW effort to analyze large amounts of map-based data to inform decisions around goals such as biodiversity conservation, habitat connectivity, and climate change resiliency.	https://wildlife.ca.gov/Data/Analysis/ACE	7/10/2019 (last updated)
California Wildlife Barriers 2020	Final	Yes	CDFW's priority wildlife movement barriers across the state. This document is focused on large wild mammal game species; however, some priorities would benefit special-status species such as bighorn sheep. Describes the wildlife movement barriers CDFW has identified as priorities for remediation. In the GAI, this includes two that are barriers for San Joaquin kit fox and one that is a barrier for Tipton kangaroo rat.	http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178511	3/1/2020
California Watershed Assessment Manual Volume I	Final	No	Prepared for CNRA and the California Bay-Delta Authority. Provides guidance for conducting a watershed assessment in California.	http://www.cwam.ucdavis.edu/Manual_chapters.htm	5/1/2005
Safeguarding California Plan: 2018 Update	Final	No	A conservation plan by CNRA. Includes goals to strengthen the climate adaptation component of conservation planning efforts, enhance habitat connectivity, protect climate refugia through strategic acquisition and protection activities, increase restoration and enhancement activities to increase climate resiliency of natural and working lands, increase biodiversity monitoring efforts, continue incorporating climate considerations into state investment decision processes, and provide educational opportunities to the public and state agency staff regarding climate impacts and adaptation options.	http://resources.ca.gov/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf	1/1/2018
A Strategy for California @ 50 Million – Supporting California's Climate Change Goals	Final	Yes	Planning report from the California Governor's Office that focuses on sustainability efforts across California in response to climate change.	http://opr.ca.gov/docs/EGPR_Nov_2015.pdf	11/1/2015
California Water Action Plan 2016 Update	Final	No	Calls for action to restore key mountain meadow habitat, manage headwaters, restore coastal watersheds, and enhance water flows in streams statewide.	http://resources.ca.gov/docs/california_water_action_plan/Final_California_Water_Action_Plan.pdf	2016
California Biodiversity Initiative	Final	No	A CNRA, California Department of Food and Agriculture, and Governor's Office of Planning and Research high-level planning document. Provides a roadmap to secure California's biodiversity future.	https://californiabiodiversityinitiative.org/pdf/california-biodiversity-action-plan.pdf	9/2018
Special-status Taxa[a] Documents	See below	See below	See below	See below	See below
Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander	Final	Yes	FWS' recovery plan for the California tiger salamander population in the GAI. The recovery criteria are: • Provide a sufficient number of habitat preserves, of sufficient quality, to meet the lifecycle needs of this species. These preserves also need to be free of contaminants and they must have a site-specific management plan. • Show that each preserve has a minimum effective population of 132 individuals for at least 26 years. • Reduce the threat of, and provide early detection of, known pathogens. • Control other aquatic species that predate on the salamanders. • Show that subpopulations within the DPS are not hybridizing with other salamander species for at least 26 years and that hybrid populations are not within 1.3 miles of these subpopulations. • Show that the issue of mortality from road crossings is being controlled or ameliorated to the point where road crossing is not a threat. • Critical habitat has been designated for this species.	https://ecos.fws.gov/docs/recovery_plan/Signed%20Central%20CTS%20Recovery%20Plan.pdf	6/6/2017

Title	Status	Spatial Data	Reference Purpose	Link	Date
California Tiger Salamander Central California DPS 5-Year Review: Summary and Evaluation	Final	No	FWS' most recent formal review of the species' condition.	https://ecos.fws.gov/docs/five_year_review/doc4466.pdf	10/21/2014
California Tiger Salamander Biological Opinion	Final	No	FWS' list of the 121 most recent biological opinions that have been used for California tiger salamander, of which 8 were for projects in the GAI.	https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=D01T	9/24/2020 (latest document)
Incidental Take Permits for California Tiger Salamander	Final	No	CDFW's list of incidental take permits issued for California tiger salamander. Since 2012, 27 permits have been issued, along with 2 revisions and 47 amendments.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	7/3/2019 (latest document)
California Tiger Salamander Central California DPS Designation of Critical Habitat	Final	No	FWS' designation of critical habitat for the California Tiger Salamander Central California DPS.	https://ecos.fws.gov/ecp/species/2076	8/23/2005
Recovery Plan for Upland Species of the San Joaquin Valley, California	Final	Yes	FWS' recovery plan for 11 listed species and 23 candidate species in the San Joaquin Valley, which includes the following species of mitigation need: San Joaquin kit fox, Tipton kangaroo rat, giant kangaroo rat, and Fresno kangaroo rat. At the time of this document's publication, the short-nosed kangaroo rat was designated by FWS as being possibly appropriate for formal listing; however, this species was last reviewed on 11/15/1994 and is not considered a candidate. Of the species of mitigation need, critical habitat has been designated only for Fresno kangaroo rat. Recovery criteria for each species are detailed with each species' 5-year review. In addition to species-specific recovery criteria, site-specific recovery criteria are itemized in Table 5 of the recovery plan.	https://ecos.fws.gov/docs/recovery_plan/980930a.pdf	9/30/1998
Fresno Kangaroo Rat 5-Year Review: Summary and Evaluation	Final	No	FWS' most recent formal review of the species condition. The recovery criteria for this species are: • Downlist to threatened: – Secure and protect all occupied habitat on public or conservation lands at three or more distinct sites of no less than 950 acres each. – A management plan for all inhabited areas identified as important to continued survival. – Population densities in three or more populations must not fall below one individual per acre and have a mean density of four or more per acre during any precipitation cycle. • Delist: – One additional site with about 2,500 acres or more of occupied habitat, with a total of no less than 5,350 acres of occupied habitat. – A management plan for all protected areas identified as important to continued survival. – Protected sites have a mean density of four individuals per acre during a complete precipitation cycle.	https://ecos.fws.gov/docs/five_year_review/doc6433.pdf	6/19/2020
Fresno Kangaroo Rat Biological Opinion	Not applicable	No	FWS has not issued biological opinions for this species.	https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=5150	Not applicable
Incidental Take Permits for Fresno Kangaroo Rat	Final	No	CDFW's list of incidental take permits issued for Fresno kangaroo rat. Since 2011, 4 permits have been issued, along with 26 amendments.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	8/14/2019 (latest document)
Fresno Kangaroo Rat Critical Habitat Designation	Final	Yes	FWS designation of critical habitat for Fresno kangaroo rat.	https://ecos.fws.gov/docs/federal_register/fr918.pdf	1/30/1985

Title	Status	Spatial Data	Reference Purpose	Link	Date
Giant Kangaroo Rat 5-Year Review: Summary and Evaluation	Final	No	FWS' most recent formal review of the species condition. The recovery criteria for this species are: • Downlist to threatened: – Secure and protect all occupied lands in Carrizo Plain Natural Area, Ciervo-Panoche Natural Area, and western Kern County areas, as specified in recovery strategy. – All protected areas identified as important to continued survival, including Carrizo Plain Natural Area. – During 5-year period, no greater than 20 percent change in population size during years without drought or greater than 35 percent above average precipitation. • Delist: – 100 percent of occupied habitat on public lands in the Cuyama Valley, San Juan Creek Valley, and Kettleman Hills. – Stable or increasing population for the Carrizo, Panoche, and western Kern County metapopulations through one precipitation cycle.	https://ecos.fws.gov/docs/five_year_review/doc6607.pdf	9/11/2020
Giant Kangaroo Rat Biological Opinions	Final	Yes	FWS issued six biological opinions for giant kangaroo rat, four of which were for projects in the GAI.	https://ecos.fws.gov/ecp/species/6051	5/18/2020 (latest document)
Incidental Take Permits for Giant Kangaroo Rat	Final	No	CDFW's list of incidental take permits issued for giant kangaroo rat. Since 2011, 2 permits have been issued, along with 3 amendments.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	3/18/2020 (latest document)
Giant Kangaroo Rat Critical Habitat Designation	Not applicable	No	FWS has not designated critical habitat for giant kangaroo rat.	https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=6051	Not applicable
Tipton Kangaroo Rat 5-Year Review	Final	Yes	FWS' most recent formal review of the species condition. The recovery criteria for this species are: • Downlist to threatened: – Secure and protect three or more distinct areas with 4,940 acres or more of contiguous, occupied habitat, with 30 percent each or more of the minimum acreage in public conservation ownership. – Create and approve a management plan for all protected areas identified as important to continued survival. – Stable or increasing populations through one precipitation cycle. • Delist: – Secure and protect a total of 22,230 acres or more of occupied habitat in public conservation ownership. – Additionally, protected sites must have a mean density of four individuals per acre during a precipitation cycle.	https://ecos.fws.gov/docs/five_year_review/doc6442.pdf	7/8/2020
Tipton Kangaroo Rat Biological Opinion	Final	No	FWS issued two biological opinions for Tipton kangaroo rat, both of which were for projects in the GAI.	https://ecos.fws.gov/ecp/species/7247	5/18/2020 (latest document)
Incidental Take Permits for Tipton Kangaroo Rat	Final	No	CDFW's list of incidental take permits issued for Tipton kangaroo rat. Since 2013, 2 permits have been issued, along with 24 amendments.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	12/5/2018 (latest document)
Tipton Kangaroo Rat Critical Habitat Designation	Not applicable	No	FWS has not designated critical habitat for Tipton kangaroo rat.	https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=7247	Not applicable

Title	Status	Spatial Data	Reference Purpose	Link	Date
San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation	Final	No	FWS' most recent formal review of the condition of the species.	https://ecos.fws.gov/docs/five_year_review/doc6647.pdf	9/28/2020
San Joaquin Kit Fox Biological Opinions	Final	No	FWS' 33 biological opinions that have been issued for San Joaquin kit fox. Twenty-two of the biological opinions fall within the GAI.	https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A006	5/21/2020 (latest document)
Incidental Take Permits for San Joaquin Kit Fox	Final	No	CDFW's list of incidental take permits issued for San Joaquin kit fox. Since 2011, 11 permits have been issued, along with 36 amendments.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	3/18/2020 (latest document)
San Joaquin Kit Fox Critical Habitat Designation	Not applicable	No	FWS has not designated critical habitat for San Joaquin kit fox.	https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=2873	Not applicable
Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon	Final	Yes	FWS recovery plan for vernal pool species in California and Oregon, which includes 25 plants, 7 invertebrates, and 1 amphibian, for a total of 33 species. In general, recovery criteria center on habitat protection and adaptive habitat management, which includes developing management plans, conducting status surveys, and finding populations to be at least maintaining their population if not increasing, conducting research, and having additional public outreach and participation. Some species-specific criteria exist, such as seed banking for plants. Sixteen regions are identified in this plan, along with 41 core areas.	https://www.fws.gov/sacramento/es/Recovery-Planning/Vernal-Pool/	12/15/2005
Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the DPS of California Central Valley Steelhead	Final	Yes	NMFS recovery plan for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and the DPS of California Central Valley steelhead. The overarching goal of this Recovery Plan is the delisting of the Sacramento River winter-run Chinook salmon ESU, Central Valley spring-run Chinook salmon ESU, and California Central Valley steelhead DPS. The recovery plan identifies the Southern Sierra Nevada Diversity group, which is included in the District 6 GAI.	https://www.fisheries.noaa.gov/resource/document/recovery-plan-evolutionarily-significant-units-sacramento-river-winter-run	7/1/2014
State Land Management Plans	See below	See below	See below	See below	See below
General Planning Handbook for California State Parks	Final	Yes	California State Parks' guidelines for general plan development, which requires an inventory of known natural resources and general guidelines to comply with federal and state laws. Two state park entities occur in the GAI. The one with specific management goals pertinent to Chapters 7 and 8 of this RAMNA is listed below.	http://www.parks.ca.gov/pages/21299/files/planning_handbook_april_2010.pdf	4/1/2010
Tule Elk State Reserve General Development Plan	Final	Yes	California State Parks' general development plan. Includes an area designated as a wildlife sanctuary.	http://www.parks.ca.gov/pages/21299/files/c350.pdf	11/1/1958
FWS Land Management Plans	See below	See below	See below	See below	See below
Kern and Pixley National Wildlife Refuges Final Comprehensive Conservation Plan	Final	Yes	FWS' plan for both the Kern and Pixley National Wildlife Refuges. In the Kern Refuge, this includes management goals to preserve and maintain 2,600 acres of Tipton kangaroo rat habitat, enhance a 215-acre riparian area, and conduct tamarisk eradication, in part, to enhance wetland value. In the Pixley Refuge, this includes management goals to preserve and maintain 4,730 acres of habitat for Tipton kangaroo rat.	https://www.fws.gov/uploadedFiles/KernNWRC_CCP.pdf	2/1/2005
Environmental Assessment: Eastern Ciervo-Panoche Natural Area Habitat Protection Project (Mouren Cattle Company parcels)	Final	Yes	Joint plan between the Bureau of Reclamation and FWS to purchase up to 2,240 acres in the eastern Ciervo-Panoche Natural Area. Goals include benefits for San Joaquin kit fox and giant kangaroo rat.	https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=19941	9/1/2014

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U.S. Military Land Management Plans	See below	See below	See below	See below	See below
Installation Master Plan 2030 Naval Air Station, Lemoore, California	Final	Yes	U.S. Navy Master Plan for the base. Includes six natural resource management areas to benefit Tipton kangaroo rat.	https://www.cnic.navy.mil/content/dam/cnic/cnrsw/Naval_Air_Station_Lemoore/Masterplan/NASL_MasterPlan_Final-reduced.pdf	7/1/2014
U.S. Bureau of Indian Affairs Land Management Plans	See below	See below	See below	See below	See below
None	None	None	No reservation lands occur in the GAI.	None	None
USFS Land Management Plans	See below	See below	See below	See below	See below
None	None	None	No USFS lands occur in the GAI.	None	None
BLM Land Management Plans	See below	See below	See below	See below	See below
Resource Management Plan for the Southern Diablo Mountain Range & Central Coast of California	Final	Yes	BLM's management plan for the Southern Diablo Mountain Range and Central Coast, which includes the Panoche-Coalinga Area of Critical Environmental Concern.	https://eplanning.blm.gov/epl-front-office/eplanning/legacyProjectSite.do?methodName=renderLegacyProjectSite&projectId=68795	9/7/2007
BLM Bakersfield Resource Management Plan	Final	Yes	BLM's management plan for BLM lands in the Bakersfield District. The plan calls for additional surveys for San Joaquin kit fox, and outlines measures to minimize take of the species. Includes goals to acquire and enhance habitat along Caliente Creek and Atwell Island for riparian habitats and species.	https://eplanning.blm.gov/epl-front-office/projects/lup/70273/92254/111143/Bakersfield_ROD-ARMP.pdf	12/1/2014
Environmental Assessment: Eastern Ciervo-Panoche Natural Area Habitat Protection Project (Martin property)	Final	Yes	Bureau of Reclamation's plan to provide funding to BLM for the purchase of 1,387 acres in the eastern Ciervo-Panoche Natural Area. Goals include benefits for San Joaquin kit fox and giant kangaroo rat.	https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=32801	3/1/2018
National Park Service Land Management Plans	See below	See below	See below	See below	See below
National Park Service Nationwide Rivers Inventory	Final	No	Listing of Nationwide River Inventory river segments that are potential candidates for inclusion in the National Wild and Scenic River System. No Nationwide River Inventory river segments are in the GAI, but five are near it.	https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm	12/21/2017
Local Government Land Management Plans	See below	See below	See below	See below	See below
San Joaquin River Parkway Master Plan	Final	Yes	San Joaquin River Conservancy's master plan for the San Joaquin River Parkway. The Conservancy is a regionally governed agency associated with the State of California.	http://sjrc.ca.gov/	7/20/2000
San Joaquin River Parkway Master Plan Update	Draft	Yes	San Joaquin River Conservancy's updated master plan and environmental impact report ("EIR") for the San Joaquin River Parkway. Includes specific management goals to designate at least three areas of 100 acres each for conservation. For the portion of the San Joaquin River that this plan covers, it recommends that management and conservation actions result in a continuous corridor that is at least 200 feet wide with no more than 200 feet of protected gaps.	http://sjrc.ca.gov/Parkway-Master-Plan-Update/	1/1/2017 (4/13/2018 is approval date for Final EIR to update the plan)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Water Resources Plans and Documents	See below	See below	See below	See below	See below
Central Valley Flood Protection Plan 2017 Update	Updated periodically (every 5 years)	Yes	California Department of Water Resources plan to reduce flood risk in the Central Valley. Includes goals to use levee setbacks to provide habitat restoration in addition to flood protection, and to increase participation in the Central Valley Habitat Exchange to purchase land from farmers in flood zones and restore them to a natural ecosystem.	https://water.ca.gov/Programs/Flood-Management/Flood-Planning-and-Studies/Central-Valley-Flood-Protection-Plan	8/1/2017
Central Valley Project Integrated Resource Plan Final Report	Final	Yes	Bureau of Reclamation's plan for the water supply of the Central Valley.	https://www.usbr.gov/mp/ssjbasinstudy/docs.html	11/1/2014
Upper San Joaquin River Basin Storage Investigation (Draft Environmental Impact Statement)	Draft	Yes	Bureau of Reclamation's plan for increasing water storage at the Friant Dam. Objectives of the plan include: increase regional water supply availability, enhance downstream conditions for native fish, reduce flood risk, and improve water quality.	https://www.usbr.gov/mp/sccao/storage/index.html	8/1/2014
Southern Sierra Integrated Regional Water Management Plan	Final	Yes	Implemented by the Southern Sierra Regional Water Management Group, which consists of 19 organizations to manage water resources for the region. Although this document has minimal direct overlap with the GAI, it has management implications over all of the river systems in the GAI.	http://www.southernsierrarwmg.org/	11/1/2018
Kings River Integrated Regional Water Management Plan	Final	Yes	Implemented by the Kings Basin Water Authority to manage water resources in the Kings Groundwater region, which is a sub-basin of the San Joaquin Valley groundwater basin.	http://www.kingsbasinauthority.org/governance/governing-documents/irwmp	10/17/2018
Integrated Regional Water Management Plan (for the Kaweah River Basin)	Draft	Yes	Implemented by the Regional Water Management Group for the Kaweah River Basin to manage water resources in the Kaweah River basin.	https://www.kdwcd.com/water-resources/#4	6/1/2017
Tule River Basin Integrated Regional Water Management Plan	Draft	Yes	Implemented by the Tule River Basin to manage water resources in the plan area.	https://www.tuleirwmp.com/	6/1/2018
Kern Integrated Regional Water Management Plan	Draft	Yes	Implemented by Kern County to manage water resources in the County. Includes a goal to restore 460 acres of riparian habitat.	http://kernirwmp.com/documents.html	9/1/2019
San Joaquin River Restoration Program	Updated periodically (as new projects are added to the program)	No	Implemented jointly by CDFW, California Department of Water Resources, Bureau of Reclamation, FWS, and NMFS as a result of the San Joaquin River Litigation Settlement, which is implemented under the San Joaquin River Restoration Settlement Act. The settlement is based on two goals: to restore and maintain fish populations in good condition in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, and to reduce or avoid water supply impacts on the Friant Division long-term contractors.	http://www.restoresjr.net/	3/30/2009 (date of the San Joaquin River Restoration Settlement Act)
County General Plans	See below	See below	See below	See below	See below
2030 Merced County General Plan	Final	Yes	General Plan for Merced County. Does not include specific land use designations for conservation; however, it has a Foothill Pasture designation that is similar to a conservation area in that there is minimal to no development and no intensive agriculture.	https://www.co.merced.ca.us/100/General-Plan	12/10/2013
Tulare County General Plan 2030	Update in progress	Yes	General Plan for Tulare County. Includes a land use designation of resource conservation.	http://generalplan.co.tulare.ca.us/	8/28/2012
Kern County General Plan	Update in progress	Yes	General Plan for Kern County. Includes land use designations of resource reserve and resource management.	https://kernplanning.com/planning/planning-documents/general-plans-elements/	9/22/2009
Kings County General Plan	Update in progress	Yes	General Plan for Kings County. Includes designations of districts for natural resources and conservation.	http://worldcat.org/arcviewer/1/CBG/2007/02/08/00000058510/viewer/file1.html	12/28/1993

Title	Status	Spatial Data	Reference Purpose	Link	Date
2000 Fresno County General Plan	Final	Yes	General Plan for Fresno County. Includes land use designations of open space and public lands and open space. Note that reserve overlay refers to reserving lands for future intensive development, not for conservation. Requires additional riparian protection 50 feet beyond the outer dripline of vegetated riparian corridors and 100 feet beyond the top-of-bank for unvegetated riparian corridors.	https://www.co.fresno.ca.us/departments/public-works-planning/divisions-of-public-works-and-planning/development-services-division/planning-and-land-use/general-plan-maps	10/3/2000
Madera County General Plan Policy Document	Updated periodically	Yes	General Plan for Madera County. Includes a land use designation of open space, but is defined in a way that does not preclude development. No land use designation that precludes development is found in this document. Requires additional riparian protection 50 feet beyond the outer dripline of vegetated riparian corridors and 100 feet beyond the top-of-bank for unvegetated riparian corridors. Requires a minimum 200-foot buffer along the San Joaquin River between Friant Dam and the Highway 145 crossing. Requires mitigation for impacts to riparian systems for the purpose of flood control to be mitigated at a ratio of 3:1.	https://www.maderacounty.com/government/community-economic-development-department/divisions/planning-division/planning-forms-and-documents/-folder-269	11/3/2015 (last amended)
City General Plans	See below	See below	See below	See below	See below
City of Madera General Plan	Periodically updated	Yes	General Plan for the City of Madera. Includes a land use designation of open space that is defined in a way that does not preclude development. No land use designation that precludes development is found in this document. Requires additional riparian protection 50 feet beyond the outer dripline of vegetated riparian corridors and 100 feet beyond the top-of-bank for unvegetated riparian corridors.	https://www.cityofmadera.ca.gov/home/departments/community-development/general-plan/	10/24/1995 (last amended 2011)
City of Madera Land Use Map	Periodically updated	Yes	Land use map for the City of Madera. Includes land use designations of open space and resource conservation/agriculture.	http://www.cityofmadera.ca.gov/wp-content/uploads/2016/04/General-Plan-Map-0116-Reference-Scale.pdf	1/6/2016 (last amended)
City of Chowchilla 2040 General Plan	Final	Yes	General Plan for the City of Chowchilla.	https://www.cityofchowchilla.org/154/Chowchilla-2040-General-Plan	5/2/2011
City of Chowchilla Land Use Map	Final	Yes	Land use map for the City of Chowchilla. Includes land use designations of open space and regional park.	https://www.cityofchowchilla.org/DocumentCenter/View/884/Chowchilla-Land-Use-Map-2010-06	6/8/2010
Porterville 2030 General Plan	Final	Yes	General Plan for the City of Porterville and land use map. Includes a land use designation of rural/agriculture/conservation with a subdesignation of natural resources.	http://www.ci.porterville.ca.us/depts/communitydevelopment/generalplan.cfm	3/4/2008
City of Fresno General Plan	Final	Yes	General Plan for the City of Fresno and land use map. Includes a land use designation of open space with subdesignations of clear zone, outdoor environmental education area, open space, ponding basin, and regional park.	https://www.fresno.gov/darm/general-plan-development-code/#tab-01	12/18/2014
Metropolitan Bakersfield General Plan	Periodically updated	Yes	General Plan for the City of Bakersfield.	http://docs.bakersfieldcity.us/weblink/Browse.aspx?startid=602140&&dbid=0	1/20/2016 (last updated)
City of Bakersfield Zoning Map	Periodically updated	Yes	Zoning map for the City of Bakersfield. Includes designations of open space and two open space subtypes of flood plain secondary and hillside development.	http://docs.bakersfieldcity.us/weblink/Browse.aspx?startid=990235	1/3/2019 (last updated)
City of Delano General Plan	Final	Yes	General Plan for the City of Delano and land use map. Includes a land use designation for parks and open space.	http://www.cityofdelano.org/113/General-Plan	12/1/2005
City of Visalia General Plan Update	Final	Yes	General Plan for the City of Visalia and land use map. Includes a zoning designation of open space.	https://www.visalia.city/depts/community_development/planning/gp.asp	10/14/2014
City of Hanford General Plan	In progress	Yes	General Plan for the City of Hanford and land use map.	https://www.cityofhanfordca.com/departments/community_development/planning_division/general_plan.php#76	In progress
City of Hanford Zoning Map	Final	Yes	Zoning map for the City of Hanford. Includes a land use designation of open space.	https://www.cityofhanfordca.com/document_center/Planning/General%20Plan/2035%20General%20Plan%20Land%20Use%20Map.pdf	4/24/2017

Title	Status	Spatial Data	Reference Purpose	Link	Date
City of Clovis General Plan 2014	Final	Yes	General Plan for the City of Clovis.	https://cityofclovis.com/planning-and-development/planning/master-plans/general-plan/	8/1/2014
City of Clovis Zoning Map	Periodically updated	Yes	Zoning map for the City of Clovis. Includes a zoning designation of open space.	https://cityofclovis.com/planning-and-development/planning/zoning/	7/31/2017 (last revised)
City of Tulare General Plan	Final	Yes	General Plan for the City of Tulare and land use map. Includes a land use designation of open space.	https://www.tulare.ca.gov/departments/community-development/development-services/planning/2035-tulare-general-plan	10/7/2014
Other Organization Conservation and Management Documents	See below	See below	See below	See below	See below
California Riparian Habitat Restoration Handbook	Final	No	Guidelines for riparian habitat restoration in the Central Valley.	https://water.ca.gov/LegacyFiles/urbanstreams/docs/ca_riparian_handbook.pdf	7/1/2009
Final Central Valley Salt & Nitrate Management Plan	Final	Yes	Management plan from Central Valley Salts to control the amount of salinity and nitrate levels in the region's water supply.	https://www.cvsalinity.org/docs/central-valley-snmp/final-snmp.html	12/1/2016
California EcoAtlas	Updated periodically (nearly daily)	Yes	Statewide database tracking the extent and condition of wetlands in California and managed by the San Francisco Estuary Institute. The San Joaquin Valley Region occurs in the GAI.	https://www.ecoatlas.org/	10/9/2020

[a] Consistent with the Caltrans SAMNA and for the purposes of this document, special-status species are defined as federally and State of California threatened, endangered, or sensitive species; State fully protected or rare species; State species of special concern; or California Rare Plant Rank 1 and 2 species.

4. EXISTING MITIGATION OPPORTUNITIES

SHC § 800.6(a)-authorized advance mitigation project types include purchasing credits and paying fees associated with existing mitigation sources. This chapter summarizes the mitigation credits and values currently available to Caltrans and/or pending through existing HCPs, NCCPs, mitigation and conservation banks, in-lieu fee programs, and mitigation credit agreements ("MCAs"). RCISs, which are a prerequisite to MCAs, are also discussed. Caltrans begins the chapter by describing the advance mitigation credits already held by Caltrans District 6.

4.1 SHOPP Advance Mitigation Credits

The 2016 SHOPP, with California Transportation Commission approval, released the first funds used to program Caltrans advance mitigation projects in several Districts. The projects were programmed against the $40 million reserve created in the 2016 SHOPP for advance mitigation projects. Thirteen advance mitigation projects were programmed in the SHOPP and are underway; one is a conservation bank under development within Caltrans District 6:

- Bloss Ranch Conservation Bank (working title, in progress)

Table 4-1 provides a brief description and available information. The Bloss Ranch Conservation Bank is intended to supply California tiger salamander conservation credits (3 aquatic and 88 terrestrial acres) for use by transportation-related projects delivered under Caltrans' SHOPP. Contracted credits are expected to be available starting in 2022 (first release), with contract completion by 2027. Credits generated in excess of the Caltrans contract will be made available by the contractor on the open market. Additional credit types proposed by the contractor, such as San Joaquin kit fox and vernal pool, and the credit release schedule are pending Interagency Review Team approval. The contractor has submitted the final prospectus to the Interagency Review Team.

Table 4-1. SHOPP Advance Mitigation Credits

Name	Year Approved	Signatories	Area (acres)	Service Area	Credit Types
Bloss Ranch Conservation Bank (working title)	In progress	**CDFW**, **FWS**	7,300	Proposed within a portion of Central California tiger salamander range (approximately between the cities of Madera, Galt, and Dublin)	Caltrans dedicated: 3 aquatic California tiger salamander credits 88 upland California tiger salamander credits

[a] Signatories in **bold** are signatories to the *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation* (Caltrans et al. 2020).

4.2 HCPs and NCCPs

HCPs[1] and NCCPs[2] are incidental take permits that authorize take of federal and/or state endangered species that is incidental to otherwise lawful activities. The activities are specified in the HCP and/or NCCP as covered activities. Covered activities consist of specified projects and activities that may have direct or indirect effects on the covered species and natural communities and for which a permittee requests take authorization. Consequently, for covered activities, an approved HCP or NCCP may guide streamlined species permitting at the local level that is consistent with the plan. When Caltrans is not an NCCP permittee, under specific conditions and with signatory agency approval, Caltrans may be able to qualify as a Participating Special Entity under the plan, gaining some of the NCCP permittee's privileges; however, not all NCCPs have a Participating Special Entry clause.

Caltrans identified the following active HCPs and NCCPs in the GAI that apply to transportation-related activities and that Caltrans may be able to use to meet its mitigation needs in the GAI:

- Bakersfield HCP (in progress)
- Kern County Valley Floor HCP
- Kern Water Bank HCP/NCCP
- Metropolitan Bakersfield HCP

Figure 4-1 depicts the locations of the above-listed HCPs and NCCPs. Table 4-2 summarizes the signatories, status, area, transportation agency permittees, covered species, and covered communities. Multiple project-specific HCPs in the GAI were not included in Table 4-2 because they were determined to not be a viable mitigation option for Caltrans. For example, they applied to a non-Caltrans single user, covered activities that were not road infrastructure-related, nor could they be adapted to be applicable to road infrastructure. In addition, when Caltrans and/or RTPAs are not currently signatories or participating special entities in any of the NCCPs listed in Table 4-2, their participation and coverage under any NCCP is at the discretion of the implementing entity/plan manager. The HCPs included in this discussion all cover a large geographic area that intersects with many planned Caltrans projects.

The Metropolitan Bakersfield HCP will expire in February 2022. Rather than amending this plan, a new Bakersfield HCP is being drafted to address several important components now required by federal regulations that were not within the original document. These new additions will include outlining biological goals and objectives, a monitoring and adaptive management plan, and no-surprises assurances. The service area for this new Bakersfield HCP is expected to be very similar to the existing Metropolitan Bakersfield HCP.

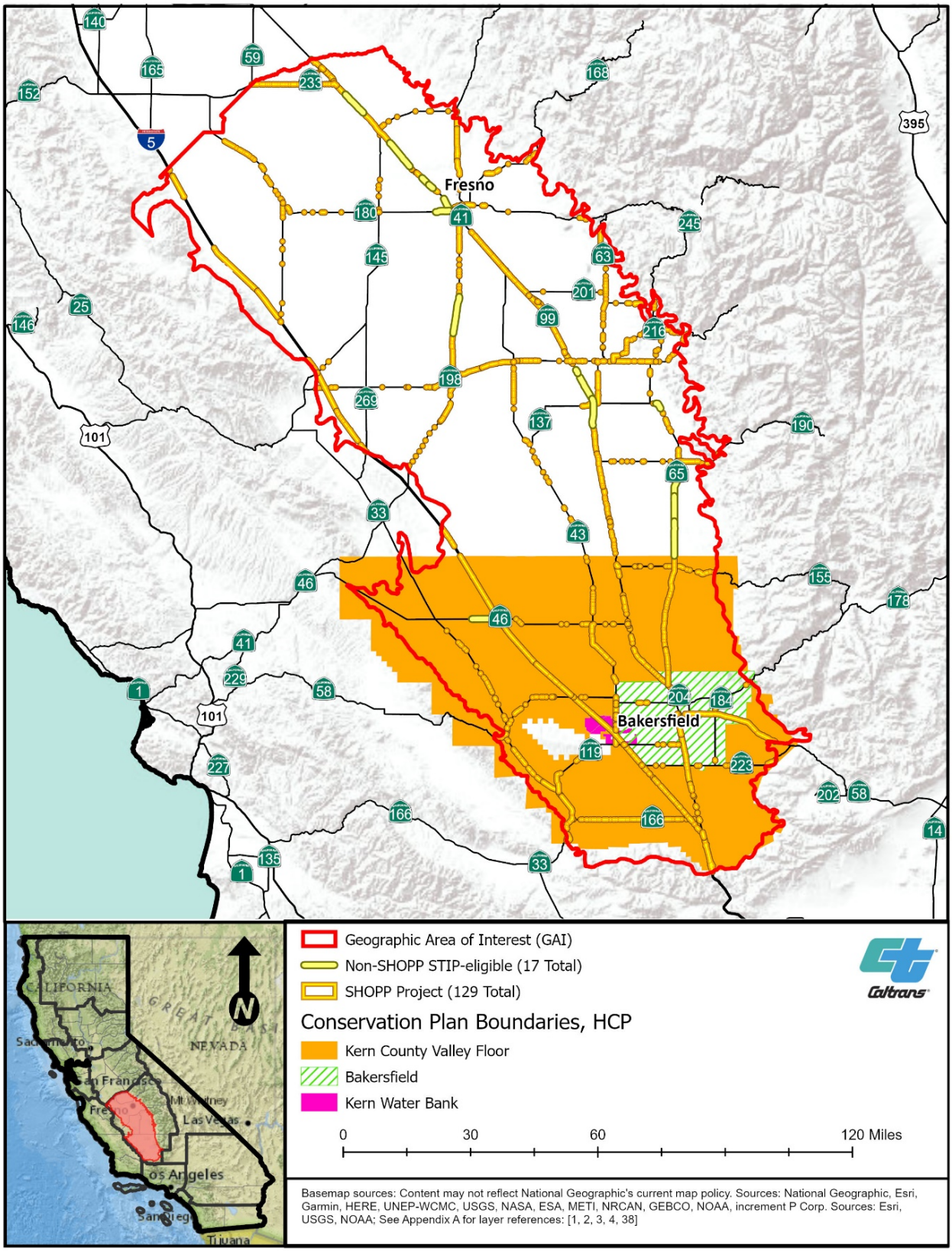
[1] Pursuant to Section 10 of the federal ESA or consultations under Section 7 of the federal ESA
[2] Pursuant to Section 2835 of the California FGC

Table 4-2. Overview of HCPs and NCCPs in the GAI[a]

Name	Signatories[b]	Date	Area (acres)	Participating Transportation Agencies	Covered Species	Covered Natural Communities
Bakersfield HCP	In progress	Draft in progress	258,406	In progress	San Joaquin kit fox, Tipton kangaroo rat, and 8 other species	Not applicable
Kern County Valley Floor HCP	**FWS,** BLM, California Energy Commission, Kern County, California Department of Conservation	2006	1,990,400	None	San Joaquin kit fox, giant kangaroo rat, Tipton kangaroo rat, and 22 other species	Not applicable
Kern Water Bank HCP/NCCP	**FWS, CDFW**, Kern Water Bank Authority	1997	19,900	None	California tiger salamander, San Joaquin kit fox, giant kangaroo rat, Tipton kangaroo rat, and 61 other species	3
Metropolitan Bakersfield HCP	**FWS, CDFW**,[c] City of Kern, City of Bakersfield	1994	259,200	None	San Joaquin kit fox, giant kangaroo rat, Tipton kangaroo rat, and 15 other species	Not applicable

[a] Up-to-date information on HCPs and NCCPs can be found at the following websites:
https://ecos.fws.gov/ecp0/conservationPlan/region/summary?region=8&type=HCP
https://wildlife.ca.gov/conservation/planning/nccp
https://bakersfieldcity.us/gov/depts/development_services/habitat.htm
[b] Signatories in **bold** are signatories to the *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation* (Caltrans et al. 2020).
[c] Although the Metropolitan Bakersfield HCP is not an NCCP, it does have a take permit associated with it from CDFW.

Figure 4-1. HCPs and NCCPs



4.3 Conservation and Mitigation Banks

A conservation or mitigation bank is privately or publicly owned land managed for its natural resource values. In exchange for permanently protecting, managing, and monitoring the land, the bank sponsor is allowed to sell or transfer habitat and/or aquatic resource credits to permittees who—after all appropriate and practicable avoidance and minimization has been performed—need to satisfy legal requirements and compensate for their project's unavoidable environmental impacts. Conservation banks generally protect threatened and endangered species habitat, while mitigation banks generally protect, restore, create, and/or enhance aquatic resources. The legal document for the establishment, operation, and use of a conservation bank or mitigation bank is a Bank Enabling Instrument ("BEI").

Caltrans identified the following active or pending mitigation and/or conservation banks with service areas that overlap all or part of the GAI:

- Alkali Sink Conservation Bank
- Big Gun Conservation Bank
- Ciervo Hills Conservation Bank
- Deadman Creek Conservation Bank (CDFW approval pending)
- Drayer Ranch Conservation Bank
- Dutchman Creek Conservation Bank
- French Camp Conservation Bank
- Grasslands Mitigation Bank
- Great Valley Conservation Bank (CDFW approval pending)
- Kennedy Table Conservation Bank
- Kern Water Bank Authority Conservation Bank
- Kreyenhagen Hills Conservation Bank
- Nicolaus Ranch Conservation Bank
- River Ranch Conservation Bank
- Sand Creek Conservation Bank (CDFW approval pending)
- Sparling Ranch Conservation Bank
- Vieira-Sandy Mush Road Conservation Bank

Information on the agency approvals, the types of credits available, and brief descriptions of each bank are provided in Table 4-3. The Big Gun, French Camp, Nicolaus Ranch, and River Ranch conservation banks—along with the Kennedy Table and Grasslands mitigations banks—do not currently provide credits for the species of mitigation need identified in this RAMNA; however, credits for other listed species are available, as listed in Table 4-3. For banks with publicly available spatial data, the location and extent of the service areas associated with the aforementioned banks are depicted on Figures 4-2, 4-3, and 4-4. As noted in Table 4-2, some banks do not have spatial data that is publicly available in an electronic format.

Table 4-3. Overview of Conservation and Mitigation Banks in the GAI[a]

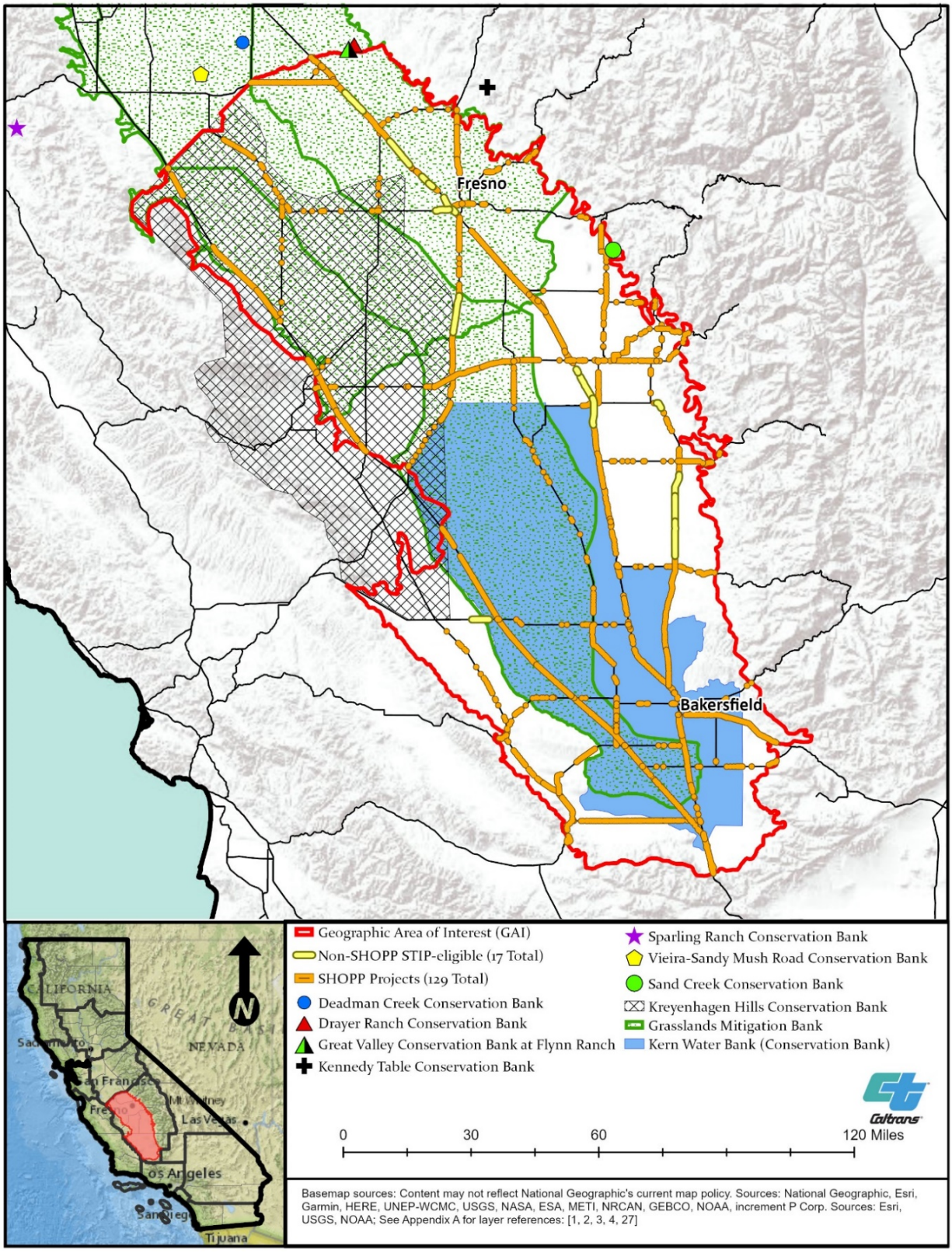
Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Location	Credit Types
Alkali Sink Conservation Bank	2016	Active – credits available*	**FWS**, **CDFW**	943.43	See Figure 4-3	San Joaquin kit fox, vernal pool fairy shrimp*, longhorn fairy shrimp (*Branchinecta longiantenna*), Swainson's hawk (*Buteo swainsoni*), and western burrowing owl (*Athene cunicularia*) * fairy shrimp credits not yet available
Big Gun Conservation Bank	2010	Active – credits available	**FWS**	48	Service area not publicly available electronically	California red-legged frog
Ciervo Hills Conservation Bank	Anticipated early 2021	Pending	**FWS, CDFW** (in progress)	25,000	Pending	San Joaquin kit fox, western burrowing owl, giant kangaroo rat (*Dipodomys ingens*), Mohave ground squirrel (*Xerospermophilus mohavensis*)
Deadman Creek Conservation Bank	2007	Active – credits available	**FWS** (seeking CDFW approval late 2021)	684	See Figure 4-2	California tiger salamander, San Joaquin kit fox, vernal pool preservation
Drayer Ranch Conservation Bank	2006	Active – credits available	**FWS**	254	See Figure 4-2	California tiger salamander, San Joaquin kit fox, Greene's tuctoria, San Joaquin orcutt grass, succulent owl's clover, vernal pool fairy shrimp, and vernal pool tadpole shrimp
Dutchman Creek Conservation Bank	2014	Active – credits available	**FWS, CDFW**	501	See Figure 4-3	California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, vernal pool tadpole shrimp, conservancy fairy shrimp, western burrowing owl, and western spadefoot toad (*Spea hammondii*)
French Camp Conservation Bank	2006	Active – credits available	**FWS**	188	Service area not publicly available electronically	Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Location	Credit Types
Grasslands Mitigation Bank	2015	Active – credits available	**Corps, EPA, FWS, CDFW**	281	See Figures 4-2 and 4-3	Giant garter snake (*Thamnophis gigas*) and seasonal wetlands
Great Valley Conservation Bank	2007	Active – credits available	**FWS** (seeking CDFW approval late 2021)	1,067	See Figure 4-2	California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, vernal pool tadpole shrimp
Kennedy Table Conservation Bank	2004	Active – credits available	**FWS**	600	See Figure 4-2	Succulent owl's clover, vernal pool fairy shrimp, and vernal pool preservation
Kern Water Bank Authority Conservation Bank	1997	Active – credits available	**FWS, CDFW**	3,267	See Figure 4-2	San Joaquin kit fox, Tipton kangaroo rat, and five other listed species
Kreyenhagen Hills Conservation Bank	2005	Active – credits available	**FWS** (seeking CDFW approval late 2021)	1,295	See Figure 4-2	San Joaquin kit fox
Nicolaus Ranch Conservation Bank	2016	Active – credits available	**FWS**	42.03	Service area not publicly available electronically	Valley elderberry longhorn beetle
River Ranch Conservation Bank	2005	Active – credits available	**FWS**	211	Service area not publicly available electronically	Valley elderberry longhorn beetle
Sand Creek Conservation Bank	2007	Active – credits available	**FWS, CDFW** (in progress; expected late 2021)	498	See Figure 4-2	San Joaquin kit fox, California tiger salamander, vernal pool preservation

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Location	Credit Types
Sparling Ranch Conservation Bank	2017	Active – credits available	**FWS, CDFW**	2,002	See Figure 4-2	California tiger salamander and California red-legged frog
Vieira-Sandy Mush Road Conservation Bank	2002	Active – credits available	**FWS**	333	See Figure 4-2	California tiger salamander, San Joaquin kit fox, conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp

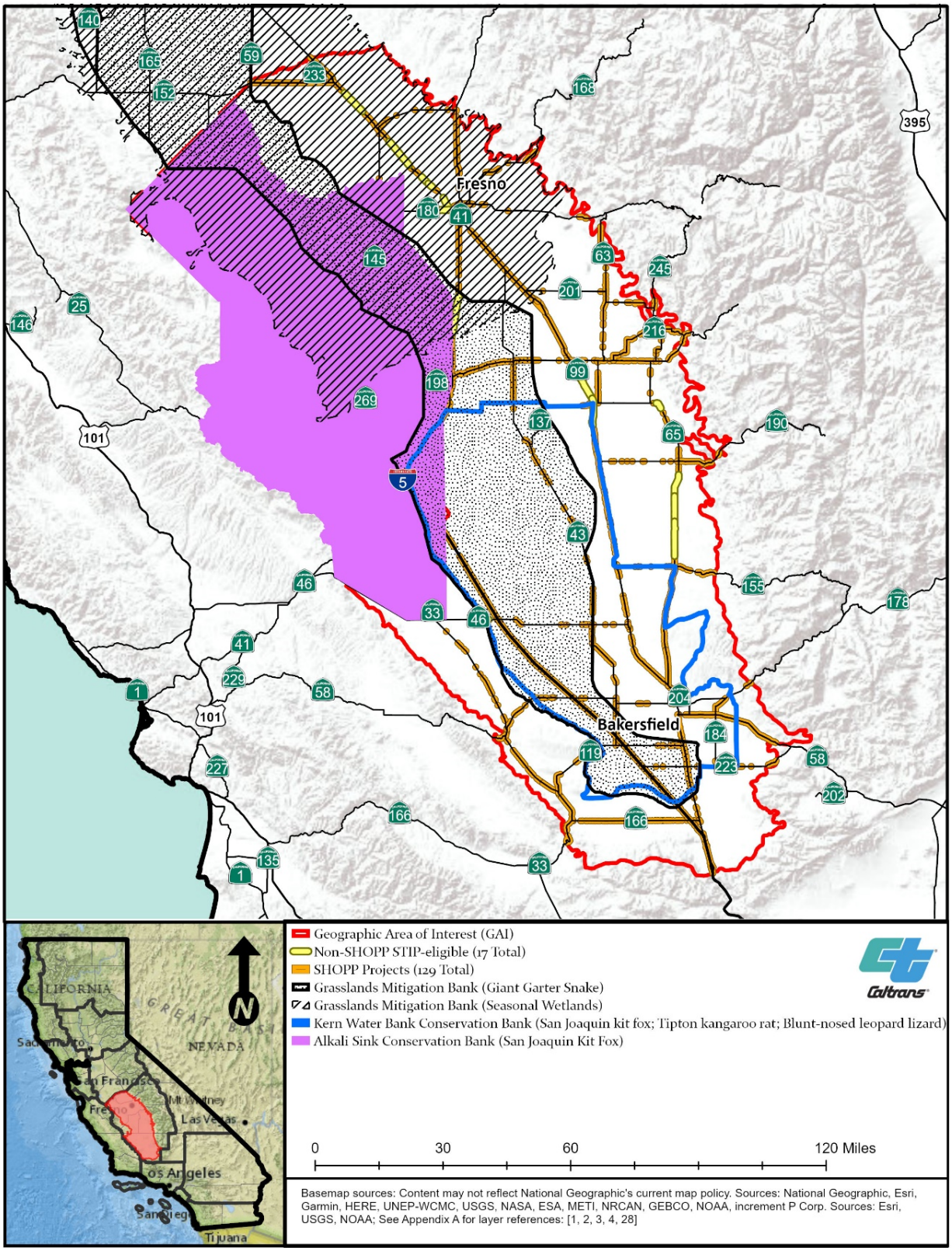
[a] Up-to-date information on approved conservation and mitigation banks, including available credits, can be found at the following websites:
https://www.wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks
https://ribits.ops.usace.army.mil/ords/f?p=107:2::::::
https://www.fws.gov/sacramento/es/Conservation-Banking/Banks/In-Area/
[b] Signatories in **bold** are signatories to the *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation* (Caltrans et al. 2020).

Figure 4-2. Conservation and Mitigation Bank Service Areas – Part 1[a]



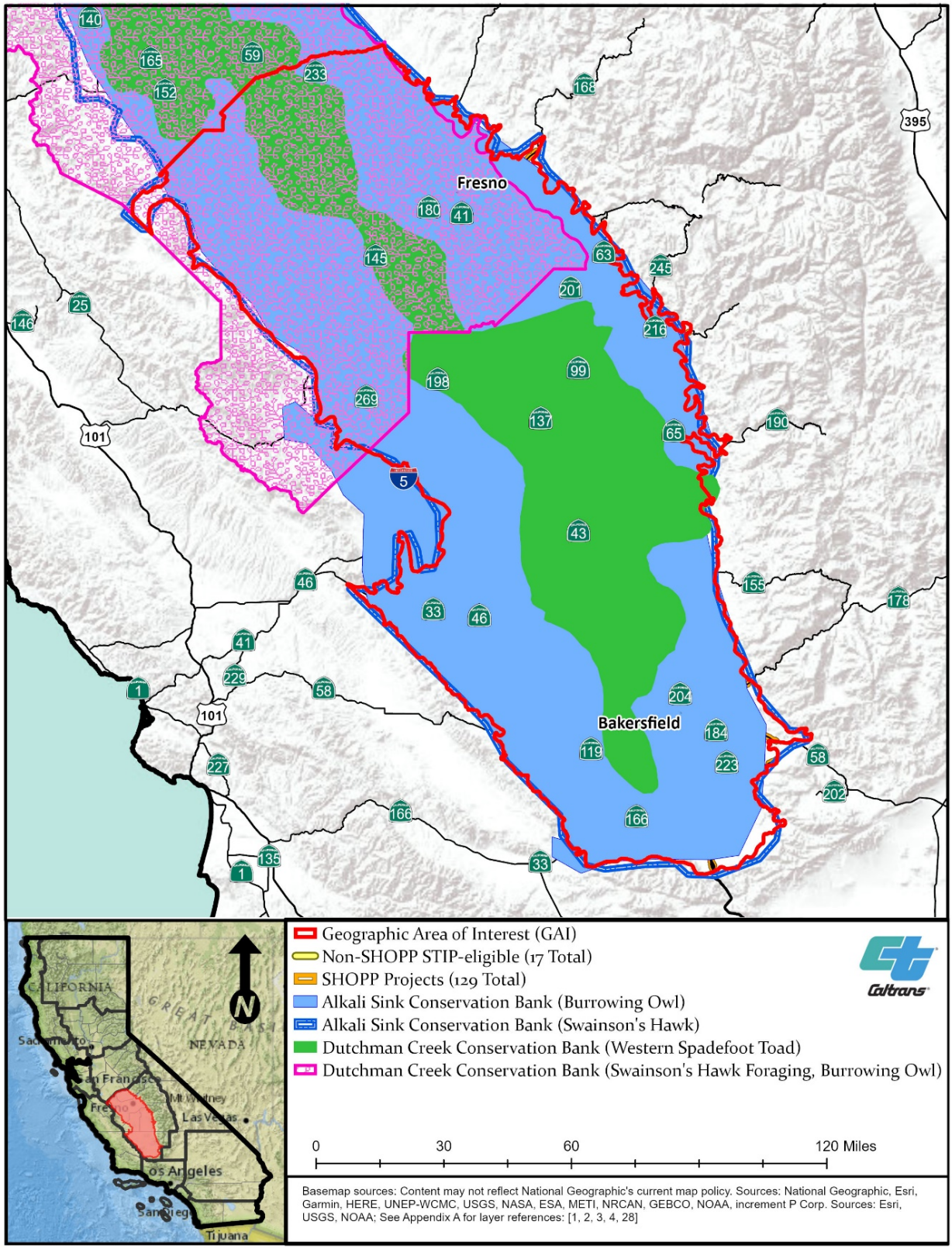
[a] Conservation and mitigation bank service areas with publicly available spatial data in electronic format are shown.

Figure 4-3. Conservation and Mitigation Bank Service Areas – Part 2[a]



[a] Conservation and mitigation bank service areas with publicly available spatial data in electronic format are shown.

Figure 4-4. Conservation and Mitigation Bank Service Areas – Part 3[a]



[a] Conservation and mitigation bank service areas with publicly available spatial data in electronic format are shown.

4.4 In-lieu Fee Programs

Compensatory mitigation can also be accomplished through participation in an in-lieu fee program, which is an agreement between a regulatory agency, or agencies, and a single in-lieu fee sponsor. In-lieu fee mitigation occurs when a permittee provides funds to an in-lieu fee sponsor instead of either completing project-specific mitigation or purchasing credits from a conservation or mitigation bank. An in-lieu fee sponsor can include entities such as public agencies or nonprofit organizations, and the fees are used to plan, build, and maintain a mitigation site. This method is similar to purchasing mitigation credits, in that the mitigation is usually conducted "off site."

This GAI falls within the service area of the Sacramento District California In-lieu Fee Program, developed by the Sacramento Corps District (Corps 2020; National Fish and Wildlife Foundation 2018). At this time, only the Corps, State Water Boards, EPA, and NMFS may approve of the use of in-lieu fee credits as offset for impacts. The program area for this in-lieu fee program is defined as the limits of the Sacramento District of the Corps in California and was established to provide aquatic resource and vernal pool credits (Figures 4-5 and 4-6). The aquatic resources service areas are divided by HUC-8 sub-basin to promote a watershed approach to assess aquatic resource losses, pressures, and restoration objectives (Figure 4-5). A watershed approach allows for an ecologically coherent assessment of stressors and restoration potential across a spectrum of aquatic resource functions, services, and landscape positions (National Fish and Wildlife Foundation 2018). The GAI overlaps the San Joaquin, King, Kaweah/Tule, and Kern service areas.

Although FWS is not a signatory to the in-lieu fee program, the vernal pool service areas are based on the vernal pool regions identified in FWS' *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (FWS 2005a). The GAI overlaps with the Southern Sierra Foothills and the San Joaquin Valley Service Areas (Figure 4-6). In addition, any vernal pools that are located outside of one of these designated service areas are covered under the "All Other Vernal Pool Areas" service area. This service area was specifically developed to account for any vernal pool resources that are located outside of one of the designated regions (National Fish and Wildlife Foundation 2018).

Table 4-4. In Lieu Fee Programs within the GAI

Name	Year Approved	Signatories[a]	Area (acres)	Program Area	Credit Types
Sacramento District California In-lieu Fee Program	2018	**Corps, EPA, NMFS, State Water Board, Central Valley RWQCB, Lahontan RWQCB**	41,600,000	Limits of the Sacramento District of the Corps in California	Aquatic resources[b], vernal pools

[a] Signatories in **bold** make up the Interagency Review Team for the program (National Fish and Wildlife Foundation 2018). They are also signatories to the *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation* (Caltrans et al. 2020).
[b] Although no stream credits are available, aquatic resource credits could potentially be purchased to mitigate for stream impacts (Corps 2020).

Figure 4-5. Sacramento District California In-lieu Fee Program Aquatic Service Areas

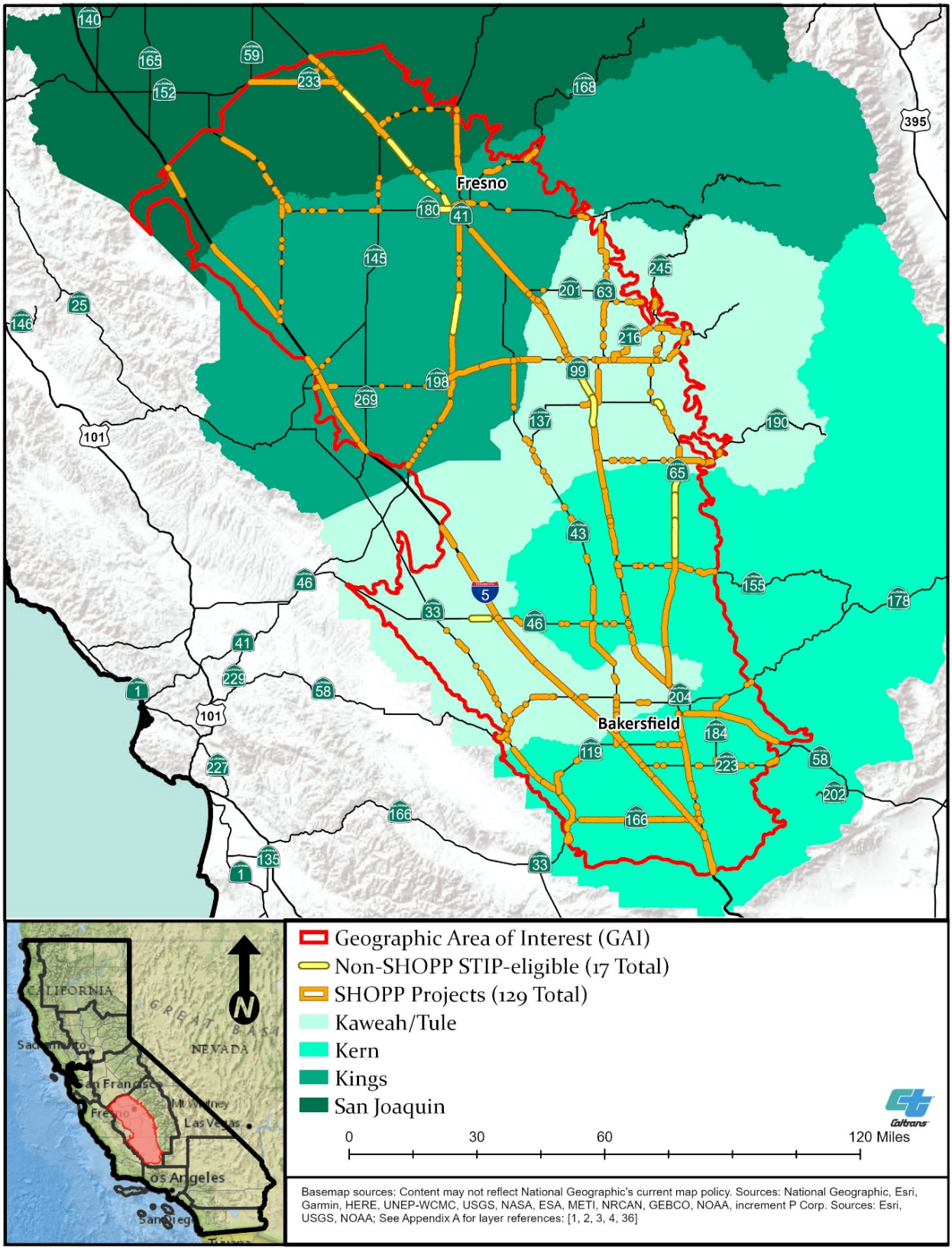
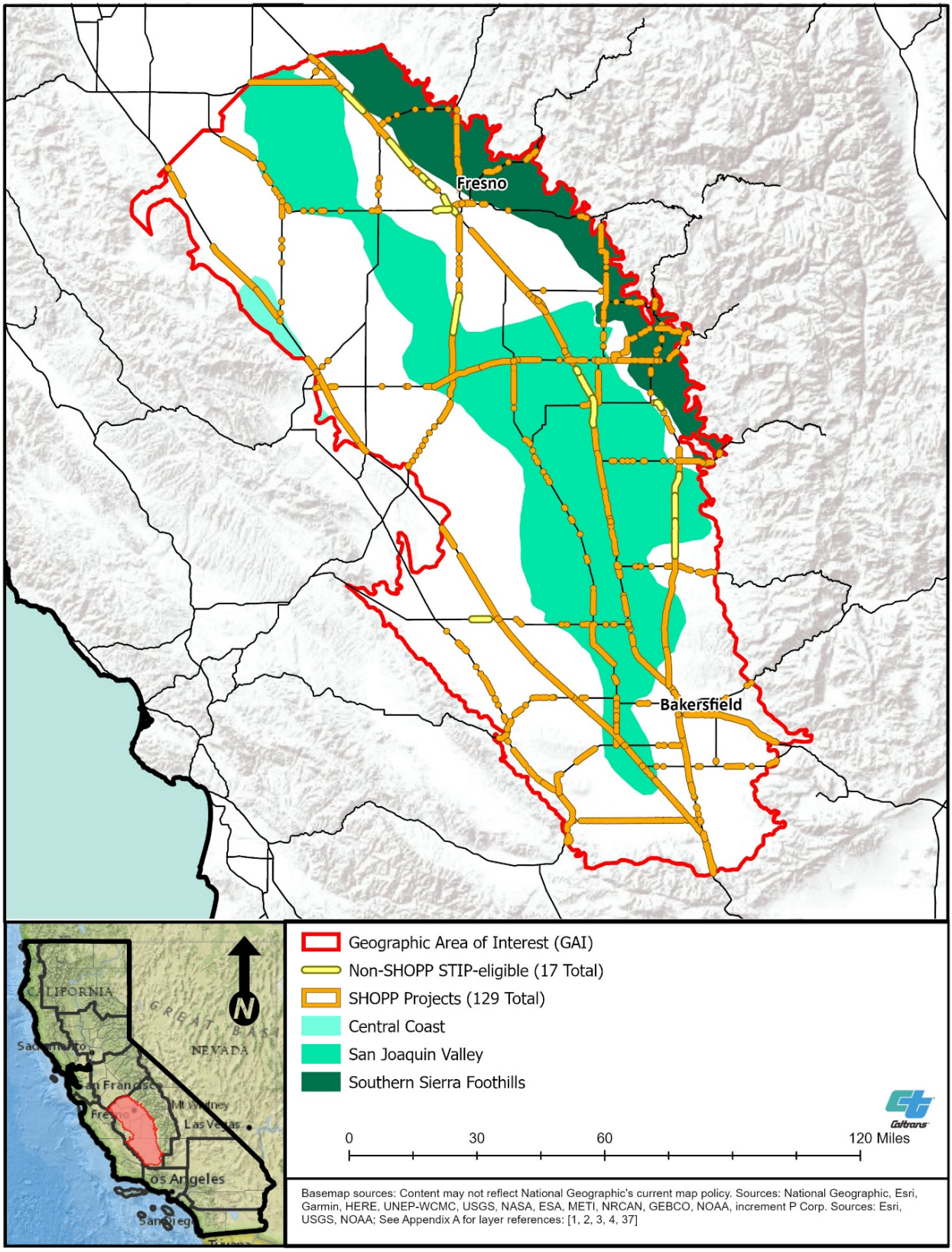


Figure 4-6. Sacramento District California In-lieu Fee Program Vernal Pool Service Areas



4.5 RCISs and MCAs

Assembly Bill 2087 established CDFW's RCIS Program in 2016 (FGC Chapter 9, § 1850, et seq.) The law set up a voluntary framework for governments and other entities to strategically plan for conservation investments in their areas, including investments performed for compensatory mitigation. To promote the conservation quality of compensatory mitigation investments, the RCIS Program provides an advance mitigation tool that can be applied to resources subject to regulations implemented by CDFW. MCAs are an advance mitigation tool that can be developed when and where an RCIS is approved by CDFW. Credits established through an MCA may be used by Caltrans as compensatory mitigation for impacts under CESA and the Lake and Streambed Alteration Program.

MCAs are not permits like HCPs and NCCPs (Section 4.2). MCA advance mitigation credits are analogous to conservation and mitigation bank credits (Section 4.3). In other words, unlike an HCP and NCCP, RCISs and MCAs are not permits for covered activities. MCAs establish mitigation credits or values. Some conservation or enhancement actions, because of their size, type, or location, would not be suitable for establishing mitigation credits through CDFW's mitigation and conservation banking program. Implementing actions on public land, such as installing wildlife crossings or removing fish passage barriers, are examples of potential enhancement actions that may establish CDFW-approved credits under an MCA and not a BEI (CDFW 2019c).

No approved RCISs are currently in the GAI; however, the Kaweah Sub-basin RCIS is in its initial phases of development. As such, no public information is currently available regarding the resources that will be covered by this RCIS. Because MCAs are issued once an RCIS has been approved, no MCAs are currently within this GAI.

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5. MODELED ESTIMATED IMPACTS

In this chapter, Caltrans documents its potential mitigation need in the GAI for fiscal years 2017/2018 to 2026/2027. Needs were based on Caltrans' anticipated SHOPP projects, regional and local STIP-eligible projects, and their estimated potential compensatory mitigation. Because the assessment is intended to inform advance mitigation project scoping, the impact estimates do not distinguish between direct or indirect, permanent or temporary impacts. Actual transportation project impacts will be determined in the future through each transportation project's environmental studies and permits.

In the sections below, Caltrans:

- Describes its approach to, and major assumptions when, estimating transportation-related advance mitigation needs in the GAI;
- Provides its estimate of potential impacts on wildlife resources for the next 10 years coincident with habitat for species of mitigation need; and
- Provides its estimate of potential aquatic resource impacts for the next 10 years from the transportation projects.

As described in Section 1.5, to focus the assessment, Caltrans District 6 identified species of mitigation need, for which results are provided below. Species of mitigation need are species for which a high probability of mitigation need is anticipated. Discussed further in Chapter 9, during advance mitigation scoping, consideration will also be given to additional special-status species that the SAMNA identified as co-occurring with the species of mitigation need, because they could potentially be affected by the same habitat impacts that affect the species of mitigation need. Further, for aquatic resources, additional consideration was given to wetlands and non-wetland waters in the sub-basins for those transportation projects that may traverse the GAI boundary.

5.1 Approach

Transportation projects eligible to use advance mitigation funded by the AMA may only be SHOPP or STIP transportation projects (SHC § 800.7; Caltrans 2019a). Hence, the advance mitigation needs for wildlife and aquatic resources in the GAI are based on Caltrans' anticipated SHOPP transportation projects; Caltrans, regional, and local STIP-eligible transportation projects; and their estimated potential compensatory mitigation. At this time:

- SHOPP transportation project needs are forecast quantitatively through the SAMNA model developed for the AMP.
- STIP-eligible needs are assessed qualitatively, through District, MPO, RTPA, and other transportation agency coordination.

Each of these is discussed briefly below.

5.1.1. SHOPP Needs Assessment

SHOPP impacts were forecast through the SAMNA. Briefly described in Section 1.4, more detailed SAMNA information is provided in the *Advanced Mitigation Needs Assessment GIS Tool Report for California Department of Transportation* (Caltrans 2018c). The SAMNA consists of an intersection of assumed transportation project footprints with natural resource layers developed for the SAMNA.

To identify the list of SHOPP projects planned for the GAI, Caltrans consulted the SHOPP Ten-Year Book (Caltrans 2019b). The intent of the SHOPP Ten-Year Book is to raise awareness of planned future transportation projects, and detailed transportation project information is not provided. It includes 129 SHOPP transportation projects in the GAI that are currently in the planning and conceptual phases (Table 5-1). Of these transportation projects, all 129 are forecast to potentially affect special-status species habitat and/or aquatic resources. An additional 16 proposed SHOPP transportation projects are located outside of the GAI, but within HUC-8 sub-basins that span the GAI boundary and may potentially affect the same aquatic resources (Table 5-2). The general locations of all 145 planned transportation projects are shown on most of the figures in this document.

Table 5-1. SHOPP Transportation Projects Potentially Affecting Special-status Species and Aquatic Resources in the GAI

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity[b]
2018/19	13384	0615000040	6	Fresno	5	0	1.7	Safety roadside rest area utilities
2018/19	13582	0614000051	6	Tulare	99	28.9	31	Headwall/Endwall
2018/19	13673	0616000003	6	Madera	99	13.1	19.6	Replace/install culverts
2018/19	15964	0615000035	6	Kern	99	0	11.2	Drainage improvements
2018/19	15965	0615000037	6	Madera	99	22.7	29.4	Shoulders – new and widening
2018/19	16000	0614000030	6	Fresno	198	14.5	18.2	Replace/install culverts
2018/19	17108	0613000243	6	Kern	5	5.6L[c]	8.8L	Bridge replacement/new construction
2018/19	20700	0600000973	6	Madera	99	R7.5[d]	15.1	Shoulders – new and widening
2019/20	13250	0614000058	6	Madera	41	6.3	9.2	Widen shoulders
2019/20	13482	0614000010	6	Kern	99	10.4	21.2	Replace/install culverts
2019/20	13547	0614000005	6	Tulare	99	19.4	NA[e]	Bridge replacement/new construction
2019/20	13704	0617000097	6	Kern	5	7.5L	9L	Replace/install culverts
2019/20	14185	0615000046	6	Fresno	5	44.4	45.4	Bridge replacement/new construction
2019/20	15883	0616000004	6	Fresno	99	R5.7	11.1	Replace/install culverts
2019/20	15963	0615000301	6	Kern	5	82	87	Replace/install culverts
2019/20	16487	0615000299	6	Kern	46	49	50.9	Bridge replacement/new construction
2019/20	16910	0616000206	6	Madera	99	9.7	NA	Replace/install culverts
2019/20	17405	0616000124	6	Kern	184	L0.9	L1.1	Roundabouts

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity[b]
2019/20	19318	0618000053	6	Fresno	145	35.2	R41.2	Replace/install culverts
2019/20	19339	0618000057	6	Kern	58	6	15.4	Replace/install culverts
2019/20	19350	0618000017	6	Kern	178	R8	50	Replace/install culverts
2019/20	19372	0618000045	6	Tulare	198	0	44	Replace/install culverts
2019/20	19373	0618000012	6	Tulare	216	R0	2.9	Replace/install culverts
2020/21	15961	0616000033	6	Kern	184	8.1	12.1	Shoulders – new and widening
2020/21	16272	0615000293	6	Tulare	245	1.4	NA	Bridge replacement/new construction
2020/21	16273	0615000295	6	Tulare	99	NA	NA	Bridge rail
2020/21	16536	0615000047	6	Kern	166	17.3	17.7	Bridge rail
2020/21	19310	0618000048	6	Fresno	5	37.2	48.8	Replace/install culverts
2020/21	19322	0618000015	6	Fresno	198	0	43	Replace/install culverts
2020/21	19331	0618000063	6	Kern	5	4.4	10.2L	Replace/install culverts
2020/21	19332	NA	6	Kern	5	10.2L	15.9L	Replace/install culverts
2020/21	19346	0617000303	6	Kern	155	0	R1.5	Replace/install culverts
2020/21	19348	0618000060	6	Kern	166	0	9	Replace/install culverts
2020/21	19349	0618000018	6	Kern	166	0	25	Replace/install culverts
2020/21	19352	NA	6	Kern	223	10.5	R20.1	Replace/install culverts
2020/21	19358	0617000304	6	Kings	41	28.4	R39.8	Replace/install culverts
2020/21	19365	0618000062	6	Tulare	63	0	5.8	Replace/install culverts
2020/21	19367	0618000044	6	Tulare	99	0	54	Replace/install culverts
2020/21	19370	0618000011	6	Tulare	99	27.6	30.6	Replace/install culverts

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity[b]
2020/21	19374	0618000016	6	Tulare	245	0	33	Replace/install culverts
2021/22	11323	0616000220	6	Tulare	99	51.6	52.2	Safety roadside rest area utilities
2021/22	13841	0616000035	6	Tulare	99	22.3	NA	Safety roadside rest area utilities
2021/22	16476	0616000208	6	Kings	41	30.6	33	Bridge replacement/new construction
2021/22	17392	0616000207	6	Madera	99	7	R7.5	Roundabouts
2021/22	17582	0617000103	6	Fresno	41	R27.6	R28.3	Replace/install culverts
2021/22	19311	0618000049	6	Fresno	5	60.1	66.1	Replace/install culverts
2021/22	19313	0618000051	6	Fresno	33	69.4	72.9	Bridge replacement/new construction
2021/22	19315	0617000306	6	Fresno	99	19.94	23.8	Bridge replacement/new construction
2021/22	19319	0618000041	6	Fresno	168	4	66	Replace/install culverts
2021/22	19335	0618000043	6	Kern	33	0	72	Replace/install culverts
2021/22	19336	0617000305	6	Kern	33	14.4	17.9	Replace/install culverts
2021/22	19338	0618000056	6	Kern	43	0.1	9.3	Replace/install culverts
2021/22	19341	0618000183	6	Kern	58	R64.4	67	Replace/install culverts
2021/22	19357	0615000309	6	Kings	41	20.08	28.4	Replace/install culverts
2021/22	19360	NA	6	Madera	99	0	30	Replace/install culverts
2021/22	19369	0617000307	6	Tulare	99	7.1	13	Replace/install culverts
2021/22	19512	NA	6	Fresno	145	0	13.4	Replace/install culverts
2021/22	19540	NA	6	Kings	198	0	26	Replace/install culverts
2021/22	19548	NA	6	Kern	5	15.9L	30	Replace/install culverts

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity[b]
2022/23	19321	0618000042	6	Fresno	180	22	138	Replace/install culverts
2022/23	19337	NA	6	Kern	33	40.4	59	Replace/install culverts
2022/23	19344	NA	6	Kern	99	2	58	Replace/install culverts
2022/23	19361	NA	6	Madera	145	8.1	12.2	Replace/install culverts
2022/23	19363	0618000061	6	Kings	43	0	3.2	Replace/install culverts
2022/23	19364	NA	6	Tulare	43	3.2	22.7	Replace/install culverts
2022/23	19368	NA	6	Tulare	99	0	7.1	Replace/install culverts
2022/23	19448	NA	6	Tulare	99	51	52	Bridge replacement/new construction
2022/23	19515	NA	6	Kern	223	1.8	10.5	Replace/install culverts
2022/23	19543	NA	6	Tulare	137	R15.4	16.6	Replace/install culverts
2022/23	19544	NA	6	Fresno	33	59.4	R62.4	Replace/install culverts
2022/23	19546	NA	6	Tulare	99	13.1	20	Replace/install culverts
2022/23	19550	NA	6	Madera	233	1.8	3.9	Replace/install culverts
2022/23	19551	NA	6	Fresno	41	0	6.2	Replace/install culverts
2022/23	19552	NA	6	Fresno	99	26.2	31.6	Replace/install culverts
2022/23	19554	NA	6	Fresno	5	10	21	Replace/install culverts
2023/24	19345	0618000059	6	Kern	99	19.5	23.6	Replace/install culverts
2023/24	19371	NA	6	Tulare	137	16.6	27.5	Replace/install culverts
2023/24	19390	NA	6	Kern	5	R0	87	Replace/install culverts
2023/24	19391	NA	6	Kern	58	0	77	Replace/install culverts
2023/24	19393	NA	6	Fresno	99	0	41	Replace/install culverts

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity[b]
2023/24	19394	NA	6	Kings	5	2	25	Replace/install culverts
2023/24	19395	NA	6	MPA	41	0	5	Replace/install culverts
2023/24	19396	NA	6	Tulare	190	2	57	Replace/install culverts
2023/24	19431	NA	6	Madera	41	0	46	Replace/install culverts
2023/24	19518	NA	6	Kern	223	21.2	31.9	Replace/install culverts
2023/24	19523	NA	6	Fresno	198	22.6	26.8	Replace/install culverts
2023/24	19531	NA	6	Fresno	33	39.8	54.4	Replace/install culverts
2023/24	19556	NA	6	Kern	99	0	10.5	Replace/install culverts
2023/24	19558	NA	6	Kern	99	R43.9L	49.4	Replace/install culverts
2023/24	19560	NA	6	Tulare	190	R14.9	19	Replace/install culverts
2023/24	19562	NA	6	Tulare	63	7.9	11.85	Replace/install culverts
2023/24	19563	NA	6	Fresno	5	0	10	Replace/install culverts
2023/24	19564	NA	6	Kern	33	17.9	21.5	Replace/install culverts
2024/25	19530	NA	6	Madera	99	23.8	23.8	Drainage improvements
2024/25	19561	NA	6	Madera	152	R0	15.6	Replace/install culverts
2024/25	19568	NA	6	Fresno	63	0	8.3	Replace/install culverts
2024/25	19569	NA	6	Madera	99	R1	9.5	Replace/install culverts
2024/25	19571	NA	6	Fresno	5	31	37.2	Replace/install culverts
2024/25	19572	NA	6	Fresno	180	81.7	109.2	Replace/install culverts
2024/25	19574	NA	6	Kern	46	33.5	46	Replace/install culverts
2025/26	19505	NA	6	Kern	155	R3.50	R4.50	Bridge replacement/new construction

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity[b]
2025/26	19524	NA	6	Kern	99	26.6	26.9	Replace/install culverts
2025/26	19533	NA	6	Tulare	99	40.8	40.8	Replace/install culverts
2025/26	19535	NA	6	Kern	58	15.4	27.8	Replace/install culverts
2025/26	19538	NA	6	Kern	46	29	37	Replace/install culverts
2025/26	19539	NA	6	Fresno	41	4	34	Replace/install culverts
2025/26	19541	NA	6	Kings	41	5	49	Replace/install culverts
2025/26	19565	NA	6	Kern	65	6.9	25.16	Replace/install culverts
2025/26	19567	NA	6	Kings	198	5	R14.8	Replace/install culverts
2025/26	19579	NA	6	Kings	198	R14.8	R21.5	Replace/install culverts
2025/26	19580	NA	6	Kern	58	31.6	39.9	Replace/install culverts
2025/26	19581	NA	6	Kern	65	R0	6.9	Replace/install culverts
2025/26	19584	NA	6	Tulare	190	8	R14.9	Replace/install culverts
2026/27	19536	NA	6	Kern	33	0	16.7	Replace/install culverts
2026/27	19542	NA	6	Tulare	65	0	38	Replace/install culverts
2026/27	19545	NA	6	Madera	145	7	25	Replace/install culverts
2026/27	19553	NA	6	Kern	155	0	71	Replace/install culverts
2026/27	19566	NA	6	Kern	119	0	31	Replace/install culverts
2026/27	19570	NA	6	Tulare	201	R2	23	Replace/install culverts
2026/27	19573	NA	6	Tulare	216	3	18	Replace/install culverts
2026/27	19577	NA	6	Fresno	33	4	79	Replace/install culverts
2026/27	19578	NA	6	Fresno	180	23.5	42.6	Replace/install culverts
2026/27	19582	NA	6	Kings	43	0	18	Replace/install culverts

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity[b]
2026/27	19586	NA	6	Kern	5	52.8	62	Replace/install culverts
2026/27	19587	NA	6	Kern	223	4	29	Replace/install culverts
2026/27	19588	NA	6	Kern	46	50.8	57.78	Replace/install culverts
2026/27	19589	NA	6	Tulare	63	0	R30	Replace/install culverts
2026/27	19590	NA	6	Kern	43	2	39	Roundabouts
2026/27	19629	NA	6	Madera	99	26.3	26.8	Shoulders – new and widening

Source: Caltrans 2018a
[a] EA = expenditure authorization
[b] Activity used for impact analysis. Transportation project activities are listed in Caltrans 2019b, Table 1.
[c] L = left
[d] R = right
[e] NA = not applicable or not available

Table 5-2. SHOPP Transportation Projects Outside of the GAI, but within HUC-8 Sub-basins

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity[b]
2018/19	13553	NA[c]	6	Fresno	180	92.2	NA	Bridge rail
2019/20	13707	NA	6	Tulare	190	34.7	39.7	Replace/install culverts
2021/22	19335	NA	6	Kern	33	0	72	Replace/install culverts
2021/22	19341	NA	6	Kern	58	64.4	67	Replace/install culverts
2021/22	19547	NA	6	Tulare	190	32.2	52.8	Replace/install culverts
2022/23	19323	NA	6	Fresno	198	19.42	22.65	Replace/install culverts
2022/23	19356	NA	6	Kings	41	0	15.5	Replace/install culverts
2022/23	19555	NA	6	Madera	41	9.3	15.4	Replace/install culverts
2023/24	19330	NA	6	Kern	5	0.73	1.08	Safety roadside rest area utilities
2023/24	19467	NA	6	Fresno	198	4	5	Bridge replacement/new construction
2024/25	19534	NA	6	Fresno	245	0	8.9	Replace/install culverts
2024/25	19575	NA	6	Madera	41	15.4	22.1	Replace/install culverts
2025/26	19541	NA	6	Kings	41	5	49	Replace/install culverts
2025/26	19583	NA	6	Madera	41	22.1	34.1	Replace/install culverts
2026/27	19559	NA	6	Kings	269	0	6	Replace/install culverts
2026/27	19576	NA	6	Madera	49	0	8	Replace/install culverts

Source: Caltrans 2018a
[a] EA = expenditure authorization
[b] Activity used for impact analysis. Transportation project activities are listed in Caltrans 2019b, Table 1.
[c] NA = not applicable or not available

Each transportation project's potential impact was defined using a buffer from the edge of pavement (see Table 1 in Caltrans 2019b). Different buffer widths were used depending on the transportation project's activity. Many projects included multiple activities. In those cases, the largest buffer was assigned to the transportation project for the potential impact analysis (Tables 5-1 and 5-2). The range of buffers relevant to the transportation projects listed in the SHOPP Ten-Year Book for this GAI are provided in Table 5-3.

Table 5-3. Assumed Buffer Widths, by SHOPP Transportation Project Activity

Activity	Buffer Distance (feet)
Bridge rail	20
Bridge replacement/new construction	40
Drainage improvements	20
Headwall/endwall	20
Replace/install culverts	20
Roundabouts	40
Safety roadside rest area utilities	10
Shoulders – new and widening	15
Widen shoulders	15

Source: Caltrans 2019b, Table 1

SHOPP Potential Impacts. The AMP developed the SAMNA strictly and specifically for Caltrans' use in advance mitigation planning—that is, when Caltrans is justifying, proposing, and scoping advance mitigation projects (Caltrans 2018c, 2019b). The SAMNA model, its foundation, and assumptions are described in the *Advanced Mitigation Needs Assessment GIS Tool Report for California Department of Transportation* (Caltrans 2019b).

The SAMNA's impact estimates from District 6's planned transportation projects anticipated between fiscal years 2017/2018 and 2026/2027 are provided in the SAMNA Report (Caltrans 2019b). All results are provided in acres. The SAMNA results for estimating impacts on special-status wildlife species are also summarized later in this chapter in Section 5.2 and provided for all habitats and species in Appendix D. SAMNA results for estimating impacts on aquatic resources can be found in Section 5.3.

5.1.2. Non-SHOPP STIP-eligible Needs Assessment

At this time, STIP-eligible needs are assessed qualitatively, through coordination between the District, MPOs, RTPAs, and other public agencies that implement transportation improvements. Obtaining a reliable list of STIP transportation projects within the 10-year planning horizon is problematic because it is never known which transportation projects will be funded through the STIP until the funds are voted on by the California

Transportation Commission, at which point the transportation projects are well past their planning and conceptualization phases and entering their delivery phases. Because of this timing, funded STIP projects will likely need compensatory mitigation before the AMP can deliver the needed mitigation. AMP planning, therefore, must glean a list of transportation projects from the broader set of non-SHOPP transportation projects that may or may not receive STIP funding, such as STIP-eligible transportation projects. Additionally, the STIP is currently receiving very little funding in favor of the "fix-it-first" philosophy of the Road Repair and Accountability Act of 2017, although there is a backlog of transportation projects that potentially needs these funds.

To address the dynamic nature of the non-SHOPP STIP-eligible list, it was necessary to identify transportation projects that will be (1) reasonably certain to occur in the same 10-year time frame as the SHOPP projects used in the SAMNA and (2) highly likely to receive STIP funding. To that end, the AMP consulted the Caltrans Division of Transportation Planning's Multimodal Operations, Non-SHOPP, Transportation Equity Report database, using the criteria that a transportation project would have to be on a fiscally constrained[1] Regional Transportation Plan, with a Ready to List[2] year identified as occurring in the 10-year planning horizon. The list would be further refined through consultation with the Districts and their regional and local transportation partners (see Table 1-2 of this document for the consultation summary). Table 5-4 summarizes activities associated with each of the 17 identified non-SHOPP STIP-eligible transportation projects planned within the GAI for fiscal years 2017/2018 to 2026/2027.

Non-SHOPP STIP-eligible Potential Impacts. Once the non-SHOPP STIP-eligible projects and their activities were identified, their potential impacts were assessed qualitatively. The qualitative analysis consisted of assessing the identified non-SHOPP STIP-eligible projects in the context of the landscape in which they occur and their proximity to SHOPP projects. The potential wildlife and aquatic resources predicted to be affected were identified from the same datasets used for the SAMNA analysis, but transportation project footprints were not generated, nor areas of potential impact calculated. The potential need for additional compensatory mitigation for resources identified in the GAI is documented in Sections 5.2 and 5.3.

[1] Transportation project funding is reasonably assured.

[2] Transportation project schedule is reasonably assured. Ready to List is a named milestone within the Caltrans project delivery process. It is the point when a complete package is ready for contractors to bid on.

Table 5-4. STIP-eligible Transportation Projects

Ready to List Year	STIP Project Identifier	Caltrans District	County	Route	Begin Mile	End Mile	Activity
12/2/2023	06-0H220	6	Madera	99	1.7	R7.5[a]	Lane widening – 4 to 6 lane
7/1/2021	06-0H360	6	Fresno	99	28.8	30.1	New interchange
3/1/2024	06-0S370	6	Fresno	41	R0.1	R7.1	Lane widening – 2 to 4 lane
3/1/2022	06-0U880	6	Tulare	99	26.3	27.6	Construct interchange
10/2/2027	06-0Y360	6	Madera	99	15.1	19.9	Lane widening – 4 to 6 lane
4/1/2024	06-32760	6	Madera	41	35.2	36.4	Lane widening – 2 to 4 lane
10/1/2020	06-34235	6	Fresno	180	53.4	R56	Highway landscape planting
5/15/2020	06-36024	6	Tulare	99	30.6	35.2	Lane widening – 4 to 6 lane
8/1/2022	06-39210	6	Fresno	99	20.7	24.4	Construct northbound and southbound auxiliary lanes
4/4/2023	06-43080	6	Tulare	65	29	30.4	Realignment and operational improvements
8/8/2023	06-43402	6	Tulare	65	R10.9	15.6	Lane widening – 2 to 4 lane
7/1/2024	06-43403	6	Tulare	65	R6.1	R11.4	Lane widening – 2 to 4 lane
7/1/2028	06-43404	6	Tulare	65	0	R6.6	Lane widening – 2 to 4 lane
7/3/2020	06-44255	6	Kern	46	27.5	30.8	Lane widening – 2 to 4 lane
2/1/2021	06-44270	6	Fresno	99	27.3	28.3	Reconstruct interchange
10/7/2022	06-48740	6	Tulare	99	36.1	36.8	Reconstruct interchange
12/2/2023	06-48950	6	Tulare	99	25.4	30.5	Lane widening – 4 to 6 or 8 lanes

[a] R = right (north on south-to-north routes, east on west-to-east routes)

5.2 Estimated Wildlife Impacts

The quantitative results given in this document are all pursuant to the SAMNA model. Specific wildlife resource impacts will be assessed as part of each transportation project's environmental studies.

The 141 special-status terrestrial plant and wildlife species evaluated through the SAMNA consisted of federal and state threatened, endangered, or sensitive species; state fully protected or rare species; or state species of special concern (Table 2-4; Appendix D; Caltrans 2019b). Using the methods described in Section 5.1.1, impacts on 39 special-status species and 16 habitat types were estimated at 1,405 acres, from the 129 Caltrans SHOPP projects listed in Table 5-1 (Caltrans 2019b). Results are summarized in Table 5-5. The complete results of the SAMNA, inclusive of the 129 transportation projects identified in the GAI that may affect special-status plant and wildlife species, are provided in Appendix D. STIP-eligible projects are planned near planned SHOPP transportation projects, and additional mitigation need may be expected from STIP-eligible transportation projects that fall within the GAI.

Table 5-5. Summary of Estimated SHOPP Impacts on Special-status Species Habitat

Ecoregion Subsection Name	Number of Caltrans SHOPP Projects	Number of Habitats	Special-status Species	Estimated Acres
Antelope Plain	5	4	23	7.2
Elk Hills and South Valley Terraces	14	6	29	48.7
Granitic Alluvial Fans and Terraces	50	7	26	479.8
Hardpan Terraces	40	8	28	311.0
Panoche and Cantua Fans and Basins	17	6	20	115.2
South Valley Alluvium and Basins	42	14	24	317.0
Tulare Basin	9	8	20	49.9
Westside Alluvial Fans and Terraces	6	6	23	76.2
Total	**129[a]**	**16[a]**	**39[a]**	**1,405.0**

[a] Totals do not reflect numbers presented in rows above. Some SHOPP transportation projects and some habitats cross more than one subsection. The 129 transportation projects are listed in Table 5-1.

Species of mitigation need are species for whom a high probability of mitigation need is anticipated. The species of mitigation need, identified in Section 1.5, were included in the analysis, and each is discussed briefly in the subsections below: California tiger salamander, San Joaquin kit fox, giant kangaroo rat, and Fresno kangaroo rat. Since the CWHR does not contain separate home ranges for Tipton kangaroo rat or short-nosed kangaroo rat, the SAMNA forecast of Fresno kangaroo rat impacts is inclusive of Tipton

and short-nosed kangaroo rat impacts, as well. In other words, anticipated impacts on the three *Dipodomys nitratoides* are combined.

5.2.1. California Tiger Salamander

Using the methods described in Section 5.1.1, impacts on the California tiger salamander and its habitat were estimated at 72.5 acres, from 42 of the 129 Caltrans SHOPP projects listed in Table 5-1 (Caltrans 2019b). Results are summarized in Table 5-6.

Table 5-6. Estimated SHOPP Impacts on California Tiger Salamander in the GAI

Ecoregion Subsection Name	Number of Caltrans SHOPP Projects	Number of Habitats	Estimated Acres
Antelope Plain	1	1	0.06
Elk Hills and South Valley Terraces	0	0	0.00
Granitic Alluvial Fans and Terraces	16	2	13.80
Hardpan Terraces	17	2	24.40
Panoche and Cantua Fans and Basins	2	1	0.08
South Valley Alluvium and Basins	0	0	0.00
Tulare Basin	0	0	0.00
Westside Alluvial Fans and Terraces	6	2	34.20
Total	**42[a]**	**3[a]**	**72.50**

[a] Totals do not reflect numbers presented in rows above. Some SHOPP transportation projects and some habitats cross more than one subsection.

5.2.2. San Joaquin Kit Fox

Using the methods described in Section 5.1.1, impacts on the San Joaquin kit fox and its habitat were estimated at 177.6 acres, from 94 of the 129 Caltrans SHOPP projects listed in Table 5-1 (Caltrans 2019b). Results are summarized in Table 5-7.

Table 5-7. Estimated SHOPP Impacts on San Joaquin Kit Fox

Ecoregion Subsection Name	Number of Caltrans SHOPP Projects	Number of Habitats	Estimated Acres
Antelope Plain	5	3	4.4
Elk Hills and South Valley Terraces	13	4	17.7
Granitic Alluvial Fans and Terraces	14	3	8.1
Hardpan Terraces	22	3	29.6
Panoche and Cantua Fans and Basins	4	2	3.8
South Valley Alluvium and Basins	25	5	53.2
Tulare Basin	5	2	1.0
Westside Alluvial Fans and Terraces	6	3	59.8
Total	**94[a]**	**7[a]**	**177.6**

[a] Totals do not reflect numbers presented in rows above. Some SHOPP transportation projects and some habitats cross more than one subsection.

5.2.3. Giant Kangaroo Rat

Using the methods described in Section 5.1.1, impacts on the giant kangaroo rat and its habitat were estimated at 109.2 acres, from 33 of the 129 Caltrans SHOPP projects (Caltrans 2019b). Results are summarized in Table 5-8.

Table 5-8. Estimated SHOPP Impacts on Giant Kangaroo Rat

Subsection Name	Number of Caltrans SHOPP Projects	Number of Habitats	Estimated Acres
Antelope Plain	5	3	4.4
Elk Hills and South Valley Terraces	12	3	16.2
Granitic Alluvial Fans and Terraces	0	0	0.0
Hardpan Terraces	0	0	0.0
Panoche and Cantua Fans and Basins	4	1	3.8
South Valley Alluvium and Basins	18	3	47.7
Tulare Basin	0	0	0.0
Westside Alluvial Fans and Terraces	5	2	37.1
Total	**33[a]**	**3[a]**	**109.2**

[a] Totals do not reflect numbers presented in rows above. Some SHOPP transportation projects and some habitats cross more than one subsection.

5.2.4. Fresno Kangaroo Rat

As stated above, the SAMNA forecast of Fresno kangaroo rat impacts is inclusive of those for Fresno kangaroo rat, Tipton kangaroo rat, and short-nosed kangaroo rat. Using the methods described in Section 5.1.1, impacts on these species and their habitat were estimated at 160 acres, from 83 of the 129 Caltrans SHOPP projects listed in Table 5-1 (Caltrans 2019b). Results are summarized in Table 5-9.

Table 5-9. Estimated SHOPP Impacts on Fresno Kangaroo Rat[a]

Subsection Name	Number of Caltrans SHOPP Projects	Number of Habitats	Estimated Acres
Antelope Plain	5	3	4.4
Elk Hills and South Valley Terraces	13	3	16.2
Granitic Alluvial Fans and Terraces	20	2	14.6
Hardpan Terraces	6	1	8.8
Panoche and Cantua Fans and Basins	5	2	3.9
South Valley Alluvium and Basins	25	4	51.3
Tulare Basin	3	1	0.9
Westside Alluvial Fans and Terraces	6	3	59.6
Total	**83[b]**	**5[b]**	**159.7**

[a] Since the CWHR does not contain separate home ranges for Tipton kangaroo rat or short-nosed kangaroo rat, the SAMNA forecast of Fresno kangaroo rat impacts includes Tipton kangaroo rat and short-nosed kangaroo impacts, as well.

[b] Totals do not reflect numbers presented in rows above. Some SHOPP transportation projects and some habitats cross more than one subsection.

5.2.5. Other Special-status Species

The selected species of mitigation need identified for this GAI focus the assessment on species that District 6 is likely to need mitigation credits for over the next 10 years, and therefore revolve the AMA in the timely manner. However, several other special-status species share habitat with the species of mitigation need, could also potentially be affected by Caltrans transportation projects, and could potentially benefit from Caltrans advance mitigation projects.

Caltrans intends to improve the conservation benefits of mitigation funded through the AMA by considering other special-status species with the potential to co-occur in habitat during advance mitigation scoping. Using the methods described in Section 5.1.1, the SAMNA forecast impacts on an additional 111 special-status terrestrial species that potentially use the same habitats and could benefit from AMA-funded mitigation (see Table 5-11 at the end of this section).

As just one example of a potential co-benefitting species, consider Nelson's antelope ground squirrel (*Ammospermophilus nelson*), a species that co-occurs with the species of mitigation need. Estimated SHOPP impacts on Nelson's antelope ground squirrel for the entire GAI are summarized in Table 5-10. Of these impacts, 118.8 acres of Nelson's antelope squirrel habitat impacts co-occur with species of mitigation need impacts. Through advance mitigation scoping, Caltrans could seek to initiate purchasing or establishing mitigation credits that would address Nelson's antelope ground squirrel mitigation credits, as well as species of mitigation need credits. When considered in the context of the whole GAI, an AMA-funded advance mitigation project could address up to approximately 84 percent of the potential impacts on Nelson's antelope ground squirrel (118.8 acres divided by 141.5 acres).

Table 5-10. Estimated SHOPP Impacts on Nelson's Antelope Ground Squirrel

Subsection Name	Number of Caltrans SHOPP Projects	Number of Habitats	Estimated Acres
Antelope Plain	5	2	4.43
Elk Hills and South Valley Terraces	13	3	16.20
Granitic Alluvial Fans and Terraces	1	1	0.20
Hardpan Terraces	2	1	6.79
Panoche and Cantua Fans and Basins	5	2	3.85
South Valley Alluvium and Basins	24	3	50.20
Tulare Basin	1	1	0.03
Westside Alluvial Fans and Terraces	6	3	59.80
Total	**38[a]**	**4[a]**	**141.50**

[a] Totals do not reflect numbers presented in rows above. Some SHOPP transportation projects and some habitats cross more than one subsection.

Table 5-11. Estimated SHOPP Impacts on Special-status Species in Species of Mitigation Need Habitat (acres)

Common Name	Species Name	Status	Alkali Desert Scrub	Annual Grassland	Barren	Desert Riparian	Desert Scrub	Eucalyptus	Lacustrine	Valley Foothill Riparian
Species of Mitigation Need	See below	See below	3.79	165.58	4.07	0.12	0.04	1.1	0.52	6.36
California tiger salamander	*Ambystoma californiense*	FT, ST	0	70.95	0	0	0	0	0.04	1.56
San Joaquin kit fox[a]	*Vulpes macrotis mutica*	FE, ST[a]	3.79	142.09	4.07	0.12	0.04	0	0	4.82
Giant kangaroo rat	*Dipodomys ingens*	FE, SE	3.17	102.55	3.52	0	0	0	0	0
Fresno kangaroo rat[b]	*Dipodomys nitratoides*	FE, SE[b]	3.79	128.52	3.82	0	0	1.1	0	0
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Bakersfield cactus	*Opuntia basilaris* var. *treleasei*	FE, SE	0	163.88	0	0	0	0	0	0
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	FS, SE	0	164.24	0	0	0	0	0	0
Braunton's milk-vetch	*Astragalus brauntonii*	FE	0	2.93	0	0	0	0	0	0
California jewelflower	*Caulanthus californicus*	FE, SE	0	163.88	0	0	0	0	0	0
California Orcutt grass	*Orcuttia californica*	FE, SE	0	2.93	0	0	0	0	0	0
Chinese camp brodiaea	*Brodiaea pallida*	FT, SE	0	0.48	0	0	0	0	0	0
Colusa grass	*Neostapfia colusana*	FT, SE	0	163.88	0	0	0	0	0	0
Conejo dudleya	*Dudleya parva*	FT	0	2.93	0	0	0	0	0	0
Congdon’s lewisia	*Lewisia congdonii*	FS, SR	0	0.48	0	0	0	0	0	0
Congdon's woolly sunflower	*Eriophyllum congdonii*	FS, SR	0	0.48	0	0	0	0	0	0
Dwarf goldenstar	*Bloomeria humilis*	FS, SR	0	32.33	0	0	0	0	0	0
Greene’s tuctoria	*Tuctoria greenei*	FE, SR	0	163.88	0	0	0	0	0	0
Hairy Orcutt grass	*Orcuttia pilosa*	FE, SE	0	163.88	0	0	0	0	0	0
Hartweg’s golden sunburst	*Pseudobahia bahiifolia*	FE, SE	0	0.48	0	0	0	0	0	0
Hoover’s spurge	*Euphorbia hooveri*	FT	0	163.88	0	0	0	0	0	0
Kaweah brodiaea	*Brodiaea insignis*	FS, SE	0	8.64	0	0	0	0	0	0
Keck’s checkerbloom	*Sidalcea keckii*	FE	0	8.73	0	0	0	0	0	0
Kern mallow	*Eremalche parryi* ssp. *kernensis*	FE	0	163.88	0	0	0	0	0	0
Lyon’s pentachaeta	*Pentachaeta lyonii*	FE, SE	0	2.93	0	0	0	0	0	0
Palmate-bracted bird’s-beak	*Chloropyron palmatum*	FE, SE	0	163.88	0	0	0	0	0	0
Red Hills vervain	*Verbena californica*	FT, ST	0	0.48	0	0	0	0	0	0
Roderick’s fritillary	*Fritillaria roderickii*	SE	0	35.26	0	0	0	0	0	0
San Benito evening-primrose	*Camissonia benitensis*	FT	0	32.33	0	0	0	0	0	0
San Fernando Valley spineflower	*Chorizanthe parryi* var. *fernandina*	FPT, FS, SE	0	2.93	0	0	0	0	0	0

Common Name	Species Name	Status	Alkali Desert Scrub	Annual Grassland	Barren	Desert Riparian	Desert Scrub	Eucalyptus	Lacustrine	Valley Foothill Riparian
San Joaquin adobe sunburst	*Pseudobahia peirsonii*	FT, SE	0	165.58	0	0	0	0	0	0
San Joaquin Valley Orcutt grass	*Orcuttia inaequalis*	FT, SE	0	164.24	0	0	0	0	0	0
San Joaquin woollythreads	*Monolopia congdonii*	FE	0	163.88	0	0	0	0	0	0
Spreading navarretia	*Navarretia fossalis*	FT	0	2.93	0	0	0	0	0	0
Springville clarkia	*Clarkia springvillensis*	FT, SE	0	8.64	0	0	0	0	0	0
Striped adobe-lily	*Fritillaria striata*	FS, ST	0	8.64	0	0	0	0	0	0
Succulent owl's-clover	*Castilleja campestris* var. *succulenta*	FT, SE	0	165.58	0	0	0	0	0	0
Invertebrates	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Longhorn fairy shrimp	*Branchinecta longiantenna*	FE	0	0.07	0	0	0	0	0	0
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	0	0	0	0	0	0	0	0.5
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT	0	68.86	0	0	0	0	0	0
Vernal pool tadpole shrimp	*Lepidurus packardi*	FE	0	32.72	0	0	0	0	0	0
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
California newt	*Taricha torosa*	SSC	0	3.81	0	0	0	0	0	0
California red-legged frog	*Rana draytonii*	FT, SSC	0	44.69	0	0	0	0	0	0
Foothill yellow-legged frog	*Rana boylii*	FS, SCT, SSC[c]	0	55.46	0	0	0	0	0	0
Western spadefoot	*Spea hammondii*	FS, SSC	3.79	165.36	0	0	0	1.1	0.52	0
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Blainville's horned lizard	*Phrynosoma blainvillii*	FS, SSC	3.79	165.58	0	0	0	1.1	0	6.36
Blunt-nosed leopard lizard	*Gambelia sila*	FE, SE, SFP	3.79	135.36	3.77	0	0.04	0	0	4.57
California legless lizard	*Anniella pulchra*	FS, SSC	0	0	0	0	0.04	1.1	0	6.36
California mountain kingsnake[d]	*Lampropeltis zonata*	FS[c,d]	0	10.95	0	0	0	0	0	0
Coachwhip	*Masticophis [Coluber] flagellum*	SSC	3.79	140.85	0	0.12	0.04	1.1	0	6.2
Giant gartersnake	*Thamnophis gigas*	FT, ST	0	101.73	0	0	0	0	0.01	0.54
Ring-necked snake	*Diadophis punctatus*	FS[c]	0	16.4	0	0	0.04	0	0	0
Two-striped gartersnake	*Thamnophis hammondii*	FS, SSC	0	37.32	0	0	0	0	0	0
Western patch-nosed snake	*Salvadora hexalepis*	SSC[c]	0.2	55.44	1.8	0	0	0.09	0	3.86
Birds	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
American white pelican	*Pelecanus erythrorhynchos*	SSC	0	0	0	0	0	0	0.26	0
Bald eagle	*Haliaeetus leucocephalus*	FS, SE, SFP, SFS	0	165.58	4.07	0.12	0	1.1	0.52	6.36

Common Name	Species Name	Status	Alkali Desert Scrub	Annual Grassland	Barren	Desert Riparian	Desert Scrub	Eucalyptus	Lacustrine	Valley Foothill Riparian
Burrowing owl	*Athene cunicularia*	FS, SSC	3.79	165.58	4.07	0.12	0.04	1.1	0	6.36
California condor	*Gymnogyps californianus*	FE, SE, SFP, SFS	0	34.77	0.06	0	0	0	0	0
Fulvous whistling-duck	*Dendrocygna bicolor*	SSC	0	0	0	0	0	0	0.23	0
Golden eagle	*Aquila chrysaetos*	FS, SFP, SFS[c]	3.79	165.58	4.07	0.12	0.04	1.1	0	6.36
Grasshopper sparrow	*Ammodramus savannarum*	SSC	0	123.51	0	0	0	0	0	0
Great blue heron	*Ardea herodias*	SFS[c]	0	165.58	0	0.12	0	1.1	0.52	6.36
Great egret	*Ardea alba*	SFS[c]	0	165.58	0	0.12	0	1.1	0.52	6.36
Lesser sandhill crane[e]	*Antigone [Grus] canadensis canadensis*[c,e]	SSC	0	43.72	0	0	0	0	0.26	0.86
Loggerhead shrike	*Lanius ludovicianus*	SSC	3.79	165.58	4.07	0.12	0.04	1.1	0	6.36
Long-eared owl	*Asio otus*	SSC	0	56.11	0	0	0	0	0	0
Mountain plover	*Charadrius montanus*	FS, SSC	0	46.14	1.31	0	0	0	0	0
Northern harrier	*Circus hudsonius*	SSC	3.79	165.58	4.07	0.12	0.04	1.1	0.52	6.36
Oregon vesper sparrow[f]	*Pooecetes gramineus affinis*	SSC[f]	0	101.25	0	0	0	0	0	0
Osprey	*Pandion haliaetus*	SFS	3.75	108.38	0.98	0.12	0.04	1.1	0.26	4.54
Peregrine falcon	*Falco peregrinus*	SFP, SFS	0	165.58	4.07	0.12	0	1.1	0.52	6.36
San Joaquin Le Conte's thrasher[g]	*Toxostoma lecontei macmillanorum*	FS, SSC[c,g]	0.04	0	0	0	0	0	0	0
Sandhill crane[e]	*Antigone [Grus] canadensis*[c]	FS, SFP, ST[e]	0	165.58	0	0	0	0	0.52	6.36
Short-eared owl	*Asio flammeus*	SSC	3.79	165.58	0	0.12	0.04	1.1	0	6.36
Snowy plover (interior population)[h]	*Charadrius nivosus*	SSC[c,h]	0	0	1	0	0	0	0.15	0
Swainson's hawk	*Buteo swainsoni*	FS, ST	0	163.98	2.58	0	0.04	1.1	0	6.36
Tricolored blackbird	*Agelaius tricolor*	FS, ST, SSC[c]	0	165.58	0	0	0	1.1	0	6.36
White-tailed kite	*Elanus leucurus*	FS, SFP	3.79	165.58	4.07	0	0.04	1.1	0	6.36
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC	0	165.58	0	0	0	0	0.52	0
Mammals	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
American badger	*Taxidea taxus*	SSC[c]	3.79	165.58	4.07	0.12	0.04	1.1	0	6.36
California pocket mouse	*Chaetodipus californicus*	SSC	0	56.11	0	0	0	0	0	0
Fringed myotis	*Myotis thysanodes*	FS[a]	0	54.56	1.3	0	0	0	0	3.73
Kit fox[a]	*Vulpes macrotis*	FE, ST[a]	3.79	142.09	4.07	0.12	0.04	0	0	4.82
Long-eared myotis	*Myotis evotis*	FS	0	0	0.06	0	0	0	0	3.73
Nelson's antelope ground squirrel	*Ammospermophilus nelsoni*	FS, ST	3.79	111.53	3.52	0	0	0	0	0

Common Name	Species Name	Status	Alkali Desert Scrub	Annual Grassland	Barren	Desert Riparian	Desert Scrub	Eucalyptus	Lacustrine	Valley Foothill Riparian
Northern river otter	*Lontra canadensis*	SSC	0	0	0	0	0	0	0	0.34
Ornate shrew[i]	*Sorex ornatus*	FE, SSC[i]	0	165.58	0	0	0	1.1	0	6.36
Pallid bat	*Antrozous pallidus*	FS, SSC	3.79	165.58	4.07	0.12	0.04	1.1	0	6.36
Ringtail	*Bassariscus astutus*	SFP[c]	0.04	100.32	0.96	0	0.04	0	0	3.92
San Joaquin pocket mouse	*Perognathus inornatus*	FS	0	164.75	4.07	0	0	0	0	0
Small-footed myotis	*Myotis ciliolabrum*	FS	0.04	56.69	0.06	0	0.04	0	0	3.73
Southern grasshopper mouse[j]	*Onychomys torridus*	FS, SSC[j]	3.79	138.54	0	0.12	0.04	0	0	6.2
Spotted bat	*Euderma maculatum*	FS, SSC	0	24.34	0	0	0.04	0	0	0.15
Townsend's big-eared bat	*Corynorhinus townsendii*	FS, SSC	3.79	165.58	4.07	0.12	0.04	1.1	0	6.36
Western mastiff bat	*Eumops perotis*	FS, SSC	3.72	160.21	3.86	0.12	0.04	1.1	0	5.94
Western red bat	*Lasiurus blossevillii*	SSC	0	165.58	0	0	0	1.1	0.52	6.36
Yuma myotis	*Myotis yumanensis*	FS	3.79	165.58	0	0.12	0.04	1.1	0.52	6.36

Notes: FE = federally endangered, FPT = federal proposed threatened, FS = federal sensitive (USFS and/or BLM sensitive), FT = federally threatened, SCE = state candidate endangered, SCT = state candidate threatened, SE = state endangered, SFP = state fully protected, SFS = state fire sensitive, SR = state rare, SSC = species of special concern (CDFW), ST = state threatened

[a] Since it is a species of mitigation need, San Joaquin kit fox is listed above, under the header. Kit fox and San Joaquin kit fox estimates may refer to the same population and subspecies.

[b] This species includes the following subspecies: Fresno (*D.n. exilis*), Tipton (*D.n. nitratoides*), and short-nosed (*D.n. brevinasus*). Short-nosed is FS and SSC and Fresno is likely extinct because there are no known populations.

[c] Latin name or regulatory status has changed since August 20, 2019, when the SAMNA model was run (Caltrans 2019b).

[d] California [Coast] mountain kingsnake. Updated taxonomy and added status (California mountain kingsnake has been split from coast mountain kingsnake; California has no special status, coast is currently listed as BLM and USFS Sensitive).

[e] Sandhill crane. Both greater sandhill crane and lesser sandhill crane subspecies occur in the GAI. Status provided for "sandhill crane" applies to greater sandhill crane.

[f] Vesper sparrow and Oregon vesper sparrow estimates may refer to the same population and subspecies.

[g] Le Conte's thrasher and San Joaquin Le Conte's thrasher estimates may refer to the same population and subspecies.

[h] Snowy plover. Interior population only. Coastal beach-nesting birds are FT and SSC and do not occur in the GAI.

[i] Ornate shrew. There are five special-status subspecies of ornate shrew. Only the Buena Vista Lake subspecies occurs in the GAI.

[j] Southern grasshopper mouse. There are two special-status species, and only the Tulare subspecies occurs in the GAI.

5.3 Estimated Aquatic Resources Impacts

The quantitative results given in this document are all pursuant to the SAMNA model. Specific aquatic resource impacts will be assessed as part of each transportation project's environmental studies.

Below, estimated aquatic resource impacts are presented for the nine HUC-8 sub-basins that are within or span the GAI boundary and may potentially affect the same aquatic resources. Aquatic resources impacts are categorized as potential impacts on special-status fish, wetlands, and non-wetland waters. Vernal pools are also discussed. Note that there is a HUC-8 sub-basin that overlaps the GAI and is not represented in the model results (Panoche – San Luis Reservoir) because no District 6 project impacts are anticipated in this watershed (the HUC-8 sub-basin overlaps the GAI only minimally).

5.3.1. Estimated Impacts on Special-status Fish Species

No impacts on special-status fish habitat were estimated for the 145 SHOPP transportation projects listed in Tables 5-1 and 5-2 (Caltrans 2019b). Since no impacts on special-status fish habitat are anticipated, they will not be analyzed further.

5.3.2. Estimated Impacts on Wetlands

Wetland resources are mapped in Appendix F. Using the methods described in Section 5.1.1, impacts on wetlands were estimated at 10.4 acres, from 27 of the 145 Caltrans SHOPP transportation projects listed in Tables 5-1 and 5-2 (Caltrans 2019b). Results are summarized in Table 5-12. STIP-eligible projects are planned near planned SHOPP transportation projects and may potentially affect the same wetland resources; additional mitigation need may be expected from STIP-eligible transportation projects that fall within the HUC-8 sub-basins.

Note the SAMNA's wetland layers provide output that appears similar to its terrestrial output, in that the results are provided in terms of wetlands. Wetland forecasts based on the SAMNA's wetland layer, however, are considered more certain than wetland forecasts based on the SAMNA's terrestrial habitat layers; hence, the wetland estimates below are based solely on the SAMNA's wetland data layer (Caltrans 2019b).

Table 5-12. Summary of SHOPP Impacts on Wetlands (acres) in the GAI

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects (HUC-8)[a]	Freshwater Emergent Wetland	Freshwater Forested/ Shrub Wetland	Estimated Acres
Fresno River	18040007	5	0.49	0.04	**0.52**
Middle Kern-Upper Tehachapi-Grapevine	18030003	13	0.44	2.43	**2.87**
Middle San Joaquin-Lower Chowchilla	18040001	8	4.69	0.34	**5.03**
Tulare Lake Bed	18030012	13	1.14	0.44	**1.58**
Upper Deer-Upper White	18030005	3	0.01	0.00	**0.01**
Upper Dry	18030009	2	0.02	0.00	**0.02**
Upper Kaweah	18030007	5	0.02	0.04	**0.06**
Upper Poso	18030004	1	0.01	0.00	**0.01**
Upper Tule	18030006	5	0.10	0.15	**0.25**
	Total	**27[b]**	**6.90**	**3.40**	**10.40**

[a] Includes transportation projects located outside of GAI, but within a HUC-8 that overlaps the GAI.
[b] Totals do not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one HUC-8.

Estimated Impacts on Vernal Pools. Critical habitat for seven vernal pool species is shown on Figure 2-7, and vernal pool location information available in CDFW's BIOS mapping is shown in Figure 2-13. Usually Caltrans avoids vernal pools; however, a number of planned SHOPP and STIP-eligible transportation projects are proximate to the areas displayed. The SAMNA does not directly estimate vernal pool impacts, but vernal pool impacts can be estimated by proxy using the SAMNA forecast impacts on vernal pool crustacean habitat. Using the methods described in Section 5.1.1, impacts on vernal pools can be inferred from estimates of the 129 SHOPP transportation projects located within the GAI and listed in Table 5-1 (Appendix D; Caltrans 2019b):

- 1 acre of longhorn fairy shrimp habitat impact, from 1 SHOPP transportation project
- 68.9 acres of vernal pool fairy shrimp habitat impact, from 34 SHOPP transportation projects
- 32.7 acres of vernal pool tadpole shrimp habitat impacts, from 8 SHOPP transportation projects

It should be noted that many, if not all, of these impacts overlap; they are not additive.

5.3.3. Estimated Impacts on Non-wetland Waters

Water resources are mapped in Appendix F. Using the methods described in Section 5.1.1, impacts on non-wetland waters were estimated at 85.8 acres, from 114 of the 145 Caltrans SHOPP transportation projects listed in Tables 5-1 and 5-2 (Caltrans 2019b). Results are summarized in Table 5-13. STIP-eligible projects are planned near planned SHOPP transportation projects and may potentially affect the same non-wetland water resources; additional mitigation need may be expected from STIP-eligible transportation projects that fall within the HUC-8 sub-basins that intersect the GAI.

Table 5-13. Summary of Estimated SHOPP Impacts on Non-wetland Waters (acres) in the HUCs

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects (HUC-8)[a]	Canal/ Ditch	Lake/ Pond	Reservoir	Stream/ River	Wash	Estimated Acres
Fresno River	18040007	8	0.76	0.00	0.00	1.53	0.00	**2.3**
Middle Kern Upper Tehachapi Grapevine	18030003	28	4.77	0.03	0.52	39.20	0.06	**44.6**
Middle San Joaquin-Lower Chowchilla	18040001	13	3.08	0.04	0.00	0.53	0.00	**3.6**
Tulare Lake Bed	18030012	37	4.98	1.15	0.00	12.30	0.00	**18.5**
Upper Deer-Upper White	18030005	6	0.17	0.07	0.00	0.87	0.00	**1.1**
Upper Dry	18030009	19	4.76	0.00	0.00	4.06	0.00	**8.8**
Upper Kaweah	18030007	19	2.55	0.06	0.15	1.31	0.00	**4.1**
Upper Poso	18030004	7	0.25	0.00	0.00	0.71	0.00	**1.0**
Upper Tule	18030006	11	1.11	0.04	0.00	0.75	0.00	**1.9**
	Total	**114[b]**	**22.40**	**1.40**	**0.67**	**61.30**	**0.06**	**85.8**

[a] Includes transportation projects located outside of GAI, but within a HUC-8 that overlaps the GAI

[b] Totals do not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one HUC-8.

6. BENEFITING TRANSPORTATION PROJECT CONSIDERATIONS

Benefiting transportation projects are transportation projects whose delivery schedules benefit from advance mitigation credits. Potentially benefiting transportation projects were identified in Chapter 5 for advance mitigation planning to guide advance mitigation scoping. Actual benefiting transportation projects will be determined in the future. Caltrans and relevant resource agencies shall evaluate the appropriateness of using advance mitigation credits on a case-by-case basis as part of each future transportation project's permitting and technical assistance processes.

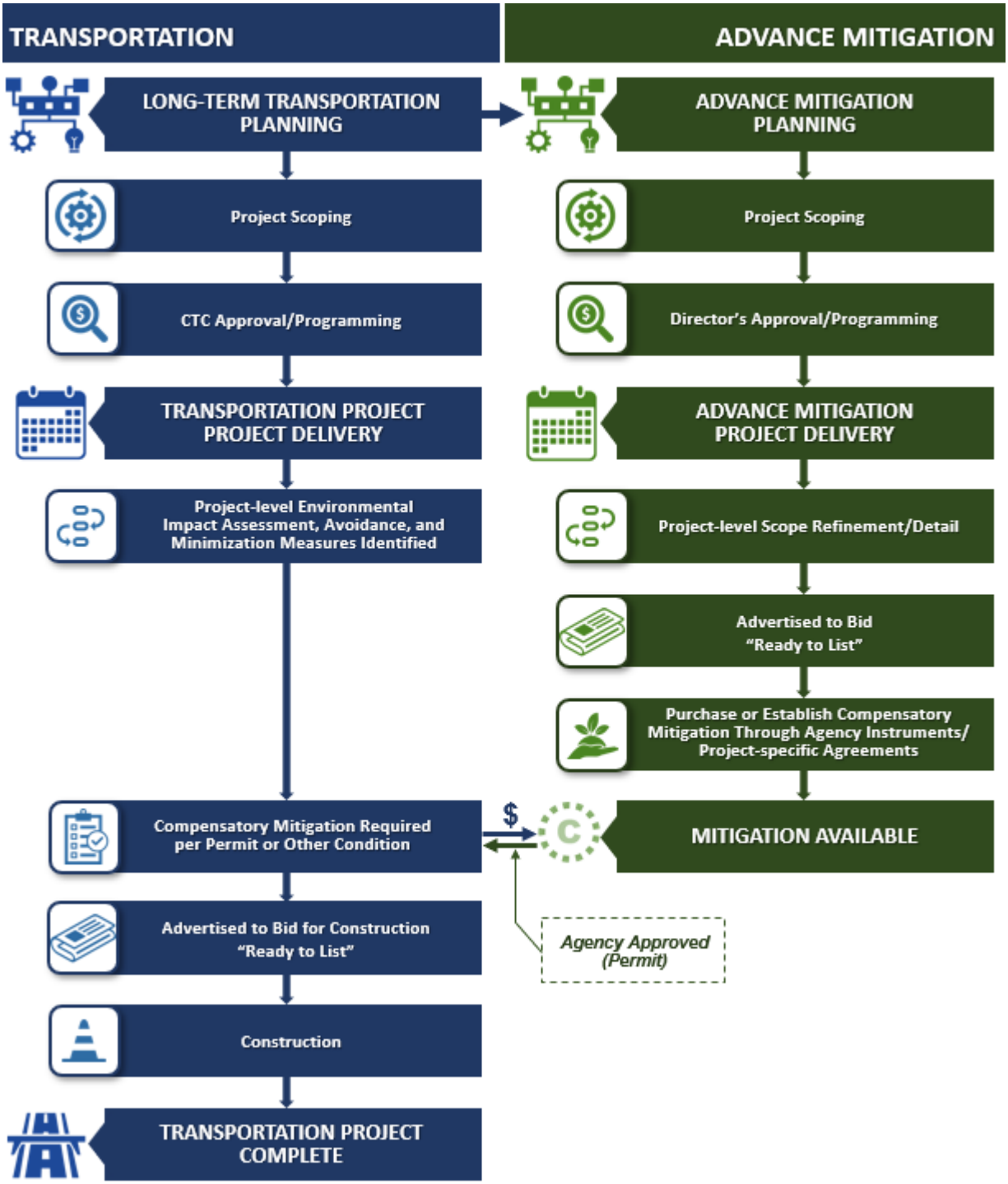
In this chapter, Caltrans summarizes the scheduling considerations and constraints of potential benefiting transportation projects. A time frame for the need for forecast mitigation is provided and analyzed. The potentially benefiting transportation projects' acceleration priorities are documented in this chapter.

6.1 Why Timing is Important

Broadly speaking, an advance mitigation project consists of (1) purchasing compensatory mitigation that has been previously approved by the resource agencies through a conservation/mitigation bank, HCP/NCCP, or in-lieu fee program; or (2) establishing and receiving approval of compensatory mitigation credits, such as establishing a mitigation bank in accordance with existing laws, policies, procedures, templates, and guidance. The time it takes to perform each authorized activity varies; however, purchasing compensatory mitigation would likely take less time than establishing compensatory mitigation.

Caltrans transportation projects must have permits and compensatory mitigation lined up before advertising and selecting a contractor to bid upon and construct a transportation project (Figure 6-1). Hence, for advance mitigation scoping, the District's selection of a specific advance mitigation project type will be contingent, in part, on the anticipated timing of the potentially benefiting transportation project impacts. This is because, to benefit transportation projects as intended, the compensatory mitigation purchased or established through an advance mitigation project will need to be available to meet actual transportation project permit conditions established through an environmental study and document process undertaken prior to the transportation project incurring impacts (Figure 6-1). The date when a Caltrans potential transportation project is expected to be Ready to List (that is, the project has been approved to be advertised to bid for construction) is an appropriate estimate for identifying when a Caltrans advance mitigation project will need to deliver compensatory mitigation to a potential benefiting transportation project.

Figure 6-1. Timing Advance Mitigation with Transportation Project Delivery



6.2 Patterns of Estimated Potential Impacts

Given that the planning horizon for this assessment covers the 2017/2018 through 2026/2027 fiscal years, and that some of the transportation projects may have already gone to bid, it is necessary to consider which of the transportation projects:

- Would need to acquire compensatory mitigation before the AMP can deliver;
- Would need compensatory mitigation delivered in a nearer time frame, which may favor seeking already existing credits; or
- Would need compensatory mitigation farther out in time, and whether there is time to establish new compensatory mitigation.

Initial estimated impact patterns are based on the planned transportation project information provided in Table 5-1.

- As shown in Tables 6-1 to 6-4 and in Figure 6-2, when the SHOPP transportation projects identified previously have their forecast species of mitigation need impacts examined relative to their expected advertising date, the compensatory mitigation needs are clustered in the middle of the 10-year planning horizon.
- As shown in Tables 6-5 and 6-6 and in Figure 6-3, when the SHOPP transportation projects identified previously have their aquatic resource impacts examined relative to their expected advertising date, the compensatory mitigation needs are also clustered in the middle of the of the 10-year planning horizon.

Spatially, these transportation projects are distributed throughout the GAI (Figure 6-4).

Table 6-1. Estimated Impacts on California Tiger Salamander, by Transportation Project Delivery Year

Expected Advertisement Year	Number of Transportation Projects	Estimated Potential Impacts (acres)	Forecast Percentage	Forecast Cumulative Percentage
2018/19	2	9.1	13	13
2019/20	2	6.9	9	22
2020/21	3	1.8	2	25
2021/22	5	7.2	10	35
2022/23	4	31.6	44	78
2023/24	5	5.5	8	86
2024/25	6	4.8	7	92
2025/26	3	4.0	6	98
2026/27	6	1.7	2	100
Total	**36**	**72.5**	**100%**	**100%**

Table 6-2. Estimated Impacts on San Joaquin Kit Fox, by Transportation Project Delivery Year

Expected Advertisement Year	Number of Transportation Projects	Estimated Potential Impacts (acres)	Forecast Percentage	Forecast Cumulative Percentage
2018/19	2	6.8	4	4
2019/20	6	11.7	7	10
2020/21	10	25.4	14	25
2021/22	9	19.5	11	36
2022/23	6	44.8	25	61
2023/24	12	41.2	23	84
2024/25	3	13.7	8	92
2025/26	9	9.1	5	97
2026/27	13	5.4	3	100
Total	**70**	**177.6**	**100%**	**100%**

Table 6-3. Estimated Impacts on Giant Kangaroo Rat, by Transportation Project Delivery Year

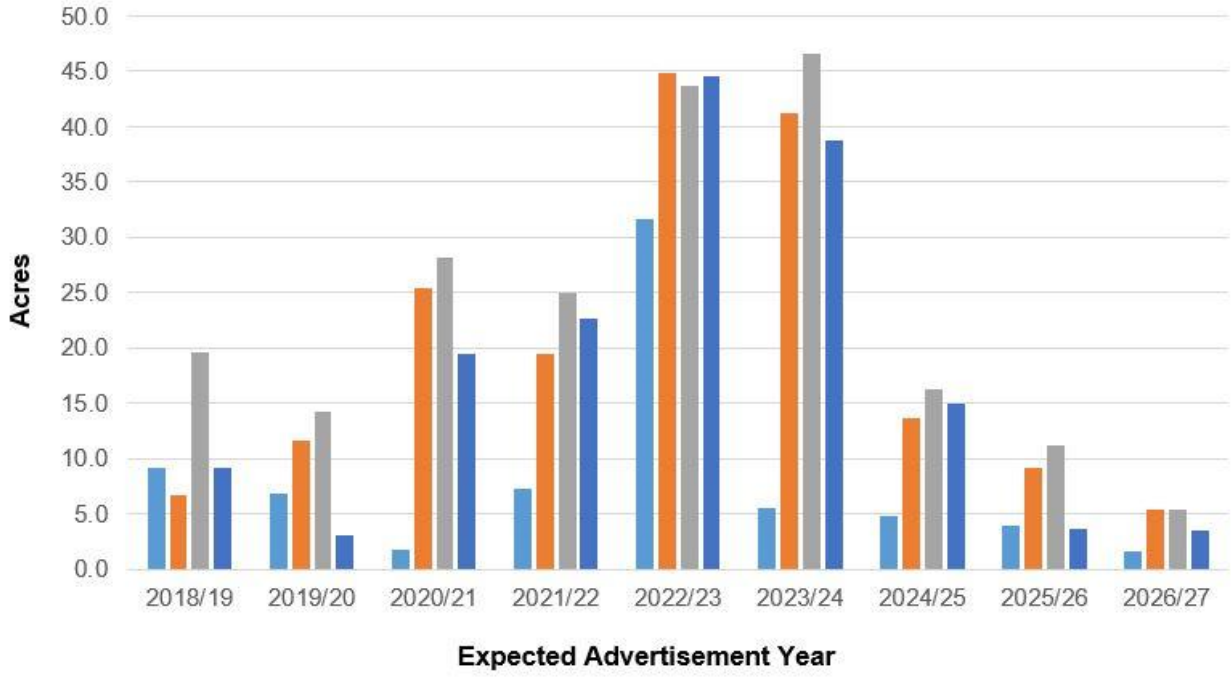
Expected Advertisement Year	Number of Transportation Projects	Estimated Potential Impacts (acres)	Forecast Percentage	Forecast Cumulative Percentage
2018/19	2	6.8	6	6
2019/20	3	2.8	3	9
2020/21	5	15.5	14	23
2021/22	4	13.6	12	35
2022/23	3	35.3	32	68
2023/24	6	27.6	25	93
2024/25	2	4.3	4	97
2025/26	3	1.9	2	99
2026/27	5	1.5	1	100
Total	**33**	**109.2**	**100%**	**100%**

Table 6-4. Estimated Impacts on Fresno Kangaroo Rat,[a] by Transportation Project Delivery Year

Expected Advertisement Year	Number of Transportation Projects	Estimated Potential Impacts (acres)	Forecast Percentage	Forecast Cumulative Percentage
2018/19	3	9.2	6	6
2019/20	4	3.0	2	8
2020/21	8	19.4	12	20
2021/22	10	22.6	14	34
2022/23	7	44.5	28	62
2023/24	10	38.7	24	86
2024/25	4	15.0	9	95
2025/26	6	3.7	2	98
2026/27	10	3.6	2	100
Total	**62**	**159.7**	**100%**	**100%**

[a] Since the CWHR does not contain separate home ranges for Tipton kangaroo rat or short-nosed kangaroo rat, the SAMNA forecast of Fresno kangaroo rat impacts is inclusive of Tipton and short-nosed kangaroo rat impacts.

Figure 6-2. Estimated Impacts on the Species of Mitigation Need, by Transportation Project Delivery Year



Notes: blue = California tiger salamander, orange = San Joaquin kit fox, gray = giant kangaroo rat, dark blue = Fresno kangaroo rat (presented in each series from left to right)

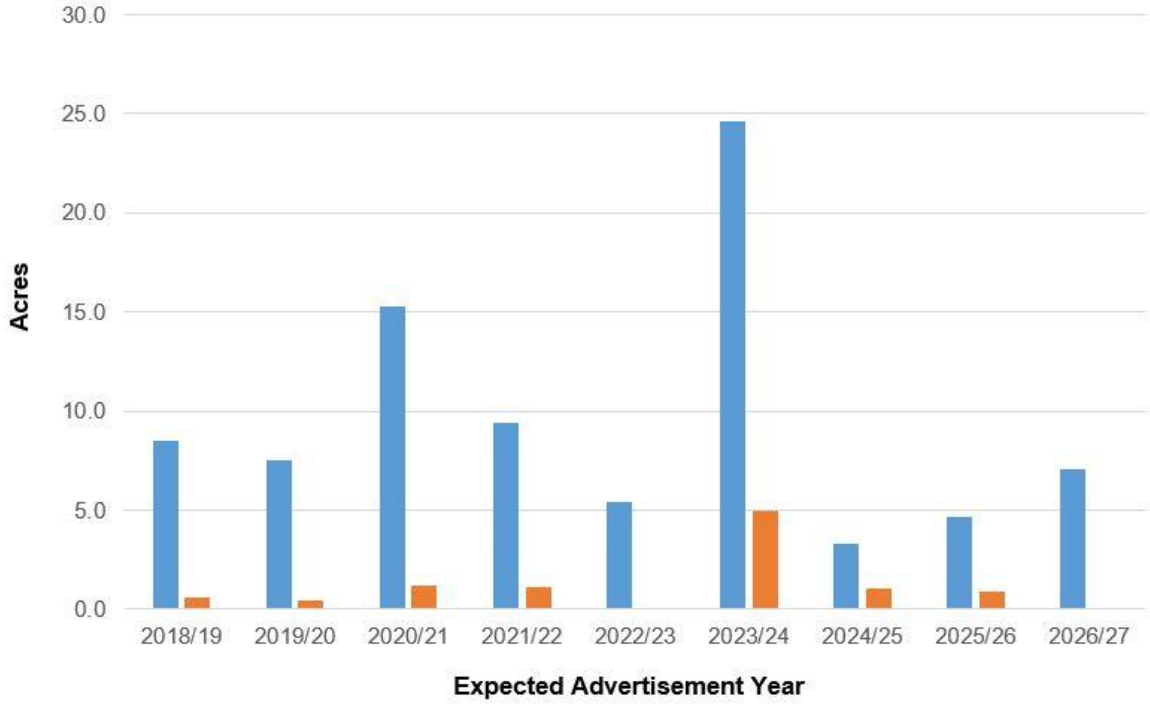
Table 6-5. Estimated Impacts on Wetland Resources, by Transportation Project Delivery Year

Expected Advertisement Year	Number of Transportation Projects	Estimated Potential Impacts (acres)	Forecast Percentage	Forecast Cumulative Percentage
2018/19	3	0.6	6	6
2019/20	6	0.5	4	11
2020/21	5	1.2	11	22
2021/22	6	1.1	11	32
2022/23	3	0.0	0	33
2023/24	9	4.9	48	80
2024/25	5	1.1	10	91
2025/26	5	0.9	8	99
2026/27	3	0.1	1	100
Total	**45**	**10.4**	**100%**	**100%**

Table 6-6. Estimated Impacts on Non-wetland Water Resources, by Transportation Project Delivery Year

Expected Advertisement Year	Number of Transportation Projects	Estimated Potential Impacts (acres)	Forecast Percentage	Forecast Cumulative Percentage
2018/19	7	8.5	10	10
2019/20	10	7.6	9	19
2020/21	14	15.3	18	37
2021/22	16	9.4	11	48
2022/23	16	5.4	6	54
2023/24	18	24.6	29	82
2024/25	7	3.3	4	86
2025/26	11	4.7	5	92
2026/27	15	7.1	8	100
Total	**114**	**85.8**	**100%**	**100%**

Figure 6-3. Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year



Notes: blue = non-wetland waters, red = wetlands (presented in each series from left to right)

6.3 Acceleration Priorities

Caltrans transportation project sequence prioritization reflects the updated information provided in the 2017/2018 to 2026/2027 (Quarter 4) SHOPP Ten-Year Book and is based on meeting the District's needs and performance targets while financially balancing the District's accounts. As shown in the tables and figures provided above, which are based on Quarter 2 of the SHOPP Ten-Year Book, most impacts on the species of mitigation need were forecast for the middle of the 10-year period evaluated in the SAMNA, 2017/2018 to 2016/2027. However, because of the dynamic nature of transportation planning, since the 2017/2018 to 2026/2027 (Quarter 2) SHOPP Ten-Year Book was published, plans associated with 14 transportation projects have changed and mitigation may be required earlier than initially thought. Figure 6-4 illustrates the location of the prioritized transportation projects, by year. Transportation projects likely to be accelerated are identified with a "*" in the notes to Figure 6-4.

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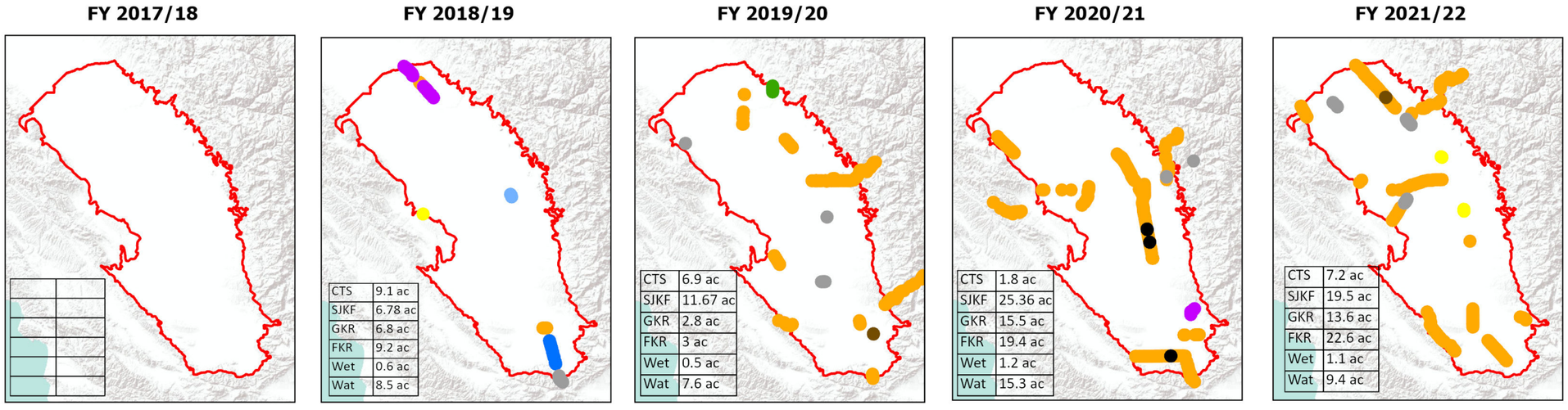
Figure 6-4. Location of Estimated Impacts, by Transportation Project Delivery Year



Sources: Esri, USGS, NOAA

Notes: SHOPP projects shown above are listed by year, below. Projects identified with a "*" are a priority for acceleration:
2017/18: none
2018/19: 13384,13582,13673,15964,15965,16000,17108, 20700
2019/20: 13250, 13482, 13547, 13704, 14185, 15883, 15963, 16487, 16910, 17405, 19318, 19339, 19350, 19372*, 19373
2020/21: 15961, 16272, 16273, 16536, 19310, 19322, 19331, 19332, 19346*, 19348*, 19349, 19352, 19358*, 19365, 19367*, 19370, 19374*
2021/22: 11323, 13841, 16476, 17392, 17582, 19311, 19313, 19315, 19319*, 19335*, 19336, 19338, 19341*, 19357*, 19360, 19369*, 19512, 19540, 19548
2022/23: 19321, 19337*, 19344, 19361*, 19363, 19364, 19368*, 19448, 19515, 19543, 19544, 19546, 19550, 19551, 19552, 19554
2023/24: 19345, 19371, 19390, 19391, 19393, 19394, 19395, 19396, 19431, 19518, 19523, 19531, 19556, 19558, 19560, 19562, 19563, 19564
2024/25: 19530, 19561, 19568, 19569, 19571, 19572, 19574
2025/26: 19505, 19524, 19533, 19535, 19538, 19539, 19541, 19565, 19567, 19579, 19580, 19581, 19584
2026/27: 19536, 19542, 19545, 19553, 19566, 19570, 19573, 19577, 19578, 19582, 19586, 19587, 19588, 19589, 19590, 19629

7. WILDLIFE RESOURCES CONSERVATION GOALS AND OBJECTIVES

Caltrans' primary objective for wildlife resources is to avoid and minimize all impacts on special-status species from Caltrans transportation projects in the GAI. However, sometimes compensatory mitigation is needed. Credits or values established through SHC § 800.6(a)-authorized advance mitigation projects offer the unique opportunity to consolidate needed mitigation to provide strategically placed and environmentally sound enhanced, restored, or created habitat and to provide an improved environmental outcome that may not be available through the usual transportation project-by-project approach to mitigation.

Caltrans seeks to align its advance mitigation projects with natural resource regulatory agencies' goals and objectives, and thus contribute to an improved environmental outcome within the GAI; see Chapter 9 for additional details. With this in mind, in this chapter, Caltrans presents its understanding of natural resource regulatory agencies' regional conservation goals and objectives that could apply to wildlife resources forecast to be potentially affected by SHOPP and STIP-eligible transportation projects, as discussed in Chapters 5 and 6.

The goals and objectives assembled for this chapter are intended to guide advance mitigation project scoping decisions toward those choices that provide for the greatest environmental benefit available through the advance mitigation planning and delivery processes. Such projects undertaken by Caltrans should contribute to wildlife resource protection and enhancement and should yield compensatory mitigation usable by future transportation projects, as specified in SHC § 800.[1] Compensatory mitigation usable by future transportation projects should be expressed in standard units or terms recognized by the natural resource regulatory agencies.

Information presented in this chapter is for advance mitigation project scoping purposes only. Transportation projects must still go through environmental and permitting processes and must demonstrate avoidance and minimization efforts prior to compensation.

7.1 Approach

For the purposes of this RAMNA, conservation goals and objectives are a broad set of regional natural resource sustainability goals and objectives that are consistent with both regulatory requirements and conservation science. To determine the wildlife resource conservation goals and objectives applicable to the GAI, Caltrans:

[1] Pursuant to SHC § 800.9, to the maximum extent practicable, the information required for an RCIS is presented here. During CDFW's review of an RCIS, CDFW determines whether the goals and objectives presented in the RCIS are consistent with FGC § 1852, subdivision (c)(8).

- First identified the natural resource regulatory agencies with the authority to both condition transportation projects and include wildlife resource-related compensatory mitigation as a transportation project condition;
- Next, to improve the probability that advance mitigation projects undertaken by Caltrans will yield credits (or similar) that will be usable during the planning period, identified species of mitigation need from the hundreds of wildlife resources evaluated through the SAMNA (see Section 1.5); and
- Then, for the species of mitigation need, identified:
  - Federal and state binding and non-binding regional conservation and land management plans relevant to the species of mitigation need;
  - Current and projected pressures and stressors on the species of mitigation need;
  - Opportunities to enhance the conservation benefits to the species of mitigation need through advance mitigation; and
  - Opportunities to provide co-benefits, where possible, to other special-status and native wildlife species through advance mitigation.

Last, Caltrans analyzed the aforementioned data in relation to the transportation-related activities that could potentially affect the species of mitigation need, and the potential range of compensatory mitigation that could satisfy a future transportation project condition associated with the activities. The results of this analysis were used to develop the advance mitigation conservation goals and objectives discussed in this chapter.

7.2 Natural Resource Regulatory Agencies with Wildlife Resources Oversight

Table 7-1 lists the natural resource regulatory agencies that regulate wildlife resources in the GAI who have the authority to require wildlife resource-related compensatory mitigation for transportation projects. Wildlife species also use aquatic resources, such as streams, wetlands, and non-wetland waters, that are regulated by other natural resource regulatory agencies; this RAMNA evaluates the mitigation need for aquatic resources separately in Chapter 8.

Table 7-1. Natural Resource Regulatory Agencies that Regulate Wildlife Resources

Agency	Summary
CDFW – Region 4, Central and Habitat Conservation Planning Branch	CDFW oversees the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species in California. CDFW's Environmental Review and Permitting, Conservation and Mitigation Banking, NCCP, and RCIS programs implement sections of the FGC, Title 14 of the California Code of Regulations, and Public Resources Code § 21000, et seq. These programs help fulfill CDFW's mission to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values. CDFW issues permits and agreements to project proponents under its authorities including incidental take permits and consistency determinations under CESA, Lake and Streambed Alteration Agreements, approvals of conservation and mitigation banks, approvals of MCAs and RCISs, and NCCP permits. NCCP permits can authorize the take of fully protected species.
FWS	FWS regulates all federally protected wildlife species and critical habitats, and requires consultation and coordination to be in compliance with the ESA. FWS authorities, including its role in mitigation, are codified under multiple statutes that address management and conservation of natural resources from many perspectives including, but not limited to, the effects of land, water, and energy development on fish, wildlife, plants, and their habitats. For projects lacking a federal nexus, under ESA § 10(a)1(B), FWS approves HCPs and issues Incidental Take Permits to address impacts on federally protected species. For projects with a federal nexus and potential impacts on federally protected species, FWS issues biological opinions under Section 7 of the ESA.
State Water Board and RWQCB – Region 5, Central Valley	The Porter-Cologne Act governs water quality regulation in California and gives the State Water Board and RWQCBs the authority to condition projects through waste discharge requirements, to protect water quality and the beneficial uses of waters of the state, as identified in basin plans. Basin plans, adopted by the State Water Board and RWQCBs, incorporate the beneficial use designation of surface waters of the state and must take into consideration the use and value of water for protection and propagation of fish, shellfish, and wildlife. Water Boards may exert jurisdiction over species to the extent that cold freshwater habitat; preservation of rare, threatened, or endangered species; spawning, reproduction, and/or early development; warm freshwater habitat; and wildlife habitat beneficial uses exist and would be affected by a project.

7.3 Species of Mitigation Need

An overview of wildlife resources is provided in Chapter 2. As described in Section 1.5, species of mitigation need were selected to focus the planning effort and improve the probability that advance mitigation projects undertaken by Caltrans will yield credits (or similar) that will be usable during the planning period. To this end, the species of mitigation need identified for the GAI are California tiger salamander, San Joaquin kit fox, giant kangaroo rat, and two additional species of kangaroo rat. Each species is briefly described below.

7.3.1. California Tiger Salamander

The Central Valley DPS of California tiger salamander is a federally and state threatened amphibian. Historically, this DPS occurred in the valleys and bordering foothills of the

Central Valley and Inner Coast Range from San Luis Obispo, Kern, and Tulare Counties in the south to Sacramento and Yolo Counties in the north (FWS 2017c). Most of the historical Central Valley populations of this California endemic species have been extirpated (FWS 2017c). Typical habitat associations include grassland, oak savanna, and edges of mixed woodland and lower-elevation coniferous forest (FWS 2017c). This species is found from near sea level up to a maximum elevation of approximately 3,940 feet above mean sea level in the Coast Ranges and 1,640 feet above mean sea level in the Sierra Nevada foothills (FWS 2017c).

California tiger salamanders need both suitable upland (that is, terrestrial) habitat for refuge and aquatic habitat for breeding and larval development. Historic California tiger salamander breeding habitat was primarily natural vernal pools and ponds, but now includes modified ephemeral and permanent ponds such as livestock ponds (FWS 2017c). Optimal breeding ponds are ephemeral, forming in winter and drying in summer, and free of predatory nonnative fish and bullfrogs (FWS 2017c). The California tiger salamander is nocturnal and spends most of its life underground (FWS 2017c). It relies on networks of underground burrows created by species such as Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Otospermophilus beecheyi*), and mole species (*Scapanus* spp.) for refuge (FWS 2017c).

7.3.2. San Joaquin Kit Fox

San Joaquin kit fox is a federally endangered and state threatened mammal. It occurs in desert-like habitats characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure (FWS 2020a). San Joaquin kit fox is typically found in areas with open, level, sandy ground. Historically, San Joaquin kit fox occurred in alkali scrub and arid grasslands throughout the San Joaquin Valley floor and adjacent foothills from southern Kern County north to Tracy in San Joaquin County and gradual slopes of the interior Coast Range (FWS 2020a). This primarily nocturnal species uses subsurface dens extending 6 or more feet below ground for shelter and reproduction (FWS 2020a).

7.3.3. Giant Kangaroo Rat

Giant kangaroo rat is a federally and state endangered mammal. This species typically inhabits annual grasslands with sandy loam soils that are not subject to flooding in winter, although it is also found in open shrublands, which provide more marginal habitat (FWS 1998). It is found from sea level up to about 2,850 feet above mean sea level (FWS 1998). Historically, this species was found from the base of the Tehachapi Mountains to the south; to 10 miles south of Los Banos, Merced County, to the north; the Carrizo Plain and San Juan Creek watershed west of the Temblor Range to the west; and on the floor of the San Joaquin Valley to the east (FWS 2020b). It currently occupies only about 5 percent of its historical range, including areas in Fresno, Kings, and Kern Counties within the GAI (FWS 2020b). This primarily nocturnal, burrowing rodent forms colonies of individuals, known as precincts (FWS 2020b). Considered a keystone species in grassland and shrubland habitats, it is preyed upon by many species, including San Joaquin kit fox (FWS 2020b).

7.3.4. Fresno Kangaroo Rat

Fresno kangaroo rat is a federally and state endangered mammal. The historical range for this species included alkali-sink scrub and arid alkali grassland communities on the San Joaquin Valley floor, from the Merced River south to the Kings River, and from the Fresno Slough east to the cities of Fresno and Selma (FWS 2020c). One of three subspecies of the San Joaquin kangaroo rat, this nocturnal animal historically occupied elevated grassy patches on alkali plains or in grassy terrain with scattered alkali patches, although it also occurred in areas with alkaline, clay soils subject to seasonal inundation (FWS 1998, 2020c). It was also associated with alkali sink communities between 200 and 300 feet above mean sea level (FWS 1998). No populations of Fresno kangaroo rat have been found since the publication of the Recovery Plan for this species in 1998, but surveys for this species were not comprehensive and potential habitat remains unsurveyed (FWS 2020c). The last capture of a Fresno kangaroo rat was at Alkali Sink Ecological Reserve in 1992 (FWS 2020c).

7.3.5. Tipton Kangaroo Rat

Tipton kangaroo rat is a federally and state endangered mammal. Historically, this species occupied arid land communities on the valley floor of the Tulare Basin in an area bounded by Tulare, Kern, and Buena Vista Lakes (FWS 1998, 2020d). Currently, this animal is found in scattered, isolated areas in Kern, Tulare, and Kings Counties, occupying less than 4 percent of its historical range (FWS 2020d). One of three subspecies of the San Joaquin kangaroo rat, this nocturnal, burrowing animal is typically found in open areas with flat terrain that is not subject to flooding, although it is also found in shrublands (FWS 2020d).

7.4 Regional Conservation Efforts

Caltrans' understanding of natural resource regulatory agency conservation goals and objectives is that they are generally designed to protect existing populations and habitat, and include acquiring, protecting, restoring, and/or enhancing habitat and linkages. Several conservation and land management plans listed in Table 3-1, relevant to the species of mitigation need, identify key habitats or designate specific lands or areas to protect for conservation of the species of mitigation need in the GAI. Presented in Table 7-2, these conservation and land management plans include measures to address specific known, ongoing threats to individuals and populations, which are incorporated into and/or inform the advance mitigation conservation goals and objectives compiled below. Caltrans may also use this information during advance mitigation project scoping to help compensatory mitigation efforts in the GAI align with the goals and objectives of natural resource regulatory agencies.

Table 7-2. Documents Identifying Areas for Species of Mitigation Need Conservation in the GAI

Document	Reference	Areas of Important Habitat
Special-status Taxa Documents	See below	See below
*Fresno kangaroo rat (*Dipodomys nitratoides exilis*) 5-Year Review: Summary and Evaluation*	FWS 2020c	Identifies recommendations for future actions, including: • Protect additional parcels of alkali sink scrub and grasslands within the Fresno kangaroo rat range; particularly any parcels on which Fresno kangaroo rats are discovered. • Continue to manage alkali sink scrub habitat for Fresno kangaroo rats.
*Giant kangaroo rat (*Dipodomys ingens*) 5-Year Review: Summary and Evaluation*	FWS 2020b	Identifies locations that should be targeted for protection: • Dispersal corridors within the northern range along Panoche and Silver creeks in western Fresno County. • The Panoche Valley in eastern San Benito County as an important source of regional expansion within the northern range (not in the GAI but adjacent). • Buena Vista Valley in western Kern County. Identifies a goal to co-locate the conservation lands acquired for San Joaquin kit fox and blunt-nosed leopard lizard with giant kangaroo rat.
*Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)*	FWS 2017c	Identifies California tiger salamander Recovery Units and their respective Management Units, including those within the GAI: • Southern San Joaquin Valley Recovery Unit • Little Table Mountain • Fresno • Orange Cove/Stone Corral • Central Valley Recovery Unit • Le Grand/Raymond
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Identifies core populations for giant kangaroo rat, Fresno kangaroo rat, Tipton kangaroo rat, and San Joaquin kit fox, and important linkage areas.

Document	Reference	Areas of Important Habitat
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Giant kangaroo rat Recovery Action 1. Of highest priority for habitat protection is proper land use and management on publicly owned and conservation lands in the Carrizo Plain Natural Area, Naval Petroleum Reserves in California, Lokern Natural Area, and Ciervo-Panoche Natural Area. Where populations of giant kangaroo rats and associated, listed species appear to be robust, land use should not be changed when ownership or conservation status of parcels changes unless there are compelling reasons to do so. For land already in public and conservation ownership, historical uses that maintained habitat for giant kangaroo rats, such as livestock grazing, should be reestablished where appropriate.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Giant kangaroo rat Recovery Action 3. Second in priority for habitat protection is the protection of additional land supporting key populations by acquisition of title, conservation easement, or other mechanisms. Areas to be protected are prioritized, as follows: • Land in the Lokern Area of western Kern County. The goal is to protect 90 percent of the existing natural land bounded on the east by natural lands just east of the California Aqueduct, on the south by Occidental of Elk Hills, on the west by State Highway 33, and on the north by Lokern Road. • Land in the Naval Petroleum Reserves in California of western Kern County. The goal is to maintain in a natural state (that is, grassland and saltbush scrub communities) 90 percent of the existing natural land in Occidental of Elk Hills and 80 percent of the natural land in Naval Petroleum Reserve in California No. 2, including all in the Buena Vista/McKittrick Valley between Elk Hills Road on the southeast and State Highway 33 on the northwest. • Existing natural land providing habitat for giant kangaroo rats in western Fresno and eastern San Benito Counties. The goal is to protect all existing natural land on the Silver Creek Ranch, and existing habitat for this species along the eastern bases of Monocline Ridge and the Tumey Hills, between Arroyo Ciervo on the south and Panoche Creek on the north. • Acquire and restore habitat on periodically farmed land with no or Class 3 irrigation water rights immediately east of occupied natural habitat along the strip described above, and west of Interstate 5. • Other natural land occupied by giant kangaroo rats in western Kern County. The goal is to protect 80 percent of existing habitat for giant kangaroo rats.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Fresno kangaroo rat Recovery Action 5. Protect natural land between the Alkali Sink Ecological Reserve and the San Joaquin River to the north (Sandy Mush Road/South Grasslands Area).

Document	Reference	Areas of Important Habitat
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Fresno kangaroo rat Recovery Action 6. Begin discussion and planning for conservation of natural lands in western Madera County; acquire title or easement to appropriate parcels from willing sellers.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Fresno kangaroo rat Recovery Action 7. Protect additional habitat for Fresno kangaroo rats in Kings County, where populations of the species are discovered. Habitat should be in blocks of at least 384 hectares (950 acres), preferably larger, with one block no less than 1,012 hectares (2,500 acres).
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Fresno kangaroo rat Recovery Action 9. Restore habitat for Fresno kangaroo rats on the Alkali Sink and Kerman Ecological Reserves. Restoration should include manipulation of the plant community to favor Fresno kangaroo rats over Heermann's kangaroo rats.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Tipton kangaroo rat Recovery Action 4. Inventory and assess existing natural land and drainage problem parcels contiguous to and near existing protected natural lands and develop a protection plan that ranks parcels that may be available according to their size and potential for supporting Tipton kangaroo rats, with the objective of connecting and expanding: • Pixley National Wildlife Refuge and the scattered parcels of the Allensworth Ecological Reserve. • Kern National Wildlife Refuge and the scattered parcels of the Semitropic Ridge conservation lands. • Kern River alluvial fan area, including the Kern Fan Element, Cole's Levee Ecosystem Preserve, and other mitigation parcels. • Additional lands that, after inventory and assessment, are identified as important to the two key elements of the recovery strategy for Tipton kangaroo rats.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Identifies three core populations for San Joaquin kit fox, and linkages between the three: • Carrizo Plain Natural Area in San Luis Obispo County. • Natural lands of western Kern County (that is, Elk Hills, Buena Vista Hill, and the Buena Vista Valley). • Lokern Natural Area and adjacent natural land (inhabited by kit foxes). • Ciervo-Panoche Natural Area of western Fresno and eastern San Benito Counties.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.i: Protect natural lands in western Kern County.

Document	Reference	Areas of Important Habitat
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.ii: Protect natural lands in the Ciervo-Panoche Natural Area of western Fresno and eastern San Benito Counties.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.iii: Expand and connect existing refuges and reserves in the Pixley-Allensworth and Semitropic Ridge natural areas through acquisition of existing natural land and farmland with drainage problems, and by safe harbor initiatives.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.iv: Expand and connect (physically or by "stepping stones") existing natural land in the Mendota area, Fresno County, with the Ciervo-Panoche Natural Area, through restoration of habitat on retired, drainage-problem farmland.[a]
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.v: Maintain and enhance connecting corridors for movement of kit foxes between the Kettleman Hills and the Valley's edge through the farmed gap between the Kettleman and Guijarral Hills, and between the Guijarral Hills and Anticline Ridge.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.vii: Maintain and enhance movement of kit foxes through agricultural land between the Lost Hills area and the Semitropic Ridge Natural Area by strategic retirement of drainage-problem farmland, acquisition, and safe harbor initiatives.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.viii: Maintain and enhance habitat and movement corridors around the southern end of the Valley between the Maricopa area on the west and Poso Creek area on the northeast through easements, zoning agreements, and safe harbor initiatives. One south Valley component is already in place. Kern Fan Element provides valuable conservation lands that serve as an important bridge between the Bakersfield area and the Elk Hills-Lokern core area. This design is being maintained by the new project owners, the Kern Water Bank Authority.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.ix: Maintain and enhance movement of kit foxes between the Mendota area, Fresno County, natural lands in western Madera County, and natural lands along Sandy Mush Road and in the wildlife refuges and easement lands of Merced County. Specifically, maintain and enhance the Chowchilla or Eastside Bypass and natural lands along this corridor through acquisition, easement, or safe harbor initiatives.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	San Joaquin kit fox Recovery Action a.xiii: Protect and enhance corridors for movement of kit foxes through the Salinas-Pajaro Region and from the Salinas Valley to the Carrizo Plain and San Joaquin Valley.

Document	Reference	Areas of Important Habitat
*San Joaquin kit fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation*	FWS 2020a	Identifies core area, linkages, and satellite areas for San Joaquin kit fox. Identifies goal to focus land acquisition on the establishment of large blocks of land (at least 10,000 acres in size) on the San Joaquin Valley Floor and western fringes.
*Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) 5-Year Review: Summary and Evaluation*	FWS 2020d	Appendix 3 identifies locations of proposed conservation and restoration areas within Kings and Kern counties in the GAI.
Conservation and Land Management Documents	See below	See below
ACE Dataset – Terrestrial Climate Change Resilience layer [ds2738]	CDFW 2018a	Identifies terrestrial resilience to climate change within the GAI.
CDFW BIOS ACE Terrestrial Connectivity Map [ds2734]	CDFW 2020c	Identifies connectivity features for terrestrial wildlife in the GAI.
CEHC	Spencer et al. 2010	Identifies Natural Landscape Blocks and Essential Connectivity Areas in the Great Central Valley Ecoregion.
CNRA Wildlife Corridors – San Joaquin Valley [ds423]	CNRA 2015	Identifies wildlife corridors throughout the state, including the GAI.
Environmental Assessment: Eastern Ciervo-Panoche Natural Area Habitat Protection Project (Martin property)	Bureau of Reclamation 2018	Identifies 1,387 acres in the eastern Ciervo-Panoche Natural Area, where the Bureau of Reclamation will provide funding to BLM for protection.

Document	Reference	Areas of Important Habitat
Environmental Assessment: Eastern Ciervo-Panoche Natural Area Habitat Protection Project (Mouren Cattle Company parcels)	FWS and Bureau of Reclamation 2014	Identifies up to 2,240 acres to be protected through purchase in the Eastern Ciervo-Panoche Natural Area.
Kern and Pixley National Wildlife Refuges Final Comprehensive Conservation Plan	FWS 2005b	Identifies 2,600 acres of upland habitat at the Kern Refuge and 4,730 acres at the Pixley Refuge that will be managed for Tipton kangaroo rat (and will benefit San Joaquin kit fox).
Kern County Valley Floor HCP	Garcia and Associates 2006	Identifies acreages of habitat within red (highest conservation importance), green (moderate conservation importance), and white (lower conservation importance) zones or species of mitigation need as follows: • Red Zone: – San Joaquin kit fox – 67,504 acres – Giant kangaroo rat – 31,668 acres – Tipton kangaroo rat – 6,226 acres • Green Zone: – San Joaquin kit fox – 90,736 acres – Giant kangaroo rat – 4,321 acres – Tipton kangaroo rat – 6,184 acres • White Zone: – San Joaquin kit fox – 79,025 acres – Giant kangaroo rat – 15,918 acres – Tipton kangaroo rat – 11,151 acres
Kern Water Bank NCCP/HCP	Kern Water Bank Authority 1997	Identifies that giant kangaroo rats have a reasonable chance of becoming permanently established at the Kern Water Bank on their own given the proximity of closest populations or high mobility. In this case, giant kangaroo rat is known to occur at Coles Levee Ecosystem Preserve just to the west and southwest of the Kern Water Bank.
Kern Water Bank NCCP/HCP	Kern Water Bank Authority 1997	Identifies that San Joaquin kit fox and Tipton kangaroo rat have existing limited populations at the Kern Water Bank, which may expand naturally and/ or artificially.

Document	Reference	Areas of Important Habitat
Metropolitan Bakersfield HCP	Metropolitan Bakersfield Habitat Conservation Plan Steering Committee 1994	Identifies Tipton kangaroo rat distribution areas: • Near Lemoore and Hanford in Kings County. • West of Tipton, Pixley, and Earlimart in Tulare County. • Between the Kern National Wildlife Refuge and Delano in Kern County. • Kern River Corridor west of Bakersfield and other scattered populations in Kern County.
Metropolitan Bakersfield HCP	Metropolitan Bakersfield Habitat Conservation Plan Steering Committee 1994	Identifies several candidate or existing preserves as having habitat that may support species of mitigation need: • Sand Ridge Wildflower Preserve potentially provides habitat for San Joaquin kit fox. • Lokern Road area supports San Joaquin kit fox and giant kangaroo rat. • Tule Elk Reserve supports Tipton kangaroo rat and may provide foraging habitat for San Joaquin kit fox. • Elk Hills area supports San Joaquin kit fox. • Pixley National Wildlife Refuge is known to contain Tipton kangaroo rat. • Kern National Wildlife Refuge contains populations of Tipton kangaroo rat. • Allensworth Ecological Preserve and the surrounding area contains San Joaquin kit fox and Tipton kangaroo rat.
Metropolitan Bakersfield HCP	Metropolitan Bakersfield Habitat Conservation Plan Steering Committee 1994	Identifies several potential preserve areas for species of mitigation need: • South of Hart Park for San Joaquin kit fox. • South of Highway 178 for San Joaquin kit fox. • Wooly-star Preserve for San Joaquin kit fox. • Wooly-threads Preserve for San Joaquin kit fox. • West of Interstate 5 for San Joaquin kit fox, Tipton kangaroo rat, and giant kangaroo rat.
Record of Decision for the Bakersfield Resource Management Plan	BLM 2014	Identifies Areas of Critical Environmental Concern, including those within the GAI (not species-specific).

Document	Reference	Areas of Important Habitat
Resource Management Plan for the Southern Diablo Mountain Range & Central Coast of California Record of Decision	BLM 2007	Identifies Areas of Critical Environmental Concern and Research Natural Areas within portions of the GAI, including: • Panoche-Coalinga Area of Critical Environmental Concern. • Monvero Residual Dunes Research Natural Area. • Joaquin Rocks Area of Critical Environmental Concern.
San Joaquin River Parkway Master Plan	San Joaquin River Conservancy 2000	Identifies natural reserves and wildlife corridors within the planning area, which consist of a 23-mile section of the San Joaquin River in portions of Fresno and Madera Counties. No species of mitigation need are included.
SWAP	CDFW 2015	Identifies American southwest riparian forest and woodland and freshwater marsh as conservation targets for the Great Valley Ecoregion (which includes the GAI).

[a] This action has been dropped from the 5-year review.

7.5 Pressures and Stressors

Pressures and stressors refer to environmental trends or physical, chemical, or biological factors or conditions that affect the species of mitigation need or their habitat. According to the SWAP (CDFW 2015), a pressure is defined as "an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the target. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant." Additionally, stress is defined in the SWAP as "[a] degraded ecological condition of a target that resulted directly or indirectly from negative impacts of pressures (e.g., habitat fragmentation)" (CDFW 2015). The *Recovery Plan for Upland Species of the San Joaquin Valley* (FWS 1998) and the *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander* (FWS 2017c) refer to these analogous pressures and stressors as threats.

The plans included in Table 7-2 identify multiple pressures and stressors contributing to the decline of the species of mitigation need within their ranges (FWS 1998, 2020a, 2020b, 2020c, 2020d, 2017c). These pressures and stressors were evaluated in relation to the types of effects that could result from transportation projects funded through SHOPP and STIP and could benefit from in-kind mitigation purchased or established through an advance mitigation project.

7.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, and habitat invasion by nonnative species have led to the loss and degradation of existing habitat for all of the species of mitigation need. Additionally, roads and urbanization fragment habitat and impede connectivity between existing populations of the species of mitigation need, as well as increase mortality resulting from traffic collisions.

7.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread nonnative, invasive species. When invasive, nonnative species enter an ecosystem, they can disrupt the natural balance, resulting in a reduction of biodiversity, degradation of habitats, alteration of native genetic diversity, shifting of habitat type, and further threats to already endangered or threatened natural resources. Invasive species are considered a threat to all of the species of mitigation need. The invasive barred tiger salamander is known to hybridize with the California tiger salamander, producing offspring that are more likely to survive than either parent species. These hybrids were also shown to negatively affect populations of the native California tiger salamander (Ryan et al. 2009). Invasive grasses can be a major problem for the species of mitigation need. In particular, improper grazing practices and habitat management can lead to a buildup of thatch consisting of nonnative grasses, which has been cited by FWS as a threat to kangaroo rats (FWS 2020b, 2020c, 2020d) and California tiger salamander (FWS 2017c). Introduced red foxes are known to prey on San

Joaquin kit fox and compete for food resources, reducing habitat value and eliminating San Joaquin kit foxes from certain areas (FWS 2020a).

7.5.3. Disease and Predation

Disease is considered a threat to most of the species of mitigation need. California tiger salamander is affected by various forms of ranavirus and a chytrid fungus that can lead to mortality and has the potential to affect populations (FWS 2017c). Disease, including encephalitis, tularemia, and a wet weather-related fungus, are specifically mentioned as threats to giant and Tipton kangaroo rats (FWS 2020b, 2020d). It is unknown whether disease may affect Fresno kangaroo rat because there are no currently known populations of this sub-species (FWS 2020c); it is possible that disease could affect the Fresno kangaroo rat if extant populations exist. Several diseases are known to affect and are considered threats to San Joaquin kit fox, including rabies, canine parvovirus, and canine distemper virus (FWS 2020a). A recent outbreak of sarcoptic mange (*Sarcoptes scabei*) has been documented in the Bakersfield kit fox population and is currently causing a population decline (FWS 2020a).

Predation is also considered a threat by FWS on California tiger salamander and San Joaquin kit fox. Introduced fish and bullfrogs are known to predate larval California tiger salamander (FWS 2017c). Coyotes, bobcats, and introduced red foxes (also mentioned above under invasive species) are known to prey on San Joaquin kit fox. In addition, kit foxes have been killed by badgers, golden eagles, and domestic and feral dogs (FWS 2017c). FWS (2020a) states that "[p]redation of kit fox by large canid predators including the coyote and non-native red fox, appears to be a major and increasing threat to the viability of kit fox populations."

7.5.4. Climate Change and Drought

Climate and climate resiliency were described in Chapter 2. While little is known regarding specific direct effects of climate change on the species of mitigation need or their habitat, predictions can be made based on observation and modeling. Recent modeling has shown a range of warming statewide from 1.99 to 4.56 degrees Celsius, and between a 22.8 percent decrease and a 22.9 percent increase in precipitation for the period between 2070 and 2099 (Stewart et al. 2016). California tiger salamander may be affected by climate change through a decrease in hydroperiods necessary to continue to support this species' life cycle (that is, inundation during winter rains and breeding habitat that holds water for a minimum of 12 weeks in a year of average rainfall). A change to hydroperiods in this way may reduce the ability of this species to reproduce and for larval salamanders to develop, while favoring nonnative hybrid tiger salamanders that are known to travel farther and faster than native salamander under higher temperatures (FWS 2017c). In addition, climate change may affect California tiger salamander through altered prey-predator relationships, increased effects from ultraviolet radiation, and increased effects from diseases (FWS 2014). Population trends for kangaroo rats are highly correlated with interannual variations in precipitation (FWS 2020d). Substantial declines in giant kangaroo rat populations have been reported following successive years of drought and

above-normal precipitation (FWS 2020b). Recent research of Tipton kangaroo rat showed that rat abundance would briefly increase during drought; however, periods of prolonged drought would cause major population decline (FWS 2020d). Negative effects on kangaroo rat and other prey items for the San Joaquin kit fox may lead to a decrease in the availability of prey items for San Joaquin kit fox (FWS 2020a); however, recent modeling shows that under various climate change models, suitable habitat for the San Joaquin kit fox may increase statewide by 12.53 to 32.61 percent from the 1981 to 2010 period to the 2070 to 2099 period (Stewart et al. 2016).

Essential habitat connectivity in the GAI, including large remaining blocks of intact habitat or natural landscape, is shown in Figure 2-8. These areas are expected to provide opportunities for the species of mitigation need to respond to climate change stress by preserving large blocks of habitat and linkage areas that will allow migration toward more suitable habitat as the climate changes, and by providing protection for the ecological processes that support key habitat. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a) is presented in Figure 2-5. Much of the GAI has no data for climate resiliency, whereas the vast majority of the GAI with data shows low climate resiliency rankings of 1 or 2. Small portions of the GAI show higher climate resiliency rankings, including some areas ranking up to 5 (high). For the most part, these areas occur in the extreme western edge of the GAI, along the base of the Diablo Range, and along the southwestern portion of the GAI along the base of the Transverse Range. Many of the natural landscape blocks and essential connectivity areas shown in Figure 2-8 occur within or adjacent to these areas with higher climate resiliency.

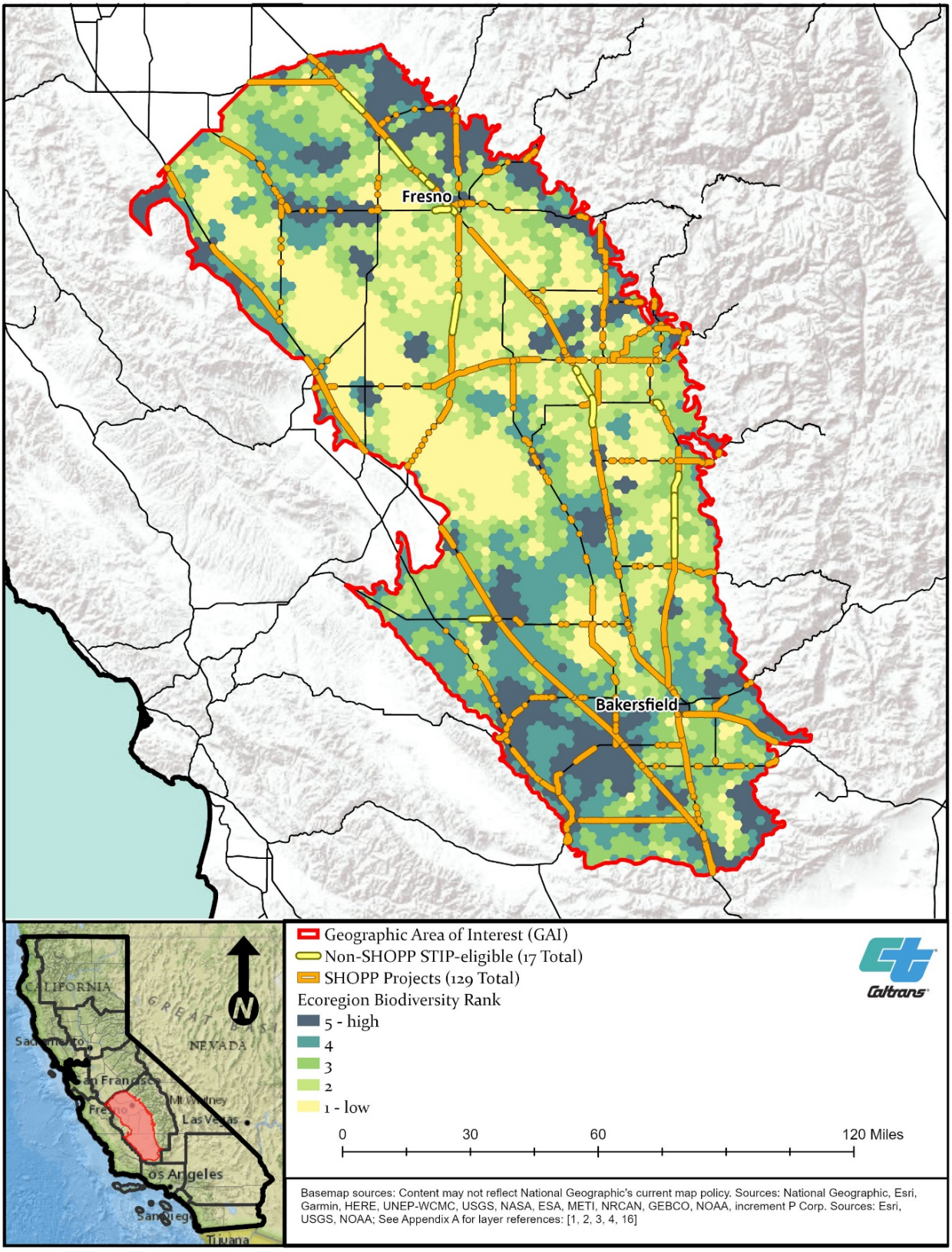
7.5.5. Contaminants

Contaminants have been implicated as a threat to all of the species of mitigation need in the GAI. While not directly related to contaminants, the application of rodenticides and other rodent control methods pose a direct threat to California tiger salamander by removing rodents from the landscape and preventing new burrow construction, thus reducing habitat for the California tiger salamander (FWS 2017c). The use of rodenticide has also been implicated as a threat to all three species of kangaroo rats and San Joaquin kit fox (FWS 2020a, 2020b, 2020c, 2020d).

7.6 Multi-species Benefits

While the species of mitigation need identified for this GAI are California tiger salamander, San Joaquin kit fox, giant kangaroo rat, and two additional species of kangaroo rat, several other special-status species share habitat with these species and could potentially be affected by Caltrans transportation projects that will need compensatory mitigation to satisfy natural resource regulatory agency conditions on a transportation project (Table 5-11). Advance mitigation planning provides Caltrans an opportunity to integrate the protection and preservation of multiple California native species, biodiversity, and ecosystems into project scoping. Figure 7-1 illustrates the regional terrestrial biodiversity in the GAI, according to CDFW's ACE GIS dataset.

Figure 7-1. Terrestrial Biodiversity in the GAI



According to these data, high to moderate terrestrial biodiversity is present along much of the State Highway System with SHOPP and STIP-eligible projects. Habitats are mapped in Appendix C, and the other special-status species that may occur in these habitats are provided in Appendix D.

Other efforts, such as planting Caltrans easements with species beneficial to pollinators, are expected to contribute to biodiversity protection and enhancement in the GAI. In addition, reducing invasive plant infestations is a co-benefit of planting native plants in Caltrans easements. One or both of those factors can be associated with roadways, depending on location. Advance mitigation purchased or established to address anticipated impacts on species of mitigation need may also provide mitigation to compensate for impacts on these other species. Caltrans will consider the special-status species with the potential to co-occur in habitat in order to inform advance mitigation scoping and thereby improve the conservation benefits of mitigation in the GAI.

7.7 Advance Mitigation Conservation Goals and Objectives

The conservation goals and objectives compiled in Table 7-3 are intended to be relevant to anticipated future SHOPP and STIP transportation project mitigation needs, be consistent with the goals and objectives of natural resource regulatory agencies for the species of mitigation need, address pressures and stressors, and support species of mitigation need population recovery and success in the GAI. Each conservation goal is supported by one or more conservation objectives; objectives are more specific, measurable, achievable, relevant, and time-bound measures that align to a desired result specified by a goal. At the broad scale, these wildlife goals and objectives encompass large-scale ecological processes, environmental gradients, biological diversity, and regional wildlife linkages. These goals and objectives prioritize regional conservation that preserves intact habitat and provides habitat linkages and connectivity. Sub-objectives are included for each objective to guide Caltrans advance mitigation scoping toward those authorized actions that would create the greatest functional lift[2] or conservation benefit for the species of mitigation need in the GAI. Sub-objectives also capture specific measures from conservation and land management plans that address threats to the species of mitigation need.[3] Several of the goals are interrelated, and many objectives could apply to more than one goal; objectives were grouped with the goal to which they most specifically aligned. Goals and objectives are generally presented in order from general to more specific.

[2] For the purposes of this document, “functional lift” means the difference between an existing degraded condition and a restored or enhanced condition.
[3] In accordance with both law and Caltrans policy, standard best management practices are followed on all Caltrans transportation projects. Hence, they are presumed and they are not itemized as goals and objectives for the AMP.

Table 7-3. Advance Mitigation Conservation Goals and Objectives for the Species of Mitigation Need

Objective	Sub-objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-1: Conserve and expand existing habitat for species of mitigation need within the GAI	See below	See below	See below
Objective WILD-1.1: Acquire, protect, restore, and/or enhance existing habitat.	**Sub-Objective WILD-1.1.1:** Identify habitat for species of mitigation need in the GAI and acquire, protect, restore, and/or enhance this habitat such that the greatest functional lift to the species of mitigation need is provided. **Sub-Objective WILD-1.1.2:** Prioritize key areas, designated critical habitat, and/or areas that provide a buffer to key areas or critical habitat. **Sub-Objective WILD-1.1.3:** Prioritize land acquisition or protection of large blocks of occupied land, land that is connected to occupied land, or land that expands or buffers existing protected lands. **Sub-Objective WILD-1.1.4:** Prioritize land acquisition or protection that supports key populations.	• California tiger salamander • San Joaquin kit fox • giant kangaroo rat • Fresno kangaroo rat • Tipton kangaroo rat	• *SWAP* (CDFW 2015) • *SWAP – Transportation Companion Plan* (CDFW 2016) • *California Essential Habitat Connectivity Project* (Spencer et al. 2010) • *Recovery Plan for Upland Species of the San Joaquin Valley, California* (FWS 1998) • *Kern and Pixley National Wildlife Refuges – Final Comprehensive Conservation Plan* (FWS 2005b) • *California tiger salamander, Central California Distinct Population Segment (*Ambystoma californiense*) 5-Year Review* (FWS 2014) • *Recovery Plan for the Central California Distinct Population Segment of the California tiger salamander* (Ambystoma californiense) (FWS 2017c) • *San Joaquin kit fox (*Vulpes macrotis mutica*) 5-Year Review* (FWS 2020a) • *Giant kangaroo rat (*Dipodomys ingens*) 5-Year Review* (FWS 2020b) • *Fresno kangaroo rat (*Dipodomys nitratoides exilis*) 5-Year Review* (FWS 2020c) • *Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) 5-Year Review* (FWS 2020d) • *Environmental Assessment: Eastern Ciervo-Panoche Natural Area Habitat Protection Project (Mouren Cattle Company parcels)* (FWS and Bureau of Reclamation 2014) • *Environmental Assessment: Eastern Ciervo-Panoche Natural Area Habitat Protection Project (Martin property)* (Bureau of Reclamation 2018) • *BLM Bakersfield Record of Decision/Approved Resource Management Plan* (BLM 2014) • *Resource Management Plan Southern Diablo Mountain Range & Central Coast of California Record of Decision* (BLM 2007) • *Kern County Valley Floor Habitat Conservation Plan – Draft* (Garcia and Associates 2006) • *San Joaquin River Conservancy Master Plan & Update* (San Joaquin River Conservancy 2000, 2017) • *Metropolitan Bakersfield Habitat Conservation Plan* (Metropolitan Bakersfield Habitat Conservation Plan Steering Committee 1994) • *Pacific Gas and Electric Company San Joaquin Valley Operation and Maintenance HCP* (Jones and Stokes 2007)
Objective WILD-1.1 (continued)	**Sub-Objective WILD-1.1.5:** Prioritize the conservation of rangeland[c] within the range of the Central California tiger salamander. **Sub-Objective WILD-1.1.6:** Prioritize preservation of land that includes natural vernal pool breeding habitat, and grasslands that include ephemeral breeding pond habitat that remains dry for at least 30 days prior to fall rains. **Sub-Objective WILD-1.1.7:** Create breeding habitat in protected areas where breeding habitat is limited. **Sub-Objective WILD-1.1.8:** Increase ground squirrel, pocket gopher, or other small mammal burrowing populations where burrow availability is limited by enhancing habitat for small burrowing mammals or by other science-supported actions.	• California tiger salamander	• *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)* (FWS 2017c) • *Pacific Gas and Electric Company San Joaquin Valley Operation and Maintenance HCP* (Jones and Stokes 2007)

Objective	Sub-objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Objective WILD-1.1 (continued)	**Sub-Objective WILD-1.1.9:** Prioritize acquisition, protection, and/or enhancement of SWAP (CDFW 2015) conservation targets: American southwest riparian forest and woodland and freshwater marsh habitat, as shown in Appendix G.	• California tiger salamander • giant kangaroo rat	• *SWAP* (CDFW 2015) • *Kern and Pixley National Wildlife Refuges – Final Comprehensive Conservation Plan* (FWS 2005b) • *BLM Bakersfield Record of Decision/Approved Resource Management Plan* (BLM 2014) • *San Joaquin River Conservancy Master Plan & Update* (San Joaquin River Conservancy 2000, 2017) • *Pacific Gas and Electric Company San Joaquin Valley Operation and Maintenance HCP* (Jones and Stokes 2007)
Objective WILD-1.1 (continued)	**Sub-Objective WILD-1.1.10:** Co-locate the conservation lands acquired for San Joaquin kit fox with giant kangaroo rat habitat.	• San Joaquin kit fox • giant kangaroo rat	• *Giant kangaroo rat (*Dipodomys ingens*) 5-Year Review* (FWS 2020b)
Goal WILD-2: Preserve, enhance, and increase connectivity between blocks of species of mitigation need habitat	See below	See below	See below
Objective WILD-2.1: Acquire, protect, restore, and/or enhance movement corridors.	**Sub-Objective WILD-2.1.1:** Identify movement corridors for the species of mitigation need in the GAI and acquire, protect, restore, and/or enhance corridors such that the greatest functional lift for the species of mitigation need is provided. **Sub-Objective WILD-2.1.2:** Prioritize habitat in key linkage areas, between habitat areas, and/or areas that provide a buffer to key or existing corridors. **Sub-Objective WILD-2.1.3:** Incorporate and consider bridges and culverts when enhancing species of mitigation need passage.	• California tiger salamander • San Joaquin kit fox • giant kangaroo rat • Fresno kangaroo rat • Tipton kangaroo rat	• *SWAP* (CDFW 2015) • *SWAP – Transportation Companion Plan* (CDFW 2016) • *California Essential Habitat Connectivity Project* (Spencer et al. 2010) • *Recovery Plan for Upland Species of the San Joaquin Valley, California* (FWS 1998) • *Kern and Pixley National Wildlife Refuges – Final Comprehensive Conservation Plan* (FWS 2005b) • *California tiger salamander, Central California Distinct Population Segment (*Ambystoma californiense*) 5-year review* (FWS 2014) • *Recovery Plan for the Central California Distinct Population Segment of the California tiger salamander* (Ambystoma californiense) (FWS 2017c) • *San Joaquin kit fox (*Vulpes macrotis mutica*) 5-Year Review* (FWS 2020a) • *Giant kangaroo rat (*Dipodomys ingens*) 5-Year Review* (FWS 2020b) • *Fresno kangaroo rat (*Dipodomys nitratoides exilis*) 5-Year Review* (FWS 2020c) • *Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) 5-Year Review* (FWS 2020d) • *BLM Bakersfield Record of Decision/Approved Resource Management Plan* (BLM 2014) • *Kern County Valley Floor Habitat Conservation Plan – Draft* (Garcia and Associates 2006) • *San Joaquin River Conservancy Master Plan & Update* (San Joaquin River Conservancy 2000, 2017)

Objective	Sub-objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-3: Support climate resiliency	See below	See below	See below
Objective WILD-3.1: Acquire, protect, restore, and/or enhance habitat that supports climate resilience.	**Sub-Objective WILD-3.1.1:** Identify habitat critical for climate resilience for species of mitigation need in the GAI and acquire, protect, restore, and/or enhance this habitat. **Sub-Objective WILD-3.1.2:** Prioritize management of invasive species in key areas, such as movement corridors, that may be exacerbated by climate change such that the greatest functional lift for the species of mitigation need is provided.	• California tiger salamander • giant kangaroo rat • Fresno kangaroo rat • Tipton kangaroo rat	• *California Essential Habitat Connectivity Project* (Spencer et al. 2010) • *Recovery Plan for Upland Species of the San Joaquin Valley, California* (FWS 1998) • *California tiger salamander, Central California Distinct Population Segment (*Ambystoma californiense*) 5-year review* (FWS 2014) • *Recovery Plan for the Central California Distinct Population Segment of the California tiger salamander* (Ambystoma californiense) (FWS 2017c) • *San Joaquin kit fox (*Vulpes macrotis mutica*) 5-Year Review* (FWS 2020a) • *Giant kangaroo rat (*Dipodomys ingens*) 5-Year Review* (FWS 2020b) • *Fresno kangaroo rat (*Dipodomys nitratoides exilis*) 5-Year Review* (FWS 2020c) • *Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) 5-Year Review* (FWS 2020d) • *Environmental Assessment: Eastern Ciervo-Panoche Natural Area Habitat Protection Project* (Mouren Cattle Company parcels) (FWS and Bureau of Reclamation 2014) • *BLM Bakersfield Record of Decision/Approved Resource Management Plan* (BLM 2014) • *Resource Management Plan Southern Diablo Mountain Range & Central Coast of California Record of Decision* (BLM 2007) • *San Joaquin River Conservancy Master Plan & Update* (San Joaquin River Conservancy 2000, 2017)
Goal WILD-4: *Decrease mortality of species of mitigation need*	See below	See below	See below
Objective WILD-4.1: Reduce impacts of invasive species on populations of species of mitigation need.	**Sub-Objective WILD-4.1.1:** Eradicate invasive species in key habitat locations and/or in areas that provide a buffer to high-value habitat for the species of mitigation need. Prioritize areas where invasive species eradication would provide the greatest functional lift to species of mitigation need and their habitat. **Sub-Objective WILD-4.1.2:** Prioritize restoration of native plant species in key target areas and/or in areas that provide a buffer to priority habitat.	• California tiger salamander • San Joaquin kit fox • giant kangaroo rat • Fresno kangaroo rat • Tipton kangaroo rat	• *SWAP – Transportation Companion Plan* (CDFW 2016) • *Recovery Plan for Upland Species of the San Joaquin Valley, California* (FWS 1998) • *Kern and Pixley National Wildlife Refuges – Final Comprehensive Conservation Plan* (FWS 2005b) • *California tiger salamander, Central California Distinct Population Segment (*Ambystoma californiense*) 5-year review* (FWS 2014) • *Recovery Plan for the Central California Distinct Population Segment of the California tiger salamander* (Ambystoma californiense) (FWS 2017c) • *San Joaquin kit fox (*Vulpes macrotis mutica*) 5-Year Review* (FWS 2020a) • *Giant kangaroo rat (*Dipodomys ingens*) 5-Year Review* (FWS 2020b) • *Fresno kangaroo rat (*Dipodomys nitratoides exilis*) 5-Year Review* (FWS 2020c) • *Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) 5-Year Review* (FWS 2020d) • *BLM Bakersfield Record of Decision/Approved Resource Management Plan* (BLM 2014) • *Kern County Valley Floor Habitat Conservation Plan – Draft* (Garcia and Associates 2006) • *Metropolitan Bakersfield Habitat Conservation Plan* (Metropolitan Bakersfield Habitat Conservation Plan Steering Committee 1994) • *San Joaquin River Conservancy Master Plan & Update* (San Joaquin River Conservancy 2000, 2017)

Objective	Sub-objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Objective WILD-4.2: Reduce impacts from predation.	**Sub-Objective WILD-4.2.1:** Identify and implement measures to reduce predation, such as developing landscape designs that decrease vulnerability to predation.	• California tiger salamander • San Joaquin kit fox • giant kangaroo rat	• *Recovery Plan for Upland Species of the San Joaquin Valley, California* (FWS 1998) • *California tiger salamander, Central California Distinct Population Segment (*Ambystoma californiense*) 5-year review* (FWS 2014) • *Recovery Plan for the Central California Distinct Population Segment of the California tiger salamander* (Ambystoma californiense) (FWS 2017c) • *San Joaquin kit fox (*Vulpes macrotis mutica*) 5-Year Review* (FWS 2020a) • *BLM Bakersfield Record of Decision/Approved Resource Management Plan* (BLM 2014) • *Kern County Valley Floor Habitat Conservation Plan – Draft* (Garcia and Associates 2006) • *Metropolitan Bakersfield Habitat Conservation Plan* (Metropolitan Bakersfield Habitat Conservation Plan Steering Committee 1994) • *San Joaquin River Conservancy Master Plan & Update* (San Joaquin River Conservancy 2000, 2017)
Objective WILD-4.3: Reduce road-associated mortality.	**Sub-Objective WILD-4.3.1:** Identify safe State Highway System crossing areas for species of mitigation need in the GAI and direct species of mitigation need to safe crossings.	• California tiger salamander • San Joaquin kit fox • giant kangaroo rat • Tipton kangaroo rat	• *SWAP – Transportation Companion Plan* (CDFW 2016) • *California tiger salamander, Central California Distinct Population Segment (*Ambystoma californiense*) 5-year review* (FWS 2014) • *Recovery Plan for the Central California Distinct Population Segment of the California tiger salamander* (Ambystoma californiense) (FWS 2017c) • *San Joaquin kit fox (*Vulpes macrotis mutica*) 5-Year Review* (FWS 2020a) • *BLM Bakersfield Record of Decision/Approved Resource Management Plan* (BLM 2014) • *San Joaquin River Conservancy Master Plan & Update* (San Joaquin River Conservancy 2000, 2017)
Goal WILD-5: Provide multi-species benefits	See below	See below	See below
Objective WILD-5.1: Acquire, protect, restore, and/or enhance habitat that provides multi-species benefits.	**Sub-Objective WILD-5.1.1:** Identify priority special-status species conservation goals and objectives within the GAI. **Sub-Objective WILD-5.1.2:** Prioritize mitigation to provide benefits to special-status species that may co-occur with species of mitigation need in key habitat types and that will provide functional lift to other special-status species within the GAI. **Sub-Objective WILD-5.1.3:** Identify State Highway System right-of-way areas where enhancement efforts may benefit pollinators, as well as species of mitigation need or other priority special-status species. **Sub-Objective WILD-5.1.4:** Establish buffer zones (ideally ≥500 feet) to reduce edge effects, provide pollinator habitat, and allow for population expansion.	• California tiger salamander • San Joaquin kit fox • giant kangaroo rat	• *SWAP* (CDFW 2015) • *California Essential Habitat Connectivity Project* (Spencer et al. 2010) • *Recovery Plan for Upland Species of the San Joaquin Valley, California* (FWS 1998) • *Giant kangaroo rat (*Dipodomys ingens*) 5-Year Review* (FWS 2020b) • *Kern and Pixley National Wildlife Refuges – Final Comprehensive Conservation Plan* (FWS 2005b) • *BLM Bakersfield Record of Decision/Approved Resource Management Plan* (BLM 2014) • *Resource Management Plan Southern Diablo Mountain Range & Central Coast of California Record of Decision* (BLM 2007) • *Kern County Valley Floor Habitat Conservation Plan – Draft* (Garcia and Associates 2006) • *Pacific Gas and Electric Company San Joaquin Valley Operation and Maintenance HCP* (Jones and Stokes 2007)

[a] This column includes species of mitigation need that could benefit from these objectives. [b] More information on these plans is provided in Chapters 3 and 4. [c] Rangeland is defined as open country used for grazing or hunting animals.

7.8 Summary

Caltrans anticipates that future SHOPP and STIP-eligible transportation projects may be conditioned by CDFW and FWS to address the pressures and stressors that threaten species of mitigation need in the GAI. The pressures and stressors include:

- Habitat loss, fragmentation, and degradation;
- Invasive species;
- Disease and predation;
- Climate change and drought; and
- Contaminants.

Hence, Caltrans will seek to align advance mitigation scopes with conservation goals and objectives that address the identified pressures and stressors, thereby aligning advance mitigation efforts with regional conservation efforts.

Regional conservation goals and objectives provide a framework for scoping mitigation credit establishment that would likely successfully offset future transportation project impacts on wildlife resources by creating functional lift or conservation benefit and by mitigating the pressures and stressors on wildlife resources in the GAI. To summarize Table 7-3:

Goals WILD-1 and WILD-2 seek to conserve existing habitat for species of mitigation need within the GAI and increase connectivity between blocks of habitat. The objectives to fulfill these goals are acquisition, protection, restoration, or enhancement of land, or a combination of these objectives. Caltrans intends to prioritize efforts that provide the greatest functional lift for the species of mitigation need, and that provide a conservation benefit in terms of size, connectivity, quality, and contribution to the climate resilience of habitat within the GAI. These goals and objectives were selected to address habitat loss, fragmentation, and degradation and to address impacts from climate change and drought. Further, Caltrans anticipates that actions completed through protection, enhancement, and restoration may also provide opportunities to address invasive species, predation, and road-associated mortality.

Goal WILD-3 seeks to support climate resiliency for California tiger salamander, San Joaquin kit fox, giant kangaroo rat, Fresno kangaroo rat, and Tipton kangaroo rat populations within the GAI. The primary objectives are to reduce the effects of climate change on these species of mitigation need by increasing the protection and functionality of land that is identified as crucial for climate resiliency, including corridors that provide the ability for these species to migrate from areas of low climate resilience into areas with higher resilience and addressing the climate change-related threat from invasive species. In addition to addressing climate change in general, these goals and objectives also address habitat loss, fragmentation, and degradation, and invasive species.

Goal WILD-4 seeks to decrease mortality of species of mitigation need from known immediate and ongoing threats to individuals or populations by protecting native

vegetation, reducing conditions that favor predators, and protecting species of mitigation need from road-associated mortality. These objectives address issues related to habitat loss, fragmentation, and degradation, and threats from invasive species, predation, and contamination.

Goal WILD-5 seeks to guide advance mitigation scoping to prioritize multi-species benefits. Advance mitigation provides the opportunity to maximize Caltrans' benefit to conservation in the GAI, including to species other than the species of mitigation need. Goal WILD-5 was developed to include conservation for multiple species and to provide compensatory mitigation for impacts on species of mitigation need.

Each of the goals and objectives have sub-objectives intended to further guide advance mitigation scoping toward natural resource regulatory agencies' regional conservation goals. These sub-objectives will prompt Caltrans to incorporate priority habitat or corridors into advance mitigation scopes and address important threats in the area through an advance mitigation project. This concept is an important way Caltrans seeks to use advance mitigation scoping to set the stage, once funding approval is received, for specific advance mitigation projects to provide a functional lift for the species of mitigation need and maximize conservation benefits from mitigation within the GAI.

8. AQUATIC RESOURCES CONSERVATION GOALS AND OBJECTIVES

Caltrans' primary objective for aquatic resources is to avoid and minimize all impacts from Caltrans transportation projects in the GAI. However, sometimes compensatory mitigation is needed. Credits or values established through SHC § 800.6(a)-authorized advance mitigation projects offer the unique opportunity to consolidate needed mitigation. This consolidation helps to provide strategically placed and environmentally sound restoration and enhancement and to provide an improved environmental outcome that may not be available through the usual transportation project-by-project approach to mitigation.

Caltrans seeks to align its advance mitigation projects with natural resource regulatory agencies' goals and objectives, and to contribute to an improved environmental outcome in the GAI. With this in mind, in this chapter Caltrans presents its understanding of natural resource regulatory agencies' regional conservation goals and objectives that could apply to the aquatic resources forecast to be potentially affected by SHOPP and STIP-eligible transportation projects, as discussed in Chapters 5 and 6.

The goals and objectives developed in this chapter are intended to guide advance mitigation scoping decisions toward those choices that will provide for the greatest environmental benefit available through the advance mitigation planning and delivery processes. Such advance mitigation projects undertaken by Caltrans should contribute to aquatic resource restoration and enhancement and should yield compensatory mitigation usable by future transportation projects, as specified in SHC § 800.[1] Compensatory mitigation usable by future transportation projects should be expressed in standard units or terms recognized by the natural resource regulatory agencies.

Information presented in this chapter is for advance mitigation project scoping purposes only. Transportation projects must still go through environmental and permitting processes and must demonstrate avoidance and minimization efforts prior to compensation.

8.1 Approach

For the purposes of this RAMNA, conservation goals and objectives are a broad set of regional natural resource sustainability goals and objectives that are consistent with both regulatory requirements and conservation science. To determine the aquatic resource conservation goals and objectives applicable to the GAI, Caltrans:

[1] Pursuant to SHC § 800.9, to the maximum extent practicable, the information required for an RCIS is presented here. During CDFW's review of an RCIS, CDFW determines whether the goals and objectives presented in the RCIS are consistent with FGC § 1852, subdivision (c)(8).

- First identified natural resource regulatory agencies with the authority to include aquatic resource-related compensatory mitigation as a transportation project permit condition;
- Next, for the aquatic resources of the GAI's sub-basins that could be permanently affected by transportation projects, Caltrans identified:
  - Federal and state policies, and binding and non-binding regional conservation and land management plans, relevant to aquatic resources in the GAI;
  - Current and projected pressures and stressors on aquatic resources, including climate resiliency;
  - Opportunities to enhance the conservation benefits for aquatic resources from advance mitigation projects; and/or
  - Opportunities to provide additional benefits, where possible, to water quality, groundwater recharge, and species that require aquatic habitats.
- Last, Caltrans analyzed the aforementioned data in relation to the transportation-related activities that could potentially affect aquatic resources, and the potential range of compensatory mitigation that could satisfy a transportation project permit condition associated with the activities.

The results of this analysis were used to develop the advance mitigation conservation goals and objectives discussed here.

8.2 Natural Resource Regulatory Agencies with Aquatic Resources Oversight

Table 8-1 lists the natural resource regulatory agencies that regulate aquatic resources in the GAI who have the authority to require aquatic resource-related compensatory mitigation for transportation projects. Terrestrial special-status wildlife species are known to use streams, wetlands, and other aquatic resources that are regulated by federal and state agencies specific to those habitat types; however, this RAMNA evaluates the mitigation need for those species separately in Chapter 7.

Table 8-1. Resource Agencies that Regulate Aquatic Resources

Agency	Summary
CDFW – Region 4, Central	CDFW oversees the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species in California. California law (FGC § 1602) also requires an entity to notify CDFW prior to commencing any activity that may 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; or deposit or dispose of debris, waste, or other materials containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. CDFW issues agreements to project proponents under its authorities, including Lake and Streambed Alteration Agreements, approvals of conservation and mitigation banks, approvals of MCAs and RCISs, and NCCP permits. Additionally, CDFW's Environmental Review and Permitting, Conservation and Mitigation Banking, NCCP, and RCIS programs implement sections of the FGC, Division 1 of Title 14 of the California Code of Regulations, et seq. These programs help fulfill CDFW's mission to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values.
EPA, Region 9	EPA has authority under the federal CWA (33 USC § 11251–1357) to restore and maintain the chemical, physical, and biological integrity of the nation's waters. EPA and the Corps jointly implement the CWA Section 404 program, which regulates the discharge of dredge or fill material into WOTUS. Federal authorizations also need to be reviewed for compliance with CWA Section 401.
State Water Board and RWQCB – Region 5, Central Valley	The Porter-Cologne Act governs water quality regulation in California and gives the State Water Board and RWQCBs the authority to condition projects through waste discharge requirements, to protect water quality and the beneficial uses of waters of the state, as identified in basin plans. Basin plans, adopted by the State Water Board and RWQCBs, incorporate the beneficial use designation of surface waters of the state and must take into consideration the use and value of water for protection and propagation of fish, shellfish, and wildlife. The State Water Board and RWQCBs have been delegated the responsibility of implementing CWA Section 401, which regulates the discharge of pollutants into WOTUS. Projects that occur in one region are regulated by that regional board, whereas projects that cross regions are regulated by the State Water Board.
Corps – South Pacific Division – Sacramento District	It is the mission of the Corps' Regulatory Program (33 CFR Part 230 and Parts 320–332) to protect the nation's aquatic resources and navigation capacity while allowing reasonable development through fair, flexible, and balanced permit decisions. The Corps is responsible for administering laws for the protection and preservation of aquatic resources pursuant to Section 10 of the Rivers and Harbors Act of 1899 and CWA Section 404. Pursuant to the Rivers and Harbors Act, all work or structures in, over, or under navigable WOTUS require Corps authorization. The Corps authorizes, under CWA Section 404, the discharge of dredged or fill material into WOTUS, including wetlands. When Corps' civil works projects are proposed to be used or altered by another entity, CWA Section 408 permission must be obtained in addition to the CWA Section 404 authorization. It is the preference of the Corps to use the following order of priority for mitigation: mitigation bank, in-lieu fee program, on-site permittee responsible mitigation, and off-site permittee responsible mitigation.

Agency	Summary
FWS	FWS has jurisdiction over all federally protected wildlife, federally protected inland non-anadromous fish species, including delta smelt, and critical habitats, and requires consultation and coordination to be in compliance with the ESA. FWS authorities, including its role in mitigation, are codified under multiple statutes that address management and conservation of natural resources from many perspectives, including, but not limited to, the effects of land, water, and energy development on fish, wildlife, plants, and their habitats. FWS approves HCPs to address impacts on federally protected species, for projects lacking a federal nexus, under ESA Section 10(a)1(B). For projects with a federal nexus and potential impacts on federally protected species, FWS issues biological opinions under ESA Section 7.
NMFS, West Coast Region	NMFS has jurisdiction over all federally protected fish and wildlife marine species and critical habitats and requires consultation and coordination to be in compliance with the ESA. NMFS manages wildlife and fisheries resources in the marine and estuarine environment. NMFS issues Biological Opinions under Section 7 of the ESA for projects that may affect federally listed species managed by the agency. In addition, NMFS manages marine mammals under the Marine Mammal Protection Act, with the exception of sea otters, which are managed by FWS. NMFS is also responsible for addressing impacts on Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation and Management Act.

8.3 Aquatic Resources Overview

An overview of aquatic resources is provided in Chapter 2 and is summarized below.

The GAI conforms to the Caltrans District 6 portion of the Great Valley Ecoregion Section. This GAI overlaps with 10 HUC-8 boundaries: Fresno River, Middle Kern-Upper Tehachapi-Grapevine, Middle San Joaquin-Lower Chowchilla, Panoche-San Luis Reservoir, Tulare Lake Bed, Upper Deer-Upper White, Upper Dry, Upper Kaweah, Upper Poso, and Upper Tule. In the GAI, the Chowchilla, Fresno, Kings, Kaweah, Kern, San Joaquin, and Tule Rivers are the major stream systems (Figure 2-12) (Central Valley RWQCB 2018a, 2018b). Additionally, there are thousands of named and unnamed tributaries, most of which flow into these rivers and into the Sacramento-San Joaquin Delta, although some terminate as lakes in the Tulare Basin or as alluvial fans. Flow into these systems originates as snowmelt from the southern Sierra Nevada.

Aquatic habitat types with the potential to occur in the GAI are mapped in Appendix F. Based on the SAMNA's wetlands and waters layers, the GAI has 163,977 acres of aquatic habitat, primarily consisting of three wetland habitats that are listed in Table 2-8 and three non-wetland waters habitats that are listed in Table 2-9 (Caltrans 2017c, 2017d). A total of nine beneficial uses that support the preservation and enhancement of wildlife habitat and aquatic resources support the AMP's objective to protect natural resources through transportation project mitigation and are relevant to this RAMNA. They are detailed in Table 2-6.

8.4 Regional Conservation Efforts

References relevant to scoping advance mitigation projects in the Caltrans District 6 GAI are listed in Chapters 3 and 4. Of these documents, several identify key habitats, specific designated waters, or areas for aquatic resource enhancement and restoration (Table 8-2). Presented in Table 8-3, many of these documents identify specific National Hydrologic Dataset named features for aquatic resource enhancement and restoration; Table 8-3 presents these features and identifies which HUC-8 they occur in. Some of the documents identify key qualities, such as water quality, that are essential for aquatic resource enhancement and restoration. The documents also include strategies for aquatic resource protection and measures to address specific known, ongoing threats to aquatic resources. Caltrans will use this information during advance mitigation project scoping to help mitigation efforts in the GAI align with the goals and objectives of natural resource regulatory agencies that approve mitigation.

8.5 Pressures and Stressors

Pressures and stressors refer to environmental trends or physical, chemical, or biological factors or conditions that affect aquatic resources. According to the SWAP (CDFW 2015), a pressure is defined as “an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the target. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant.” Additionally, stress is defined in the SWAP as “[a] degraded ecological condition of a target that resulted directly or indirectly from negative impacts of pressures (e.g., habitat fragmentation)” (CDFW 2015). The Corps defines human stressors as human-caused sources of disturbance within an ecosystem, such as roads, urban areas, and agricultural lands (Corps 2015).

The documents in Table 8-2 identify multiple pressures and stressors on aquatic resources in the GAI where hydrology, land use and management, and climate intersect. These pressures and stressors were evaluated in relation to the types of direct and indirect effects that could result from transportation projects funded through SHOPP and STIP and could benefit from in-kind mitigation purchased or established through an advance mitigation project.

8.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, and habitat invasion by nonnative species have led to the loss and degradation of aquatic resources. Additionally, roads and urbanization may fragment habitat, impede connectivity between populations, impede connectivity between habitats used during different life stages, contribute to nonpoint source pollution, or alter local hydrology.

Table 8-2. Documents Identifying Aquatic Resource Goals and Objectives in the GAI

Document	Reference	Information Identified
Policies, Procedures, Guidelines, and Water Quality Plans	See below	See below
2008 Final Compensatory Mitigation Rule	73 *Federal Register* 19670	Corps' ruling to establish standards and criteria for the use of all types of compensatory mitigation, including on-site and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts on WOTUS. Recognizes that consolidating mitigation may be environmentally preferable for linear projects (because advance or at least concurrent compensatory mitigation is environmentally preferable, but not always possible to achieve) (Preamble and 33 Section 332.3).
303(d) List of Impaired Water Bodies	State Water Board 2018	Section 303(d) of the CWA requires that every 2 years, each state submit to EPA a list of rivers, lakes, and reservoirs in the state for which pollution control or requirements have failed to provide for water quality. Based on a review of this list and its associated Total Maximum Daily Load Priority Schedule (Table 2-7), 26 water bodies are listed as impaired in the GAI. Of the 26, only the Mendota Pool to Bear Creek portion of the San Joaquin River (HUC-8 18040001) has an established TMDL.
California Wetlands Conservation Policy	Executive Order W-59-93	The "No Net Loss Policy" for wetlands aims to "[e]nsure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship and respect for private property."
National Wetlands Mitigation Action Plan	EPA 2002	An EPA and Corps comprehensive, interagency document to further achievement of the goal of no net loss of wetlands. The goals and objectives of the *National Wetlands Mitigation Action Plan* were incorporated into the 2008 Final Compensatory Mitigation Rule, which was updated in 2015 and includes the no net loss policy.
Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division	Corps 2015	Provides guidelines for compensatory mitigation site selection. A watershed approach should be used when selecting sites to establish compensatory mitigation.
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	State Water Board 2019	Creates a State of California wetland definition, a framework for determining jurisdiction of state wetlands, wetland delineation procedures, and application procedures for discharges of dredge and fill material to waters of the state.

Document	Reference	Information Identified
Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin	Central Valley RWQCB 2018a	Identifies water quality objectives and beneficial uses for the Sacramento River Basin and the San Joaquin River Basin.
Water Quality Control Plan for the Tulare Lake Basin	Central Valley RWQCB 2018b	Identifies water quality objectives and beneficial uses for the Tulare Lake Basin.
Conservation and Land Management Documents	See below	See below
Central Valley Flood Protection Plan 2017 Update	California Department of Water Resources 2017	Guidance document for reducing flood risk in the Central Valley. Identifies habitat restoration as an important component to levee setback projects and seeks to increase participation in the Central Valley Habitat Exchange, which restores farmland to natural habitat.
Integrated Regional Water Management Plan ("IRWMP") (for the Kaweah River Basin)	Kaweah River Basin Regional Water Management Group 2017	This plan generally pursues increasing groundwater resources, improving water quality, and increasing water availability for riverine systems. Specific goals highlighted in this plan include reducing flood risk for Dry Creek, Lewis Creek, and Deep Creek. The Paregien site, located in HUC-8 18030007, is identified for riparian restoration.
Kern and Pixley National Wildlife Refuges Final Comprehensive Conservation Plan	FWS 2005b	Identified a goal of enhancing a 215-acre riparian area and conducting tamarisk eradication in the Kern Refuge, located in the following HUC-8s: 18030004, 18030005, and 18030012.
Kern County Valley Floor Habitat Conservation Plan	Garcia and Associates 2006	Overall goals of the plan include the following: • Establish and manage habitat preserves that cumulatively cover up to 78,944 acres in Red Zones (highest-value conservation habitat) and 441,223 acres in Green Zones (second highest-value conservation habitat). The conservation habitats include riparian, wetland, and aquatic habitats. Targets valley sink scrub, a wetland habitat, for specific habitat protection.
Kern IRWMP	Kern County 2019	This plan generally pursues increasing groundwater resources, improving water quality, and increasing water availability for riverine systems. Specific goals highlighted in this plan include restoring 460 acres of riparian habitat, recharging 8,000 acres of groundwater, and reducing nonnative plants in riparian systems to 5 percent or less of total plant mass.

Document	Reference	Information Identified
Kern Water Bank Authority Habitat Conservation Bank	Kern Water Bank Authority 1997	The management emphasis of the plan is the conservation of upland habitats and sensitive habitats around recharge basins to benefit three animal species and two plant species. Targets intermittent wetlands and alkali sink habitats for protection.
Kings Basin IRWMP	Kings Basin Water Authority 2018	This plan generally pursues increasing groundwater resources, improving water quality, and increasing water availability for riverine systems. It highlights the Coelho and Gragnani Wetlands Restoration Project, located in HUC-8 18030009, as an important restoration project in the basin.
Recovery Plan for Upland Species of the San Joaquin Valley	FWS 1998	Identifies important habitats, including some wetlands.
Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon	FWS 2005a	FWS recovery plan for vernal pool species in California and Oregon. Regions in the plan in the GAI include South Sierra Foothills, containing the Fresno, Kaweah, Kings, Lake Success, Tulare, and Yokohl core areas, and the San Joaquin Valley, which includes the Cross Creek and Pixley core areas. These core areas include or overlap the following HUC-8s: 18030005, 18030006, 18030007, 18030009, 18030012, 18040001, and 18040006. Listed species for recovery in these core areas include vernal pool fairy shrimp, vernal pool tadpole shrimp, conservancy fairy shrimp, San Joaquin Valley Orcutt grass, Colusa grass, succulent owl's-clover, Greene's tuctoria, and Hoover's spurge. Additional unlisted aquatic species of concern expected to benefit from this plan in the GAI include midvalley fairy shrimp (*Branchinecta mesovallensis*), California fairy shrimp (*Linderiella occidentalis*), and spiny-sepaled buttoncelery (*Eryngium spinosepalum*).
Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook salmon and Central Valley Spring-run Chinook salmon and the DPS of California Central Valley Steelhead	NMFS 2014	NMFS recovery plan for the Sacramento River winter-run Chinook salmon Evolutionarily Significant Unit, Central Valley spring-run Chinook salmon Evolutionarily Significant Unit, and California Central Valley steelhead DPS. The Diversity Group of this plan that occurs in the GAI is the Southern Sierra Nevada Diversity Group, which does not include the Sacramento River Winter-run Chinook salmon Evolutionarily Significant Unit. Goals of this plan center on the delisting of these Chinook salmon Evolutionarily Significant Units and steelhead DPS. Many specific goals and objectives are identified in the document and are too numerous to include here; however, improving habitat along the San Joaquin River is listed as a recovery action.

Document	Reference	Information Identified
Southern Sierra IRWMP	Southern Sierra Regional Water Management Group 2018	This plan generally pursues increasing groundwater resources, improving water quality, and increasing water availability for riverine systems. Specific goals highlighted in this plan include the promotion of natural water storage through restoration of meadows, streams, and riparian forests.
SWAP	CDFW 2015	Identifies American southwest riparian forest and woodland and freshwater marsh as conservation targets. Identifies the Upper Kern Native Fish Assemblage as a conservation target for the Tulare-Buena Vista Lakes (HUC-4 1803), and the San Joaquin Native Aquatic Species for the San Joaquin (HUC-4 1804). These areas would correspond to all HUC-8s in the GAI.
Tule River Basin IRWMP	Tule River Basin 2018	This plan generally pursues increasing groundwater resources, improving water quality, and increasing water availability for riverine systems. Specific goals highlighted in this plan include reducing the concentration of arsenic, perchlorate, and nitrate.

Table 8-3. Aquatic Features Identified in this Chapter, by HUC-8

Fresno River HUC-8 18040007	Middle Kern-Upper Tehachapi-Grapevine HUC-8 18030003	Middle San Joaquin-Lower Chowchilla HUC-8 18040001	Panoche-San Luis Reservoir HUC-8 08040014	Tulare Lake Bed HUC-8 18030012	Upper Kaweah HUC-8 1030007	Upper Poso HUC-8 18030004	Upper Tule HUC-8 18030006
Fresno River	Caliente Creek Kern River	San Joaquin River	Chowchilla River	Kings River Tulare Lake	Cross Creek Dry Creek Kaweah River	Poso Creek	Deep Creek Lewis Creek Tule River

Note: Although partially inside the GAI, the Upper Deer-Upper White (HUC-8 18030005) and Upper Dry (HUC-8 18030009) HUC-8s do not contain National Hydrology Dataset named features in the plans listed in Table 8-2 nor the goals listed in Table 8-4.

8.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread nonnative, invasive species. When invasive, nonnative species enter an ecosystem, they can disrupt the natural balance, resulting in a reduction of biodiversity, degradation of habitats, alteration of native genetic diversity, shifting of wetland type, and further threats to already endangered or threatened natural resources. If invasive plant species become dominant in vernal pool systems, such as Mediterranean barley (*Hordeum marinum*) and annual beard grass (*Polypogon monspeliensis*), many native aquatic species can become sparse or locally extirpated (CDFW 2015). Invasive plant species that affect riparian systems in the GAI include giant reed (*Arundo donax*), perennial pepperweed (*Lepidium latifolium*), and gum (*Eucalyptus* sp.) (Cal-IPC 2020). Invasive animal species that can damage aquatic ecosystems in the GAI include nutria, barred tiger salamander, bullfrog, and western mosquitofish. These species prey on native aquatic species and disrupt the food web of aquatic ecosystems. A total of 51 new fish species have become established in the Central Valley, including striped bass (*Morone saxatilis*), white catfish (*Ameiurus catus*), American shad (*Alosa sapidissima*), and others (CDFW 2015).

8.5.3. Altered Hydrology and Water Quality

Water quality and hydrology can be altered directly and/or indirectly when aquatic systems are modified by physical barriers or features, such as roads, bridge infrastructure, and check dams. Physical barriers can alter water quality and hydrology both upstream and downstream of the transportation feature through modified flows. Specifically, vernal pool and seasonal wetland hydrology may be altered by changes to surface and subsurface flow, depending on topography, precipitation, and soil types (FWS 2005a), as can the hydrology that supports other freshwater wetland and riparian communities. Water-related structures, such as culverts and bridges found throughout the Central Valley's rivers and tributaries, have affected the aquatic ecosystem by altering historical flooding regimes, erosion, and deposition of sediments that maintain floodplains. Stormwater, including road runoff, may also stress aquatic systems by introducing heavy metals, salts, nutrients, and other materials that can harm aquatic species (CDFW 2015).

Water Temperature

Various factors contribute to water temperature, including the density of riparian vegetation, drought, diversions, and others. These changes stress aquatic species sensitive to temperature during various life stages. Water temperature also affects dissolved oxygen, which is required for aquatic species and can change the solubility of toxins, and water temperature has a direct effect on fish egg development (California Department of Fish and Game 2004).

8.5.4. Climate Change and Drought

The Central Valley will likely experience more flooding in the winter, greater erosion of riparian habitats, and increased river and creek sedimentation as a result of climate

change (California Emergency Management Agency 2012). Cold winter storms that currently create a deep Sierra snowpack that, as it melts, provides flows to Central Valley streams and rivers throughout the summer are expected to become warmer and more unpredictable, resulting in less snow and more rain. The expected result of these warmer winter conditions is higher average winter flows and a shorter runoff period that will lead to increased flooding and lower average summer flows in Central Valley streams and rivers (CDFW 2015). Caltrans' analysis of the potential climate change in District 6 indicates a rise in absolute minimum air temperature by up to 9.9 degrees Fahrenheit by 2085, yielding hotter summer and drier winters, and additional flooding in the San Joaquin River and tributaries (Caltrans 2019c).

Climate change is hypothesized to affect aquatic resources in the GAI by shifting snowmelt to earlier in the year, mixed with intense rainfall events in the foothills that feed Central Valley rivers, resulting in increased flooding. Climate change heightens the threat of high stream flow because of increases in the frequency and magnitude of greater precipitation events resulting from warmer weather across California. According to the Bureau of Reclamation (2016), climate change is projected to increase flood volumes by 60 to 80 percent over the next 50 years for the San Joaquin River Basin. Rapid snowmelt and less snowpack will result in increased flooding and earlier timing of runoff, making it harder to capture runoff in reservoirs, then reducing the availability of water in the Central Valley (California Emergency Management Agency 2012).

The USGS California Water Science Center ("CWSC") Geophysical Fluid Dynamics Lab Climate Model 2.1 suggests that the Central Valley will experience a 40 percent decline in stream flow during the twenty-first century. Consequently, surface water for agriculture and riparian habitats will be less available (CWSC 2019). With less water available for agriculture, CWSC projects less surface water will be available in aquatic systems. Model simulations conducted by CWSC indicate that with the reduced stream flow in the Central Valley, increased demands for irrigation water would require increased groundwater pumping. As a result of this anticipated increase in groundwater pumping, Central Valley streams and rivers are expected to experience reduced base flow, reduced groundwater outflows to the Delta, increased depths to groundwater, and land subsidence.

8.6 Multi-resource Benefits

Advance mitigation planning provides Caltrans an opportunity to integrate the enhancement and/or restoration of multiple aquatic resource related values into its advance mitigation scoping to benefit California native aquatic biodiversity, special-status species, and aquatic resources.

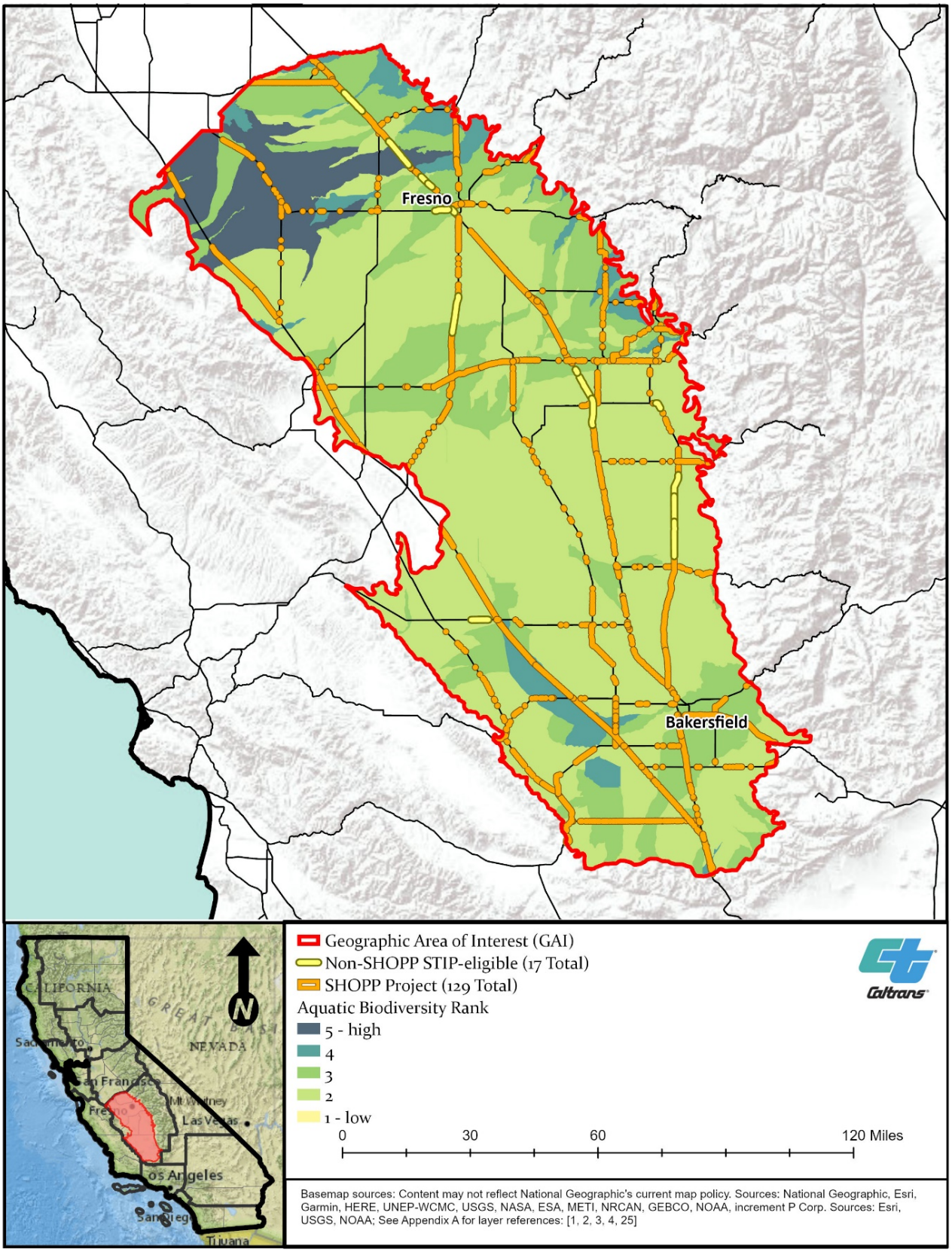
- Figure 8-1 illustrates the regional aquatic biodiversity in the GAI, as provided by CDFW's ACE GIS dataset. According to these data, low to moderate aquatic biodiversity dominates the GAI. However, some areas of moderate to high aquatic biodiversity are present along the State Highway System where SHOPP and STIP-eligible projects, especially in the southern portion of the GAI and along the eastern

edge, and there are some isolated areas with high aquatic biodiversity in the northern portion of the GAI.

- Enhancing and/or restoring the aquatic resources of the GAI is expected to contribute to biologically sustainable populations of special-status aquatic, wetland, and riparian plant and wildlife species. For example, enhancement and/or restoration of seasonal wetland habitat, including vernal pools, would likely benefit several aquatic and terrestrial species that depend on these types of habitats, such as vernal pool branchiopods and California tiger salamander.
- Enhancing and/or restoring the aquatic resources of the GAI is expected to support or contribute to beneficial uses of waters of the GAI. For example, enhancement and/or restoration of wetlands adjacent to spawning habitat would likely improve spawning habitat water quality and increased shaded riverine habitat will improve riparian conditions for fish species. Further, enhancement and/or restoration of wetlands adjacent to GAI waterways could sequester contaminants on waterways identified as 303(d) impaired and/or with an established TMDL.

Caltrans will consider aquatic resources' biodiversity values, special-status species with the potential to co-occur in aquatic habitats, the beneficial uses of waterways, and impaired waterways during advance mitigation scoping—thereby improving the conservation benefits of mitigation in the GAI.

Figure 8-1. Aquatic Biodiversity



8.7 Advance Mitigation Conservation Goals and Objectives

The conservation goals and objectives compiled in Table 8-4 are intended to be relevant to anticipated future SHOPP and STIP transportation project compensatory mitigation needs, be consistent with the goals and objectives of natural resource regulatory agencies for aquatic resources, address pressures and stressors on aquatic resources, and support mitigation success in the GAI. Each conservation goal is supported by one or more conservation objective; objectives are more specific, measurable, achievable, relevant, and time-bound measures that align to a desired result specified by a goal. At the broad scale, these aquatic resources goals and objectives encompass ecological processes, address functions and values of aquatic systems, and prioritize regional conservation that preserves intact aquatic resources, restores aquatic function, and supports climate change planning. Sub-objectives are included for each objective to guide Caltrans' advance mitigation scoping toward those actions that would create the greatest functional lift or conservation benefit, support long-term preservation, restore surface water flows, and reduce climate change effects on aquatic resources in the GAI. Sub-objectives also capture specific measures from conservation and land management plans that address threats to aquatic resources. Several of the goals are interrelated, and many objectives could apply to more than one goal; objectives were grouped with the goal to which they most specifically aligned. Goals and objectives are generally presented in order from general to more specific.

The goals and objectives presented herein are intended to support the watershed approach, as practiced by natural resource regulatory agencies. The watershed approach is an analytical process through which the Corps, State Water Board, and RWQCBs make decisions that support the sustainability or improvement of aquatic resources, with the goal of maintaining and improving the quality and quantity of aquatic resource through strategic selection of compensatory mitigation sites. The Corps subscribes to a watershed approach for compensatory mitigation that uses the HUC-based classification system, or a topographic watershed-based system, depending on the size and location of a [transportation or other] project (Corps 2015). The State Water Board and RWQCBs generally subscribe to an approach for compensatory mitigation decisions that follows the Corps' watershed approach; however, the HU classification system may be used on a case-by-case basis (State Water Board 2019). Additionally, the goals, objectives, and sub-objectives presented in Table 8-4 reflect Caltrans' intention to develop advance mitigation project scopes for in-kind mitigation.

Table 8-4. Advance Mitigation Conservation Goals and Objectives for Aquatic Resources

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-2
Goal AR-1: No net loss of area, functions, and values of aquatic resources	See below	See below
Objective AR-1.1: Improve quantity and function of aquatic resources.	**Sub-Objective AR-1.1.1:** Enhance and/or restore aquatic resources such that the greatest functional lift to the aquatic resource is provided, including by consolidating compensatory mitigation. **Sub-Objective AR-1.1.2:** Prioritize enhancement and/or restoration in key aquatic habitats that are identified in the SWAP, FWS, NMFS recovery plans, and other land management plans that are identified in Table 8-2. **Sub-Objective AR-1.1.3:** Prioritize enhancement, and/or restoration of riparian vegetation to increase connectivity between existing blocks of riparian vegetation, particularly in the upper San Joaquin River and Cross Creek as well as other named and unnamed tributaries into the San Joaquin River, many of which are listed in Table 8-3. **Sub-Objective AR-1.1.4:** Enhance and/or restore aquatic resource functions, such as connectivity, abundance of native plants, and water quality, that define habitat value for aquatic organisms.	• *SWAP* (CDFW 2015) • *Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines* (Corps 2015) • *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Water Board 2019) • *Kern County Valley Floor HCP* (Garcia and Associates 2006) • *Kern Water Bank Authority Habitat Conservation Bank* (Kern Water Bank Authority 1997) • *Kern and Pixley National Wildlife Refuges Final Comprehensive Conservation Plan* (FWS 2005b) • *Recovery Plan for Vernal Pool Ecosystems of California and Oregon* (FWS 2005a) • *Southern Sierra IRWMP* (South Sierra Regional Water Management Group 2018) • *Kings River IRWMP* (Kings Basin Water Authority 2018) • *Kaweah River Basin IRWMP* (Regional Water Management Group 2017) • *Tule River Basin IRWMP* (Tule River Basin 2018) • *Kern IRWMP* (Kern County 2019) • *NMFS Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the DPS of California Central Valley Steelhead* (NMFS 2014)
Goal AR-2: Restore and maintain the chemical, physical, and biological integrity of waters	See below	See below
Objective AR-2.1: Protect and enhance water quality.	**Sub-Objective AR-2.1.1:** Enhance beneficial uses of waters in the GAI through water quality improvements. **Sub-Objective AR-2.1.2:** Prioritize enhancement and/or restoration of resources identified with RWQCB beneficial use designations, such as biological habitats of special significance and rare, threatened, or endangered species; cold freshwater habitat; warm freshwater habitat; spawning, reproduction, and/or early development; migration of aquatic species; estuarine habitat; and wildlife habitat. **Sub-Objective AR-2.1.3:** Prioritize controlling erosion, nutrients, contaminants, and temperatures in the HUC-8s listed in Table 8-3. **Sub-Objective AR-2.1.4:** Protect, acquire, or fund the enhancement of water quality objectives for aquatic resources, for example, in the San Joaquin River. **Sub-Objective AR-2.1.5:** Enhance and/or restore areas with high water quality protection and remediation values.	• *Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin* (Central Valley RWQCB 2018a) • *Water Quality Control Plan for the Tulare Lake Basin* (Central Valley RWQCB 2018b) • *SWAP* (CDFW 2015) • *Southern Sierra IRWMP* (Southern Sierra Regional Water Management Group 2018) • *Kings River IRWMP* (Kings Basin Water Authority 2018) • *Kaweah River Basin IRWMP* (Regional Water Management Group 2017) • *Tule River Basin IRWMP* (Tule River Basin 2018) • *Kern IRWMP* (Kern County 2019)

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-2
Objective AR-2.2: Improve surface water hydrology.	**Sub-Objective AR-2.2.1:** Enhance and/or restore natural hydrologic regimes. **Sub-Objective AR-2.2.2:** Reconnect severed aquatic systems and improve connectivity within aquatic systems. **Sub-Objective AR-2.2.3:** Reestablish hydrologic regimes or drainage patterns for better function of riparian areas, freshwater emergent wetlands, freshwater forested/shrub wetlands, and ephemeral and intermittent drainages.	• *SWAP* (CDFW 2015) • *Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines* (Corps 2015) • *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Water Board 2019) • *Kern and Pixley National Wildlife Refuges Final Comprehensive Conservation Plan* (FWS 2005b) • *Central Valley Flood Protection Plan 2017 Update* (California Department of Water Resources 2017) • *Recovery Plan for Upland Species of the San Joaquin Valley* (FWS 1998)
Objective AR-2.3: Improve natural water storage and groundwater recharge.	**Sub-Objective AR-2.3.1:** Enhance and/or restore areas with high value for water storage and groundwater recharge. **Sub-Objective AR-2.3.2:** Promote natural water storage through restoration of stream and riparian areas' natural functions to provide improved water storage and release. **Sub-Objective AR-2.3.3:** Reduce excessive and invasive vegetation along stream/riparian corridors to optimize vegetative transpiration rates to sustainable levels and increase water storage in soils and streams.	• *Southern Sierra IRWMP* (Southern Sierra Regional Water Management Group 2018) • *Kings River IRWMP* (Kings Basin Water Authority 2018) • *Kaweah River Basin IRWMP* (Regional Water Management Group 2017) • *Tule River Basin IRWMP* (Tule River Basin 2018) • *Kern IRWMP* (Kern County 2019) • *Kern Water Bank Authority Habitat Conservation Bank* (Kern Water Bank Authority 1997)
Goal AR-3: Support climate resiliency	See below	See below
Objective AR-3.1: Reduce impacts from climate change.	**Sub-Objective AR-3.1.1:** Enhance and/or restore aquatic resource function and value in areas of lower climate resilience, such as the central portion of the GAI, to reduce climate change effects on aquatic resources. **Sub-Objective AR-3.1.2:** Prioritize riparian areas of the HUC-8s listed in Table 8-3 and implement improvements that involve enhancement and/or restoration to improve freshwater quantity and quality, floodplain connectivity, and in-stream cover continuity. **Sub-Objective AR-3.1.3:** Enhance and/or restore aquatic habitats by using native species such as Fremont's cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), arroyo willow (*Salix lasiolepis*), cattails (*Typha* spp.), rushes (*Juncus* sp.), and bulrushes (*Schoenoplectus* sp.) to reduce the effects of climate change. **Sub-Objective AR-3.1.4:** Reduce adverse in-stream flooding effects by restoring affected headwater and tributary hydrological functions for the San Joaquin River, Dry Creek, Lewis Creek, Deep Creek, and Poso Creek. **Sub-Objective AR-3.1.5:** Prioritize enhancement and/or restoration in areas that can also reduce risk in flood prone systems, in particular areas along the San Joaquin River, Dry Creek, Lewis Creek, Deep Creek, and Poso Creek.	• *SWAP* (CDFW 2015) • *Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines* (Corps 2015) • *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Water Board 2019) • *Kern and Pixley National Wildlife Refuges Final Comprehensive Conservation Plan* (FWS 2005b) • *Central Valley Flood Protection Plan 2017 Update* (California Department of Water Resources 2017) • *Southern Sierra IRWMP* (Southern Sierra Regional Water Management Group 2018) • *Kings River IRWMP* (Kings Basin Water Authority 2018) • *Kaweah River Basin IRWMP* (Regional Water Management Group 2017) • *Tule River Basin IRWMP* (Tule River Basin 2018) • *Kern IRWMP* (Kern County 2019)
Objective AR-3.2: Improve aquatic habitat resiliency.	**Sub-Objective AR-3.2.1:** Promote native plant species that can stabilize banks, improve filtering of nutrient loads from water, and maintain the flood conveyance properties of streams and estuaries, such as rushes, bulrushes, cattail, and willows. **Sub-Objective AR-3.2.2:** Prioritize management of invasive species in aquatic habitats, such as giant reed, tree of heaven, red gum, black locust, and saltcedar, that may be exacerbated by climate change such that the greatest functional lift is provided. **Sub-Objective AR-3.2.3:** Enhance and/or restore small (i.e., high order) tributaries/streams that discharge into larger rivers such as the Kings, Kaweah, Kern, Tule, San Joaquin, Chowchilla, and Fresno Rivers.	• *SWAP* (CDFW 2015) • *Central Valley Flood Protection Plan 2017 Update* (California Department of Water Resources 2017) • *Southern Sierra IRWMP* (Southern Sierra Regional Water Management Group 2018) • *Kings River IRWMP* (Kings Basin Water Authority 2018) • *Kaweah River Basin IRWMP* (Regional Water Management Group 2017) • *Tule River Basin IRWMP* (Tule River Basin 2018) • *Kern IRWMP* (Kern County 2019)

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-2
Goal AR-4: Provide multi-resource benefits	See below	See below
Objective AR-4.1: Coordinate mitigation to provide benefits to other resources.	**Sub-Objective AR-4.1.1:** Identify aquatic resource areas currently occupied by, or that provide habitat for, one or more special-status species, or areas that contribute to the protection of ecologically, geographically, and/or genetically distinct populations or sub-populations of obligate aquatic special-status species. **Sub-Objective AR-4.1.2:** Enhance and/or restore geographic, topographic, hydrologic, and soil features that support vernal pool complexes, riparian habitats, stream/wash habitats, and alkali sink habitat critical to vernal pool crustaceans and plants, such as California fairy shrimp, Bakersfield saltbush, and slough thistle. **Sub-Objective AR-4.1.3:** Increase shaded riverine aquatic habitat in the San Joaquin River, Caliente Creek, and Cross Creek for fish and other aquatic life.	• *SWAP* (CDFW 2015) • *Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines* (Corps 2015) • *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Water Board 2019) • *Kern and Pixley National Wildlife Refuges Final Comprehensive Conservation Plan* (FWS 2005b) • *Central Valley Flood Protection Plan 2017 Update* (California Department of Water Resources 2017) • *Kern County Valley Floor HCP* (Garcia and Associates 2006) • *Recovery Plan for Upland Species of the San Joaquin Valley* (FWS 1998) • *Recovery Plan for Vernal Pool Ecosystems of California and Oregon* (FWS 2005a) • *NMFS Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the DPS of California Central Valley Steelhead* (NMFS 2014)

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8.8 Summary

Caltrans anticipates that future SHOPP and STIP-eligible transportation projects may be conditioned by the Corps, State Water Board, RWQCB, and CDFW and NMFS to address the pressures and stressors that threaten aquatic resources in the GAI. The pressures and stressors include:

- Habitat loss, fragmentation, and degradation;
- Invasive species;
- Altered hydrology and water quality; and/or
- Climate change and drought.

Hence, Caltrans will seek to align advance mitigation scopes with conservation goals and objectives that address the identified pressures and stressors, thereby aligning advance mitigation efforts with regional conservation efforts. As noted in Title 33 CFR Section 332.3, consolidating compensatory mitigation is ecologically preferable.

Regional conservation goals and objectives provide a framework for scoping mitigation credit establishment that would likely successfully offset future transportation project impacts on aquatic resources by creating functional lift or conservation benefit, and by mitigating the pressures and stressors on aquatic resources in the GAI. To summarize Table 8-4:

Goal AR-1 seeks to achieve no net loss of aquatic resource area, functions, and values in the GAI. The primary objectives associated with this goal are to provide functional lift and long-term protection of aquatic resources, protect and enhance water quality, and restore and enhance surface water hydrology. The sub-objectives were selected to address the following pressures and stressors: habitat loss, fragmentation, and degradation as well as altered hydrology and water quality.

Goal AR-2 seeks to restore and maintain the chemical, physical, and biological integrity of waters. The primary objectives associated with this goal are to protect and enhance water quality and restore and enhance surface water hydrology. The sub-objectives were selected to address the following pressures and stressors: altered hydrology and water quality.

Goal AR-3 seeks to support climate resiliency for aquatic resources in the GAI. The primary objectives are to reduce impacts on aquatic resources from climate change and to improve aquatic habitat climate resiliency. The sub-objectives were selected to address the following pressures and stressors: habitat loss, fragmentation, and degradation; invasive species; and climate change and drought.

Goal AR-4 seeks to guide advance mitigation project scoping to prioritize multi-resource benefits, with the only objective being to coordinate mitigation efforts for multi-resource benefits. The sub-objectives of Goal AR-4 describe what additional benefits exist for other resources in the GAI, including benefits to upland terrestrial habitat. Goal AR-4 was developed to include conservation for multiple resources while seeking to address transportation projects' effects on aquatic resources.

Each of the goals and objectives have sub-objectives intended to further guide advance mitigation scoping toward natural resource regulatory agencies' regional conservation goals. These sub-objectives will prompt Caltrans to incorporate multiple benefits into advance mitigation scopes and address important threats in the area through an advance mitigation project. This concept is an important way Caltrans seeks to use advance mitigation scoping to set the stage, once funding approval is received, for specific advance mitigation projects to provide a functional lift for aquatic resources and to maximize conservation benefits from mitigation within the GAI.

9. ASSESSMENT OF AUTHORIZED ACTIVITIES

Informed by this RAMNA and its reviewers' comments and feedback, Caltrans District 6 will nominate advance mitigation projects to the Caltrans Director and request funding approval (see Step 4 in Figure 1-1, Figure 6-1; Caltrans 2019a). Each advance mitigation project nominated to the Director will consist of a scope, schedule, and cost for an SHC § 800.6(a)-authorized activity. With respect to scope, in this chapter, Caltrans analyzes the information presented previously to identify advance mitigation project scope options that have a high probability of successfully meeting the AMP's transportation project and environmental objectives. Understanding the regulatory framework, environmental setting, available opportunities to purchase credits, impact forecasts, transportation project schedule needs, and natural resource regulatory agency goals and objectives will assist Caltrans District 6 with scoping of SHC § 800.6(a)-authorized activities, to be considered further for potential funding by the AMA (see Step 4 of Figure 1-1, Section 9.4).

Note that the analysis presented in this chapter is for advance mitigation project scoping purposes only. Transportation projects must still go through environmental and permitting processes and must demonstrate avoidance and minimization efforts prior to compensation.

9.1 Overview of Advance Mitigation Project Scope Development

Advance mitigation project scopes will provide enough information, at the appropriate level of detail, for the Caltrans Director to concur with funding. Appropriately, project scopes will address transportation project delivery acceleration and natural resources protection. To meet the AMP's objective of accelerating transportation project delivery, at a minimum, advance mitigation project scopes will be consistent with the AMP's founding legislation and the state's competitive bid requirements, and will address transportation project schedule milestones and constraints (Table 9-1). To meet the AMP's objective of natural resource protection through transportation project mitigation, at a minimum, an advance mitigation project scope will be consistent with natural resource regulatory agency's goals and objectives, which may be expressed in an approved regulatory instrument or interagency agreement and/or aligned with conservation goals and objectives identified in Chapter 7 or Chapter 8 and summarized in Table 9-2.

Table 9-1. Summary of Transportation-related Advance Mitigation Project Scope Requirements

Advance mitigation project scopes must include the following:
Be an authorized activity in accordance with SHC § 800.6(a)
Benefit multiple transportation projects' delivery schedules
Deliver mitigation anticipated to be needed to fulfill the mitigation requirements of transportation improvements[a]
Be consistent with natural resource regulatory agency goals and objectives
Yield mitigation in units and terms approved by natural resource regulatory agencies with the authority to condition transportation project permits with compensatory mitigation
Employ, as appropriate, existing applicable state and federal standards and instruments, mitigation-related agreements, advance mitigation project-specific agreements,[b,c] and contracts with qualified third parties[d]
Address overlapping mitigation requirements
Implement the state's competitive proposal and bidding processes[d]
Strategically exercise the AMA
Manage the financial, technical, and strategic risks associated with Caltrans' investments

[a] California Constitution, Article XIX, § 2, subdivision (a)
[b] An advance mitigation project-specific interagency agreement is a general term to describe an agreement between resource agencies that attaches or binds advance mitigation requirements to a sponsor, qualified third party, or permittee; natural resource regulatory agencies agree that the action provides mitigation. Examples of advance mitigation project-specific interagency agreements include cooperative agreements, MCAs, or other interagency agreements. Advance mitigation project-specific interagency agreements are developed after a Caltrans advance mitigation project is funded.
[c] The authority for Caltrans to enter into interagency agreements with public entities such as CDFW is under SHC § 114 and SHC § 130.
[d] Procedures for Caltrans to enter in contracts with third parties are available at: http://ppmoe.dot.ca.gov/des/oe/contractor-info.html.

Table 9-2. Summary of Conservation-related Goals and Objectives

Advance mitigation project scopes will strive to:
Benefit multiple wildlife species and aquatic resources
Be consistent with existing regional conservation planning expressed in a resource agency strategic plan, conservation plan, HCP, NCCP, watershed plan, restoration plan, investment strategy, RCIS, BEI, in-lieu fee program instrument, land management plan, or other documented conservation effort
Benefit regional biodiversity
Contribute to landscape climate change resiliency
Contribute to landscape connectivity
Contribute to federal and/or California special-status species population recovery
Mitigate effects of stressors on wildlife species and aquatic resources
Restore and rehabilitate wildlife habitat and aquatic resources

9.2 Benefiting Transportation Project Needs Summary

The proximity of planned SHOPP and non-SHOPP STIP-eligible transportation projects to natural resources is shown in figures throughout this document. Estimated transportation project mitigation needs within the GAI for fiscal years 2017/2018 to 2026/2027 are presented in Chapter 5, and the timing of the needs is analyzed in Chapter 6. For the time interval under consideration, 2017/2018 to 2026/2027, District 6 intends to prioritize purchasing or developing mitigation credits or values that may benefit Senate Bill 1 transportation projects that are planned for the middle and end of the planning period. Hence, given the expected timing of mitigation need, at this time (December of fiscal year 2020/2021) mitigation that can be purchased or established by 2023/2024 (within the next 2 years) could address approximately:

- 16 acres of California tiger salamander habitat, potentially contributing to the acceleration of 20 transportation projects
- 69.5 acres of San Joaquin kit fox habitat, potentially contributing to the acceleration of 37 transportation projects
- 35.3 acres of giant kangaroo rat habitat, potentially contributing to the acceleration of 16 transportation projects
- 61 acres of Fresno kangaroo rat (inclusive of Tipton and short-nosed kangaroo rat), potentially contributing to the acceleration of 30 transportation projects
- 7 acres of wetlands, potentially contributing to the acceleration of 22 transportation projects
- 39.7 acres of non-wetland waters, potentially contributing to the acceleration of 51 transportation projects, where “waters” is a general term that can apply to WOTUS, waters of the state, or both. (As discussed previously, the SAMNA model does not distinguish between federal or state jurisdictions.)

All or some of these needs could form the basis for Caltrans District 6 to develop an advance mitigation project scope. In addition, Caltrans SHOPP advance mitigation credits established by the Bloss Ranch Conservation Bank,[1] under development, may be able to address California tiger salamander credit needs in the northern portion of the GAI (see Section 4.1).

9.3 Authorized Activity Summary

Advance mitigation project scope options that have a high probability of successfully meeting the AMP's objectives are feasible. Below, each of the 11 SHC § 800.6(a)-authorized advance mitigation project types is briefly described, followed by a discussion of its feasibility. Listed in Table 9-3, some advance mitigation project types are not currently feasible because they are not available in the GAI. Others are not currently feasible because a regulatory and administrative pathway is not available. Still others may be not be feasible to implement on a schedule to contribute to accelerated transportation project delivery. Results of the feasibility analysis are summarized in the subsections below and in Table 9-4 (wildlife resources) and Table 9-5 (aquatic resources), both of which are located at the end of this chapter

Table 9-3. Advance Mitigation Project Types[a]

Advance Mitigation Project Type	Authorization	Section
Caltrans pays mitigation fees or other costs or payments associated with coverage of transportation projects under an approved NCCP[b] and/or an approved HCP.	SHC § 800.6(a)(2)	9.3.1
Caltrans purchases credits from an existing conservation bank.	SHC § 800.6(a)(1)	9.3.2
Caltrans purchases credits from an existing mitigation bank.	SHC § 800.6(a)(1)	9.3.3
Caltrans purchases credits from an existing in-lieu fee program.	SHC § 800.6(a)(1)	9.3.4
Caltrans purchases credits developed through an MCA, established under a CDFW-approved RCIS.[c]	SHC § 800.6(a)(3)(A)	9.3.5
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated conservation bank, in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)	9.3.6
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated mitigation bank in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)	9.3.7
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated in-lieu fee program in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)	9.3.8

[1] Bloss Ranch Conservation Bank is outside of the GAI, but its service area covers a portion of the GAI.

Advance Mitigation Project Type	Authorization	Section
Caltrans funds the implementation of conservation actions and habitat enhancement actions[c,d] to generate mitigation credits pursuant to an MCA established under a CDFW-approved RCIS.[c] The scope may include Caltrans first entering into or funding the preparation of an MCA.[c] The scope may also include Caltrans first entering into or funding the preparation of an RCIS.[c]	SHC § 800.6(a)(3) SHC § 800.6(a)(3)(A)	9.3.9
Caltrans acquires, restores, manages, monitors, enhances, and preserves lands, waterways, aquatic resources, or fisheries, or funds the acquisition, restoration, management, monitoring, enhancement, and preservation of lands, waterways, aquatic resources, or fisheries, that would measurably advance a conservation objective specified in an RCIS if the department concludes that the action or actions could conserve or create environmental values that are appropriate to mitigate the anticipated potential impacts of planned transportation improvements.	SHC § 800.6(a)(3)(B)	9.3.10
When the other mitigation options (above) are not practicable, Caltrans may perform mitigation in accordance with a programmatic mitigation plan[e] pursuant to SHC § 800.9. The programmatic mitigation plan shall include, to the maximum extent practicable, the information required for an RCIS.[c]	SHC § 800.6(a)(4) SHC § 800.9	9.3.11

[a] Caltrans intends to contract or subcontract implementation tasks when appropriate and as required.
[b] When Caltrans is a permittee under the NCCP, or if Caltrans qualifies as a Participating Special Entity and the project is a covered activity in the NCCP.
[c] See: https://www.wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[d] Under specific conditions, fish passage and wildlife crossing structures may qualify as enhancement actions under an RCIS in accordance with FGC § 1850–1861.
[e] Programmatic mitigation plans are defined in 23 USC § 169(a) (SHC § 800.9). No more than 25 percent of the funds in the AMA may be allocated for this purpose over a 4-year period [SHC § 800.6(a)(4)].

9.3.1. HCP and/or NCCP Fees

HCPs and NCCPs are discussed in Section 4.2. HCPs and NCCPs are species-focused and are aligned with and plan for natural resource protection. HCPs and NCCPs provide for incidental take under the ESA and CESA. FWS is the signatory agency to HCPs and CDFW is the signatory agency to NCCPs.

Caltrans identified three final HCPs, one in-progress HCP, and one final HCP/NCCP that have plan areas that overlap the GAI (Table 4-2, Figure 4-1). Caltrans is not a permittee to any of them; however, the Kern Water Bank HCP/NCCP does cover some road-related activities. When Caltrans is not a permittee, it is unknown whether Caltrans would be able to contribute to an NCCP because Caltrans would need to apply as a Participating Special Entity to the plan's sponsor to qualify for some of the plan's privileges. It is also unknown whether the NCCPs where Caltrans might qualify as a Participating Special Entity are structured in such a way that Caltrans could purchase bulk credits or values in advance of transportation project delivery—that is, through advance mitigation project delivery.

Feasibility. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years,[2] at which point the credits or values would be available to transportation projects. For NCCPs where Caltrans would seek Participating Entity status, such as Kern Water Bank HCP/NCCP, there may be transportation project schedule benefits if contributions were complete by 2023/2024 (Table 4-2, see Figures 6-2 and 6-4 for schedule). The District and a specific NCCP sponsor would need to determine the feasibility of this approach.

9.3.2. Conservation Bank Credit Purchase

Conservation banks are discussed in Section 4.3. Conservation banks are species-focused, and each bank's alignment with natural resource protection is documented through its BEI. Caltrans identified 16 conservation banks in the GAI. In the GAI, FWS is a signatory to all 16 banks: 8 include California tiger salamander credits, 11 include San Joaquin kit fox credits, 1 includes giant salamander credits, and 1 includes Tipton kangaroo rat credits (Table 4-3). CDFW is a co-signatory to 5 of the 16 banks and recognizes credits for the dually listed species of mitigation need at 2 of them. Sparling Ranch Conservation Bank includes CDFW credits for California tiger salamander. Kern Water Bank Authority Conservation Bank includes CDFW credits for multiple species, including San Joaquin kit fox and Tipton kangaroo rat.

Conservation bank service areas are shown in Figures 4-2, 4-3, and 4-4, and the anticipated transportation project impact forecast is presented by year in Figure 6-2. When placed side-by-side, it is possible to see that multiple transportation projects may need credits and a number of banks may have them available by 2023/2024, when the credits might contribute to transportation project acceleration.

Feasibility. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to transportation projects. The District will need to approach each bank to confirm the availability of credits and bulk credit purchase terms. Bulk credits purchased through an advance mitigation project might, with FWS approval, be incorporated into future ESA biological assessments and/or opinions. Since the species of mitigation need are dually listed species, it is possible that compensatory mitigation will, with CDFW approval, be applied to meet future CDFW CESA permit conditions on transportation projects, also. For all banks, a BEI amendment would be required to formalize a process for bulk pre-permit credit purchases, and additional time for amending the bank should be considered. At this time (December of fiscal year 2020/2021), the Inter-Agency Project Delivery Team is developing new bank templates that incorporate pre-permit purchase terms, and these are anticipated to be available at the end of 2020. A BEI amendment would also be required for FWS-only

[2] Caltrans contracting processes and agency interactions are incorporated into this time estimate.

bank credits to be incorporated into future CDFW CESA permits. The decision to amend a BEI is at the discretion of the bank sponsor.

9.3.3. Mitigation Bank Credit Purchase

Mitigation banks are discussed in Section 4.3. Mitigation banks are wetlands- and waters-focused, and each bank's alignment with natural resource protection is documented through its BEI. One mitigation bank in the GAI provides seasonal wetland credits: the Grasslands Mitigation Bank, with the Corps, EPA, FWS, and CDFW as signatories.

Feasibility. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to transportation projects. The mitigation bank service areas are shown in Figures 4-2, 4-3, and 4-4, and the anticipated transportation project impact forecast is presented by year in Figure 6-3. When placed side-by-side, some transportation projects that need species of mitigation need credits may also need waters or wetlands credits by 2023/2024, when the credits might contribute to transportation project acceleration. For all banks, a BEI amendment would be required to formalize a process for bulk pre-permit credit purchases, and additional time for amending the bank should be considered. At this time (December of fiscal year 2020/2021), the Inter-Agency Project Delivery Team is developing new bank templates that incorporate pre-permit purchase terms, and these are anticipated to be available at the end of 2020. The decision to amend a BEI is at the discretion of the bank sponsor.

9.3.4. In-lieu Fee Credit Purchase

In-lieu fee programs are discussed in Section 4.4. An in-lieu fee program conducts wetland, stream, or threatened or endangered species habitat restoration, creation, enhancement, or preservation activities.[3] Once enough money is received by the program, it implements the project in that watershed. The in-lieu fee program's alignment with natural resource protection is documented through its enabling instrument.

There is one in-lieu fee program that overlaps the GAI, established through the Corps' process, the Sacramento District California In-Lieu Fee Program ("ILF Program"). The ILF Program covers the geographic area under the jurisdiction of the Corps Sacramento District within the state of California,[4,5] which overlaps the entire GAI. The ILF Program is approved by the Corps, EPA, NMFS, State Water Board, Central Valley RWQCB, and Lahontan RWQCB and offers permittees an in-lieu fee option to satisfy their compensatory mitigation obligations as determined by the applicable regulatory agencies for impacts on aquatic resources authorized under the CWA, the Rivers and Harbors Act, the ESA, the Porter-Cologne Water Quality Control Act, and other applicable laws.

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[3] https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/banking_faq.pdf
[4] www.cvmshcp.org
[5] http://cvmshcp.org/pdf%20files/Clean_Water_Act_In_Lieu_Fee.pdf

Feasibility. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to transportation projects. Bulk credits purchased from the ILF Program through an advance mitigation project might, with Corps and/or Central Valley RWQCB approval, be incorporated into future CWA or Porter-Cologne Water Quality Control Act conditions on transportation projects. The District will need to approach the Sacramento ILF Program to confirm bulk credit pre-permit purchase terms. At this time (December of fiscal year 2020/2021), the Sacramento ILF Program is amending its enabling instrument to allow for pre-permit bulk credit purchases. The amendment process is expected to conclude shortly.

9.3.5. MCA Credit Purchase

As discussed in Section 4.5, MCAs are an advance mitigation tool that can be developed when and where an RCIS is approved by CDFW. At this time (December of fiscal year 2020/2021), instructions and guidance for establishing MCAs are being developed by CDFW,[6] and the required foundational RCISs are not underway in the GAI. RCISs and MCAs are aligned with and plan for natural resource protection.

Feasibility. At this time (December of fiscal year 2020/2021), no MCA credits are available for purchase in the GAI.

9.3.6. Conservation Bank Establishment

Instructions and guidance for establishing conservation banks are available from CDFW[7] and FWS.[8] Conservation banks are species-focused, and each bank's alignment with natural resource protection will be documented through its BEI—a primary deliverable of an advance mitigation project. CDFW and FWS are potential signatories, and there also may be circumstances where the Corps and/or State Water Board would participate.

To support future transportation project conditions, a conservation bank funded through the AMA would establish CESA and ESA credits. At a minimum, conservation bank establishment project scopes will refer to and rely on GAI information provided in:

- Chapter 2, *Environmental Setting*
- Chapter 7, *Wildlife Resources Conservation Goals and Objectives*
- Chapter 8, *Aquatic Resources Conservation Goals and Objectives*
- Appendix C, *Land Cover Types*
- Appendix D, *Complete SAMNA Species Results*

An understanding of CDFW and FWS goals and objectives for wildlife resources in the GAI will improve the chances that credits established through an advance mitigation project will meet the compensatory mitigation needs of Caltrans' future transportation projects. In Chapter 7, Caltrans analyzed and synthesized the relevant and applicable

[6] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[7] https://wildlife.ca.gov/Conservation/Planning/Banking/Templates
[8] https://www.fws.gov/endangered/esa-library/pdf/Conservation_Banking_Guidance.pdf

information listed in Chapter 3 to develop its understanding of CDFW and FWS goals and objectives for the GAI. In brief, it is Caltrans' understanding that a conservation bank that addresses one or more of the following goals would be consistent with CDFW and FWS goals:

- Conserve and expand habitat for species of mitigation need within the GAI (WILD-1).
- Preserve and increase connectivity between blocks of species of mitigation need habitat (WILD-2).
- Support climate resiliency (WILD-3).
- Decrease mortality of species of mitigation need (WILD-4).
- Provide multi-species benefits (WILD-5).

Further, for each objective, Table 7-3 presented sub-objectives, which are intended to help guide Caltrans advance mitigation project scoping toward protecting natural resources through transportation project mitigation.

Feasibility. As pointed out above, instructions and guidance for establishing conservation banks are available from CDFW and FWS. After the Caltrans Director's approval for funding, delivering an advance mitigation project to establish a conservation bank is expected to take 2 to 6 years before the initial credit release; the credits or values would be available to transportation projects according to the credit release schedule in the Interagency Review Team-approved BEI (CNRA et al. 2011). Caltrans may contract or subcontract bank establishment and/or implementation tasks, including site selection.

9.3.7. Mitigation Bank Establishment

Instructions and guidance for establishing mitigation banks are available from the Corps[9] and CDFW.[10] Mitigation banks are wetland and/or waters-focused, and each bank's alignment with natural resource protection will be documented through its BEI—a primary deliverable of an advance mitigation project. The Corps, RWQCB, FWS, and CDFW are potential signatories. There also may be some circumstances where CDFW's participation in a bank would be documented through an MCA.

To support future transportation project conditions, Caltrans would prioritize wetland and non-wetland water credit establishment under the Corps' jurisdiction (wetlands and WOTUS) and RWQCB jurisdiction (waters of the state), as well as credit establishment under CDFW's Lake and Streambed Alteration Program.

At a minimum, mitigation bank establishment project scopes will refer to and rely on GAI information provided in:

- Chapter 2, *Environmental Setting*
- Chapter 7, *Wildlife Resources Conservation Goals and Objectives*

[9] https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/mitig_info/
[10] https://wildlife.ca.gov/Conservation/Planning/Banking/Templates

- Chapter 8, *Aquatic Resources Conservation Goals and Objectives*
- Appendix E, *Hydrologic Units*
- Appendix F, *Aquatic Resource Locations*

An understanding of Corps, RWQCB, FWS, and CDFW goals and objectives for aquatic resources in the GAI will improve the chances that credits established through an advance mitigation project will meet the compensatory mitigation needs of Caltrans' future transportation projects. In Chapter 8, Caltrans analyzed and synthesized the relevant and applicable information listed in Chapter 3 to develop its understanding of Corps, RWQCB, and CDFW goals and objectives for the GAI. In brief, it is Caltrans' understanding that a mitigation bank that addresses one or more of the following goals would be consistent with natural resource regulatory agency goals:

- No net loss of functions and values of WOTUS[8] and waters of the state to ensure the overall net loss and long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property, as described in Executive Order W-59-93 [11] (AR-1).
- Support climate resiliency for aquatic resources (AR-2).
- Provide multi-resource benefits (AR-3).

Further, for each objective, Table 8-4 presented sub-objectives, which are intended to help guide Caltrans advance mitigation project scoping toward protecting natural resources through transportation project mitigation.

Feasibility. As discussed above, instructions and guidance for establishing mitigation banks are available from the Corps and CDFW and, hence, establishing credits is feasible. After the Caltrans Director's approval for funding, delivering an advance mitigation project to establish a mitigation bank is expected to take at least 2 to 6 years before the initial credit release, at which point the credits or values would be available to transportation projects. Caltrans may contract or subcontract bank establishment and/or implementation tasks, including site selection.

9.3.8. In-lieu Fee Program Establishment

In-lieu fee programs are wetlands, water, and/or wildlife oriented and their alignment with natural resource protection will be documented through its enabling instrument. Instructions and guidance for establishing in-lieu fee programs are available from the federal agencies.[12] With respect to wildlife, like the Corps, FWS also follows federal guidance for establishing an in-lieu fee program; however, a supportive regulatory and administrative pathway for CDFW to develop an in-lieu fee program has not been developed. Hence, the Corps, EPA, NMFS, FWS, State Water Board, and RWQCBs are potential in-lieu fee program signatories.

[11] Preservation alone is not recognized by the Corps or RWQCB as providing no net loss.
[12] https://www.spl.usace.army.mil/Missions/Regulatory/Mitigation/

To support future transportation project conditions, in-lieu fee program establishment projects would rely on the same information as mitigation bank establishment (Section 9.3.7). At a minimum, in-lieu fee establishment project scopes will refer to and rely on GAI information provided in:

- Chapter 2, *Environmental Setting*
- Chapter 7, *Wildlife Resources Conservation Goals and Objectives*
- Chapter 8, *Aquatic Resources Conservation Goals and Objectives*
- Appendix E, *Hydrologic Units*
- Appendix F, *Aquatic Resource Locations*

At this time (December of fiscal year 2020/2021), the Sacramento District California ILF Program covers Corps and State Water Board aquatic jurisdictional resources of the GAI. To support future transportation project permits, Caltrans would prioritize in-lieu fee program establishment for resources not already covered through the Sacramento District California ILF Program or seek to augment the existing Sacramento District California ILF Program. For example, Caltrans might seek to establish credits that could be applied as compensatory mitigation to offset impacts as part of future ESA biological assessments and/or opinions in coordination with FWS.

Feasibility. As discussed above, instructions and guidance for establishing an in-lieu fee program are available from the federal agencies. After the Caltrans Director's approval for funding, delivering an advance mitigation project to establish an in-lieu fee program is expected to take 3 to 6 years: 2 to 3 years for set up, followed by 1 to 2 years to purchase credits. Credits or values would be available to transportation projects according to the Interagency Review Team-approved in-lieu fee enabling instrument. Caltrans may contract or subcontract in-lieu fee program establishment and/or implementation tasks.

9.3.9. MCA Credit or Value Establishment

As pointed out in Section 4.5, MCAs are an advance mitigation tool that can be developed when and where an RCIS is approved by CDFW. In accordance with the *Regional Conservation Investment Strategies Program Guidelines*, MCAs are typically species- and species habitat-focused; however, an MCA can include credits for riparian habitat to meet mitigation needs under a Lake and Streambed Alteration Agreement. An MCAs' alignment with natural resource protection will be documented through the foundational RCIS and the MCA itself—a deliverable of an advance mitigation project (CDFW 2018d). RCISs are also an SHC § 800.6(a)-authorized advance mitigation project deliverable.

At this time (December of fiscal year 2020/2021), instructions and guidance for establishing MCAs are being developed by CDFW[13] and one RCIS is underway in the GAI. For completeness of the discussion, Caltrans envisions that credits or values funded through the AMA could be established under three scenarios:

[13] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation

- Caltrans enters into or funds the preparation of an MCA, where Caltrans is the MCA sponsor. Caltrans, CDFW, and a third-party landowner would likely be signatories to the MCA. This scenario assumes an existing RCIS anticipates the requirements and needs for MCA credits that could be applied to Caltrans transportation projects. In other words, the focal species, non-focal species, or other conservation elements of the associated conservation or habitat enhancement actions proposed in the MCA included in the RCIS would directly apply to and address Caltrans needs.
- Caltrans funds performance of conservation actions and habitat enhancement actions as needed to generate mitigation credits pursuant to an MCA, where a third party is the MCA sponsor. The MCA sponsor, CDFW, and the landowner would be signatories to the MCA. This scenario assumes an existing RCIS anticipates the requirements and needs for MCA credits to apply to transportation projects.
- Caltrans prepares or funds the preparation of an RCIS that anticipates transportation project requirements and needs for MCA credits before entering into or funding the preparation of an MCA itself.

To support future transportation project permits, an MCA or, if needed, an RCIS in concert with an MCA, funded through the AMA, would establish CESA and/or Lake and Streambed Alteration Program credits[14] and CDFW would be the signatory. Caltrans may also request other agencies to be signatories to the MCA or seek project-specific interagency agreements with other agencies whose jurisdiction overlaps with CDFW's. However, participation in an MCA may be more feasible for state agencies than federal agencies. Under federal definitions, MCAs may be treated as permittee responsible mitigation. Federal agencies prioritize credits purchased or established through banking and in-lieu fee programs over permittee responsible mitigation.

Feasibility. After the Caltrans Director's approval for funding, an RCIS is anticipated to take at least 2 years to develop and be approved by CDFW. This development and approval time would have to be factored into the timeline of delivery for this advance mitigation pathway.

At this time (December of fiscal year 2020/2021), MCA regulatory and administrative pathways are being developed through pilots and the mechanism is not predictable. Without a predictable supportive regulatory and administrative pathway for the resource agencies to develop an MCA, the time needed to establish an MCA and its related credits or values is uncertain. However, once a CDFW-approved RCIS is in place,[15] it is likely that delivering an advance mitigation project to establish an MCA and its credits or values

[14] Caltrans is the Lead Agency under CEQA; CDFW's permitting authority does not include conditioning transportation projects under CEQA (Section 7).
[15] In accordance with SHC § 800.6(a)(3)(A), advance mitigation project scopes funded through the AMA may also include Caltrans first entering into or funding the preparation of an RCIS, which could add 2 to 3 years to the schedule.

would take 4 to 8 years: 2 to 3 years to set up the MCA, followed by 2 to 6 years to perform a conservation action or habitat enhancement action[16] to establish the credits or values. Credits would become available to Caltrans' SHOPP and STIP transportation projects according to the credit release schedule in the CDFW-approved MCA. Caltrans would include seeking signatures from agencies with overlapping jurisdictions and/or parallel evaluations into the scope and schedule.

Wildlife Crossing and Aquatic Corridor Enhancements

One potential benefit of the RCIS and MCA process is that it may provide a mechanism for investments in increasing the permeability of the road system through wildlife crossings, fish passage improvements, and other aquatic corridor enhancements. Through an MCA developed under an RCIS, CDFW would be authorized to recognize credits established through wildlife crossing and aquatic corridor construction made separate from and distinct from specific transportation projects. An MCA for connectivity would be consistent with Caltrans' understanding of CDFW and USFWS' goal and objective to preserve and increase connectivity between blocks of species of mitigation need habitat (WILD-2).

To support future transportation project permits, it would be necessary for a wildlife crossing or aquatic corridor improvement MCA funded through the AMA to establish CESA and/or Lake and Streambed Alteration Program credits. Through the MCA development process, CDFW would identify how the credits could be applied to meet transportation project permit conditions. There is also potential for the RWQCBs to identify how credits could be applied to meet the transportation project conditions under their jurisdiction. Where conditions would be suitable for CWA credits, there is potential for the Corps to consider aquatic corridor enhancement/restoration projects to be compensatory mitigation (Corps 2018). If Caltrans wanted to consider these for Corps mitigation, Caltrans would need to comply with the Corps mitigation regulations and guidance for permittee responsible mitigation.

9.3.10. Mitigation That Meets an RCIS Conservation Objective

SHC § 800.6(a)(3)(B) authorizes the following expenditure from the AMA:

> *Caltrans acquires, restores, manages, monitors, enhances, and preserves lands, waterways, aquatic resources, or fisheries, or funds the acquisition, restoration, management, monitoring, enhancement, and preservation of lands, waterways, aquatic resources, or fisheries that would measurably advance a conservation objective specified in an RCIS if the department concludes that the action or actions could conserve or create environmental values that are appropriate to mitigate the anticipated potential impacts of planned transportation improvements.*

Feasibility. At this time (December of fiscal year 2020/2021), this authorized activity is not feasible. A supportive regulatory and administrative pathway for a resource agency

[16] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation

to recognize credits or values outside of existing advance mitigation mechanisms, such as the procedures to establish banks, does not exist. Without an existing regulatory pathway, the time to establish credits or values for this advance mitigation project type is uncertain.

9.3.11. Mitigation in Accordance with a Programmatic Mitigation Plan

This project type may be undertaken by Caltrans if all of the other advance mitigation project types discussed above are not feasible [SHC § 800.6(a)(4)]. In brief, SHC § 800.6(a)(4) and SHC § 800.9 authorize the following expenditure from the AMA:

> *Caltrans performs mitigation in accordance with a programmatic mitigation plan pursuant to SHC §800.9. The programmatic mitigation plan shall include, to the maximum extent practicable, the information required for a RCIS.*

At this time (December of fiscal year 2020/2021), a supportive regulatory and administrative pathway for a natural resource regulatory agency to recognize credits or values established through this advance mitigation project type does not exist. These activities would, therefore, likely require an advance mitigation project-specific agreement, such as a cooperative agreement, and the time needed to establish credits or values for this advance mitigation project type is uncertain. In general, unless otherwise prescribed in regulation, in this case, an advance mitigation project-specific interagency agreement should include the agency's jurisdiction, resource type, resource value, protection level, service area, time frame, performance and compliance requirements, mitigation accounting procedures, funding, monitoring, and the advance mitigation project's closeout terms and conditions.

Feasibility. At this time (December of fiscal year 2020/2021), a number of the authorized activities listed in Table 9-3 appear to be feasible. This suggests that addressing Caltrans SAMNA-estimated need will not require another approach in accordance with SHC § 800.6(a)(4). At this time, management of the AMA does not need to consider limiting any advance mitigation project type to 25 percent of the fund.

9.3.12. Discussion

Caltrans modeled its compensatory mitigation needs in the GAI for fiscal years 2018 through 2027 (Chapter 5) and evaluated its needs in light of when transportation projects might need the mitigation (Chapter 6, Section 9.2). Based on its evaluation, Caltrans found that credits purchased or established by 2023/2024 (within the next 2 years) have the potential to accelerate between 16 and 51 transportation projects planned for the GAI.

Summarized in Tables 9-4 and 9-5, Caltrans identified a number of options for how to meet its mitigation needs. The authorized activities consist of options to purchase existing mitigation credits (Section 9.3.3, Tables 9-4 and 9-5) or establish additional mitigation (Section 9.3.5, Tables 9-4 and 9-5).

Since Caltrans District 6 is currently establishing a California tiger salamander conservation bank with a service area that extends into the GAI (Bloss Ranch Conservation Bank; see Section 4.1) and the service areas of eight California tiger

salamander conservation banks overlap the GAI (Section 4.3), Caltrans' need for California tiger salamander credits is less than that for the other species of mitigation need—that is, the San Joaquin kit fox, giant kangaroo rat, and Fresno kangaroo rat (inclusive of Tipton and short-nosed kangaroo rat). A number of credit purchase options are available for San Joaquin kit fox that could likely be purchased by 2023/2024, potentially accelerating 37 transportation projects. In contrast, there is only one bank with Tipton kangaroo rat credits and, without advance mitigation, addressing Tipton and Fresno kangaroo rat mitigation through normal transportation project delivery has the potential to delay 30 transportation projects. While there are currently no conservation banks available for giant kangaroo rat credits, several banks with credits for giant kangaroo rat will become available within the next few years. With respect to aquatic resources, they may potentially benefit from the Sacramento ILF Program credits, as well as the one bank currently offering seasonal wetland credits. Fifty-one transportation projects could potentially benefit from having non-wetland waters credits purchased or established through advance mitigation by 2023/24 and 22 transportation projects could potentially benefit from having wetlands credits purchased or established through advance mitigation by 2023/24.

9.4 Next Steps

Caltrans is required to avoid and minimize any impacts on the environment where practicable, but some impacts are unavoidable. When this is the case, Caltrans may use compensatory mitigation to offset these unavoidable impacts on the environment. Compensatory mitigation involves the restoration, establishment, enhancement, and/or preservation of the environment, including wetlands, non-wetland waters, and threatened or endangered species and/or their habitats, including riparian habitat.

Caltrans District 6 will consider all feasible options when developing advance mitigation project scopes. The feasibility of each authorized activity to meet the mitigation need depends on the availability of a regulatory and administrative pathway and other conditions summarized in Tables 9-4 and 9-5. Not included in the tables is an explicit comparison of other desired qualities, outcomes, or other factors of performing any particular authorized activity, which Caltrans District 6 will also consider based on its localized knowledge of delivering mitigation in its region. As just one example, Caltrans may prioritize advance mitigation projects that reduce risk in implementation and long-term management by eliciting others to be bank or in-lieu fee sponsors.

As described in the introduction to this chapter, as well as Section 9.1, to inform the advance mitigation project scope, Caltrans District 6 will use information within the RAMNA. Each scope will consider mitigation needs; the timing of mitigation needs; conservation data and plans; input from natural resource regulatory agencies, interested parties, and tribes; feasibility; timing; and other financial, strategic, and technical risks associated with transportation project delivery and conservation actions. Advance mitigation project scopes will also employ, as appropriate, existing applicable state and

federal standards and instruments, mitigation-related agreements, advance mitigation project-specific agreements, and contracts with qualified third parties.

District 6 will submit a nominated advance mitigation project's scope, schedule, and budget to the Caltrans Director for approval. When the Director concurs and funding is approved, Caltrans District 6 will commit to delivering the advance mitigation project within the scope, schedule, and budget communicated with nomination materials. At that point, Caltrans District 6 will initiate project delivery (see Steps 6 through 10 in Figure 1-2; Caltrans 2019a). Advance mitigation project delivery includes stakeholder engagement, project alternative analysis and further scoping, coordination with natural resource regulatory agencies with the authority to approve compensatory mitigation, contracting with third parties and/or credit sponsors, and developing an agency-approved instrument and/or one or more advance mitigation project-specific interagency agreement. In addition:

- Stakeholder engagement will be conducted in accordance with each advance mitigation project's communication plan and be consistent with the applicable and appropriate requirements of existing applicable state and federal standards and instruments.
- Further scoping, when appropriate for the advance mitigation project type, will include site selection, when necessary. Site selection may be performed by Caltrans or under contract to Caltrans through a competitive bid process, and may include existing mitigation providers, for example, banks, NCCPs, MCAs, as well as the identification of new acquisitions. When a competitive bid process is used, sites are subject to what bid respondents put forward in their proposals. Site selection should strive for consistency with appropriate conservation goals and objectives identified in Chapters 7 and 8.
- Further scoping, when appropriate for the advance mitigation project type, may be necessary to identify steps required to meet the goal of satisfying overlapping jurisdictional mitigation requirements.
- Instruments and advance-mitigation project-specific interagency agreement(s) will specify the terms of use of the credits, including the service areas. Service areas will be defined based on feedback from the natural resource regulatory agencies. It is intended for the ecological units used for this RAMNA to lead to ecologically based advance mitigation project scopes and service areas; Caltrans uses HUC-8s to be consistent with the 2008 Mitigation Rule and ecoregions to be consistent with the SWAP.

As with all credits and values established through advance mitigation processes, the credits' suitability for application to a specific transportation project is determined in the future, on a case-by-case basis, when transportation project mitigation requirements are known.

Table 9-4. Wildlife Resources Credit Options and Feasibility, December 2020

Statement of Caltrans Need	Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Credits or values purchased or established by 2023/2024 could address up to 114 acres of species of mitigation need, potentially contributing to the acceleration of 43 transportation projects.	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Authorized Activity Consists of Purchasing Credits or Paying Fees	See below	See below	See below	See below	See below
See above	Pay HCP and/or NCCP fees.	Yes	Maybe. Two HCPs, one pending HCP, and two NCCP/HCPs are in the area. Caltrans is not a permittee and it is unknown whether Caltrans could become a Participating Special Entity.	Yes, FWS and CDFW	1 to 3 years
See above	Purchase conservation bank credits	Yes, with BEI amendment	Yes, six FWS-approved and three FWS/CDFW-approved or pending banks in GAI with San Joaquin kit fox credits. One bank with FWS and CDFW-approved Tipton kangaroo rat credits.	Yes, with CDFW, Corps, and State Water Board	1 to 3 years
See above	Purchase in-lieu fee credits	Yes, with instrument amendment	Yes, one ILF Program	Yes, with Corps, NMFS, EPA, and State Water Board	1 to 3 years
See above	Purchase MCA credits	No	Not applicable	Not applicable	Not applicable

Statement of Caltrans Need	Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Authorized Activity Consists of Establishing Credits or Values	See below	See below	See below	See below	See below
See above	Establish conservation bank	Yes	Yes, both CDFW and FWS	Yes	2 to 6 years
See above	Establish in-lieu fee program	Yes	Yes, with Corps and FWS	No. However, could be aligned with Corps ILF Program.	2 to 6 years
See above	Establish MCA credits or values[b]	Maybe—one RCIS in progress	Maybe—MCA guidelines in progress	Yes, through parallel evaluation(s)	Unknown (pilot underway)
See above	Establish RCIS and MCA[b]	RCIS – Yes (RCIS guidelines available) MCA – No (MCA guidelines in progress)	Maybe	Yes, through parallel evaluation(s)	Unknown (pilot underway)
See above	Establish mitigation that meets an RCIS objective	No	Not applicable	Not applicable	Not applicable
See above	Establish mitigation in accordance with a programmatic mitigation plan	No	Not applicable	Not applicable	Not applicable

[a] Caltrans contracting processes and agency interactions are incorporated into this time estimate.
[b] Either Caltrans or a third party would be the signatory with CDFW.

Table 9-5. Aquatic Resources Credit Options and Feasibility, December 2020

Statement of Caltrans Need	Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Credits or values purchased or established by 2023/2024 could address approximately 7 acres of wetlands and 45.1 acres of non-wetland waters of mitigation need, potentially contributing to the acceleration of 22 and 51 transportation projects, respectively.	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Authorized Activity Consists of Purchasing Credits or Paying Fees	See below	See below	See below	See below	See below
See above	Purchase conservation or mitigation bank credits	Yes, with BEI amendment	Yes, for seasonal wetlands there is one Corps-approved bank	Yes, RWQCBs, CDFW, and FWS	1 to 3 years
See above	Purchase in-lieu fee credits	Yes, with instrument amendment	Yes, Corps and State Water Board	Yes, may be able to align with FWS	1 to 3 years
See above	Purchase MCA credits	No	Not applicable	Not applicable	Not applicable
Authorized Activity Consists of Establishing Credits or Values	See below	See below	See below	See below	See below
See above	Establish conservation or mitigation bank	Yes	Yes, Corps, CDFW, and FWS	Yes, Corps, State Water Board, CDFW, and FWS	2 to 6 years

Statement of Caltrans Need	Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
See above	Establish in-lieu fee program	Yes (however, already established for the GAI)	Yes, for FWS	Yes, Corps, State Water Board and FWS	2 to 6 years
See above	Establish MCA credits or values[b]	Maybe—one RCIS in progress	Maybe—MCA guidelines in progress	Yes, through parallel evaluation(s)	Unknown (pilot underway)
See above	Establish RCIS and MCA[b]	RCIS – Yes (RCIS guidelines available) MCA – No (MCA guidelines in progress)	Maybe—MCA guidelines in progress	Yes, through parallel evaluation(s)	Unknown (pilot underway)
See above	Establish mitigation that meets an RCIS objective	No	Not applicable	Not applicable	Not applicable
See above	Establish mitigation in accordance with a programmatic mitigation plan	No	Not applicable	Not applicable	Not applicable

[a] Caltrans contracting processes and agency interactions are incorporated into this time estimate.
[b] Either Caltrans or a third party would be the signatory with CDFW.

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