ADVANCE MITIGATION PROGRAM

Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections within Caltrans District 6 Regional Advance Mitigation Needs Assessment

Version 1.0

Establishing Caltrans' Need for Advance Mitigation in the Vicinity of Caltrans Districts 6 and 9, forecast fiscal years 2021/22 to 2030/31

California Department of Transportation – District 6

July 2023

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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*
Basin Plan	Water Quality Control Plan
BEI	Bank Enabling Instrument
BLM	Bureau of Land Management
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CCC	California Coastal Commission
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
DPS	distinct population segment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FGC	California Fish and Game Code
FHWA	Federal Highway Administration
FishPAC	Fish Passage Advisory Committee
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
HUC-4	hydrologic unit code four-digit
HUC-6	hydrologic unit code six-digit
HUC-8	hydrologic unit code eight-digit
HUC-12	hydrologic unit code twelve-digit
MCA	mitigation credit agreement
MPO	metropolitan planning organization
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NMFS	National Marine Fisheries Service
NPS	National Park 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 Reporting Tool	Statewide Advance Mitigation Needs Assessment 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 2021/22—2030/31*
SHS	State Highway System
STIP	State Transportation Improvement Program
SWAP	State Wildlife Action Plan
SWRCB	State Water Resources Control Board
TMDL	total maximum daily load
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
Water Boards	SWRCB and RWQCB
WOTUS	waters of the U.S.

EXECUTIVE SUMMARY

This *Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections within Caltrans District 6 Regional Advance Mitigation Needs Assessment* ("RAMNA") was developed with the goal of realizing the benefits of long-range planning to help manage the risks and priorities of the California Department of Transportation ("Caltrans") Advance Mitigation Program ("AMP"). It was developed in accordance with the AMP Final Formal Guidelines ("AMP Guidelines")[1] and incorporates information and feedback received from outreach to the natural resource regulatory agencies,[2] the Federal Highway Administration, other transportation agencies, Native American tribes, interested parties, and the public. Caltrans District 6 is the lead district for this planning-level effort.

Background. 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 intent of the legislation was 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. The 11 activities authorized by SHC § 800 et seq. consist of purchasing or establishing compensatory mitigation credits[3,4] developed through an authorized regulatory mechanism.[5] Upon delivery, the credits are expected to be both available and at hand for Caltrans and natural resource regulatory agencies to use as offsets to transportation project impacts. The actual finding, however, of a specific credit's adequacy and/or suitability to offset an impact, as well as the placement of natural resource regulatory agency compensatory mitigation conditions on transportation

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[1] https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/amp-final-formal-guidelines-a11y.pdf

[2] For the AMP, "natural resource regulatory agencies" refers specifically to the signatories to the 2020 *Master Process Agreement for Planning and Developing Advance Mitigation throughout California for the California Department of Transportation Advance Mitigation Program*. The signatories are California Department of Fish and Wildlife ("CDFW"); State Water Resources Control Board; U.S. Army Corps of Engineers Los Angeles, Sacramento, and San Francisco Districts; U.S. Environmental Protection Agency; U.S. Fish and Wildlife Service; National Marine Fisheries Service; and California Coastal Commission.

[3] Compensatory mitigation is a mitigation strategy that is preferentially applied only after it has been determined that there will be unavoidable adverse impacts on natural resources 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.

[4] Credits are the usual currency of mitigation established through an advance mitigation project; however, other values may also be established.

[5] Authorized regulatory mechanisms include the regulatory processes to establish mitigation banks and in-lieu fee programs.

projects, is conducted in the future through each transportation project's environmental studies and permits.

Purpose. Described in the AMP Guidelines, advance mitigation planning is the AMP's process for justifying, proposing, scoping, and securing internal Caltrans AMA funding approval for advance mitigation projects. Advance mitigation planning consists of five steps. Steps 1 and 2 serve to focus the assessment (see Section ES.1, below). Step 3 is this RAMNA. Steps 4 and 5 of the AMP's advance mitigation planning process narrow down the suite of potential advance mitigation projects to a few that have a high probability of meeting the AMP's goals (see Section ES.9, below).

A RAMNA is a desktop study that consists of the best readily available information for Caltrans Districts to refer to when scoping and proposing advance mitigation projects to be funded by the AMA. The information was sensibility checked by other Caltrans functional units, natural resource regulatory agencies, and others before it was finalized. When the Caltrans AMP invests in advance mitigation projects to purchase compensatory mitigation credits, Caltrans assumes that the credits are aligned with existing natural resource regulatory agency goals and objectives. When the Caltrans AMP invests in advance mitigation projects to establish compensatory mitigation, it will aim to establish credits approved by multiple natural resource regulatory agencies. Whether purchased or established, Caltrans intends for credits to be delivered on a schedule that will revolve the AMA.

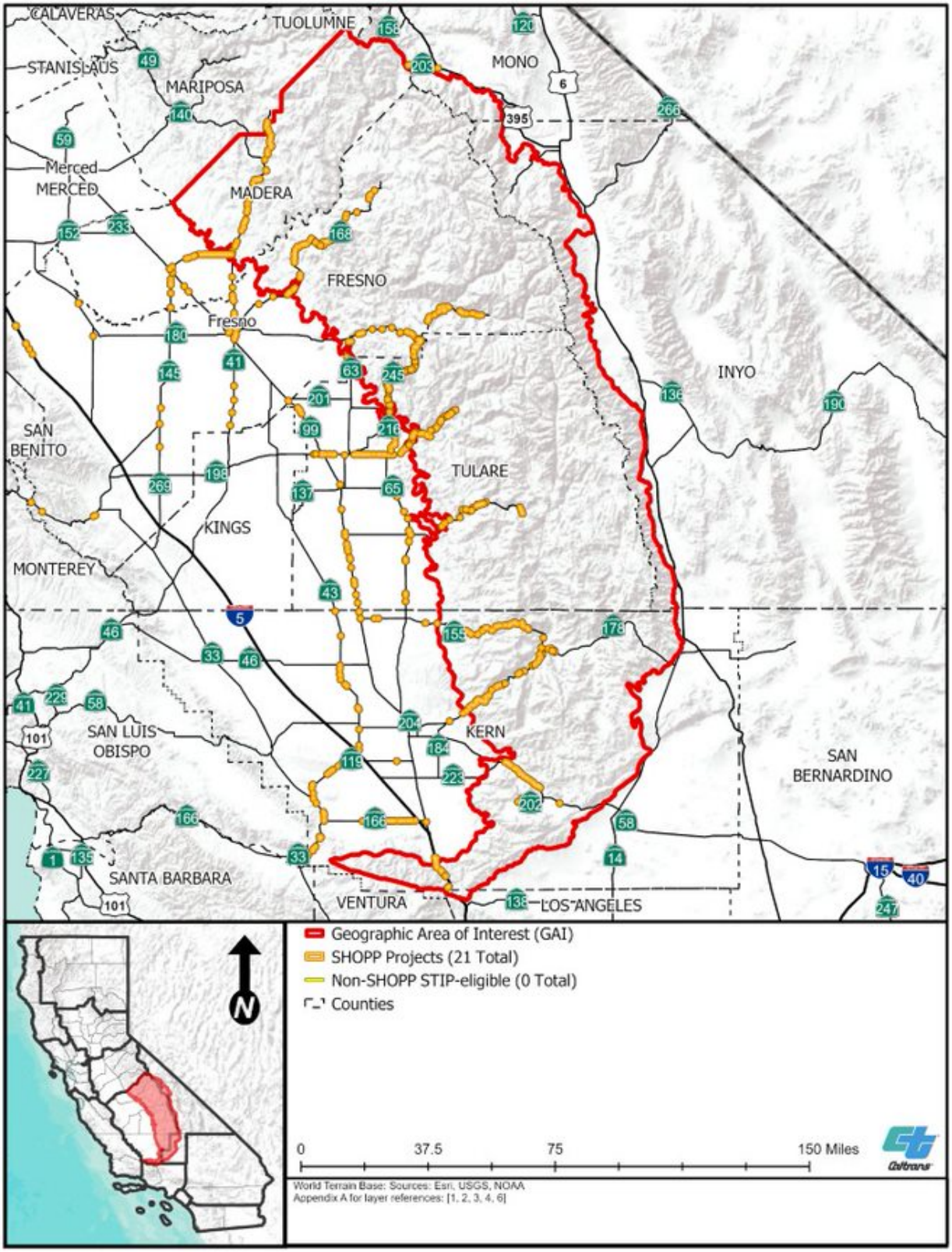
Through the RAMNA's review process, the conservation goals and objectives provided in the RAMNA were vetted with the natural resource regulatory agencies. Caltrans thinks incorporating natural resource regulatory agency goals and objectives into advance mitigation project scopes improves the chances that the compensatory mitigation credits will be (1) usable as transportation project impact offsets and (2) "protect natural resources through transportation project [compensatory] mitigation" [SHC § 800(a)]. Each RAMNA chapter is briefly summarized below.

Figure ES-1 shows the geographic area of interest ("GAI") road infrastructure.

ES.1 Geographic Area of Interest and Resource Focus

Focusing this assessment 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. Focusing the assessment also improves the chances that resultant credits will be available on a timeframe that will revolve the AMA. Hence, for advance mitigation planning, Caltrans focused the RAMNA on a specific time period, a specific area, and typical compensatory mitigation needs.

Figure ES-1. GAI Road Infrastructure



The time period assessed in this RAMNA is for fiscal years 2021/22 through 2030/31, a planning period consistent with Caltrans:

- Long-term transportation plans conceptualized in the *State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2021/22—2030/31* ("SHOPP Ten-Year Book"; Caltrans 2021a). Transportation projects in the SHOPP Ten-Year Book have not undergone the environmental and permitting process.
- Modeled compensatory mitigation needs published in the *Statewide Advance Mitigation Needs Assessment*[6] *Report Second Quarter 2021/22 Fiscal Year* ("SAMNA Report"; Caltrans 2023). Compensatory mitigation needs in the SAMNA Report are modeled and do not reflect an environmental and permitting process.

The GAI assessed in this RAMNA consists of the Sierra Nevada and Sierra Nevada Foothills ecoregion sections located within Caltrans District 6. GAIs are established at an ecoregion or hydrological unit code eight digit ("HUC-8") subbasin scale to define appropriate planning areas for mitigation implementation and anticipated use areas that align with natural resource regulatory agency practices (Caltrans 2019a). Caltrans District 6 selected the GAI because SAMNA model results for fiscal years 2021/22 through 2030/31 (Caltrans 2021b) indicate that investing AMP funds to implement landscape-scale mitigation in the ecoregions 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.

Because the SAMNA model forecast impacts on hundreds of species' habitats, to further focus the planning effort, Caltrans District 6 identified species for which natural resource regulatory agencies condition transportation projects and those transportation projects that would most likely benefit if compensatory mitigation credits were available. These "species of mitigation need" are California tiger salamander (*Ambystoma californiense*), San Joaquin kit fox (*Vulpes macrotis mutica*), striped adobe-lily (*Fritillaria striata*), and Springville clarkia (*Clarkia springvillensis*). Compensatory mitigation for aquatic resources[7] and riparian habitat were also identified as both historical transportation project compensatory mitigation needs and anticipated future transportation project compensatory mitigation needs within the GAI.

While the GAI is predominantly within Caltrans District 6, to be inclusive of a complete ecoregion section, a portion of the GAI extends into Caltrans District 9 (Figure ES-1).

[6] The SAMNA Reporting Tool is a geographic information system ("GIS") overlay model developed by Caltrans to support advance mitigation planning (Caltrans 2018a).
[7] For the purposes of this document, aquatic resources include all fish, wetlands, and non-wetland waters regulated by CDFW, U.S. Fish and Wildlife Service, California Coastal Commission, State Water Resources Control Board and Regional Water Quality Control Boards, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and National Marine Fisheries Service.

ES.2 Environmental Setting

Information on the GAI's environmental setting is provided in Chapter 2 and its associated appendices. To develop an understanding of the GAI that is consistent with natural resource regulatory agency tools and references, geospatial data from the SAMNA Reporting Tool, CDFW's BIOS, and other readily available information are summarized and presented. Climate change resiliency, wildlife connectivity, biodiversity, and conserved lands are among the information presented. A critical habitat map is provided.

The GAI consists of approximately 6.9 million acres of the Sierra Nevada and Sierra Nevada Foothills ecoregion sections, which are overlapped by all or portions of 22 HUC-8 sub-basins.

ES.3 Relevant Plans, Policies, and Regulations

Compensatory mitigation is informed by regulatory requirements, regulatory mechanisms 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 113 documents that may be relevant to advance mitigation planning and advance mitigation project delivery: 32 laws, guidelines, and regulations; 17 statewide and regional planning documents; 22 plans and permits and other documents focused on species of mitigation need; 19 state agency, federal agency, Native American tribal, and local government land management plans; 10 water resources plans and documents; 10 county, city, and local government general plans; and 3 nongovernmental organization conservation and management documents. A summary and links to these documents can be found in Chapter 3.

ES.4 Existing Mitigation Opportunities

For the purposes of the RAMNA, existing mitigation opportunities are potential opportunities for Caltrans to use AMA funds to purchase compensatory mitigation that was previously approved by one or more natural resource regulatory agencies. In accordance with SHC § 800.6(a), the approved credits or values eligible for purchase may have been established through a conservation bank, mitigation bank, natural community conservation plan ("NCCP"), habitat conservation plan ("HCP"), in-lieu fee program, or mitigation credit agreement ("MCA") developed in accordance with a CDFW-approved regional conservation investment strategy ("RCIS").

Chapter 4 presents readily available information regarding existing mitigation opportunities for the GAI. In brief, Caltrans identified no NCCPs or HCPs where Caltrans is a participant or may be eligible to participate, 11 pending or active conservation and/or mitigation banks, 1 active in-lieu fee program, 1 approved RCIS, and no MCAs.

Existing mitigation opportunities can also inform both regional understanding and advance mitigation project scoping because they may be expressions of resource agency

conservation goals and objectives[8] and may be suitable for concurrent transportation project mitigation.

ES.5 Estimated Impacts

Prior to developing a focused advance mitigation project scope to purchase or establish mitigation credits or values, as authorized by SHC § 800.6(a), Caltrans must determine whether it needs advance mitigation credits. Since environmental and permitting processes have not yet taken place, Caltrans must rely on estimating future SHOPP transportation project[9] impacts through the SAMNA model, as well as qualitative assessments of STIP-eligible transportation project needs,[10] to define the range of its potential advance mitigation needs.

Chapter 5 provides transportation project impact estimates for fiscal years 2021/22 to 2030/31. In the GAI, 21 SHOPP transportation projects and no non-SHOPP STIP-eligible transportation projects are in their conceptualization phase for the planning period. Many of these planned transportation improvements are not forecast to affect terrestrial or aquatic resources and many forecast impacts may be avoided during transportation project delivery. Nevertheless, the compensatory mitigation estimates presented reflect the best available information about compensatory mitigation needs at this time.

Impact estimates for the species of mitigation need are summarized in Tables ES-1 and ES-2. Since natural resource regulatory agencies routinely place species of mitigation need conditions on transportation projects, it is likely that Caltrans transportation project schedules would benefit from available credits for these species. Similarly, impact estimates for wetland, non-wetland waters, vernal pool habitat, and riparian habitat are summarized in Tables ES-3 through ES-6, respectively.

When Caltrans scopes advance mitigation projects to establish mitigation, Caltrans intends to center the advance mitigation projects on the species of mitigation need and/or aquatic resources and to address conservation benefits and values for other special-status terrestrial species and resources. It is likely that STIP-eligible transportation projects would have compensatory mitigation conditions placed on them by natural resource regulatory agencies, similar to conditions placed on SHOPP transportation projects.

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[8] 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.

[9] Caltrans undertakes SHOPP transportation projects to address maintenance, safety, operation, and rehabilitation of the SHS; such projects do not add new capacity to the system. https://catc.ca.gov/programs/state-highway-operation-and-protection-program

[10] Metropolitan planning organizations, regional transportation planning agencies, and other public agencies also undertake transportation projects to address non-SHOPP STIP-funded transportation improvements.

Table ES-1. Estimated SHOPP Impacts on Species of Mitigation Need in the GAI

Ecoregion Section	California Tiger Salamander: Number of Caltrans SHOPP Projects[a]	California Tiger Salamander: Estimated Habitat Impact (acres)	San Joaquin Kit Fox: Number of Caltrans SHOPP Projects[a]	San Joaquin Kit Fox: Estimated Habitat Impact (acres)	Striped Adobe-lily: Number of Caltrans SHOPP Projects[a]	Striped Adobe-lily: Estimated Habitat Impact (acres)	Springville Clarkia: Number of Caltrans SHOPP Projects[a]	Springville Clarkia: Estimated Habitat Impact (acres)	Total
Sierra Nevada	0	0.0	0	0.0	3	3.6	0	0.0	**3.6**
Sierra Nevada Foothills	7	9.9	12	9.2	12	13.6	12	14.2	**19.2**
Total[b]	**7**	**9.9**	**12**	**9.2**	**12**	**17.2**	**12**	**14.2**	**22.8**

[a] Transportation projects are listed in Appendix B.
[b] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one ecoregion section.

Table ES-2. Summary of Estimated SHOPP Project Impacts on Threatened and Endangered Fish Habitat in the GAI (acres)[a,b]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Lahontan Cutthroat Trout	Paiute Cutthroat Trout	Total[c]
Upper King	18030010	2	0.4	0.0	**0.4**
Upper San Joaquin	18040006	2	0.3	0.3	**0.3**
Total	Not applicable	**2**	**0.7**	**0.3**	**0.7**

[a] Threatened and endangered fish species habitat impacts are forecast by the SAMNA Reporting Tool.
[b] Stream/river habitat impacts are provided. Stream/river habitat impacts are assumed to be representative of fish habitat impacts.
[c] For sub-basins with more than one species, co-occurrence of impacts is assumed. Acreage for the total impact across all habitat types is provided.

Table ES-3. Summary of Estimated SHOPP Impacts on Wetlands in the GAI (acres)[a]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Freshwater Emergent Wetland	Freshwater Forested/ Shrub Wetland	Freshwater Pond	Total[b]
Middle Kern-Upper Tehachapi-Grapevine	18030003	3	0.0	0.1	0.0	**0.1**
Middle San Joaquin-Lower Chowchilla	18040001	1	<0.1	0.0	0.0	**<0.1**
Upper Dry	18030009	1	0.0	0.0	<0.1	**<0.1**
Upper Kaweah	18030007	1	0.0	<0.1	0.0	**<0.1**
Upper San Joaquin	18040006	1	0.0	<0.1	0.0	**<0.1**
Total[b,c]	Not applicable	**6**	**<0.1**	**0.2**	**<0.1**	**0.2**

[a] The SAMNA forecasts impacts on wetlands for 5 of the 21 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect wetlands.

Table ES-4. Summary of Estimated SHOPP Impacts on Non-wetland Waters in the GAI (acres)[a]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Reservoir	Stream/River	Total[b]
Fresno River	18040007	1	0.0	0.2	**0.2**
Middle Kern-Upper Tehachapi-Grapevine	18030003	5	0.0	1.5	**1.5**
Middle San Joaquin-Lower Chowchilla	18040001	2	0.0	0.2	**0.2**
South Fork Kern	18030002	1	0.0	<0.1	**<0.1**
Tulare Lake Bed	18030012	2	0.0	0.2	**0.2**
Upper Deer-Upper White	18030005	1	0.0	<0.1	**<0.1**
Upper Dry	18030009	1	0.0	0.2	**0.2**
Upper Kaweah	18030007	3	0.1	0.4	**0.6**
Upper King	18030010	2	0.0	0.4	**0.4**
Upper Poso	18030004	2	0.0	0.1	**0.1**
Upper San Joaquin	18040006	2	0.0	0.8	**0.8**
Total[b,c]	Not applicable	**13**	**0.1**	**4.0**	**4.1**

[a] The SAMNA forecasts impacts for 11 of the 21 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect non-wetland waters.

Table ES-5. Summary of Estimated SHOPP Project Impacts on Vernal Pool Habitat in the GAI (acres)[a]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Vernal Pool Fairy Shrimp	Vernal Pool Tadpole Shrimp	Total
Middle San Joaquin-Lower Chowchilla	18040001	3	1.3	1.4	**1.4**
Tulare Lake Bed	18030012	1	3.6	3.6	**3.6**
Upper Dry	18030009	1	0.1	<0.1	**0.1**
Upper Kaweah	18030007	3	1.3	1.3	**1.3**
Upper Tule	18030006	2	0.4	0.0	**0.4**
Total[b,c]	Not applicable	**8**	**6.8**	**6.3**	**6.9**

[a] The SAMNA forecasts impacts for 5 of the 21 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect non-wetland waters.

Table ES-6. Summary of Estimated SHOPP Project Impacts on Riparian Habitat in the GAI (acres)[a]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Valley Foothill Riparian	Total (acres)[b,c]
Middle Kern-Upper Tehachapi-Grapevine	18030003	2	0.3	**0.3**
Upper Kaweah	18030007	3	0.1	**0.1**
Upper Poso	18030004	1	0.1	**0.1**
Upper Tule	18030006	2	<0.1	**<0.1**
Total[c,d]	Not applicable	**7**	**0.6**	**0.6**

[a] The SAMNA forecasts impacts for 4 of the 21 HUCs in the GAI.
[b] The sum of montane riparian and valley foothill riparian habitat impacts is provided.
[c] Totals may be different on account of rounding.
[d] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect riparian habitat.

ES.6 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 (July of fiscal year 2023/24), Caltrans is 2 years into the SHOPP Ten-Year Book planning period. Hence, for the time period under consideration, fiscal years 2021/22 through 2030/31, Caltrans District 6 intends to prioritize purchasing or developing mitigation credits or values that are planned for the middle of the 10-year planning period.

Given the expected timing of mitigation need, at this time (July of fiscal year 2023/24) credits or values that can be purchased or established by 2025/26 (within the next 2 years) could address a subset of the impacts presented in Chapter 5. For example, mitigation credits purchased or established in 2 years could potentially address:

- 3.7 acres of Springville clarkia habitat and 3.6 acres of striped adobe-lily habitat impacts in the Sierra Nevada Ecoregion Section, potentially contributing to the acceleration of 4 and 3 transportation projects, respectively
- 9.9 acres of California tiger salamander habitat, 9.2 acres of San Joaquin kit fox habitat, 14.2 acres of Springville clarkia habitat, and 13.6 acres of striped adobe-lily habitat impacts in the Sierra Nevada Foothills Ecoregion Section, potentially contributing to the acceleration of 7, 12, 12, and 12 transportation projects, respectively
- 0.2 acre of non-wetland waters impacts in the Fresno River Sub-basin, potentially contributing to the acceleration of 1 transportation project
- 0.1 acre of wetland, 1.5 acres of non-wetland waters, and 0.3 acre of riparian habitat impacts in the Middle Kern-Upper Tehachapi-Grapevine Sub-basin, potentially contributing to the acceleration of 3, 4, and 2 transportation projects, respectively
- <0.1 acre of wetland, 0.2 acre of non-wetland waters, and 1.4 acres of vernal pool habitat impacts in the Middle San Joaquin-Lower Chowchilla Sub-basin, potentially contributing to the acceleration of 1, 2, and 3 transportation projects, respectively
- 0.2 acre of non-wetland waters impacts in the South Fork Kern Sub-basin, potentially contributing to the acceleration of 1 transportation project
- 0.2 acre of non-wetland waters and 3.6 acres of riparian habitat impacts in the Tulare Lake Bed Sub-basin, potentially contributing to the acceleration of 2 and 1 transportation projects, respectively
- <0.1 acre of non-wetland waters impacts in the Upper Deer-Upper White Sub-basin, potentially contributing to the acceleration of 1 transportation project
- <0.1 acre of wetland, 0.2 acre of non-wetland waters, and 0.1 acre of vernal pool habitat impacts in the Upper Dry Sub-basin, potentially contributing to the acceleration of 1, 1, and 1 transportation projects, respectively
- <0.1 acre of wetland, 0.6 acre of non-wetland waters, 1.3 acres of vernal pool habitat, and 0.1 acre of riparian habitat impacts in the Upper Kaweah Sub-basin,

potentially contributing to the acceleration of 1, 3, 3, and 3 transportation projects, respectively

- <0.1 acre of non-wetland waters impacts in the Upper Kern Sub-basin, potentially contributing to the acceleration of 1 transportation project
- 0.4 acre of non-wetland waters and 0.4 acre of threatened and endangered fish habitat impacts in the Upper King Sub-basin, potentially contributing to the acceleration of 2 and 2 transportation projects, respectively
- 0.1 acre of non-wetland waters and 0.1 acre of riparian habitat impacts in the Upper Poso Sub-basin, potentially contributing to the acceleration of 2 and 1 transportation projects, respectively
- <0.1 acre of wetland, 0.8 acre of non-wetland waters, and 0.8 acre of threatened and endangered fish habitat impacts in the Upper San Joaquin Sub-basin, potentially contributing to the acceleration of 2, 1, and 2 transportation projects, respectively
- 0.4 acre of vernal pool habitat and <0.1 acre of riparian habitat impacts in the Upper Tule Sub-basin, potentially contributing to the acceleration of 2 and 2 transportation projects, respectively

Organized by species of mitigation need and aquatic resources, the complete temporal analysis of Caltrans needs is provided in Chapter 6.

It should be noted that at this time, several transportation projects have been delayed or eliminated and the timing of Caltrans needs may change. Caltrans will consider the updated transportation schedule when scoping and funding advance mitigation projects. The feasibility of addressing the needs through the SHC § 800.6(a) authorized activities is discussed in Chapter 9.

ES.7 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 these agencies and their comments and suggestions were incorporated.

Wildlife Resources Goals and Objectives

When establishing wildlife resources compensatory 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 with the authority to approve wildlife resource-related credit establishment and with 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 encompasses 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 summarize how state and federal natural resource regulatory agencies, land

managers, and other 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 species of mitigation need habitats in the GAI; however, advance mitigation for the benefit of species of mitigation need 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 species of mitigation need
- Preserving, enhancing, and increasing connectivity between blocks of species of mitigation need habitat
- Supporting resiliency of the landscape to climate change
- Decreasing mortality and competition, and protecting population health of species of mitigation need
- Prioritizing multi-species and multi-resource 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.

Aquatic Resources Goals and Objectives

When establishing aquatic resources compensatory 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 encompasses restoring, maintaining, and enhancing large-scale ecological processes, environmental gradients, biological diversity, and regional linkages. Aquatic resources goals developed for this RAMNA prioritize:

- Providing for no net loss of area, functions, values, and conditions of wetland and non-wetland water resources
- Restoring and maintaining the chemical, physical, and biological integrity of wetlands and non-wetland waters
- Supporting resiliency of aquatic resources to climate change
- Providing multi-resource benefits

Sub-objectives are included for each goal in Chapter 8 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.8 Authorized Activity Summary

A summary of Caltrans' need for compensatory mitigation credits in the GAI and the feasibility of each SHC § 800.6(a) authorized activity to address is provided in Chapter 9.

Forecast mitigation needs and the timing of their needs was presented in Chapter 6 and summarized in Section ES.6. The mechanisms available to address the needs are discussed in Chapter 9. Broadly speaking, 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 Districts will consider all feasible options when developing advance mitigation project scopes. At this time (July of fiscal year 2023/24), purchasing credits approved through a bank or in-lieu fee instrument, or establishing new credits through a bank or in-lieu fee instrument, is likely feasible. The feasibility of each authorized activity to meet the forecast mitigation need in time to accelerate transportation projects will depend on the availability of a regulatory and administrative pathway and other conditions.

As pointed out above, when Caltrans scopes advance mitigation projects to establish mitigation, Caltrans intends to center the advance mitigation projects on the species of mitigation need and aquatic resources and to address conservation benefits and values for other special-status terrestrial species and resources. Caltrans also intends to scope credit establishment projects that align with conservation goals and objectives, address multi-resource benefits, and address overlapping jurisdictions.

ES.9 Next Steps

Caltrans Districts 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, the Caltrans District will begin advance mitigation project delivery, which includes stakeholder engagement, project alternative analysis, 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.

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, on a case-by-case basis, when transportation project mitigation requirements are known.

1. INTRODUCTION

California's State Highway System ("SHS") relies on long-range planning documents to guide its operation and maintenance. In this *Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections within Caltrans District 6 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 Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections for a 10-year planning horizon. Sources used for this RAMNA are cited throughout this document, and links to geographic information system ("GIS") sources are provided in Appendix A, *GIS Sources*.

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 compensatory 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.

When compensatory 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 a greater ecological value than implementing multiple small project-by-project actions. Credits are the usual currency of advance mitigation 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: https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation.

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[1] Compensatory mitigation is a mitigation strategy that is preferentially applied only after it has been determined that there will be unavoidable adverse impacts on natural resources 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.

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 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 activities authorized in SHC § 800.6(a) consist of purchasing or establishing compensatory mitigation credits developed through an appropriate regulatory mechanism, which are then available for use by transportation projects to offset adverse impacts (Table 1-1). 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.

Table 1-1. Advance Mitigation Project Types[a]

Advance Mitigation Project Type	Authorization
Caltrans pays mitigation fees or other costs or payments associated with coverage of transportation projects under an approved natural community conservation plan ("NCCP")[b] and/or an approved habitat conservation plan ("HCP").	SHC § 800.6(a)(2)
Caltrans purchases credits from an existing conservation bank.	SHC § 800.6(a)(1)
Caltrans purchases credits from an existing mitigation bank.	SHC § 800.6(a)(1)
Caltrans purchases credits from an existing in-lieu fee program.	SHC § 800.6(a)(1)
Caltrans purchases credits developed through a mitigation credit agreement ("MCA"), established under a California Department of Fish and Wildlife ("CDFW")-approved regional conservation investment strategy ("RCIS").[c]	SHC § 800.6(a)(3)(A)
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)
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)
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)
Caltrans funds the implementation of conservation actions and habitat enhancement actions[c,d] to generate mitigation credits pursuant to an MCA[b] 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)

Advance Mitigation Project Type	Authorization
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)
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

[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 California Fish and Game Code ("FGC") § 1850–1861.
[e] Programmatic mitigation plans are defined in 23 U.S. Code ("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)].

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). As shown on 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 phase 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)

1.1.1. 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 satisfies Step 3 (Figure 1-1; Caltrans 2019a) and provides the results of a regional assessment of Caltrans' advance mitigation needs in the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections.[3]

Caltrans District 6 will first use the information and analysis presented in this RAMNA to inform Step 4 of the advance mitigation planning phase. 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,

[3] Pursuant to SHC § 800.9, to the maximum extent practicable, the information required for an RCIS is presented in this RAMNA. 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).

for an advance mitigation project to be nominated to the Caltrans Director for funding approval. The advance mitigation planning phase will conclude when the Caltrans Director approves a specific nominated Caltrans District 6 advance mitigation project for funding (Step 5; Caltrans 2019a). Thereafter, Caltrans District 6 will use the RAMNA as a reference (Caltrans 2019a).

1.1.2. Advance Mitigation Project Delivery Phase

Steps 6 through 10 consist of the AMP's advance mitigation project delivery phase. Advance mitigation project delivery is undertaken after an advance mitigation project has been approved by the Caltrans Director and has been programmed[4] (Caltrans 2019a; see Figure 1-2). The phase consists of implementing the authorized activities under SHC § 800.6(a), which are existing advance mitigation mechanisms or procedures under development.

1.1.3. 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 to develop only those 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 that the advance compensatory mitigation will be considered adequate and/or suitable by a natural resource regulatory 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. For example, using mitigation credits from a conservation bank where only

[4] Programming refers to the process Caltrans employs to set priorities for funding advance mitigation projects at the Caltrans District and project level. Through programming, Caltrans commits revenues over a multiyear period to a specific advance mitigation project.

preservation exists would not qualify for wetland or riparian impacts for some regulatory agencies.

- Regulatory agency approvals are discretionary and often conditional; well-executed advance mitigation does not necessarily increase the likelihood of obtaining agency approval for any particular transportation project.
- The 2008 Mitigation Rule expresses a preference for advance mitigation (in several forms) but also provides flexibility for off-site and out-of-kind mitigation where important aquatic resources in a watershed area have been identified as priority areas because of the importance of such resources, widespread loss of such resources, and/or the likelihood of successful execution of mitigation at priority sites.
- 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 and require a scope, schedule, and budget.
- Advance mitigation projects to establish credits should allow for longer timelines for plant establishment, which is crucial to success.
- 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 AMA is a revolving account. With a revolving account, reimbursed funds are reinvested into new advance mitigation projects.

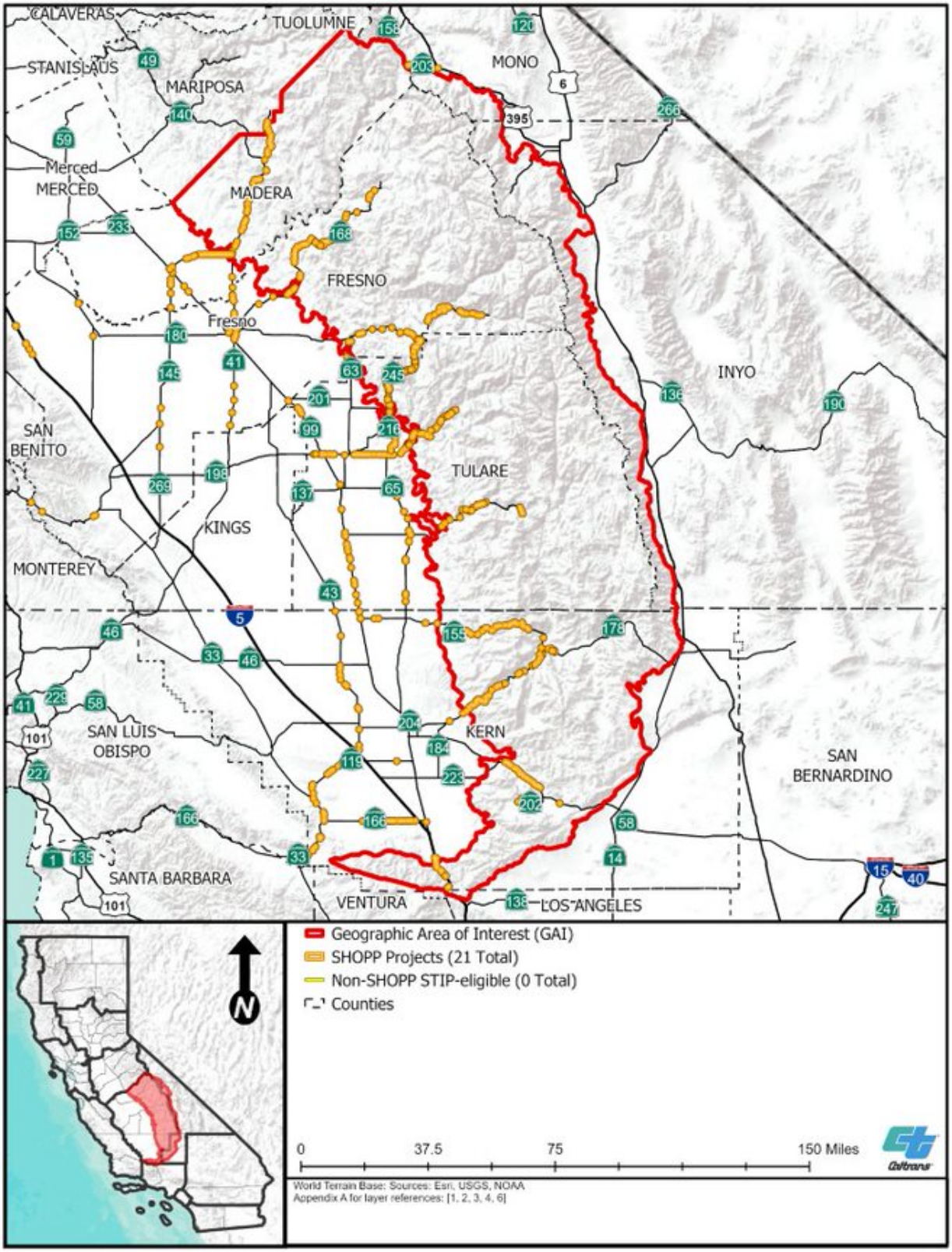
The above list is not presented in any order or priority.

1.2 Caltrans District 6 Transportation Infrastructure[5]

Headquartered in Fresno, Caltrans District 6 is responsible for maintaining and operating 2,030 centerline miles in Fresno, Kern, Kings, Madera, and Tulare Counties. The SHS roadways within District 6 range from scenic two-lane highways to controlled-access freeways. Figure 1-3 shows the road infrastructure in the geographic area of interest ("GAI") for this RAMNA. State Routes 41 and 245 are north-to-south routes within the GAI. State Routes 58, 155, 168, 178, 180, 190, and 198 are the primary east-to-west routes within the GAI.

[5] Adapted from: https://dot.ca.gov/caltrans-near-me/district-6/d6-about

Figure 1-3. GAI Road Infrastructure



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

1.3 Regulatory Framework Summary

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

- California Endangered Species Act ("CESA") (FGC § 2050 et seq.)
- California Environmental Quality Act ("CEQA") (Public Resources Code § 21000 et seq.)
- Federal Clean Water Act ("CWA"), Sections 401 and 404 (33 USC § 1251–1376)
- Federal Endangered Species Act of 1973 ("ESA") (16 USC § 1531–1543), as amended
- Lake and Streambed Alteration Program (FGC § 1600 et seq.)
- National Environmental Policy Act ("NEPA") (42 USC § 4321 et seq.)
- Porter-Cologne Water Quality Control Act (California Water Code § 13000 et seq.)
- Rivers and Harbors Act of 1800, Section 10 (33 USC § 403)

Natural resource regulatory agencies that may need to be engaged for transportation projects that may adversely affect natural resources in the GAI are listed in Table 1-2.

Each of the natural resource regulatory agencies listed in Table 1-2 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 a compensatory mitigation credit that was established through an instrument or other formal interagency agreement as satisfying a transportation project's compensatory mitigation conditions. As a lead agency under CEQA and NEPA, Caltrans may also determine compensatory mitigation is required.

Table 1-2. Natural Resource Regulatory Agencies with Oversight over Natural Resources in the GAI

Partner	Web Address
CDFW, Central Region	https://wildlife.ca.gov/regions/4
CDFW, Inland Deserts Region	https://wildlife.ca.gov/Regions/6
California State Water Resources Control Board ("SWRCB")	https://www.waterboards.ca.gov/
California Regional Water Quality Control Board ("RWQCB"), Central Valley	https://www.waterboards.ca.gov/centralvalley/
California RWQCB, Lahontan	http://www.waterboards.ca.gov/lahontan/
California RWQCB, Los Angeles	https://www.waterboards.ca.gov/losangeles/
National Marine Fisheries Service ("NMFS"), West Coast Region, Central Valley Office San Joaquin River Branch	https://www.fisheries.noaa.gov/about/west-coast-region
Corps, South Pacific Division, Los Angeles District	http://www.spl.usace.army.mil/
Corps, South Pacific Division, Sacramento District	https://www.spk.usace.army.mil/
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/

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

- *Memorandum of Understanding Concerning Mitigation and Conservation Banking and In-Lieu Fee Programs in California* (California Natural Resources Agency ["CNRA"] et al. 2011)
- *Conservation Bank and Mitigation Bank Applications and Fees* (FGC § 1797 et seq.)
- *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)
- *Advance Mitigation and Regional Conservation Investment Strategies,* mitigation credit agreements (FGC § 1856)
- *Final Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division* (Corps 2015)

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,[6] 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 HCPs and 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 2020, 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 2021/22—2030/31* ("SHOPP Ten-Year Book") for fiscal years 2022 to 2031 (Caltrans 2021a). The forecast was performed using the Caltrans Statewide Advance Mitigation Needs Assessment Reporting Tool ("SAMNA Reporting Tool"), a GIS overlay model developed by Caltrans to support advance mitigation planning (Caltrans 2021b). Potential impacts for all 12 Caltrans Districts were estimated. Statewide, almost 1,000 transportation projects and over 600 wildlife and aquatic resources were evaluated through the SAMNA Reporting Tool, yielding thousands of results (Caltrans 2021a). The subset of the Caltrans District 6 transportation projects that are planned in the GAI during the planning period covered by this RAMNA—and the hydrologic unit code eight-digit ("HUC-8"), ecoregion section, advertised year, and planned activities for each planned transportation project—are included in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*, of this RAMNA.

For consistency and as appropriate, tables, figures, and information presented throughout this document, including in 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 2021a. Results are presented in four different reports: terrestrial and aquatic species and subspecies, 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 by Caltrans to justify, propose, and scope advance mitigation projects (Caltrans 2023). The SAMNA results:

- 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;

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

- 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 the SAMNA 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 focused this analysis on a geographic area with wildlife habitats and aquatic resources where planned transportation project schedules would likely benefit from (1) having compensatory mitigation credit purchase transactions complete and/or (2) compensatory mitigation credit supplies increased.

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.

1.5.1. GAI

To identify a focus area, consistent with Step 2 of the advance mitigation planning process (Figure 1-1), in 2022, Caltrans District 6 subject matter specialists:

- Reviewed the entirety of Caltrans District 6's SAMNA results by HUC-8 sub-basin and ecoregion (Caltrans 2023; www.dot.ca.gov/programs/environmental-analysis/biology/advancemitigation);
- Reviewed the SAMNA results' associated future transportation project locations and activities anticipated for the State Highway Operation and Protection Program ("SHOPP") (Caltrans 2021a);
- Reviewed non-SHOPP STIP-eligible transportation improvement plans for the next 10 years;
- Noted that advance mitigation planning for the Great Valley Ecoregion Section was performed in 2020 (Caltrans 2020);
- Observed that the portions of Caltrans District 6 located within the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections have forecast compensatory mitigation needs during the planning period; and

- Identified the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections as locations where Caltrans District 6 and other public agencies that implement transportation improvements could benefit from advance mitigation planning—hereafter called the "GAI" (Figure 1-3).

As pointed out in Section 1.4, the RAMNA is designed to be consistent with SAMNA Reporting Tool geospatial data and model assumptions. One of those decisions is the areal presentation of modeled results. In consultation with the natural resource regulatory agencies, it was determined that presenting SAMNA results by HUC-8 and ecoregion section, and not political boundaries, would steer advance mitigation planning toward better ecological outcomes: the 2008 Mitigation Rule specifies the HUC-8 as the basis of service areas for mitigation banks, and CDFW's State Wildlife Action Plan ("SWAP") is organized by ecoregion. Because the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections form ecological boundaries and not political boundaries, some portions of the GAI overlap Caltrans District 9. In addition to Caltrans District 6, Caltrans District 9 may choose to take the lead on an advance mitigation project that would address its needs within the GAI.

1.5.2. Species of Mitigation Need

Compensatory mitigation for species in the GAI was identified as both a historical and anticipated future transportation project compensatory mitigation need within District 6. SHOPP transportation projects have historically been conditioned by natural resource regulatory agencies for some species more routinely than others and have benefited from mitigation credits, when available.

Caltrans does not typically need compensatory mitigation credits for species where impacts can be avoided or minimized. Hence, to further focus the planning effort, Caltrans District 6 identified species that, if compensatory mitigation credits were available, transportation project schedules could potentially benefit. The determination was made after reviewing SAMNA results for the planning period. These "species of mitigation need" are California tiger salamander (*Ambystoma californiense*), San Joaquin kit fox (*Vulpes macrotis mutica*), striped adobe-lily (*Fritillaria striata*), and Springville clarkia (*Clarkia springvillensis*). The central California distinct population segment ("DPS") of California tiger salamander is federally and state threatened. San Joaquin kit fox is federally endangered and state threatened. Striped adobe-lily is state threatened and U.S. Forest Service ("USFS") sensitive. Springville clarkia is federally threatened and state endangered.

These species informed the analysis of estimated impacts provided in Chapter 5, *Modeled Estimated Impacts*, and Chapter 6, *Benefiting Transportation Project Considerations*, as well as the discussion in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*, and Chapter 8, *Aquatic Resources Conservation Goals and Objectives*.

1.5.3. Aquatic Resources

Compensatory mitigation needs for aquatic resources[7] and riparian habitat in the GAI were identified as both historical transportation project compensatory mitigation needs and anticipated future transportation project compensatory mitigation needs within Caltrans District 6. SHOPP transportation projects have historically been conditioned by natural resource regulatory agencies for these resources and have benefited from mitigation credits, when available.

Compensatory mitigation needs are anticipated for 12 of the 22 HUC-8 sub-basins that overlap the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections in the GAI:

- Fresno River (18040007)
- Middle Kern-Upper Tehachapi-Grapevine (18030003)
- Middle San Joaquin-Lower Chowchilla (18040001)
- South Fork Kern (18030002)
- Tulare Lake Bed (18030012)
- Upper Deer-Upper White (18030005)
- Upper Dry (18030009)
- Upper Kaweah (18030007)
- Upper King (18030010)
- Upper Poso (18030004)
- Upper San Joaquin (18040006)
- Upper Tule (18030006)

These sub-basins inform the analysis of estimated threatened and endangered fish, wetland, non-wetland waters, and riparian impact estimates provided in Chapter 5, *Modeled Estimated Impacts*, and Chapter 6, *Benefiting Transportation Project Considerations*, as well as the discussion in Chapter 8, *Aquatic Resources Conservation Goals and Objectives*.

1.6 RAMNA

This RAMNA is a planning-level document that:

- Provides a desktop analysis of relevant available information pertaining to the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections, referred to as the GAI;
- Applies to fiscal years 2021/22 to 2030/31 (planning period), which is concurrent with the time period addressed by the SHOPP Ten-Year Book (Caltrans 2021a);
- Discusses potential compensatory mitigation conditions that may be placed on future transportation projects by the seven resource and regulatory agency

[7] For the purposes of this document, aquatic resources include all fish, wetlands, and non-wetland waters regulated by CDFW, FWS, SWRCB and RWQCBs, Corps, EPA, and NMFS.

signatories[8] 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[9] compensatory mitigation needs for the GAI and planning period, as reported by the SAMNA (Caltrans 2023);
- 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 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 communication milestones within the advance mitigation project planning process (Caltrans 2019a). Each is summarized in the following sections.

1.7.1. 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*

[8] Natural resource regulatory signatories are CDFW; SWRCB; Corps Los Angeles, Sacramento, and San Francisco Districts; EPA; FWS; NMFS; and California Coastal Commission ("CCC").
[9] *Aquatic resources* is defined in Section 1.5.3, footnote 7.

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 April 2023, 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]	June 20, 2023
Corps, Sacramento District	June 15, 2023
EPA	June 22, 2023
FWS	June 22, 2023
NMFS	June 8, 2023
SWRCB	June 19, 2023

[a] SHC § 800 et seq. specifically directs Caltrans to consult with CDFW on all activities pursuant to the AMP.

1.7.2. Interagency Meeting and Coordination

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. Interagency Meetings

Meeting Participants	Meeting Date
CDFW, SWRCB, RWQCB, Corps, FWS, Caltrans	June 14, 2023
CDFW	July 10, 2023

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 the 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 and 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 near 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	Title	Content
Chapter 10	References	This chapter lists references cited in the RAMNA.
Appendices	Various	Appendices supporting this document: Appendix A – GIS Sources Appendix B – Transportation Projects Planned for the GAI during the Planning Period Appendix C – Land Cover Types Appendix D – Complete SAMNA Species Results Appendix E – Hydrologic Units Appendix F – List of 303(d) Impaired Waters Appendix G – Aquatic Resource Locations

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2. ENVIRONMENTAL SETTING

In this chapter, Caltrans describes the GAI in terms of ecoregion sections, land ownership, topography, climate, land cover, invasive species, special-status species, critical habitat, connectivity, sub-basins, hydrology, flood hazard areas, water quality, wild and scenic rivers, aquatic resources,[1] riparian habitat, and fire severity zones. Intended to inform advance mitigation project scoping, this assessment relied on readily available literature and GIS sources, including the vegetation and other geospatial data layers developed for the SAMNA Reporting Tool (Caltrans 2018a). Sources used for this assessment are cited throughout the chapter, and links to GIS sources are provided in Appendix A, *GIS Sources*.

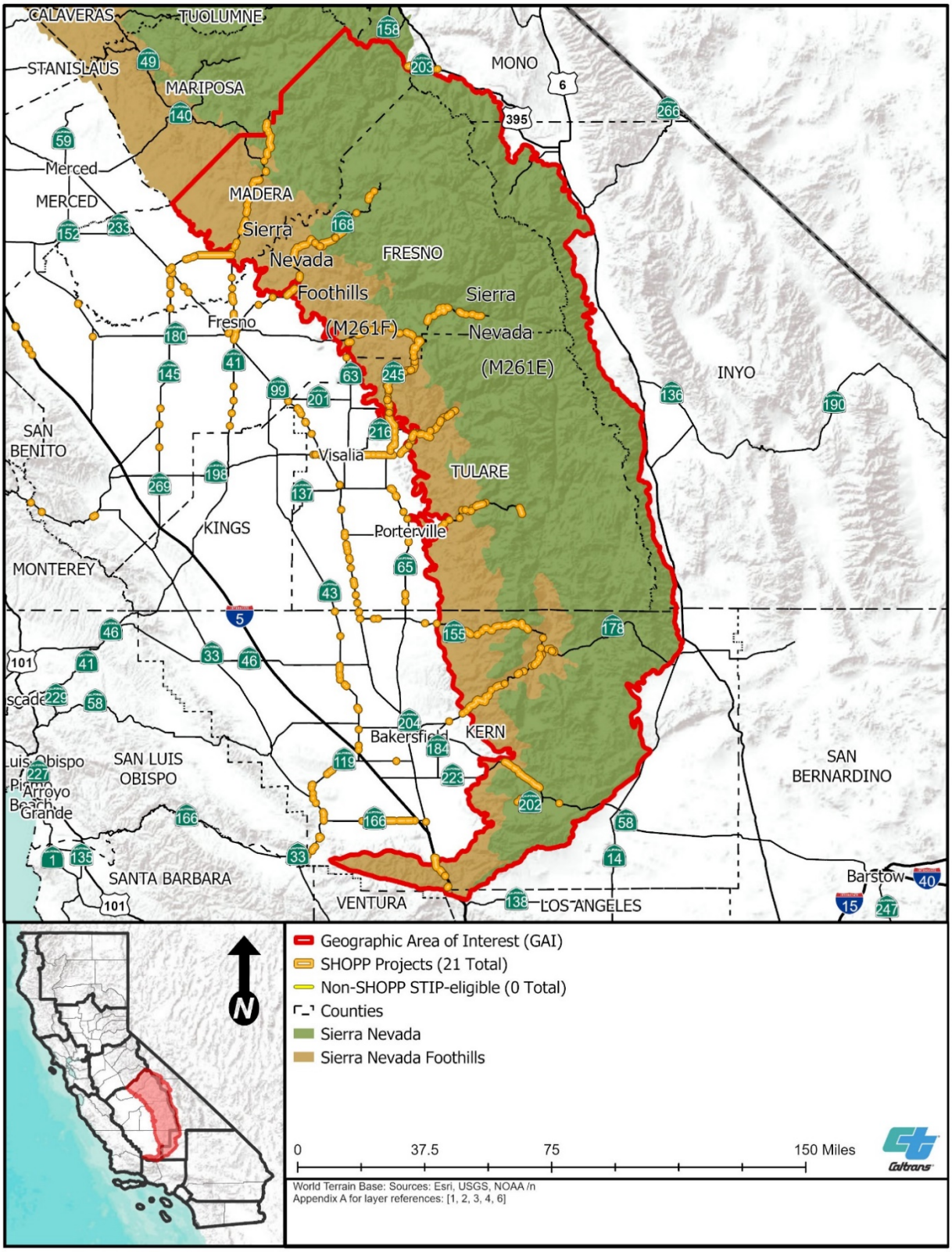
On each figure, Caltrans has provided the general location of planned SHOPP transportation projects that, during the 10-year planning period addressed by this document, natural resource regulatory agencies may condition with compensatory mitigation.[2] The GAI's road infrastructure is described in Chapter 1, *Introduction*, and information about planned transportation projects is provided in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period,* and Chapter 5, *Modeled Estimated Impacts*.

2.1 Ecoregion Sections in the GAI

The GAI consists of approximately 6.9 million acres within the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections, which are overlapped by all or portions of 22 sub-basins (see Section 2.10) (Figure 2-1). Ecoregion sections are defined as the largest ecological unit of the U.S. Department of Agriculture ("USDA") USFS National Hierarchical Framework of Ecological Units, which are nested within larger provinces (Cleland et al. 1997). The Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections are within the larger Sierran Forest – Alpine Meadows Province (McNab et al. 2007).

[1] For the purposes of advance mitigation planning, aquatic resources consist of wetlands and non-wetland waters that may be subject to CCC, Corps, EPA, RWQCB, and/or CDFW regulations, as well as special-status fish that may be subject to CCC, FWS, and/or NMFS regulations or managed by CDFW.
[2] Since no STIP-eligible transportation projects are anticipated, no STIP-eligible transportation projects are mapped.

Figure 2-1. Ecoregion Sections in the GAI



2.2 Land Ownership in the GAI

The GAI spans parts of Fresno, Inyo, Kern, Los Angeles, Madera, Mono, and Tulare Counties (Figure 2-2). Federal lands, which account for most of the land in the GAI (67 percent) are administered and managed by the USDA's USFS, Corps, the U.S. Department of Interior's Bureau of Land Management ("BLM"), Bureau of Reclamation, National Park Service ("NPS"), FWS, and other federal agencies (Table 2-1, Figure 2-2). National Park land includes Sequoia National Park and Kings Canyon National Park. USFS land includes Sierra National Forest. Privately owned and managed land accounts for 29 percent of the GAI. Only 1.4 percent is managed by nonprofit conservancies and land trusts; 1.3 percent is governed by counties, cities, and special districts; and 0.8 percent is owned by Native American tribes. State lands, which account for 0.6 percent of land in the GAI, include lands owned and managed by the California Department of Parks and Recreation, CDFW, California Department of Forestry and Fire Protection, California State Lands Commission, University of California, and other state lands (Table 2-1, Figure 2-2).

2.2.1. Protected Lands

The California Protected Areas Database, developed by the 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 the best available public information at the time of development and, as such, may not represent all protected lands in California.

In 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 projects are in unassigned lands or in areas with a GAP status of 3. Lands with conservation easements are also identified in the California Protected Areas Database; some of the planned SHOPP transportation projects are near conservation easements (Figure 2-3).

Table 2-1. Land Ownership in the GAI

Land Owner or Land Use	Total Acreage per Agency/Owner[a]	Ownership as Percentage of GAI
USFS	3,146,789	45.3
Private (agriculture)	1,668,951	24.0
NPS	947,089	13.6
BLM	526,576	7.6
Private (urban and other)	210,666	3.0
Private (natural vegetation)	128,355	1.8
Nonprofit conservancy and land trust	97,035	1.4
City, county, and special district	89,530	1.3
Tribal lands	56,382	0.8
California Department of Parks and Recreation	22,061	0.3
Corps	15,486	0.2
CDFW	10,771	0.2
U.S. Bureau of Reclamation	10,282	0.1
Private (unassigned)	8,116	0.1
California Department of Forestry and Fire Protection	5,226	0.1
California State Lands Commission	1,566	<0.1
FWS	1,219	<0.1
University of California	150	<0.1
Other federal agency	39	<0.1
Other state agency	6	<0.1
Total	**6,946,295**	**100%**

Sources: U.S. Bureau of Indian Affairs, California Protected Lands Database, California Conservation Easement Database, Caltrans 2021c, U.S. Census Bureau, USDA, and California Department of Technology for land parcels
[a] Numbers were rounded to the nearest whole number.

Figure 2-2. Land Ownership

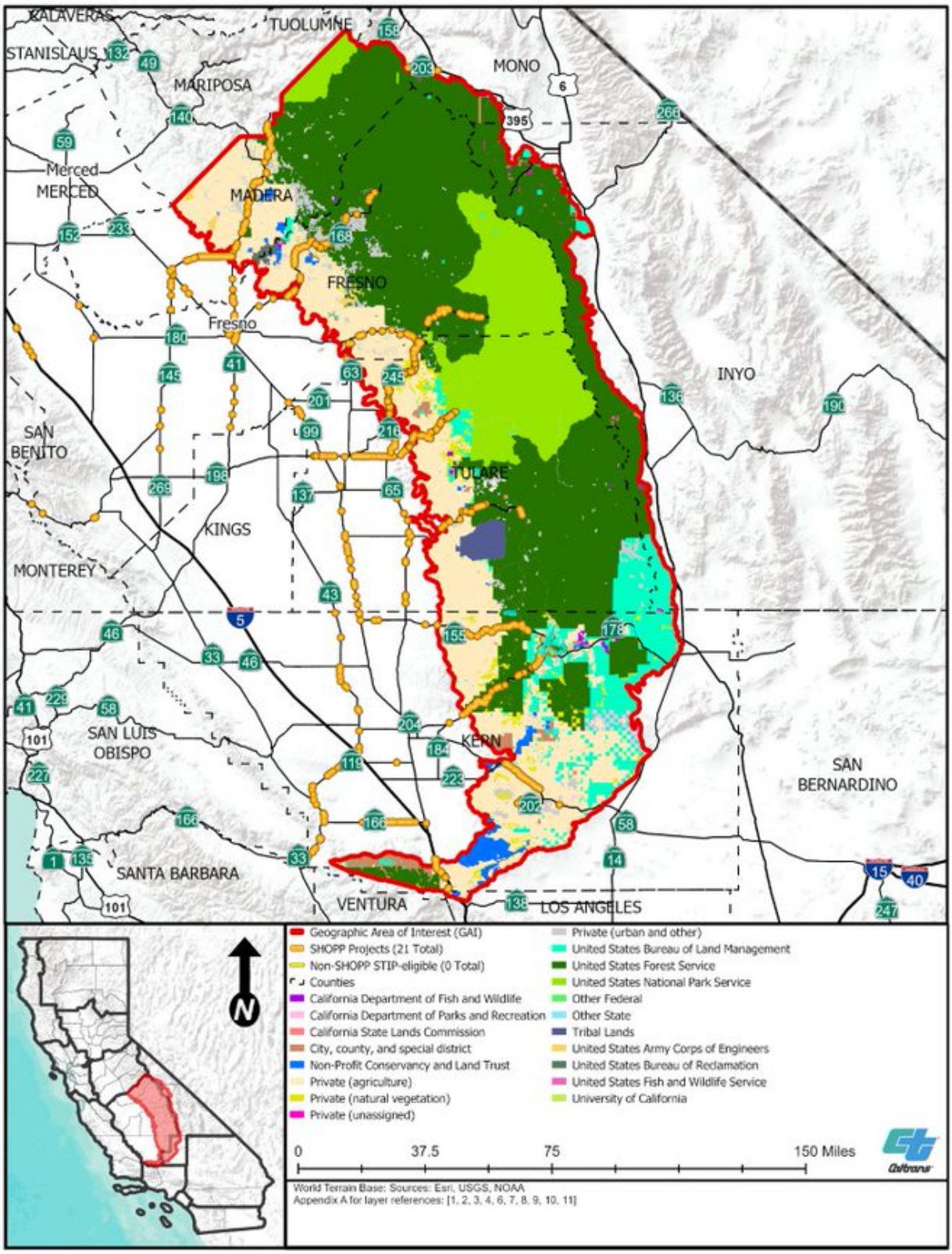
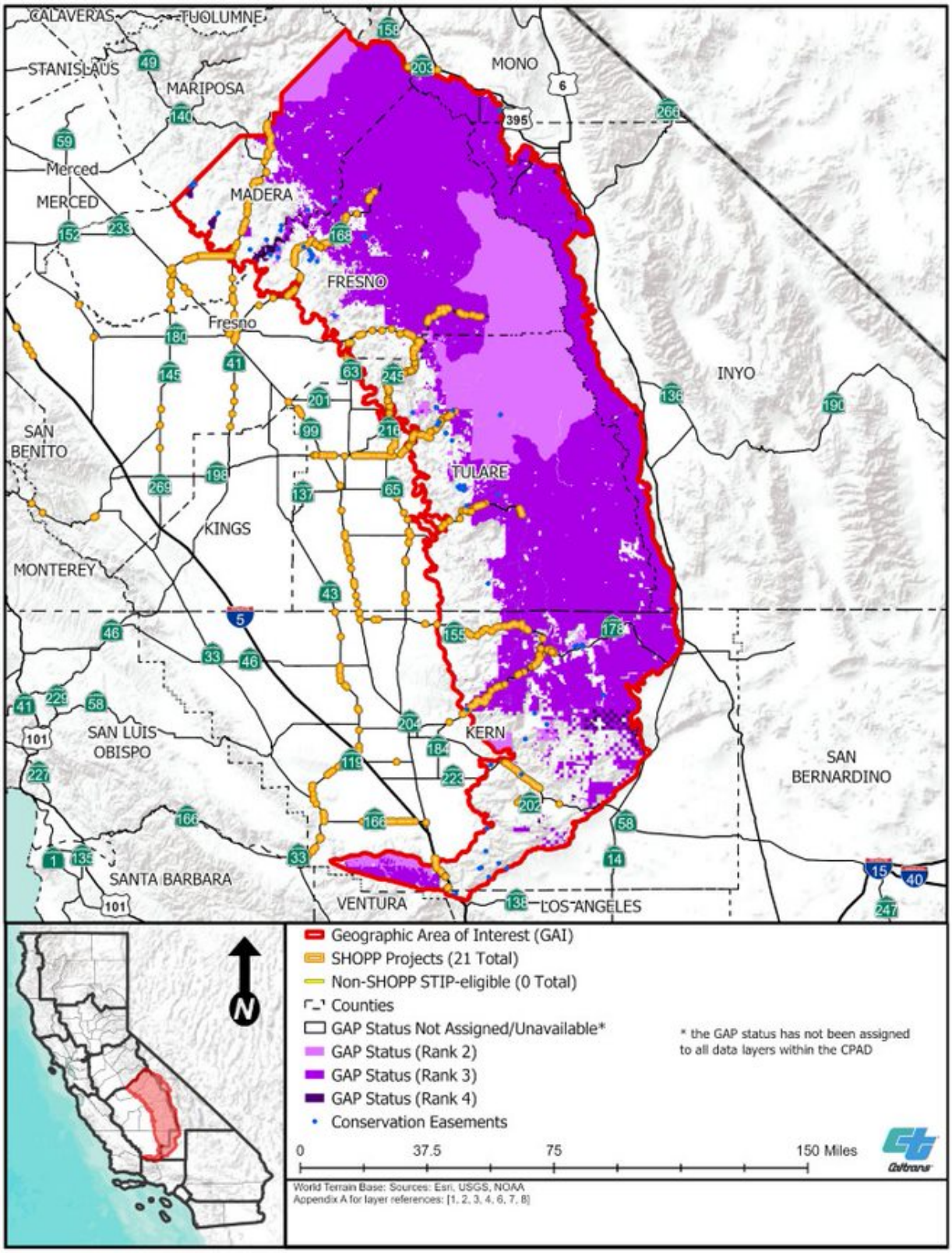


Figure 2-3. Protected Lands



2.3 Topography

The GAI is located in central California and includes part of the Sierra Nevada range, with the Sierra Nevada foothills in the west and the Transverse Ranges in the south. Topographical boundaries include the San Joaquin Valley to the west and the Mojave Desert to the east and south. Elevations in the GAI range from 300 to 14,482 feet above mean sea level (Figure 2-4).

2.4 Climate

The GAI is characterized by a Mediterranean climate, with hot, dry summers and cool, rainy winters, with an average temperature of 55 to 66 degrees Fahrenheit (Caltrans 2018b). Mean annual precipitation on the valley floor ranges from less than 5 inches in the south to 15 inches in the north (USGS 2014).

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.

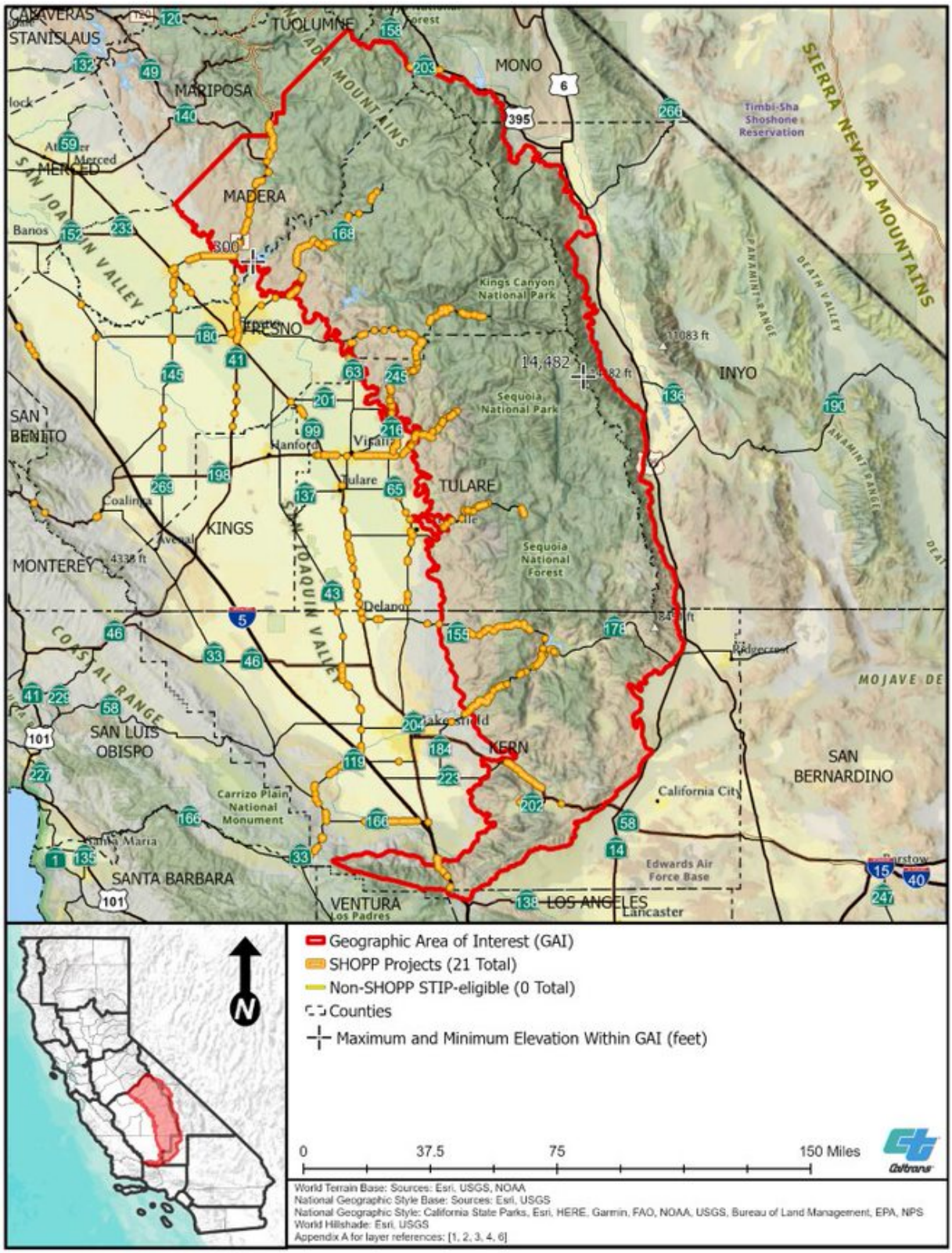
2.4.1. Climate Vulnerability Assessment

From 2017 through 2019, Caltrans performed a statewide climate change vulnerability assessment for the SHS (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, reliability, and capacity. Transportation systems were designed for historical climate conditions; changing climatic conditions, including an increased frequency of extreme weather events, are expected to disrupt and damage the SHS. Predicted climate change effects consist of projected extended periods of higher temperatures in summer; large fluctuations in precipitation, with dry years becoming drier and wet years becoming wetter; and an increased risk of drought, wildfires, and landslides over the three time periods analyzed in the technical report (Caltrans 2018b).

Figure 2-4. Topography



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—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 2018a).

Resiliency is an important consideration when establishing compensatory mitigation. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a) is presented on Figure 2-5. The predicted climate resilience of the GAI ranges from areas with low resilience, located only along the extreme western edge of the GAI and along the base of the Sierra Nevada range, and high climate resilience ranking along the highest points of the Sierra Nevada range.

2.5 Land Cover Types

General land cover types are depicted on the maps provided in Appendix C, *Land Cover Types*. Land cover types in the GAI were extracted 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 2021c). Based on these data, tree-dominated habitats account for the largest habitat type, encompassing 53.5 percent of the GAI, with Sierran mixed conifer the most common. Shrub-dominated habitats account for 19.6 percent of the GAI, with mixed chaparral the most common. Herbaceous-dominated habitats account for 15.8 percent of the GAI, with annual grassland the most common. Aquatic habitats account for 1.0 percent of the GAI, with lacustrine the most common. Developed and non-vegetated habitat types (barren areas) combined account for 10.1 percent of the GAI, with barren the most common (Table 2-2, Appendix C). Land cover is generally shown on Figure 2-6.

Figure 2-5. Terrestrial Climate Resilience Rankings

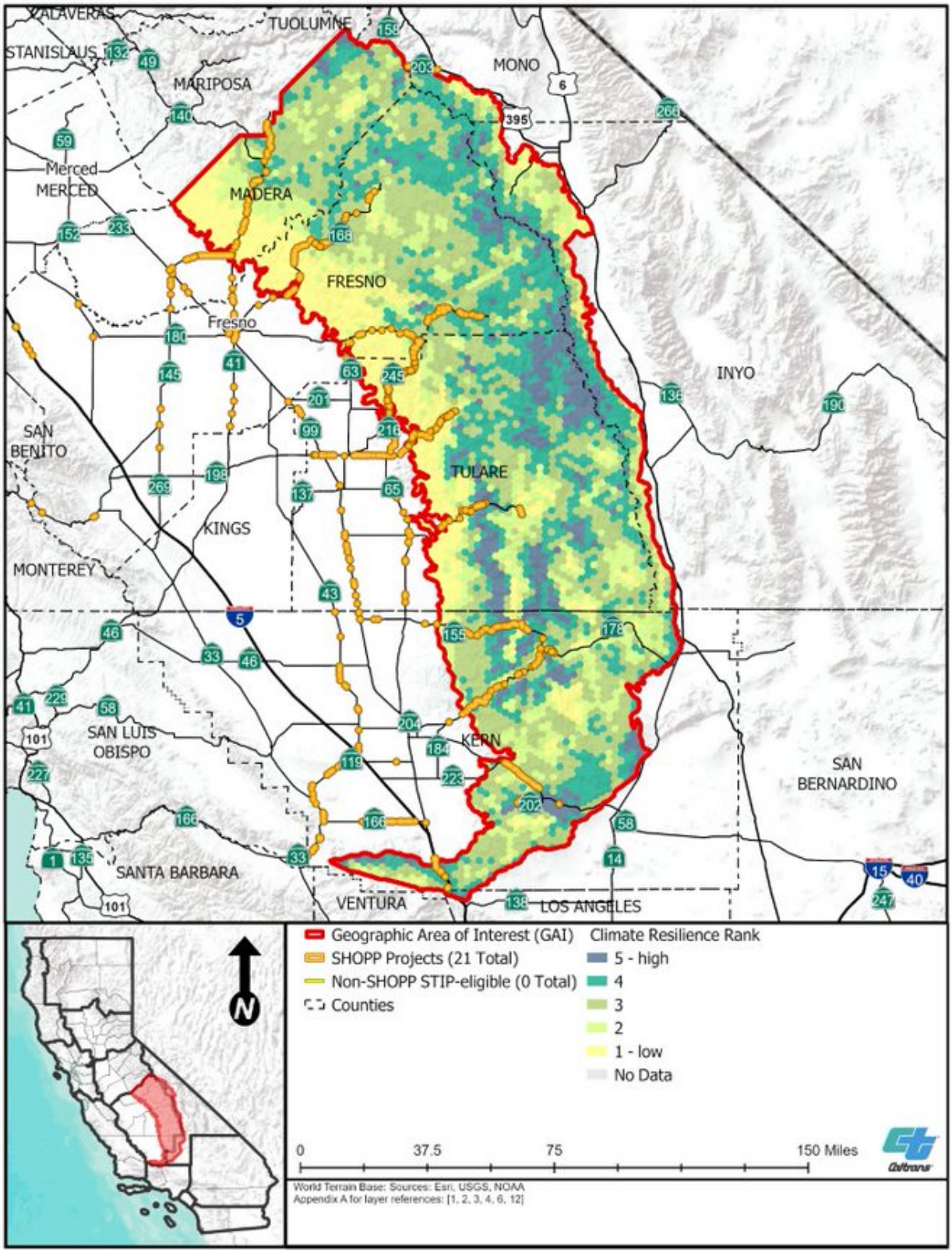


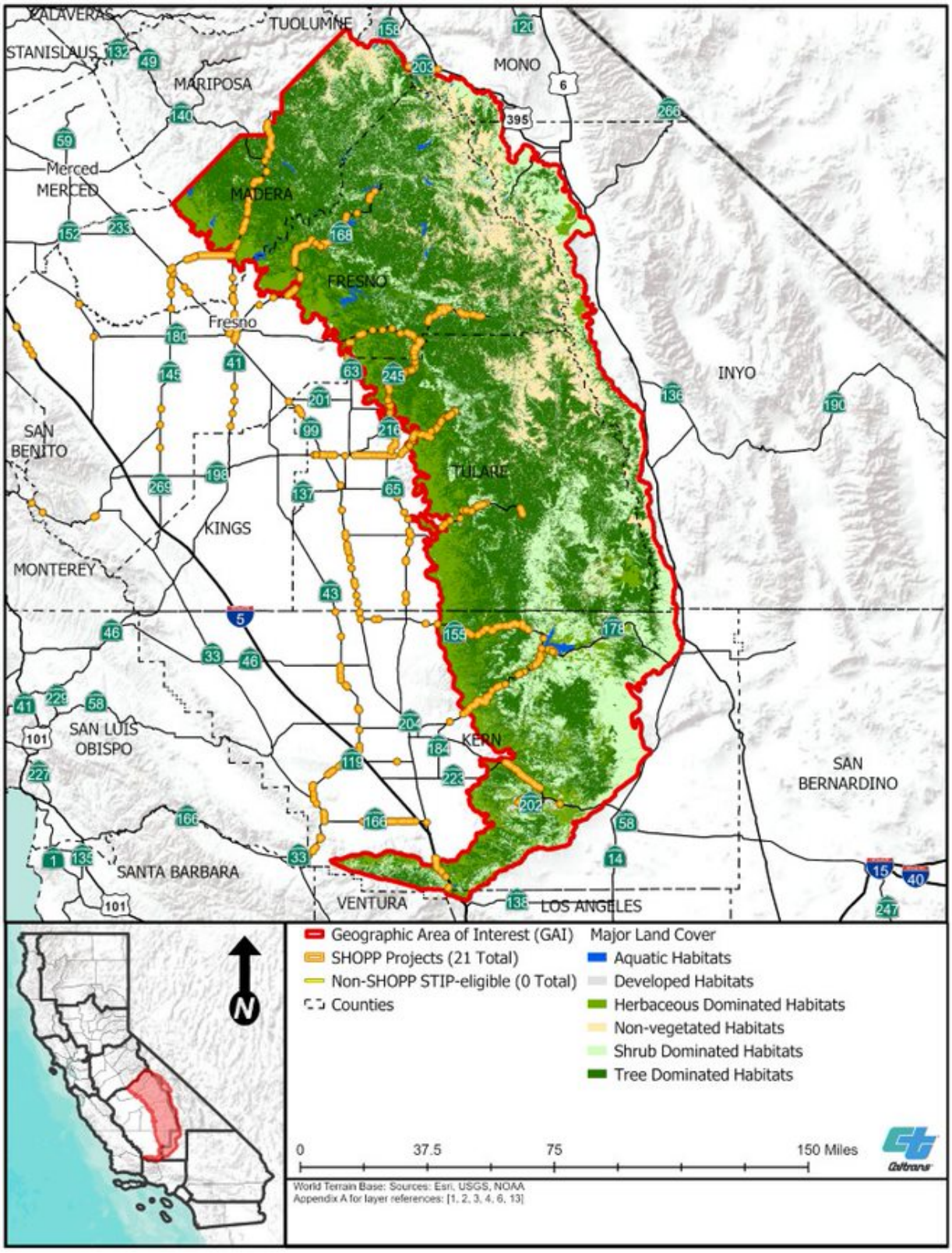
Table 2-2. Land Cover Types

CWHR Habitat Type	Acres[a]	Cover as Percentage of GAI[b]
Tree-dominated Habitats	**3,709,857**	**53.46**
Aspen	14,278	0.21
Blue Oak-Foothill Pine	74,744	1.08
Blue Oak-Foothill Pine; Blue Oak Woodland	244	<0.01
Blue Oak Woodland	538,797	7.76
Closed-Cone Pine-Cypress	429	0.01
Coastal Oak Woodland	1	<0.01
Desert Riparian	407	0.01
Eastside Pine	22,337	0.32
Eucalyptus	3	<0.01
Jeffrey Pine	129,297	1.86
Joshua Tree	3,078	0.04
Juniper	64,178	0.92
Lodgepole Pine	158,581	2.29
Montane Hardwood	482,540	6.95
Montane Hardwood-Conifer	132,719	1.91
Montane Riparian	43,476	0.63
Pinyon-Juniper	275,160	3.97
Ponderosa Pine	95,005	1.37
Red Fir	315,671	4.55
Sierran Mixed Conifer	628,010	9.05
Subalpine Conifer	475,089	6.85
Valley Foothill Riparian	10,543	0.15
Valley Oak Woodland	223,189	3.22
White Fir	22,081	0.32
Shrub-dominated Habitats	**1,362,419**	**19.63**
Alkali Desert Scrub	2,197	0.03
Akali Desert Scrub; Desert Scrub	34	<0.01
Alpine Dwarf-Shrub	79,140	1.14
Bitterbrush	9,950	0.14

CWHR Habitat Type	Acres[a]	Cover as Percentage of GAI[b]
Chamise-Redshank Chaparral	24,908	0.36
Coastal Scrub	191	<0.01
Desert Scrub	290,323	4.18
Desert Scrub; Desert Wash	7	<0.01
Desert Wash	2,919	0.04
Low Sage	8,647	0.12
Mixed Chaparral	375,118	5.41
Montane Chaparral	315,064	4.54
Sagebrush	253,921	3.66
Herbaceous-dominated Habitats	**1,093,371**	**15.76**
Annual Grassland	1,026,187	14.79
Fresh Emergent Wetland	239	<0.01
Pasture	121	<0.01
Perennial Grassland	11,808	0.17
Wet Meadow	55,016	0.79
Aquatic Habitats	**70,189**	**1.01**
Lacustrine	66,834	0.96
Riverine	3,354	0.05
Riverine; Lacustrine	1	<0.01
Developed Habitats	**26,955**	**0.39**
Cropland	15,775	0.23
Deciduous Orchard	34	<0.01
Irrigated Hayfield	716	0.01
Irrigated Row and Field Crops	28	<0.01
Urban	10,402	0.15
Non-vegetated Habitats	**676,716**	**9.75**
Barren	676,716	9.75
Total	**6,939,507**	**100%**

Source: Caltrans 2021c
[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 area, 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 n.d.). Invasive species may affect native species, including special-status species, by directly competing for resources, preying on native species, introducing or spreading diseases, reducing the complexity and biodiversity of ecosystems, altering soil chemistry and water availability, and increasing wildfire potential (CDFW 2018b; FWS 2012).

Three organizations 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 2022).

In the GAI, invasive plant species have been specifically identified as threats or stressors to terrestrial and aquatic biological resources (CDFW 2018b). 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 ecoregion sections that overlap the GAI in the California SWAP or the Cal-IPC inventory include, but are not limited to, tree of heaven (*Ailanthus altissima*), giant reed (*Arundo donax*), wild oat (*Avena barbata* and *A. fatua*), black mustard (*Brassica nigra*), ripgut brome (*Bromus diandrus*), red brome (*Bromus rubens*), cheatgrass (*Bromus tectorum*), tocalote (*Centaurea melitensis*), yellow star-thistle (*Centaurea solstitialis*), bull thistle (*Cirsium vulgare*), Bermuda grass (*Cynodon dactylon*), bristly dogtail grass (*Cynosurus echinatus*), Scotch broom (*Cytisus scoparius*), Russian olive (*Elaeagnus angustifolia*), medusahead (*Elymus caput-medusae*), eucalyptus (*Eucalyptus* spp.), rattail sixweeks grass (*Festuca myuros*), rye grass (*Festuca perennis*), French broom (*Genista monspessulana*), cutleaf geranium (*Geranium dissectum*), English ivy (*Hedera helix*), summer mustard (*Hirschfeldia incana*), common velvet grass (*Holcus lanatus*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), hare barley (*Hordeum murinum* ssp. *leporinum*), rough cat's-ear (*Hypochaeris radicata*), perennial pepperweed (*Lepidium latifolium*), pennyroyal (*Mentha pulegium*), Harding grass (*Phalaris aquatica*), annual beard grass (*Polypogon monspeliensis*), Himalayan blackberry (*Rubus bifrons*), sheep sorrel (*Rumex acetosella*), saltcedar or tamarisk (*Tamarix* spp.), and tall sock-destroyer (*Torilis arvensis*) (Cal-IPC 2022; CDFW 2015a).

Nonnative animals that are/may be present in the GAI and that can negatively affect aquatic species include barred tiger salamander (*Ambystoma mavortium*), western

mosquitofish (*Gambusia affinis*), green sunfish (*Lepomis cyanellus*), bullfrogs (*Lithobates catesbiana*), rainbow trout (*Onocorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and red-eared slider (*Trachemys scripta elegans*) (CDFW 2015a). Nonnative animals that are/may be present in the GAI and that can negatively affect terrestrial wildlife through competition, predation, or parasitism include brownheaded cowbirds (*Molothrus ater*) and red fox (*Vulpes vulpes*). Invasive animal species that are/may be associated with urban areas include domestic dogs (*Canis lupus familiaris*) and domestic cats (*Felis catus*).

2.7 Special-status Species

Special-status terrestrial species are discussed below, with additional detail provided in Appendix D, *Complete SAMNA Species Results*. Threatened and endangered fish species with the potential to occur in the GAI are discussed in Section 2.15.2.

Special-status species with the potential to occur in the GAI that are anticipated to be affected were extracted from the SAMNA Reporting Tool's species-attributed vegetation data layer, which was developed using the CWHR (CDFW 2019), the Jepson Herbarium's floristic province layer, CDFW's RareFind 5 database (CDFW 2021a), and other information (Caltrans 2021b; Appendix D). Special-status terrestrial species in the SAMNA are 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). Based on a search of the SAMNA Reporting Tool's species-attributed vegetation layer, 121 non-fish special-status species have the potential to occur in the GAI (121 species in the Sierra Nevada Ecoregion and 101 species in the Sierra Nevada Foothills Ecoregion).

Although it is the best information currently available, the SAMNA Reporting Tool's species list is uncertain (Appendix D). The species-attributed list developed for the SAMNA Reporting Tool depends on a species having a defined geographic range within the CWHR or having occurrences documented in the California Natural Diversity Database (Caltrans 2021b). When CWHR home range and/or California Natural Diversity Database occurrence information is incorrect or out-of-date, the probability that a species will be misidentified as potentially present increases. Hence, SAMNA results go through a sensibility evaluation prior to being used to inform advance mitigation scoping (Appendix D). Further, although SAMNA data layers and results are suitable to assist with advance mitigation project scoping, establishing compensatory mitigation credits approved by one or more natural resource regulatory agencies requires additional analysis and site-specific studies.

2.8 Critical Habitat

FWS and NMFS regulate impacts on critical habitat under the ESA. The ESA (16 USC § 1531–1544) defines critical habitat for a threatened or endangered species as (i) "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."

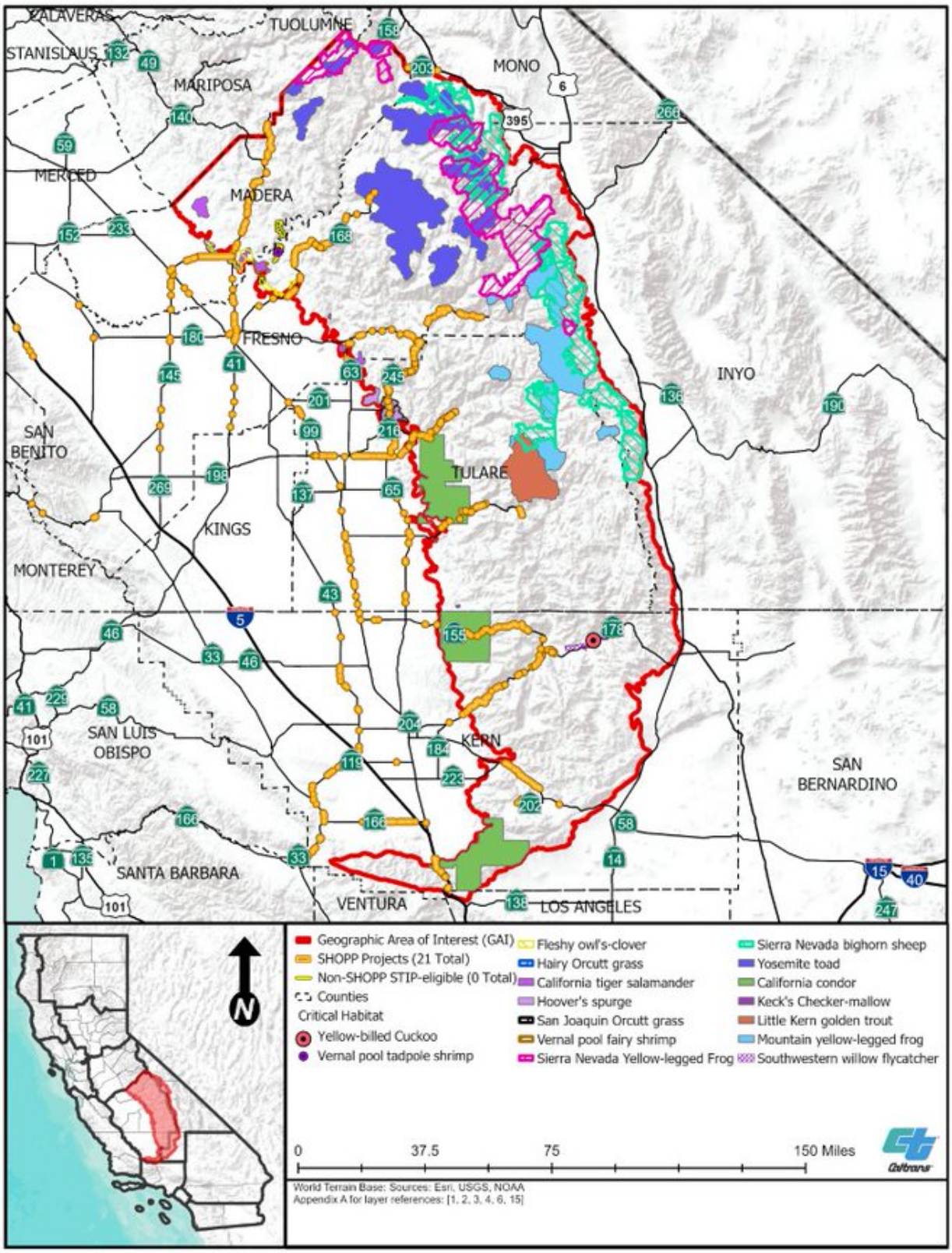
Further, the ESA clarifies that critical habitat "shall not include the entire geographical area which can be occupied by the threatened or endangered species." Critical habitat designations reflect a rigorous process. Before publishing the rule finalizing the critical habitat designation, FWS publishes 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 16 species (FWS 2021a):

- California condor (*Gymnogyps californianus*)
- California tiger salamander (*Ambystoma californiense*)
- Fleshy owl's-clover (*Castilleja campestris* ssp. *succulenta*)
- Hairy Orcutt grass (*Orcuttia pilosa*)
- Hoover's spurge (*Chamaesyce hooveri*)
- Keck's checker-mallow (*Sidalcea keckii*)
- Little Kern golden trout (*Onocorhynchus mykiss whitei*)
- Mountain yellow-legged frog (*Rana muscosa*)
- San Joaquin Orcutt grass (*Orcuttia inaequalis*)
- Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*)
- Sierra Nevada yellow-legged frog (*Rana sierrae*)
- Southwestern willow flycatcher (*Empidonax trailii extimus*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- Vernal pool tadpole shrimp (*Lepidurus packardi*)
- Yellow-billed cuckoo (*Coccyzus americanus*)
- Yosemite toad (*Anaxyrus canorus*)

Critical habitat is an important consideration when establishing compensatory mitigation. Designated critical habitat for these species is indicated on Figure 2-7. Note that designated critical habitat represented by points on Figure 2-7 are units too small to depict at the regional level assessed in this RAMNA.

Figure 2-7. Federally Designated Critical Habitat



2.9 Connectivity

Roads can be barriers to special-status wildlife species movement and block migration and access to and from suitable upstream habitat for special-status fish species. Improving habitat connectivity and permeability of the SHS may provide a mechanism for maintaining biodiversity in the face of California's human population growth and climate change (CDFW 2020a).

2.9.1. Wildlife Movement

Caltrans identified four connectivity assessments applicable and relevant to the GAI: the California Essential Habitat Connectivity ("CEHC") Project, ACE, CDFW's *California Wildlife Barriers 2020* report, and the Sierra Nevada Foothills Wildlife Connectivity Modeling Project. Each is briefly summarized below.

California Essential Habitat Connectivity

The 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).

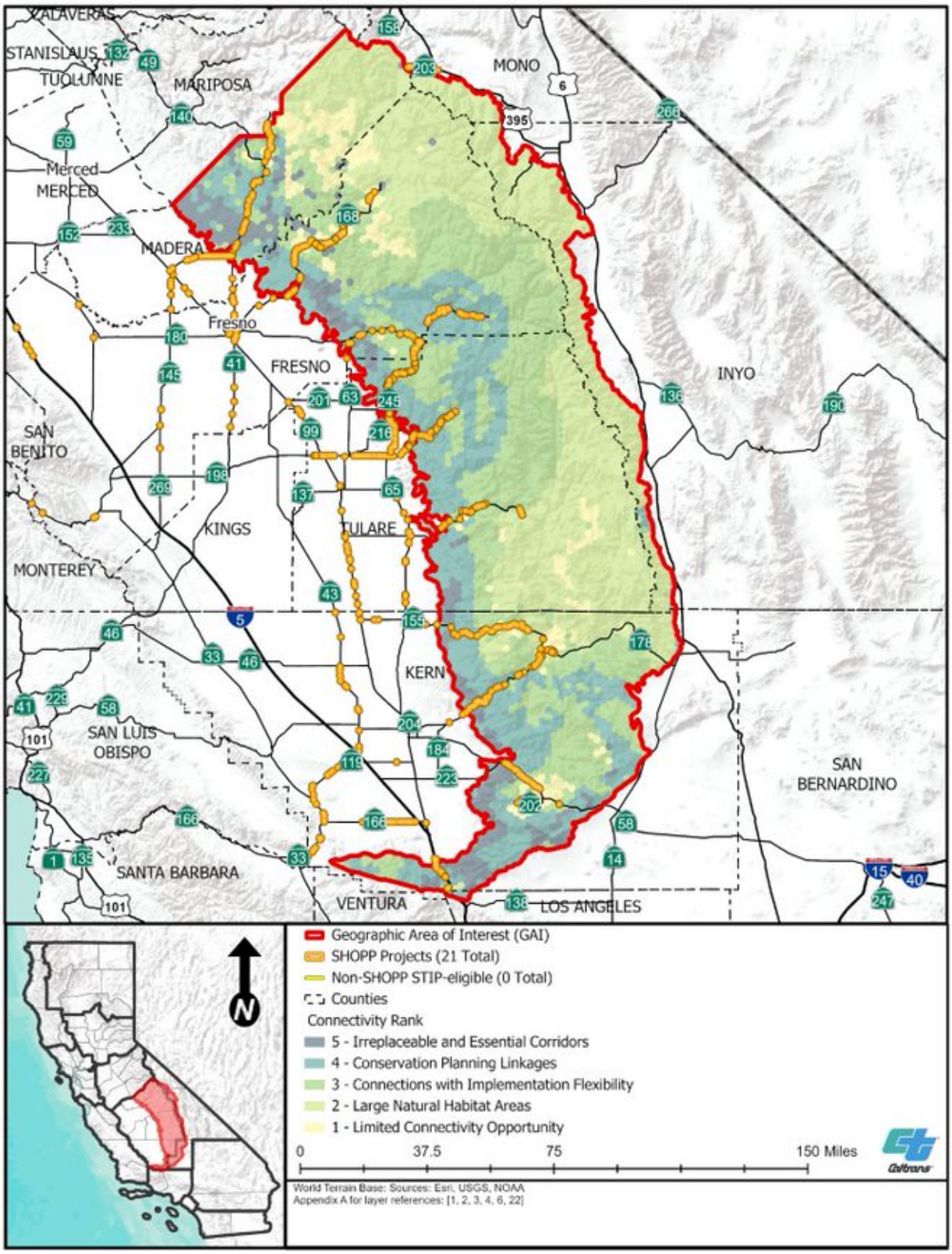
CDFW's Areas of Conservation Emphasis

CDFW's ACE version 3 terrestrial connectivity dataset (CDFW 2020b) 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

Figure 2-8. Terrestrial Connectivity



- Rank 1 (limited connectivity opportunity) – areas where land use limits connectivity, including some lakes

Connectivity is an important consideration when establishing compensatory mitigation. Most of the planned SHOPP transportation projects occur in areas with a connectivity rank of 3, 4, or 5, with fewer planned transportation projects occurring in areas with a connectivity rank of 1 or 2 (Figure 2-8).

CDFW's Restoring California's Wildlife Connectivity 2022 Report

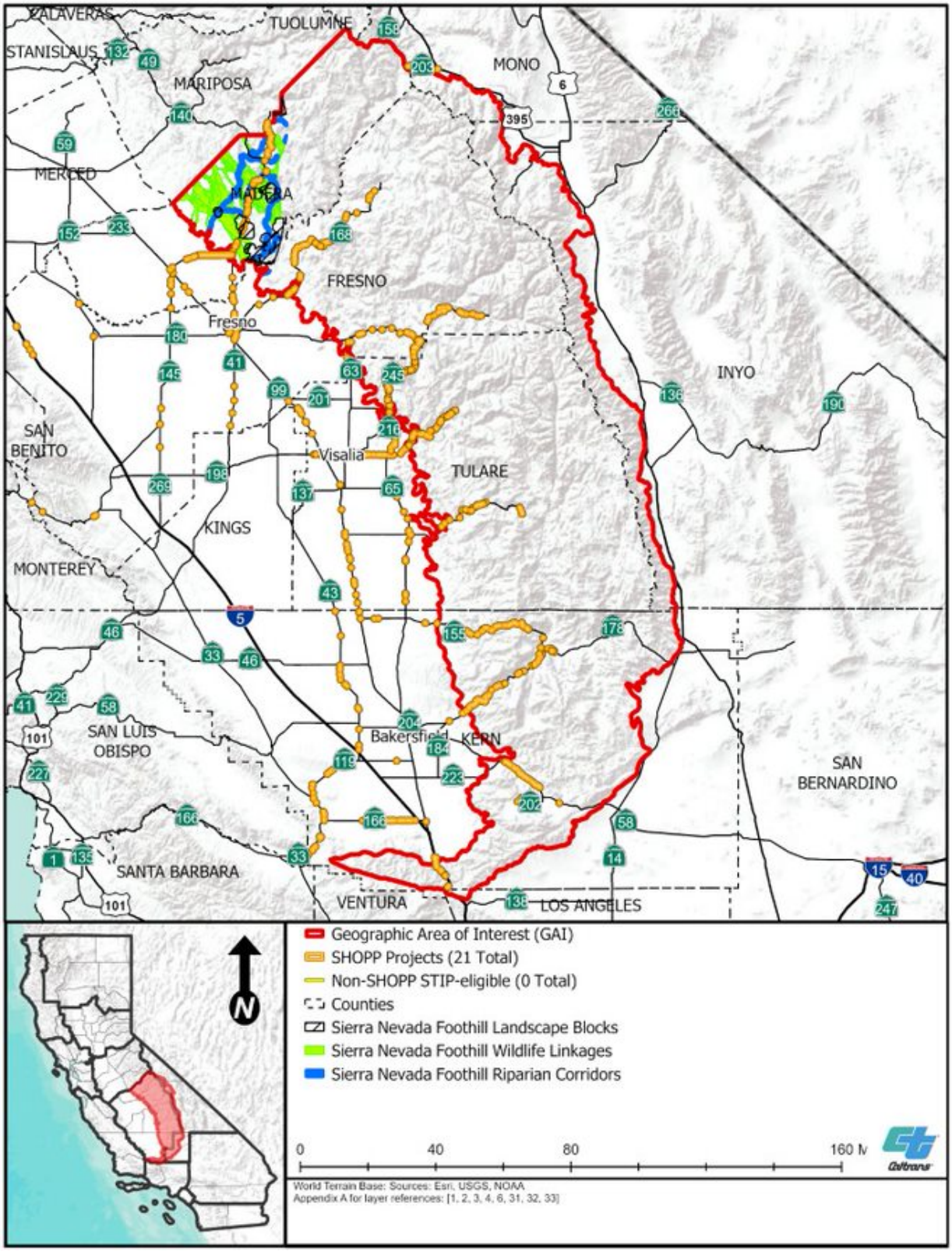
CDFW's *Restoring California's Wildlife Connectivity 2022* report identified priority wildlife connectivity project locations based on barriers created by linear infrastructure across the state, including the SHS, railroads, canals, high-speed rail alignments, and local roads, to help focus financial resources on improving wildlife movement (CDFW 2022). 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. This report is an update to the 2020 priority barrier dataset (CDFW 2020a); it includes an updated list of priority wildlife barriers in each region, identifies additional wildlife barriers across the state, and identifies two top-priority barriers in each region. A total of 150 segments of linear infrastructure was identified as having wildlife barriers, with 62 identified as priority wildlife barriers and 12 on the statewide top-priority list (CDFW 2022).

Five priority wildlife movement barriers were identified in the GAI. These barriers and target species for movement include (1) State Route ("SR") 180 Kings Canyon Foothills in Fresno County (mule deer, mountain lion, black bear, and badger), (2) SR 178 Canebrake in Kern County (mule deer, mountain lion, and black bear), (3) SR 58 Tehachapi grade in Kern County (mule deer, mountain lion, and black bear), (4) Interstate 5 Grapevine in Kern County (mountain lion, mule deer, black bear, and kit fox), and (5) Oakhurst – Wawona in Madera and Mariposa Counties (deer, mountain lion, and black bear) (CDFW 2020a).

Sierra Nevada Foothills Wildlife Connectivity Modeling Project

The Sierra Nevada Foothills Wildlife Connectivity Modeling Project builds on the CEHC Project and includes finer-scale information on the importance of the foothills as a movement corridor for mule deer and other large mammals between the Central Valley and Sierra Nevada. It identifies core habitat areas or landscape blocks for nine focal species and connections between these core areas, including riparian corridors and other linkages. The Sierra Nevada Foothills Wildlife Connectivity Modeling Project is limited to an area that extends south to Madera County and, therefore, intersects only with the northwestern part of the GAI (Figure 2-9) (CDFW 2015b).

Figure 2-9. Sierra Nevada Foothills Wildlife Connectivity Modeling



2.9.2. Fish Passage

Article 3.5 of Chapter 1 of Division 1 of the SHC, also known as “Senate Bill 857” (Kuehl, Chapter 589 and Statute of 2005), prohibits the new construction or continued maintenance upgrades of SHS facilities that prevent or impede the passage of salmon and steelhead. The majority of salmon and steelhead in California are listed as either threatened or endangered, and barriers on the SHS further block fish from gaining access to upstream habitat.

SHC § 156.1 requires Caltrans to:

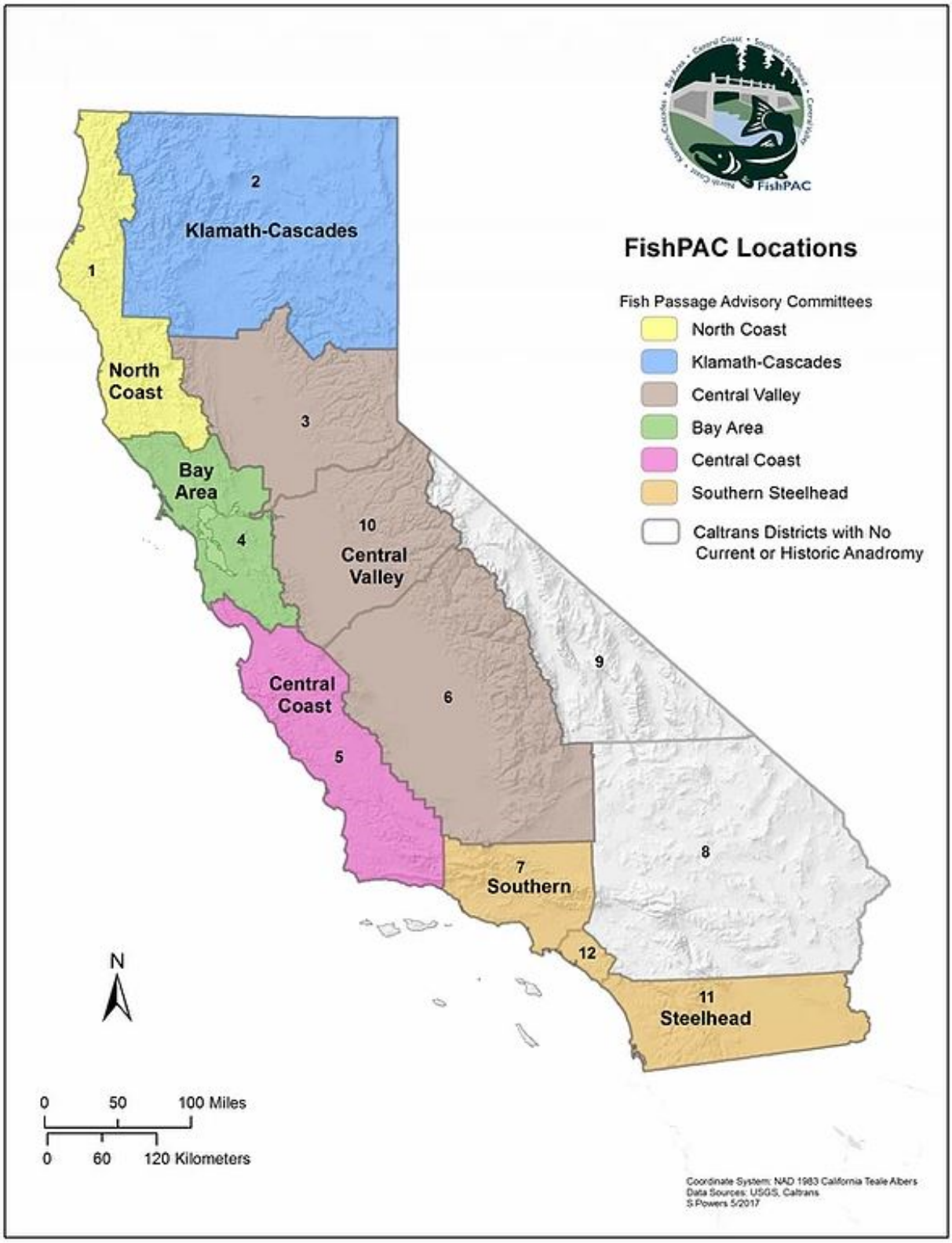
1. Provide an annual list of fish passage priorities for the SHS to the legislature. Fish Passage Annual Reports are available on the Caltrans Legislative Affairs website, and the most recent report is available from: https://dot.ca.gov/programs/legislative-affairs/reports
2. Complete assessments of potential barriers to anadromous fish prior to commencing any transportation project using state or federal transportation funds
3. Submit assessments to the California Fish Passage Assessment Database
4. Construct all new transportation projects in a way that does not pose or create a barrier to fish passage

The CESA and ESA list 10 evolutionarily significant units (“ESUs”)/DPSs of salmon and steelhead as threatened or endangered. Barriers created by the SHS are known to block access to habitat for each of these species units. CDFW, in coordination with CalTrout, estimates that without increased intervention, to include habitat remediation and restoration, the following species will become extinct in California in the next 40 years:

- Three identified species’ units currently listed as state and/or federally endangered: Central California Coast ESU coho salmon, Sacramento River winter-run ESU chinook salmon, and Southern California DPS steelhead
- Seven identified species currently listed as state and/or federally threatened: Southern Oregon/Northern California ESU coho salmon, Central Valley spring-run ESU and California Coastal ESU chinook salmon, and Central Valley DPS, Northern California DPS, Central California Coast DPS, and South-Central California Coast DPS steelhead

Figure 2-10 depicts the six California Fish Passage Advisory Committee (“FishPAC”) locations throughout the state. The FishPAC is a partnership between Caltrans, CalTrout, CCC, CDFW, FWS, NMFS, Pacific States Marine Fisheries Commission, and other local fish passage advocates. The FishPACs share science and data related to known fish barriers and prioritize SHS locations based on high-value habitat recovery.

Figure 2-10. California Fish Passage Advisory Committee Locations



FishPACs support the implementation of meaningful, long-term fish passage solutions for SHS projects within each FishPAC geographic area. FishPACs recommend technical solutions, explore options for accelerated delivery of transportation projects, and identify potential funding mechanisms for both new barrier removal projects and the long-term maintenance of existing fish passage facilities for the SHS. Stream simulation designs and full-span solutions to fish passage also consider and incorporate benefits for both terrestrial and wildlife species, and can also help to address sediment transport, water temperature, dissolved oxygen, and stream erosion issues.

The FishPACs help advance the desired outcomes of legislative guidance included in the SHC and promote collaborative, interjurisdictional solutions. Long-term, full-span fish passage solutions are key to enhancing connectivity for both aquatic and terrestrial species in California's watersheds. Providing access to upstream habitats will help ensure fish populations can respond and adapt to climate change stressors such as drought, wildfire, sea-level rise, changes in stream flow, and water temperature.

The FishPAC network of over 200 fish passage experts, advocates, and partners throughout the range of salmon and steelhead work collaboratively to address legacy transportation barriers with long-term solutions that facilitate both fish passage and climate resilience.

The FishPAC helps Caltrans advance the desired outcomes of SHC § 156 (J. Walth, Caltrans, personal communication, 2020). Since 2006, in collaboration with FishPAC, statewide, Caltrans has partially or fully remediated 51 barriers on the SHS and identified 556 additional barriers to salmon and steelhead. Results of Caltrans' and FishPACs' efforts to locate, assess, prioritize, and remediate fish passage barriers on the SHS are documented in Fish Passage Annual Reports prepared by Caltrans and submitted to the legislature as required by SHC § 156.1.

As specified above, the FishPAC also provides SHS-related information to the Fish Passage Assessment Database, to be incorporated into its periodic updates.[3] Information regarding verified SHS fish passage barriers is available through the appropriate FishPAC.

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 ("HUs") of various scales, each with an assigned hydrologic unit code ("HUC") that is georeferenced to USGS topographic maps (USGS 2014). Each HUC classification consists of 2 to 12 digits. For example, 6-digit HUCs, or "HUC-6s," map to the basin level; 8-digit HUCs, or "HUC-8s," map to the sub-basin level; and 12-digit HUCs, or "HUC-12s," map to the sub-watershed level.

[3] More information about the Fish Passage Assessment Database can be found in CalFish 2018.

The SAMNA Reporting Tool expresses the landscape in terms of USGS HUC-8 sub-basins and, hence, information in this RAMNA is also presented by HUC-8 (Caltrans 2021c; USGS 2014). However, the California Department of Water Resources and Water Boards (SWRCB and the RWQCBs) do not necessarily use HUC-8 codes (California Department of Water Resources 2016). The Water Boards also use the Calwater system (that is, HUs) for state-level purposes such as assigning beneficial uses to waters. The Calwater system is a hierarchical system similar to USGS HUCs. Calwater levels begin with the division of the state into 10 hydrologic regions. Each hydrologic region is progressively subdivided into five smaller, nested levels: HUs, hydrologic areas, hydrologic sub-areas, super planning watersheds, and planning watersheds.

Appendix E, *Hydrologic Units*, provides a crosswalk between the HUC-8 and HU classification systems for each HUC-8 in the GAI. The GAI overlaps 22 sub-basins, which loosely correspond to 18 HUs (Appendix E). Figure 2-11 shows the overlap between sub-basins and state-level HUs in the GAI.

2.11 Hydrology

The 22 sub-basins of the GAI drain an area of 6,939,465 acres (10,843 square miles) (Table 2-3, Figure 2-11). Described individually in Appendix E, *Hydrologic Units*, these sub-basins include 11,309 rivers and streams that traverse 12,785 miles in the Central Valley RWQCB boundary (Table 2-3). Sub-basin acreages shown in Table 2-3 may include areas outside of the GAI. Major rivers in the GAI include the Kings, Kaweah, Tule, and Kern Rivers, which drain the west face of the Sierra Nevada.

Figure 2-11. HUC-8 Sub-basins and HUs

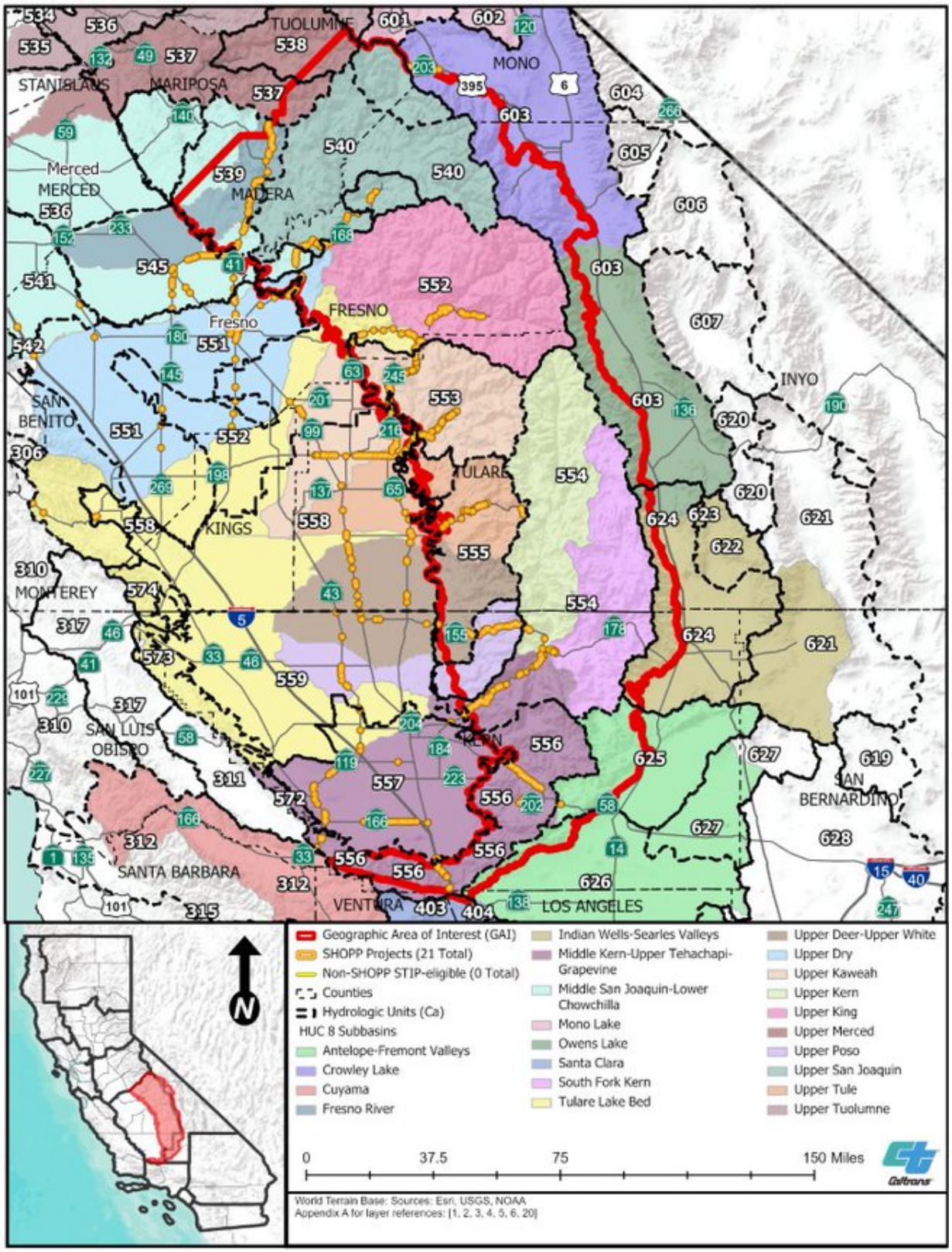


Table 2-3. Sub-basins

Sub-basin Name	Sub-basin Code (HUC-8)	Drainage Area (acres)[a]	Rivers and Streams (count)	Total Reach Length (miles)[a]
Antelope-Fremont Valleys	18090206	296,433	920	877
Crowley Lake	18090102	343,796	408	521
Cuyama	18060007	128	0[b]	0[b]
Fresno River	18040007	189,944	302	355
Indian Wells-Searles Valleys	18090205	151,149	223	260
Middle Kern-Upper Tehachapi-Grapevine	18030003	753,523	1,998	1,969
Middle San Joaquin-Lower Chowchilla	18040001	137,620	294	312
Mono Lake	18090101	26	0[b]	0[b]
Owens Lake	18080103	205,351	178	284
Santa Clara	18070102	1,894	4	2
South Fork Kern	18030002	627,984	815	1,100
Tulare Lake Bed	18030012	118,361	279	281
Upper Deer-Upper White	18030005	213,828	198	368
Upper Dry	18030009	69,022	169	174
Upper Kaweah	18030007	528,573	875	929
Upper Kern	18030001	699,177	982	1,138
Upper King	18030010	988,199	1,491	1,629
Upper Merced	18040008	101,196	152	163
Upper Poso	18030004	145,008	163	255
Upper San Joaquin	18040006	1,048,762	1,366	1,609
Upper Tule	18030006	319,395	492	558
Upper Tuolumne	18040009	96	0[b]	0[b]
Total	Not applicable	**6,939,465**	**11,309**	**12,785**

Source: California Department of Water Resources
[a] Numbers were rounded to the nearest whole number.
[b] Although a small portion of the HUC-8 occurs within the GAI, no rivers or streams within the HUC-8 occur in the GAI.

2.12 Flood Hazard Areas

As designated by the Federal Emergency Management Agency, a Special Flood Hazard Area is the land area that is covered by the floodwaters of a 100-year base flood (Federal Emergency Management Agency 2020). In accordance with Executive Order 11988, all federally approved projects that encroach into a 100-year base floodplain must try 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).

Flood hazard areas in the GAI are shown on Figure 2-12. Water bodies associated with the majority of flood hazard risk in the GAI include Eastman Lake, Hensley Lake, Millerton Lake, Shaver Lake, Lake Thomas A. Edison, and Lake Isabella. This information is important for scoping advance mitigation projects and transportation projects undertaken in the GAI, which will need to comply with Executive Order 11988.

2.13 Water Quality

Water quality objectives for surface waters and groundwater in the GAI are provided in the *Water Quality Control Plan for the Tulare Lake Basin* (Central Valley RWQCB 2018), the *Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin* (Central Valley RWQCB 2019), and the *Water Quality Control Plan for the Lahontan Region* (Lahontan RWQCB 2019) ("Basin Plans"). Water quality objectives identified in the Basin Plan 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 taste and odor is narrative. Undesirable tastes and odors in water are an aesthetic nuisance and can indicate the presence of other pollutants.

Surface water and groundwater beneficial uses[4] are also identified in the Basin Plans (Central Valley RWQCB 2018, 2019; Lahontan RWQCB 2019). If it cannot be avoided, a water body'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. Hence, this RAMNA considers beneficial uses identified for water bodies located in the GAI relevant to the RAMNA when they support

[4] RWQCBs may have region-specific definitions of beneficial uses or beneficial uses with no statewide equivalent. These definitions can be consulted in the latest document version, entitled "bu_definitions," at: https://www.waterboards.ca.gov/about_us/performance_report_1314/plan_assess/docs/.

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 2-4).

Through habitat and other improvements, advance mitigation projects have the potential to contribute to compliance with the SWRCB CWA Section 303(d) List of Total Maximum Daily Load Priority Schedule. For example, fish passage projects in impaired watersheds that increase road/stream crossing capacity, improve the alignment of the crossing, or implement weirs, baffles, or other grade/velocity-control devices at undersized road/stream crossings will improve sediment transport and/or 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.

The CWA Section 303(d) list of impaired waters includes 28 water bodies in the GAI (SWRCB 2021). This RAMNA considers a water body's CWA Section 303(d) impairment designation as relevant to the RAMNA when it indicates a waterbody's loss of a relevant aquatic resource-related beneficial use (Table 2-4). These waterbodies, their impairments, and whether total maximum daily loads ("TMDLs") have been established are provided in Appendix F, *List of 303(d) Impaired Waters*. A RWQCB may need to consult with CDFW or other natural resource regulatory agencies to determine whether a beneficial use may be affected by a water quality-related decision.

Figure 2-12. Flood Hazard Areas

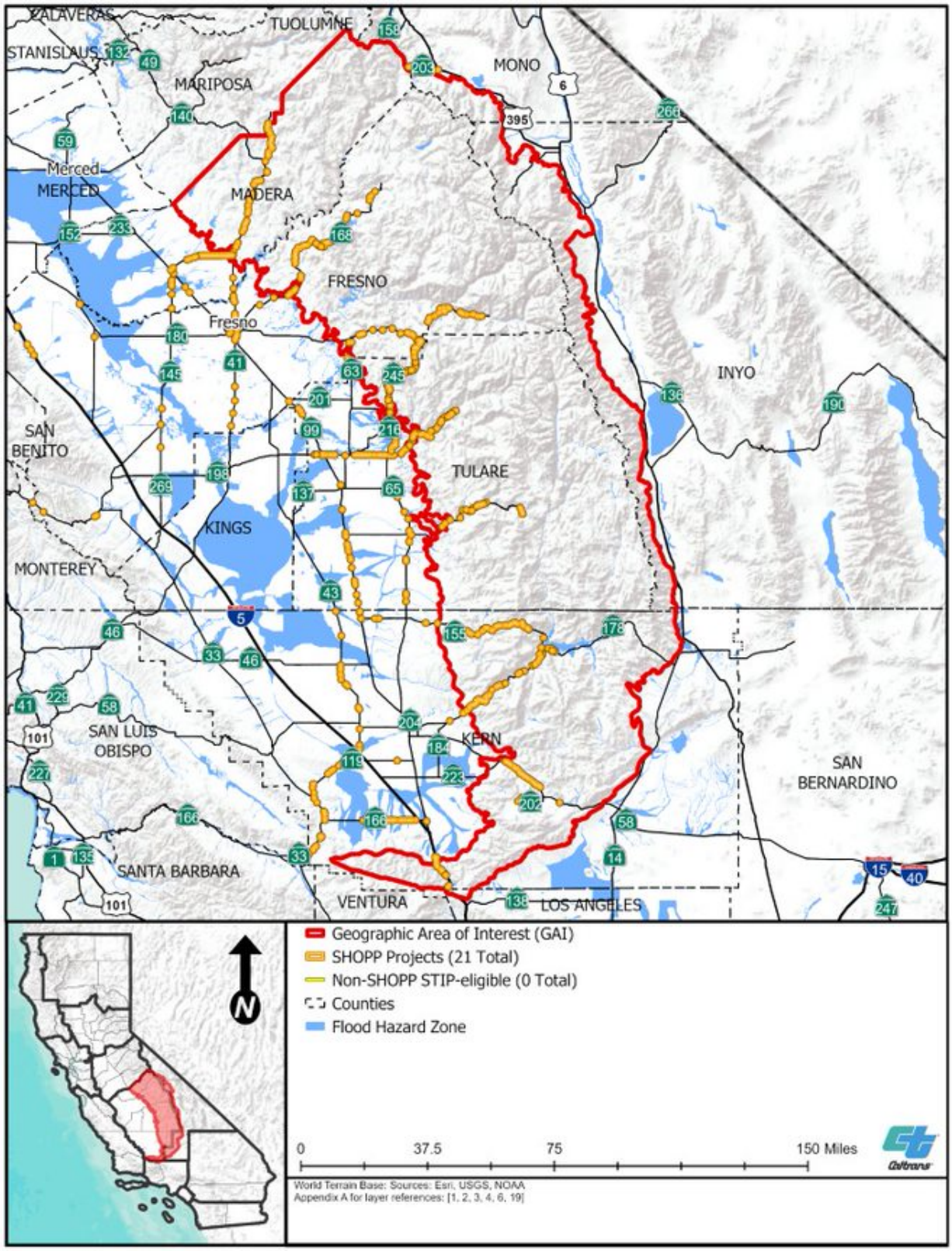


Table 2-4. Beneficial Uses

Beneficial Use	Sacramento River and San Joaquin River Basin Plan	Tulare Lake Basin Plan	Lahontan Region Basin Plan	Relevant to RAMNA?[a]
Agricultural supply	Applicable	Applicable	Applicable	No
Aquaculture	Not applicable	Not applicable	Applicable	No
Cold freshwater habitat	Applicable	Applicable	Applicable	Yes
Commercial and sport fishing	Not applicable	Not applicable	Applicable	No
Flood peak attenuation/flood water storage	Not applicable	Not applicable	Applicable	Yes
Freshwater replenishment	Not applicable	Applicable	Applicable	Yes
Groundwater recharge	Not applicable	Applicable	Applicable	Yes
Hydropower generation	Applicable	Applicable	Not applicable	No
Industrial process supply	Applicable	Applicable	Not applicable	No
Industrial service supply	Applicable	Applicable	Applicable	No
Inland saline water habitat	Not applicable	Not applicable	Applicable	Yes
Migration of aquatic organisms	Not applicable	Applicable	Applicable	Yes
Municipal and domestic supply	Applicable	Applicable	Applicable	No
Navigation	Applicable	Not applicable	Not applicable	No
Non-contact water recreation	Applicable	Applicable	Applicable	No
Rare, threatened, or endangered species	Not applicable	Applicable	Not applicable	Yes
Spawning, reproduction, and/or early development	Applicable	Applicable	Applicable	Yes
Warm freshwater habitat	Applicable	Applicable	Applicable	Yes
Water contact recreation	Applicable	Applicable	Applicable	No
Water quality enhancement	Not applicable	Not applicable	Applicable	Yes
Wildlife habitat	Applicable	Applicable	Applicable	Yes

Source: Central Valley RWQCB 2018, 2019; Lahontan RWQCB 2019
[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.

2.14 Wild and Scenic Rivers

The purpose of the federal Wild and Scenic Rivers Act of 1968 (16 USC Chapter 28) and the state Wild and Scenic Rivers Act of 1972 (Public Resources Code § 5093.50) is to protect and enhance the wild, scenic, and recreational values of designated rivers (National Wild and Scenic Rivers System 2016; Water Education Foundation 2022). 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.

The Kern, Kings, and Merced Rivers are nationally designated wild and scenic rivers in the GAI (National Wild and Scenic Rivers System 2016; Omnibus Public Land Management Act of 2009). On November 24, 1987, Congress designated the North Fork of the Kern River from the Tulare-Kern County line to its headwaters in Sequoia National Park and the South Fork from its headwaters in the Inyo National Forest to the southern boundary of the Domelands Wilderness in the Sequoia National Forest, with 123.1 miles as wild, 7 miles as scenic, and 20.9 miles as recreational. On November 3, 1987, Congress designated the Kings River from the confluence of the Middle Fork and the South Fork to the point at elevation 1,595 feet above mean sea level, the Middle Fork from its headwaters at Lake Helen to the confluence with the main stem, and the South Fork from its headwaters at Lake 11599 to the confluence with the main stem, with 65.5 miles as wild and 15.5 miles as recreational. On November 2, 1987, and October 23, 1992, Congress designated the Merced River from its source (including Red Peak Fork, Merced Peak Fork, Triple Peak Fork, and Lyle Fork) in Yosemite National Park to Lake McClure and the South Fork from its source to the confluence with the main stem, with 71 miles as wild, 16 miles as scenic, and 35.5 miles as recreational. The locations of these nationally designated wild and scenic rivers are provided on Figure 2-13. There are no state designated wild and scenic rivers in the GAI.

2.15 Aquatic Resources

A high-level view of major aquatic resources in the GAI is provided on Figure 2-14, and detailed maps of aquatic resources are provided in Appendix G, *Aquatic Resource Locations*. For the purposes of advance mitigation planning, aquatic resources in the GAI include wetlands and non-wetland waters that may be subject to Corps, EPA, RWQCB, and/or CDFW regulations, as well as special-status fish managed by CDFW, FWS, or NMFS. Riparian habitat is discussed separately in Section 2.16.

Corps and EPA jurisdiction under Section 404 of the CWA includes any activity that may cause a discharge of dredged or fill material into waters of the U.S. (“WOTUS”), including wetlands. Corps jurisdiction also includes any work or structure affecting navigable WOTUS, pursuant to Section 10 of the Rivers and Harbors Act and 33 CFR § 329,

respectively. RWQCB jurisdiction includes any activity that may cause a discharge of waste to waters of the state, including WOTUS, rivers, streams, and lakes, including ephemeral, intermittent, and perennial watercourses and wetlands, seeps, and springs. 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;[5] and deposit or dispose of material into any river, stream, or lake.

2.15.1. Historical Context

Historically, the abundant streams throughout the Sierra Nevada mountain range were utilized by Native Americans with little impacts to hydrology. Most of the impacts to the range's hydrology came with the gold rush as miners dammed, diverted, dewatered, excavated, polluted, and filled streams with debris from large hydraulic mines. Riparian areas and the surrounding vegetation were removed for flumes, mine timbers, buildings, and fuel. Streams were also utilized for hydroelectricity, and old mining waterways and structures were replaced with more substantial concrete infrastructure. Large water projects including dams along the San Joaquin, Kern, Kings, and American Rivers were completed before 1960 (Kattelmann 1996). Development in the western Sierra foothills, including hydropower facilities, forest management practices, fire suppression, livestock grazing, and agricultural and municipal water diversions have altered natural river flow regimes, leading to the conversion of wet meadows to drier habitats and degradation of streams and aquatic habitat. In addition, the introduction of trout has led to declines in many native fish species (CDFW 2015a).

Today, the snowmelt and precipitation from the Sierra Nevada range flow into waterways, refilling reservoirs or recharging groundwater basins within the Central Valley. Those waterways flow into the San Joaquin River that eventually join with the Sacramento River at the Sacramento-San Joaquin Delta. The southern forks of the Kings River and streams to the south drain into the Tulare basin. Water is also utilized in two water delivery projects, the State Water Project and the federal Central Valley Project, providing water to farms and cities throughout central and southern California and portions of the Bay Area (Water Education Foundation 2022).

[5] Rivers, streams, and lakes include ephemeral, intermittent, and perennial watercourses.

Figure 2-13. Wild and Scenic Rivers in the GAI

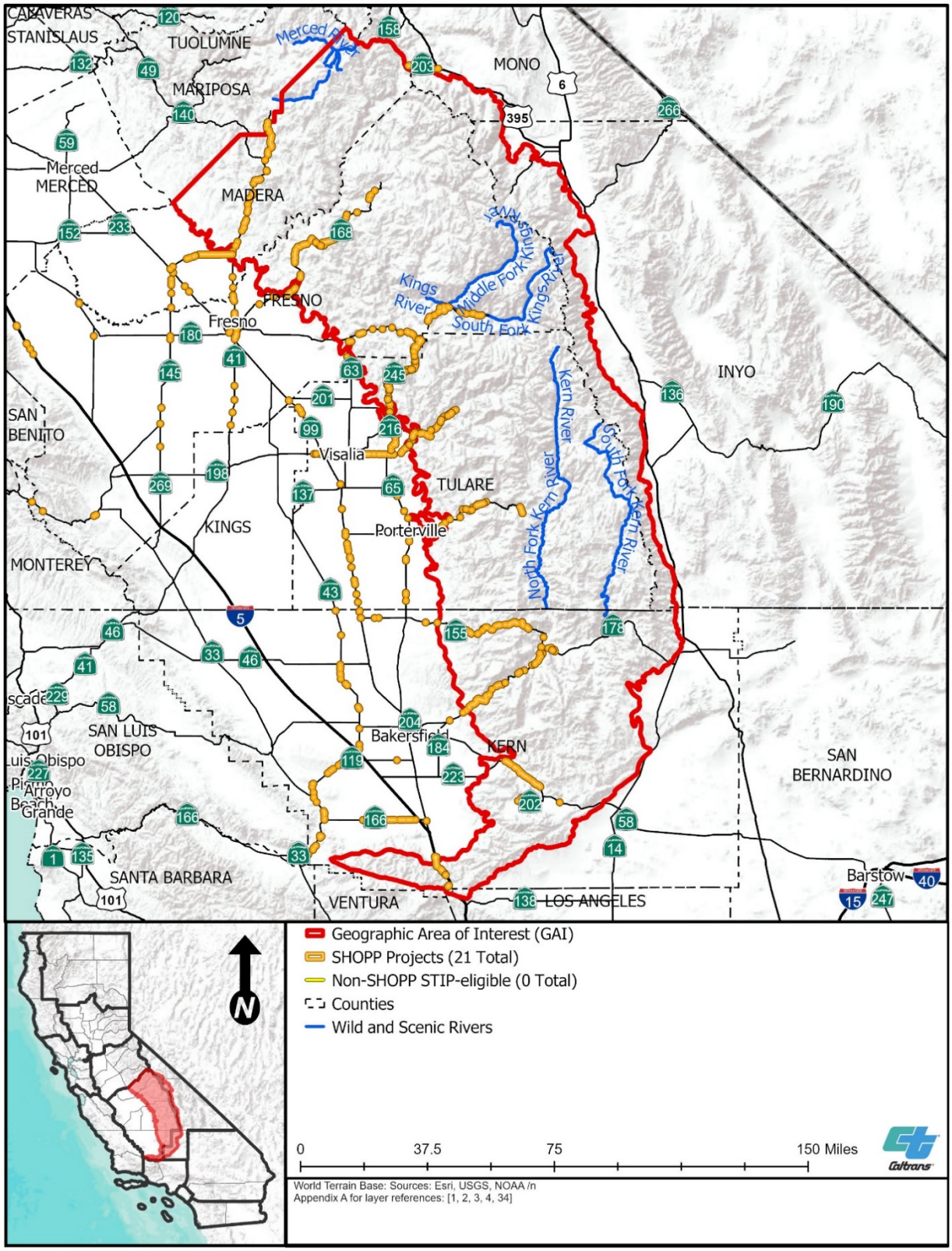
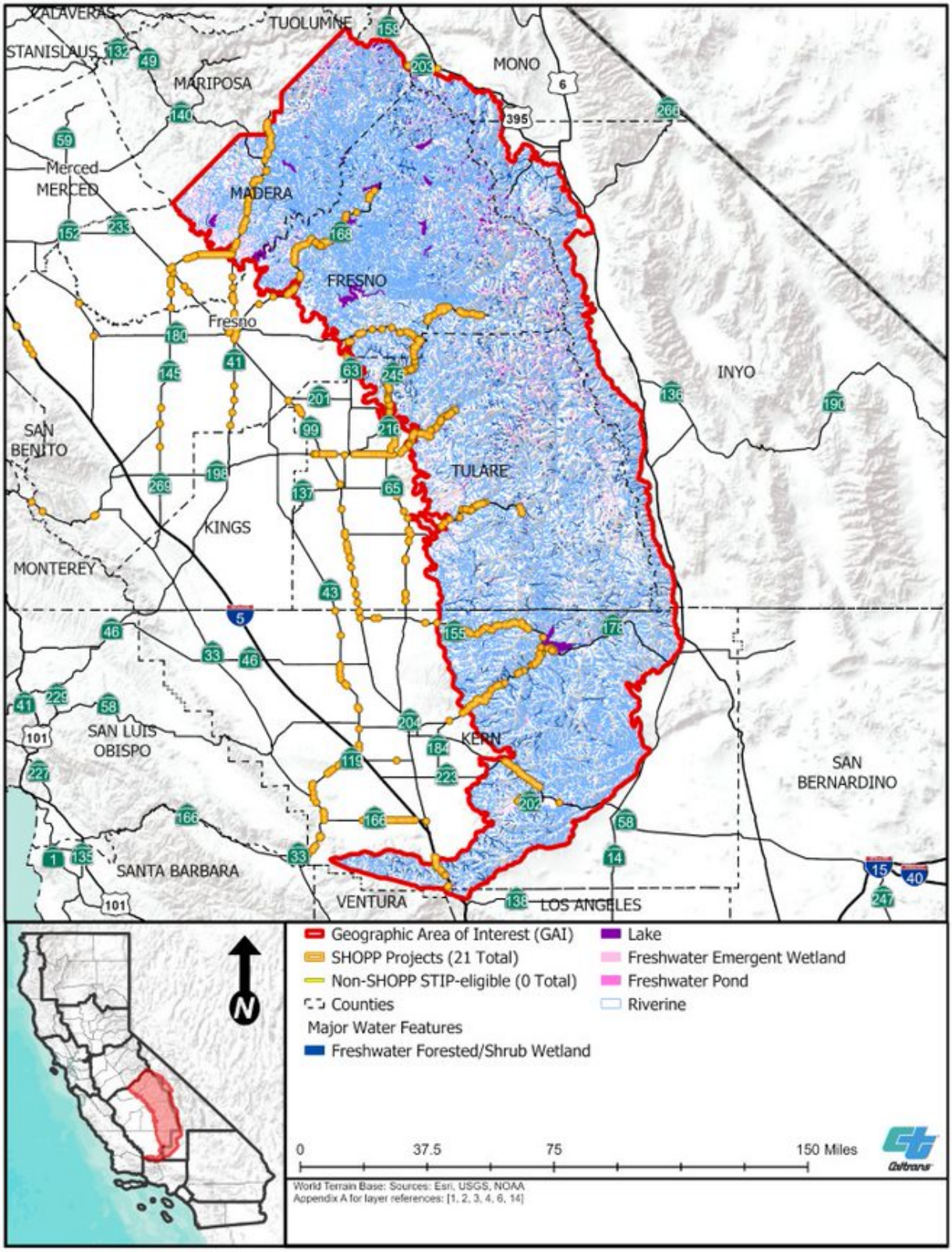


Figure 2-14. Aquatic Resource Features and Major Stream Systems[a]



[a] For greater detail, see Appendix G.

2.15.2. Threatened and Endangered Fish Species

Special-status terrestrial species with the potential to occur in the GAI are discussed in Section 2.7, above. Special-status fish species are discussed below.

Threatened and endangered fish species with the potential to occur in the GAI were extracted from the SAMNA Reporting Tool's fish habitat layer, which was developed using the USGS National Hydrography Dataset and other information (Caltrans 2018a, 2021f). Based on a search of the fish habitat layer, six federally or state listed threatened or endangered fish species have the potential to occur in the GAI:

- federally threatened Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*)
- federally threatened Little Kern golden trout (*Oncorhynchus mykiss whitei*)
- federally and state endangered Mohave tui chub (*Siphateles bicolor mohavensis*)
- federally and state endangered Owens pupfish (*Cyprinodon radiosus*)
- federally threatened Paiute cutthroat trout (*Oncorhynchus clarkii seleniris*)
- federally and state endangered unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*)

However, three of these species do not occur in the GAI: Mohave tui chub (occurs east of the GAI), unarmored threespine stickleback (occurs south of the GAI), and Owens pupfish (occurs east of the GAI within Owens Valley). The SAMNA assumes presence of a fish species within an entire HUC-8 where there are known occurrences within part of a HUC-8.

Lahontan cutthroat trout has self-sustaining populations within the Upper San Joaquin, Upper Stanislaus, and Upper Mokelumne watersheds. Little Kern golden trout currently occupies the Little Kern River watershed, including Soda Spring Creek and Clicks Creek tributaries. Paiute cutthroat trout has been introduced to the Stairway Creek watershed within Madera County and Sharktooth Creek watershed within Fresno County.

Although it is the best information currently available, the SAMNA Reporting Tool's fish species list is uncertain (Caltrans 2021b). Hence, although the SAMNA data layers and results are suitable to assist with advance mitigation project scoping, establishing compensatory mitigation credits approved by one or more natural resource regulatory agencies requires additional analysis and site-specific studies.

2.15.3. Wetlands

Wetland resources information for the GAI was extracted from the SAMNA Reporting Tool, which relies on the FWS National Wetlands Inventory maps (FWS 2021b) and data from the San Francisco Estuary Institute (2018) California Aquatic Resource Inventory (Table 2-5, Appendix G; Caltrans 2021d). 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, provide no information on plant species associated with mapped areas, and, hence, are relatively coarse. Although suitable for advance mitigation project scoping, site-specific wetland studies that result in more detailed mapping and classification of wetland aquatic resources would be required for advance mitigation

projects to establish compensatory mitigation credits. For example, under Section 404 of the CWA, the Corps considers wetlands to be jurisdictional WOTUS only if they have the three parameters of hydrology, hydrophytic vegetation, and hydric soils, and satisfy criteria to be connected to a traditionally navigable water.

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 2-2 may not align with those presented in Table 2-5 (Caltrans 2021d).

Vernal Pools

Vernal pools are waters of the State. Vernal pools that do not have a continuous surface connection to a relatively permanent water may also be considered jurisdictional WOTUS if they meet the current "significant nexus" criteria to a traditionally navigable water. The SAMNA Reporting Tool's wetland layer does not include vernal pools. However, potential vernal pool habitat can be inferred from the modeled Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp habitat developed for the SAMNA that is based on California Natural Diversity Database vernal pool invertebrate species occurrences.[6] Vernal pools mapped using CDFW's ACE vernal pools layer [ds2732] are shown on the left side of Figure 2-15, and the California Natural Diversity Database occurrence of vernal pool invertebrate species and a 4-mile buffer mapped with the SAMNA Reporting Tool are shown on the right side of Figure 2-15.

2.15.4. Non-wetland Waters

Other, non-wetland water resources information for the GAI was extracted from the SAMNA Reporting Tool, which relies on the USGS National Hydrography Dataset (Table 2-5, Appendix G; Caltrans 2021e). Although suitable for advance mitigation project scoping, site-specific studies that result in more detailed mapping and classification of other, non-wetland aquatic resources 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 2-2 may not align with those presented in Table 2-5 (Caltrans 2021e).

[6] Although the SAMNA Reporting Tool does not use California Natural Diversity Database occurrences of vernal pool plants to map vernal pools, vernal pool plant species impact forecasts are provided in Appendix D.

Figure 2-15. Vernal Pools

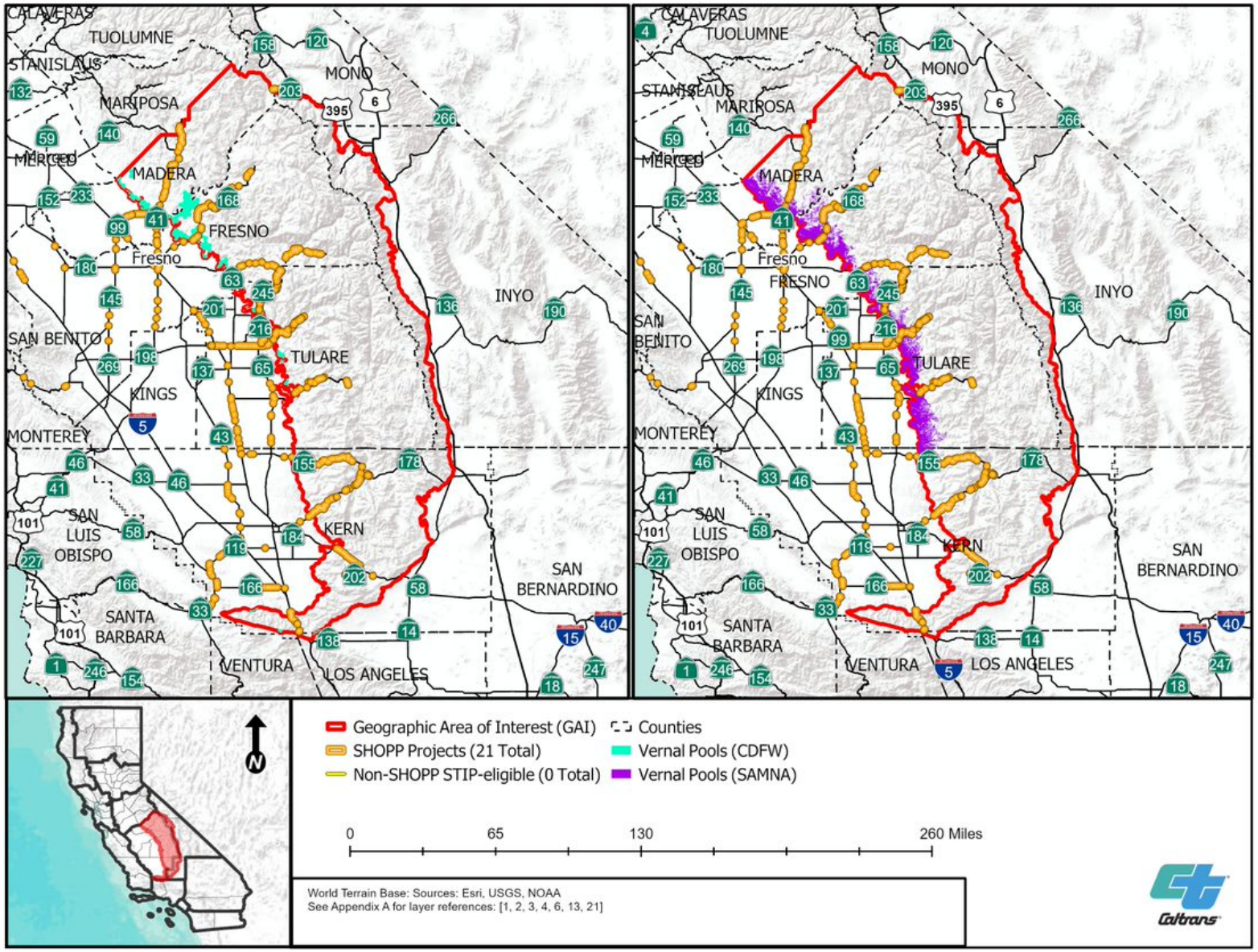


Table 2-5. Wetland and Non-Wetland Water Types in the GAI

Type	Antelope-Fremont Valleys (acres) 18090206	Crowley (acres) 18090102	Cuyama (acres) 18060007	Fresno River (acres) 18040007	Indian Wells-Searles Valleys (acres) 18090205	Middle Kern-Upper Tehachapi-Grapevine (acres) 18030003	Middle San Joaquin-Lower Chowchilla (acres) 18040001	Mono Lake (acres) 18090101	Owens Lake (acres) 18080103	Santa Clara (acres) 18070102	South Fork Kern (acres) 18030002	Tulare Lake Bed (acres) 18030012	Upper Deer-Upper White (acres) 18030005	Upper Dry (acres) 18030009	Upper Kaweah (acres) 18030007	Upper Kern (acres) 18030001	Upper King (acres) 18030010	Upper Merced (acres) 18040008	Upper Poso (acres) 18030004	Upper San Joaquin (acres) 18040006	Upper Tule (acres) 18030006	Upper Tuolumne (acres) 18040009	Total (acres)[a]
Depressional Perennial Natural Emergent	10.5	<0.1	Not mapped	<0.1	Not mapped	<0.1	<0.1	Not mapped	<0.1	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	<0.1	<0.1	0.2	<0.1	Not mapped	<0.1	<0.1	Not mapped	**10.7**
Depressional Perennial Natural Non-Vegetated	0.4	<0.1	Not mapped	<0.1	Not mapped	Not mapped	<0.1	Not mapped	0.7	Not mapped	1.3	Not mapped	Not mapped	Not mapped	<0.1	<0.1	0.6	3.4	Not mapped	0.1	Not mapped	Not mapped	**6.6**
Depressional Perennial Natural Vegetated	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	**<0.1**
Depressional Perennial Unnatural Emergent	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	0.9	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	Not mapped	**0.9**
Depressional Perennial Unnatural Non-vegetated	5.4	3.0	Not mapped	<0.1	0.1	18.6	<0.1	Not mapped	1.4	Not mapped	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not mapped	<0.1	<0.1	<0.1	Not mapped	**29.1**
Depressional Perennial Unnatural Vegetated	0.1	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	<0.1	Not mapped	Not mapped	Not mapped	<0.1	<0.1	<0.1	Not mapped	**0.1**
Depressional Seasonal Natural Emergent	358.6	37.4	Not mapped	<0.1	3.0	54.1	0.4	0.06	21.3	<0.1	133.5	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	13.1	<0.1	0.3	<0.1	Not mapped	**622.8**
Depressional Seasonal Natural Forested	1.7	<0.1	Not mapped	<0.1	0.1	<0.1	1.4	Not mapped	2.1	Not mapped	74.9	<0.1	Not mapped	<0.1	<0.1	<0.1	<0.1	39.3	Not mapped	<0.1	<0.1	Not mapped	**119.4**
Depressional Seasonal Natural Non-Vegetated	9.3	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	<0.1	Not mapped	<0.1	<0.1	Not mapped	**9.5**
Depressional Seasonal Natural Shrub-Scrub	24.8	8.3	Not mapped	<0.1	13.4	11.6	1.3	Not mapped	29.0	Not mapped	141.7	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	4.0	<0.1	<0.1	<0.1	Not mapped	**234.2**
Depressional Seasonal Unnatural Emergent	9.1	0.4	Not mapped	<0.1	Not mapped	1.8	<0.1	Not mapped	Not mapped	Not mapped	0.1	Not mapped	<0.1	<0.1	<0.1	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	Not mapped	**11.4**
Depressional Seasonal Unnatural Forested	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	Not mapped	**<0.1**
Depressional Seasonal Unnatural Non-vegetated	13.9	<0.1	Not mapped	<0.1	0.1	6.2	<0.1	Not mapped	Not mapped	Not mapped	0.2	Not mapped	<0.1	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	<0.1	<0.1	<0.1	Not mapped	**20.4**

Type	Antelope-Fremont Valleys (acres) 18090206	Crowley (acres) 18090102	Cuyama (acres) 18060007	Fresno River (acres) 18040007	Indian Wells-Searles Valleys (acres) 18090205	Middle Kern-Upper Tehachapi-Grapevine (acres) 18030003	Middle San Joaquin-Lower Chowchilla (acres) 18040001	Mono Lake (acres) 18090101	Owens Lake (acres) 18080103	Santa Clara (acres) 18070102	South Fork Kern (acres) 18030002	Tulare Lake Bed (acres) 18030012	Upper Deer-Upper White (acres) 18030005	Upper Dry (acres) 18030009	Upper Kaweah (acres) 18030007	Upper Kern (acres) 18030001	Upper King (acres) 18030010	Upper Merced (acres) 18040008	Upper Poso (acres) 18030004	Upper San Joaquin (acres) 18040006	Upper Tule (acres) 18030006	Upper Tuolumne (acres) 18040009	Total (acres)[a]
Depressional Seasonal Unnatural Shrub-Scrub	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	2.0	Not mapped	Not mapped	0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	**2.1**
Freshwater Emergent Wetland	492.0	2,447.4	Not mapped	986.6	17.0	1,691.0	1,123.2	Not mapped	1,081.7	3.8	8,467.5	138.2	472.6	184.9	2,297.2	7,391.1	8,198.8	1,299.9	286.4	10,343.6	1,191.6	0.29	**48,114.8**
Freshwater Forested/ Shrub Wetland	174.2	1,897.1	Not mapped	134.7	167.5	1,358.2	67.3	Not mapped	1,049.1	5.7	3,226.6	115.4	201.0	59.7	2,722.2	3,769.6	7,877.8	749.7	97.2	7,629.3	521.6	Not mapped	**31,824.1**
Freshwater Pond	58.8	341.1	Not mapped	552.8	6.5	231.7	275.6	Not mapped	75.5	Not mapped	70.2	151.1	61.5	71.6	267.3	389.0	750.6	211.8	65.9	1,224.7	299.3	Not mapped	**5,105.3**
Lacustrine Natural Non-vegetated	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	1.5	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	1.4	3.3	Not mapped	2.0	Not mapped	Not mapped	**8.3**
Lacustrine Unnatural Non-vegetated	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	1,635.7	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	<0.1	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	**1,635.7**
Lake	155.0	3,075.6	Not mapped	1,625.9	Not mapped	378.5	2.0	Not mapped	469.4	Not mapped	6,921.7	Not mapped	Not mapped	47.9	2,311.1	6,273.9	14,286.5	851.3	Not mapped	21,357.9	173.3	Not mapped	**57,929.1**
Riverine	3,475.0	2,572.2	1.2	1,789.8	981.7	6,349.6	963.4	Not mapped	1,685.7	11.4	4,393.2	1,212.8	1,634.2	671.3	4,209.9	5,806.8	11,662.0	355.4	1,320.2	12,828.7	2,043.2	Not mapped	**63,967.8**
Total[b]	**4,789**	**10,383**	**1**	**5,090**	**1,189**	**10,104**	**4,070**	**<1**	**4,418**	**21**	**23,431**	**1,618**	**2,369**	**1,034**	**11,808**	**23,630**	**42,779**	**3,531**	**1,770**	**53,387**	**4,229**	**<1**	**209,652**

Sources: Caltrans (2021d, 2021e)
[a] Rounded to the nearest tenth. Numbers may not sum due to rounding.
[b] Rounded to the nearest whole number. Numbers may not sum due to rounding.

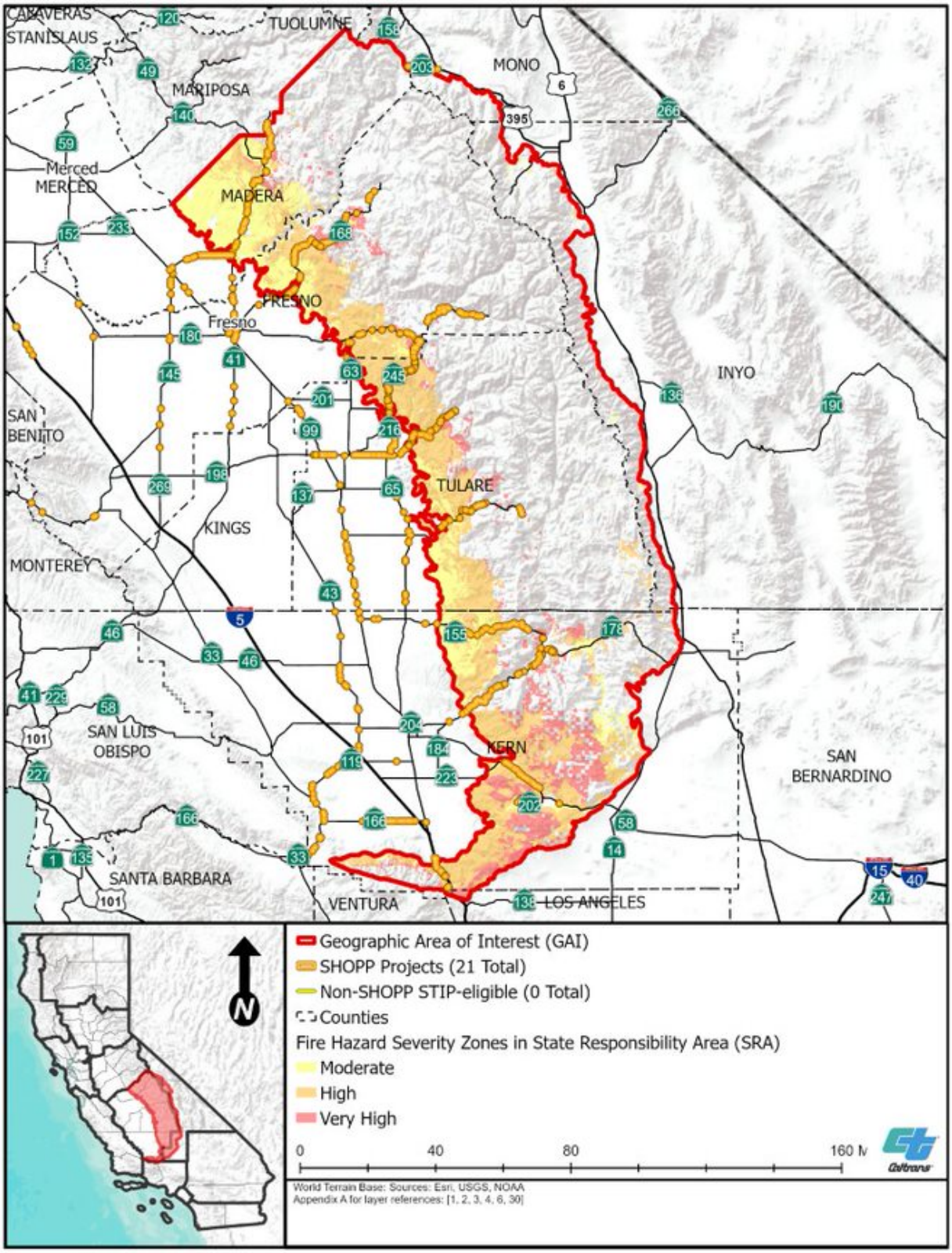
2.16 Riparian Habitat

Riparian habitats may include portions that are wetlands or non-wetland waters, but they also may be outside of these categories. California does not have a GIS layer for riparian ecotones and the natural resource regulatory agencies with authority in California do not have a definition for riparian habitat. Nevertheless, CWHR does include three riparian habitat types: montane riparian, valley foothill riparian, and desert riparian, which are included in the SAMNA's terrestrial vegetation data layer (Caltrans 2021c). In the GAI, riparian habitat types are a subset of the land cover types listed in Table 2-2 and include montane riparian and valley foothill riparian.

2.17 Fire Hazard Severity Zones

The California Department of Forestry and Fire Protection prepares Fire Hazard Severity Zone maps that classify the severity of fire hazards in California (Figure 2-16). These maps are developed by assigning a hazard score based on factors that influence fire likelihood and behavior, including fire history, existing and potential fuel, predicted flame length, blowing embers, terrain, and typical fire weather. Hazard scores are averaged over zone areas to result in a moderate, high, or very high zone class. As indicated on Figure 2-16, most of the moderate and high fire hazard severity zones are found in the western parts of the GAI in the Sierra Nevada foothills, with very high fire hazard severity zones located in the southern part of the GAI. This information is important for scoping advance mitigation projects and transportation projects undertaken within the GAI and it may inform the types of materials that can be used in an area based on their fire resistance capabilities.

Figure 2-16. Fire Hazard Severity Zones



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 the 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 RCIS documents are discussed separately in Chapter 4, *Existing Mitigation Opportunities,* because they represent or support current compensatory mitigation credit purchase 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 of relevant documents, policies, and regulations in Table 3-1 is not exhaustive. Additional relevant resources may be consulted by Caltrans as advance mitigation planning is conceptualized. When conducting advance mitigation project scoping, Caltrans will check to determine whether it has the most up-to-date version of a particular reference.

3.1 Relationship to Goals and Objectives

As pointed out in Chapter 1, *Introduction,* 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 California tiger salamander, San Joaquin kit fox, striped adobe-lily, Springville clarkia, and aquatic resources as historical and anticipated mitigation needs. 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 Chapter 7, *Wildlife Resources Conservation Goals and Objectives*, and Chapter 8, *Aquatic Resources Conservation Goals and Objectives*. As much as practicable, however, Caltrans intends for any compensatory mitigation established in the GAI to support these specific wildlife and aquatic resources to benefit other wildlife and aquatic 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
California Fish and Game Commission Wetlands Resources Policy	Updated periodically	No	California Fish and Game Commissions policy to seek to provide for the protection, preservation, restoration, enhancement, and expansion of wetland habitat in California.	https://fgc.ca.gov/About/Policies/Miscellaneous#Wetlands	8/18/2005 (last amended)
California Water Boards 2010 Update to Strategic Plan 2008–2012	Final	No	Update to strategic plan from the Water Boards. 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
CESA	Updated periodically (by California legislature)	No	CESA prohibits the take of any species of wildlife designated by the California Fish and Game Commission as an endangered, threatened, or candidate species. CDFW may authorize the take of any such species by permit if the conditions set forth in FGC § 2081, subdivisions (b) and (c), are met. (See California Code of Regulations, Title 14, § 783.4.)	https://www.wildlife.ca.gov/Conservation/CESA	9/10/2018 (last amended)
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
Native Plant Protection Act	Final	No	Enacted in 1977, the Act allows the California Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the Native Plant Protection Act. The Act prohibits take of endangered or rare native plants but includes some exceptions for agricultural and nursery operations and emergencies, and after properly notifying CDFW for vegetation removal from canals, roads, and other sites; changes in land use; and in certain other situations.	https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?division=2.&chapter=10.&lawCode=FGC	1/1/1977
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)
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
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	Final	No	Implemented by the SWRCB. 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)
Streambed Alteration Program 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. In general terms, CDFW jurisdiction extends to top-of-bank of the outer extent of riparian habitat, if present. Additionally, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species.	https://www.wildlife.ca.gov/conservation/lsa	6/27/2017 (last amended)
Water Quality Control Plan for the Central Valley Region	Updated periodically	Yes	Implemented by the Central Valley RWQCB. Establishes general and site-specific water quality standards and objectives in the Sacramento River Basin.	https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/#basinplans	2/1/2019 (last revision)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Water Quality Control Plan for the Lahontan Region	Updated periodically	Yes	Implemented by the Lahontan RWQCB. Establishes general and site-specific water quality objectives in the Lahontan Basin.	https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/	10/29/2019 (last updated)
Water Quality Control Plan for the Tulare Lake Basin	Updated periodically	Yes	Implemented by Central Valley RWQCB. Establishes general and site-specific water quality standards and objectives in the Tulare Lake Basin.	https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/#basinplans	5/24/2018 (last revision)
Federal Laws, Guidelines, and Regulations	See below	See below	See below	See below	See below
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
303(d) List of Impaired Water Bodies	Updated periodically	No	EPA and SWRCB listing of regulated impaired water bodies.	https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2018_integrated_report.html	4/11/2018 (last updated)
40 CFR § 131.12 California Antidegradation Policy	Final	No	Implemented by SWRCB. Required by federal law, the Antidegradation 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)
Corps Regulatory Guidance Letter 18-01	Final	No	Corps' guidance document on determining compensatory mitigation credits for the removal of obsolete dams and other structures from rivers and streams.	https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll9/id/1473	9/25/2018
Current Implementation of Waters of the United States	Updated periodically	No	EPA's website on the implementation and definition of WOTUS, based on the most current agency rulemaking and legal decisions.	https://www.epa.gov/wotus/current-implementation-waters-united-states	5/30/2023 (last updated)
CWA	Updated periodically (by Congress)	No	Authorized by EPA and delegated to the Corps and SWRCB, 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)
CWA § 401	Updated periodically (by Congress)	No	Implemented by EPA and SWRCB. Regulates discharge of pollutants into WOTUS.	https://www.law.cornell.edu/uscode/text/33/1341	12/27/1977 (last amended)
CWA § 402 National Pollutant Discharge Elimination System MS4 Permit	Updated periodically (by Congress)	No	Implemented by EPA and SWRCB. Regulates discharge of stormwater from municipal sources that is a conveyance or system of conveyances and is: ▪ owned by a state, city, town, village, or other public entity that discharges to WOTUS; ▪ designed or used to collect or convey stormwater (for example, storm drains, pipes, ditches); ▪ not a combined sewer; and ▪ not part of a sewage treatment plant or publicly owned treatment works.	https://www.epa.gov/npdes/stormwater-discharges-municipal-sources	1/19/2019 (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)
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

Title	Status	Spatial Data	Reference Purpose	Link	Date
Federal Climate Action Plans	Updated periodically	No	Action plans by the federal government to broadly address the effects of climate change. These plans are individually tailored to each federal department. Those plans pertinent to this RAMNA are under the Departments of Agriculture, Commerce, and Interior, as well as plans specific to the Corps and EPA.	https://www.sustainability.gov/adaptation/	1/1/2021
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)
FWS Mitigation Policy	Final	No	FWS policy that builds upon the guidance in the 1981 Mitigation Policy for FWS recommendations and requirements on mitigating adverse impacts of land and water developments on fish and wildlife.	https://www.fws.gov/policy-library/A1501fw2	5/10/2023
FWS Endangered Species Act Compensatory Mitigation Policy	Final	No	FWS policy that adopts mitigation principles established in the FWS Mitigation Policy, establishes compensatory mitigation standards, and provides guidance for the application of compensatory mitigation through implementation of the ESA.	https://www.fws.gov/policy-library/a1501fw3	5/10/2023
National Wetlands Mitigation Action Plan	Final	No	EPA and Corps comprehensive, interagency document to further achievement of 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
Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change	Updated periodically	No	FWS document that addresses adaptation, mitigation, and engagement strategies to achieve goals and objectives of minimizing the impact of climate change on fish and wildlife by applying science in managing species and habitats, reducing levels of greenhouse gases, and collaborating with other organizations to determine solutions to challenges and threats to fish and wildlife conservation posed by climate change.	https://climatechange.lta.org/wp-content/uploads/cct/2015/03/CCStrategicPlan.pdf	9/1/2010
Section 10 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	Authorizes the Corps to protect navigable WOTUS by requiring a permit for construction of any structure over a navigable WOTUS. A Section 10 permit is required if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of a navigable WOTUS.	https://www.epa.gov/cwa-404/section-10-rivers-and-harbors-appropriation-act-1899	7/26/1947 (last amended)
Section 14 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	This Act is also known as 33 USC Section 408 or, more simply, Section 408. Implemented by the Corps. Regulates the temporary occupation or use of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work built by the United States.	https://www.law.cornell.edu/uscode/text/33/408	10/23/2018 (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)
Statewide and Regional Resource Planning Documents	See below	See below	See below	See below	See below
A Climate Change Vulnerability Assessment of California's Terrestrial Vegetation	Final	Yes	CDFW's document to assess the climate vulnerability of terrestrial vegetation.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=116208&inline	1/1/2016
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
ACE Connectivity Project Version 3.0	Updated periodically	Yes	A CDFW effort to analyze large amounts of map-based data to inform decisions related to goals such as biodiversity conservation, habitat connectivity, and climate change resiliency.	https://wildlife.ca.gov/Data/Analysis/ACE	7/10/2019 (last updated)

Title	Status	Spatial Data	Reference Purpose	Link	Date
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 road map to secure California's biodiversity future.	https://californiabiodiversityinitiative.org/pdf/california-biodiversity-action-plan.pdf	9/1/2018
California Essential Habitat Connectivity 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
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 Watershed Assessment Manual Volume I	Final	No	Provides guidance for conducting a watershed assessment in California.	https://www.epa.gov/system/files/documents/2022-02/caliwam.pdf	5/1/2005
Restoring California's Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Project Locations by Region	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.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=204648&inline	12/1/2022
Caltrans Adaptation Strategies Report: District 6	Final	No	Caltrans initiated a major agency-wide effort to adapt its infrastructure so that it can withstand future conditions. The effort began by determining which assets are most likely to be adversely affected by climate change in each Caltrans District.	https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2020-adaptation-priorities-reports	6/1/2020
Caltrans Climate Change Vulnerability Assessment, District 6 Technical Report	Final	No	Caltrans assessment of climate change vulnerabilities for Caltrans District 6.	https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2019-climate-change-vulnerability-assessments	12/17/2019
Conservation and Mitigation Banking	Updated periodically	No	CDFW's main public webpage describing the process for creating and using mitigation banks.	https://wildlife.ca.gov/Conservation/Planning/Banking	1/1/2022
Large Mammal-Vehicle Collision Hot Spot Analyses, California, USA	Final	Yes	Western Transportation Institute's report documenting the methods and results of hot-spot analyses of large wild mammal-vehicle collisions in California, with an emphasis on mule deer. These analyses identified the road sections that had the highest concentration of deer-vehicle crashes and mule deer carcasses. Special-status species were not addressed.	https://westerntransportationinstitute.org/wp-content/uploads/2019/09/4W6693_Huijser-and-Begley-FINAL-Report-Caltrans-Statewide-20190913-reduced-image-size.pdf	9/13/2019
From Wildlife-Vehicle Conflict to Solutions for California Wildlife & Drivers	Final	Yes	University of California, Davis's Road Ecology Center report on the ecological and financial cost of vehicle collisions with wildlife throughout the state, broken down by different regions in the state.	https://roadecology.ucdavis.edu/resource-type/report	11/10/2021
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
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

Title	Status	Spatial Data	Reference Purpose	Link	Date
SWAP Transportation Companion Plan	Final	Yes	CDFW's companion document to SWAP for protection of species specific to transportation project planning.	https://wildlife.ca.gov/SWAP/Final/Companion-Plans	12/1/2016
SWAP Water Management Companion Plan	Final	Yes	CDFW's companion document to SWAP to recommend water management practices throughout the state of California.	https://wildlife.ca.gov/SWAP/Final/Companion-Plans	12/1/2016
Special-status Taxa[a] Documents[b]	See below	See below	See below	See below	See below
Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)	Final	Yes	FWS' recovery plan for the population of California tiger salamander occurring in the GAI. The recovery criteria are: ▪ Provide enough 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 and 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.	https://ecos.fws.gov/docs/recovery_plan/Signed%20Central%20CTS%20Recovery%20Plan.pdf	6/6/2017
California Tiger Salamander, Central California Distinct Population Segment (*Ambystoma californiense*) 5-year Review: Summary and Evaluation	Updated periodically	Yes	FWS' most recent formal review of the species condition.	https://ecos.fws.gov/docs/five_year_review/doc4466.pdf	12/21/2014
Designation of Critical Habitat for the California Tiger Salamander, Central Population; Final Rule	Final	Yes	FWS' designation of critical habitat for the California tiger salamander central California DPS.	https://www.govinfo.gov/content/pkg/FR-2005-08-23/pdf/05-16234.pdf#page=2	8/23/2005
Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander	Draft	No	CDFW guidance on site assessment, survey, and reporting requirements for the California tiger salamander.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83915&inline	10/1/2003
California Tiger Salamander Biological Opinions	Updated periodically	Yes	FWS' list of the 128 most recent biological opinions that have been issued for California tiger salamander, 8 of which were for projects in the GAI.	https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=D01T	8/13/2021 (latest document)
Incidental Take Permits for California Tiger Salamander	Updated periodically	No	CDFW's list of incidental take permits issued for California tiger salamander from its publicly available document search website. There are 163 documents listed in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	7/20/2022 (latest document)
Recovery Plan for Upland Species of the San Joaquin Valley: San Joaquin Kit Fox (*Vulpes macrotis mutica*)	Final	No	FWS' recovery plan for 11 listed species and 23 candidate species in the San Joaquin Valley, which includes the San Joaquin kit fox. 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/ecp/species/2873	9/30/1998
Five-Year Status Review for San Joaquin Kit Fox (*Vulpes macrotis mutica*)	Final	No	FWS' most recent formal review of the condition of the San Joaquin kit fox species.	https://ecos.fws.gov/ecp/species/2873	9/28/2020
San Joaquin Kit Fox Critical Habitat Designation	Not available	No	Critical habitat has not been designated for this species.	https://ecos.fws.gov/ecp/species/2873	Not available

Title	Status	Spatial Data	Reference Purpose	Link	Date
San Joaquin Kit Fox Biological Opinion	Updated periodically	No	FWS' list of the 36 most recent biological opinions that have been issued for San Joaquin kit fox, 19 of which were for projects in the GAI.	https://ecos.fws.gov/tails/pub/document/19269343	5/7/2021 (latest document)
Standardized Recommendations for protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance	Final	No	FWS' guidance on site assessment, survey, and reporting requirements for San Joaquin kit fox.	https://www.fws.gov/sites/default/files/documents/survey-protocols-for-the-san-joaquin-kit-fox.pdf	1/1/2011
Incidental Take Permits for San Joaquin Kit Fox	Final	No	CDFW's list of incidental take permits issued for San Joaquin kit fox from its publicly available document search website. There are 81 documents in the search.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=199172	2/22/2022 (latest document)
Federal Review Annual Description of Progress on Listing Actions: Striped Adobe-lily (*Fritillaria striata*)	Final	No	FWS' most recent formal review of the candidate status of the species.	https://ecos.fws.gov/ecp/species/524	10/25/1999
Striped Adobe Lily Species Management Plan	Yes	No	CDFW's management plan for the striped adobe-lily. This plan summarizes known information about the species at the time it was written and presents multiple goals centered on topics of research for the species, with the intention of improving management practices.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3206	1/31/1989
Population Status and Management Analysis of *Clarkia springvillensis, Fritillaria striata*, and *Pseudobahia peirsonii* in the San Joaquin Valley California.	Final	No	CDFW document describing the status of Springville clarkia and striped adobe lily at the time the document was written. The document also provides a summary of protection measures for each occurrence that was known at the time.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3177	3/18/1991
Incidental Take Permits for the Striped Adobe-lily Species	Not available	No	CDFW does not appear to have published any incidental take permits for this species as of January 2023.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	Not available
Recovery Plan for the Springville Clarkia	Not available	No	FWS has not published a recovery plan for this species.	https://ecos.fws.gov/ecp/species/8309	Not available
Springville Clarkia (*Clarkia springvillensis*) 5-Year Review	Yes	Yes	FWS' most recent review of the condition of the species.	https://ecos.fws.gov/docs/tess/species_nonpublish/3954.pdf	8/31/2022
Designation of Critical Habitat for Springville Clarkia	Not available	No	Critical habitat has not been designated for this species.	https://ecos.fws.gov/ecp/species/8309	Not available
Springville Clarkia Biological Opinion	Not available	No	FWS has not issued any biological opinions for this species.	https://ecos.fws.gov/ecp/species/8309	Not available
Incidental Take Permits for Springville Clarkia	Final	No	CDFW's list of incidental take permits issued for Springville clarkia from its publicly available document search website. There is 1 document in the search.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=195208	8/20/2021 (latest document)
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 covers 33 species, including 25 plants, 7 invertebrates, and 1 amphibian. In general, recovery criteria center on habitat protection and adaptive habitat management, which includes developing management plans, conducting status surveys, 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 and preferential transition from intensive agriculture to grazing near western spadefoot toad conservation areas.	https://ecos.fws.gov/docs/recovery_plan/Vernal%20Pool%20Ecosystem%20Final%20Recovery%20Plan.pdf	12/15/2005

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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. State Park entities with specific management goals pertinent to Chapters 7 and 8 of this RAMNA are listed below.	http://www.parks.ca.gov/pages/21299/files/planning_handbook_april_2010.pdf	4/1/2010
Eastern Kern County Onyx Ranch State Vehicle Recreation Area	In progress	No	The Off-Highway Motor Vehicle Recreation Department of California State Parks posted a commission meeting summary stating they are in the process of creating a general plan for the Eastern Kern County Onyx Ranch State Vehicle Recreation Area.	https://ohv.parks.ca.gov/pages/1140/files/Item%206-B6-Great%20Basin%20District-Russ%20Dingman.pdf	5/20/2022
Millerton Lake State Recreation Area Resource Management Plan	Final	No	Management plan for Millerton State Recreation Area. Includes goals for restoration of riparian areas in several creeks to improve fish spawning habitat. This plan also includes management of the Kechaye Cultural Preserve. California tiger salamander is known to occur at Millerton Lake State Recreation Area.	https://www.parks.ca.gov/?page_id=21299	4/1/2010
FWS Land Management Plans	See below	See below	See below	See below	See below
Hopper Mountain, Bitter Creek, and Blue Ridge National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Assessment	Final	Yes	FWS' management plan covering three national wildlife refuges, of which the Bitter Creek and Blue Ridge National Wildlife Refuges occur in the GAI. San Joaquin kit fox is known to occur at Bitter Creek National Wildlife Refuge. Goals pertaining to the Bitter Creek National Wildlife Refuge relevant to this RAMNA include: ▪ Enhance 9,000 acres of grassland habitat for special-status species in the San Joaquin Valley. ▪ Restore and enhance riparian habitat by modifying water control structures to restore natural flows. ▪ Remove invasive saltcedar and selectively replant with native riparian species. Although the Blue Ridge National Wildlife Refuge occurs in the GAI, many of the goals for this refuge are centered on helping California condor (*Gymnogyps californianus*) recovery efforts, and none are pertinent to this RAMNA.	https://www.fws.gov/sites/default/files/documents/Final%20CCP%20HopperMtn%20BitterCrk%20BlueRdg%20NWRs%20Sept%202013.pdf	9/30/2013
U.S. Military Land Management Plans	See below	See below	See below	See below	See below
Not applicable	Not applicable	Not applicable	No active military facilities with a land management plan occur in the GAI.	Not applicable	Not applicable
U.S. Bureau of Indian Affairs Land Management Plans	See below	See below	See below	See below	See below
Not applicable	Not applicable	Not applicable	The Western Mono Indians of the Big Sandy Rancheria, Cold Springs Rancheria, and Northfork Rancheria have lands in the GAI. The Chukchansi Indians of the Picayune Rancheria and Table Mountain Rancheria have lands in the GAI. The Yokuts Indians of the Tule River Indian Tribe have lands in the GAI. None of these tribal nations appear to have a land management plan pertinent to this RAMNA.	Not applicable	Not applicable

Title	Status	Spatial Data	Reference Purpose	Link	Date
USFS Land Management Plans	See below	See below	See below	See below	See below
Ecological Restoration Implementation Plan	Final	Yes	USFS' internal restoration plan, which includes general strategies focused on increasing collaboration with other organizations, completion of land management plans, and forest-specific goals. Goals for the Inyo National Forest include the stabilization and reduction of erosion and sedimentation in streams as well as the improvement of water quality. A goal for the Sequoia National Forest is to restore meadows and streams at Mack Meadow.	https://www.fs.usda.gov/detail/lassen/landmanagement/?cid=stelprdb5411635	1/1/2013
Land Management Plan for the Inyo National Forest	Final	Yes	USFS' management plan for the Inyo National Forest. Includes a general goal to restore species composition and structure on at least 20,000 acres of vegetation and 400 acres of riparian areas in the next 10 to 15 years.	https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf	9/1/2019
Land Management Plan: Part 2 Los Padres National Forest Strategy	Final	No	USFS' management plan for the Los Padres National Forest. Includes a goal to enhance 22 miles of aquatic habitat.	https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5337817.pdf	9/1/2005
Land Management Plan for the Sequoia National Forest Pre-objection Version	Draft	Yes	USFS' draft plan for forest management in the Sequoia National Forest. Includes a variety of aquatic resource-based restoration goals to be implemented within 15 years of the plan's approval.	https://www.fs.usda.gov/project/?project=3375	6/1/2022
Land Management Plan for the Sierra National Forest Pre-objection Version	Draft	Yes	USFS' draft plan for forest management in the Sierra National Forest. Includes a variety of aquatic resource-based restoration goals to be implemented within 15 years of the plan's approval.	https://www.fs.usda.gov/project/?project=3375	6/1/2022
Managing Sierra Nevada Forests	Final	No	USFS' published collection of papers summarizing the state of the science on topics relevant to this forest management approach and presenting case studies of collaborative planning efforts and field implementation of these new practices.	https://pitmodoc.opennrm.org/docs/416	3/1/2012
Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement	Final	No	USFS' plan for forest management in each of the National Forests of the Sierra Nevada Mountains. Those in the GAI include El Dorado, Lassen, Plumas, and Tahoe National Forests.	https://www.fs.usda.gov/detail/r5/landmanagement/planning/?cid=STELPRDB5349922	1/1/2004
BLM Land Management Plans	See below	See below	See below	See below	See below
Bakersfield Resource Management Plan	Final	Yes	Management direction of BLM lands in the Bakersfield District. Includes a general goal to enhance and restore aquatic habitats in the plan area.	https://eplanning.blm.gov/epl-front-office/projects/lup/70273/92254/111143/Bakersfield_ROD-ARMP.pdf	12/1/2014
Bishop Resource Management Plan Record of Decision	Final	Yes	Management direction of BLM lands in the Bishop District. Includes a requirement for a 150-foot disturbance buffer from riparian areas. Includes goal to restore habitat in a variety of streams.	https://eplanning.blm.gov/epl-front-office/projects/lup/70447/92777/111784/Bishop_RMP_ROD_1993_w_app_glossary_508.pdf	4/1/1993
Millerton Lake Resource Management Plan Record of Decision	Final	No	Management direction of BLM lands in the California Great Basin Region.	https://www.usbr.gov/mp/nepa/nepa_project_details.php?Project_ID=546	11/4/2011
NPS Land Management Plans	See below	See below	See below	See below	See below
Nationwide Rivers Inventory	Final	Yes	Listing of Nationwide River Inventory river segments that are potential candidates for inclusion in the National Wild and Scenic Rivers System. The Kern, Kings, and Merced Rivers have listed national river segments that occur in the GAI.	https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm	12/21/2017
Devils Postpile National Monument General Management Plan and Environmental Assessment	Draft	Yes	NPS' management plan for Devil's Postpile National Monument. Includes a general goal to enhance and restore aquatic habitats in the plan area.	https://parkplanning.nps.gov/document.cfm?parkID=296&projectID=26581&documentID=60642	8/1/2014

Title	Status	Spatial Data	Reference Purpose	Link	Date
General Management Plan and Comprehensive River Management Plan for Sequoia and Kings Canyon National Parks	Final	Yes	NPS' management plan for Sequoia and Kings Canyon National Parks. Includes a general goal to enhance and restore riverbank and wetland habitats in the plan area.	https://parkplanning.nps.gov/document.cfm?parkID=342&projectID=11110&documentID=17344	9/1/2006
Yosemite National Park General Management Plan	Final	No	NPS' management plan for Yosemite National Park.	https://www.nps.gov/yose/getinvolved/planning.htm	9/16/1980
Local Government Land Management Plans	See below	See below	See below	See below	See below
Lost Lake Park Master Plan	Final	Yes	Fresno County's plan for the management of the Lost Lake Park. Included in the plan is a goal to restore the San Joaquin River floodplain, seasonal wetlands, and riparian vegetation along riparian corridors within the park.	https://www.co.fresno.ca.us/services/search?q=lost%20lake%20park%20master%20plan	4/18/2011
Water Resources Plans and Documents	See below	See below	See below	See below	See below
Antelope Valley Integrated Regional Water Management Plan	Updated periodically	Yes	Antelope Valley Regional Water Management Group's management plan for water resources in the plan area, which consists of the extreme southeastern part of the GAI.	https://pw.lacounty.gov/wwd/avirwmp/	1/1/2019 (last updated)
Central Valley Flood Protection Plan 2022 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/Conservation-Strategy	12/1/2021
Fremont Basin Integrated Regional Water Management Plan	Final	Yes	Regional Water Management Group's management plan for water resources in the plan area, which primarily consists of the central portion of the desert region of Kern County.	http://www.californiacity-ca.gov/CC/index.php/fremont-basin-irwm	2/1/2019
Inyo-Mono Integrated Regional Water Management Plan	Updated periodically	Yes	Inyo-Mono Regional Water Management Group's management plan for water resources in the plan area, which includes all of Inyo and Mono Counties and a portion of Kern and San Bernardino Counties.	https://inyo-monowater.org/our-work/inyo-mono-irwm-plan/	9/25/2019 (last updated)
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
Madera Integrated Regional Water Management Plan	Updated periodically	Yes	Implemented by the Regional Water Management Group of Madera County, which is made up of numerous irrigation districts, water districts, and local municipalities. The plan includes general goals to improve water quality; reduce flood risk, erosion, and sedimentation; and conduct aquatic habitat restoration.	https://maderarwmg.com/	5/1/2019
Sustainable Groundwater Management Act Portal	Updated periodically	Yes	California Department of Water Resources' central website to find information about groundwater sustainability agencies and to download groundwater sustainability plans.	https://sgma.water.ca.gov/portal/	Updated nearly continuously
Southern Sierra Integrated Regional Water Management Plan	Final	Yes	Implemented by the Southern Sierra Regional Water Management Group, which consists of 19 organizations that manage water resources in the region. Includes a goal to restore aquatic habitat along several streams.	http://www.southernsierrarwmg.org/	11/1/2018
TMDL Action Plans in the Central Valley and Tulare Lake Regions	Updated periodically	No	SWRCB and Central Valley RWQCB's list of TMDL action plans for the Central Valley and Tulare Lake Regions. None of the TMDL plans are for features in the GAI.	https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/	6/14/2022 (last updated)
TMDL Action Plans in the South Lahontan Region	Updated periodically	No	SWRCB and Lahontan RWQCB's list of TMDL action plans for the South Lahontan Region. None of the TMDL plans are for features in the GAI.	https://www.waterboards.ca.gov/lahontan/water_issues/programs/tmdl/	9/14/2022 (last updated)

Title	Status	Spatial Data	Reference Purpose	Link	Date
County General Plans	See below	See below	See below	See below	See below
2000 Fresno County General Plan	Updated periodically	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	6/1/2016 (last amended)
Inyo County General Plan	Updated periodically	Yes	Includes implementation measures and land use for transportation system and natural resources categories.	https://www.inyocounty.us/services/planning-department/inyo-county-general-plan	8/30/2022 (last amended)
Kern County General Plan	Updated periodically	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/	4/13/2021 (last amended)
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 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)
Mono County General Plan	Updated periodically	Yes	General plan for Mono County. Includes a land use designation of natural habitat protection, open space, and resource management. Includes general goal to restore riparian woodlands, wetlands, and riparian habitat.	https://monocounty.ca.gov/planning/page/general-plan	1/1/2021 (last amended)
Tulare County General Plan 2030	Updated periodically	Yes	General plan for Tulare County. Includes a land use designation of resource conservation.	http://generalplan.co.tulare.ca.us/	10/9/2015 (last amended)
City General Plans	See below	See below	See below	See below	See below
Metropolitan Bakersfield General Plan	Updated periodically	Yes	General plan for Bakersfield. Zoning for the city includes land use designations of open space along with two open space subtypes of floodplain secondary and hillside development.	http://docs.bakersfieldcity.us/weblink/Browse.aspx?startid=602140&&dbid=0	1/20/2016 (last updated)
Town of Mammoth Lakes General Plan	Updated periodically	Yes	General plan for Mammoth Lakes. Zoning for the city includes land use designations of open space that includes wetlands, floodplains, and streams. The plan also includes a general goal to restore riparian habitat of Mammoth Creek.	https://www.townofmammothlakes.ca.gov/162/General-Plan	8/7/2019 (last updated)
Porterville Area Community Plan	Updated periodically	Yes	General plan for Porterville. San Joaquin kit fox, striped adobe-lily, and Springville clarkia are known to occur in the planning area. Identifies goals for the enhancement of wetlands, vernal pools, and the Tule River. Contains land use designation for open space and conservation.	https://www.ci.porterville.ca.us/departments/community_development/general_plan_update.php#outer-222sub-223	2/1/2015 (last updated)
Tehachapi General Plan	Updated periodically	Yes	General plan for Tehachapi. Identifies goals for the enhancement of creek and riparian corridors. Contains land use designation for open space.	https://www.liveuptehachapi.com/272/Planning-Documents	1/1/2015 (last updated)
Other Conservation and Management Documents	See below	See below	See below	See below	See below
California EcoAtlas	Updated periodically (nearly daily)	Yes	Statewide database tracking the extent and condition of wetlands in California, managed by the San Francisco Estuary Institute.	https://www.ecoatlas.org/	Updated nearly daily

Title	Status	Spatial Data	Reference Purpose	Link	Date
Demonstrating the California Wetland Status and Trends Program: A Probabilistic Approach for Estimating Statewide Aquatic Resource Extent, Distribution and Change Over Time	Final	No	A report from the Southern California Coastal Water Research Project describing a pilot study that is tracking wetland conditions statewide.	https://www.sccwrp.org/publications/	4/1/2015
Wildlife Connectivity Across the Northern Sierra Nevada Foothills	Final	Yes	Builds on the CEHC project by taking a fine-scale look at connectivity within the Northern Sierra Nevada Forest and between the forest and adjacent lands in the Central Valley and Sierra Nevada.	https://conservationcorridor.org/cpb/Krause_et_al_2015.pdf	1/1/2015

[a] Consistent with the Caltrans SAMNA and Chapter 4, *Existing Mitigation Opportunities*, 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; and State species of special concern.
[b] A search for CDFW 5-year reviews for species of mitigation need was conducted but none were found.

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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 MCAs. RCISs, which are a prerequisite to MCAs, are also discussed.

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 Caltrans Districts. The projects were programmed against the $40 million reserve created in the 2016 SHOPP for advance mitigation project delivery. Thirteen pilot advance mitigation projects were programmed in the SHOPP and their delivery is underway; however, none are located in the GAI.

4.2 HCPs and NCCPs

HCPs[1] and NCCPs[2] define covered activities that consist of specific projects and actions that may have adverse effects on covered species and natural communities. The adverse effects associated with the covered activities are estimated and incidental take permits are issued by FWS and/or CDFW. Once the HCP, NCCP, or HCP/NCCP is adopted and the incidental take permits are issued, signatories and participating special entities, where applicable, can request take authorization for project-related effects on covered species. Participation in an adopted HCP, NCCP, or HCP/NCCP streamlines permitting processes by eliminating the need to obtain project-specific incidental take permits from FWS and/or CDFW and provides early documentation of compliance with CESA and ESA.

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 Entity clause.

Caltrans identified no active or pending HCPs or NCCPs in the GAI to which Caltrans and/or RTPAs are currently signatories or Participating Special Entities. Although multiple project-specific HCPs exist in the GAI, they apply to non-transportation agency single users.

4.3 Conservation and Mitigation Banks

A conservation or mitigation bank is privately or publicly owned land managed for its natural resource values and can be for profit or nonprofit. In exchange for permanently protecting, managing, and monitoring the land, the bank sponsor is allowed to sell or

[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

transfer habitat and/or aquatic resource credits to permittees who—after all appropriate and practicable avoidance and minimization have been performed—need to satisfy legal requirements and compensate for their project's unavoidable natural resource 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 11 active conservation and/or mitigation banks with service areas that overlap at least part of the SHS within the GAI. Information on the agency approvals, the types of credits available, and brief descriptions of each bank are provided in Table 4-1, and the location and extent of the service areas associated with the aforementioned banks are depicted on Figures 4-1 through 4-4. Several of these conservation and mitigation banks do not provide credits for the species of mitigation need identified in this RAMNA; however, credits for other listed species or habitats are available, as listed in Table 4-1.

Several additional conservation and/or mitigation banks have service areas that are partially within the GAI, but do not overlap any state highways within the GAI. These banks were omitted from Table 4-1 because they would not be usable by Caltrans for fulfilling mitigation requirements.

Table 4-1. Overview of Conservation and Mitigation Banks in the GAI[a]

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Credit Types
Big Gun Conservation Bank	2010	Active – credits available	**FWS**	52	California red-legged frog
Black Mountain Conservation Bank	2018	Active – credits available	**CDFW**	1,940	Desert tortoise, Mohave ground squirrel, American badger, desert kit fox, loggerhead shrike, LeConte's thrasher, stream
Deadman Creek Conservation Bank	2007	Active – credits available	**FWS**	714	California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, vernal pool tadpole shrimp
Drayer Ranch Conservation Bank	2005	Active – credits available	**FWS**	254.4	California tiger salamander (sold out), San Joaquin kit fox (sold out), vernal pool preservation
Great Valley Conservation Bank at Flynn Ranch	2007	Active – credits available	**FWS**	1,067	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	Vernal pool fairy shrimp, succulent owl's clover
Mojave Desert Tortoise Umbrella Conservation Bank	2020	Active - credits available	**FWS, CDFW**	4,700	Desert tortoise (Western Mojave and Colorado River Recovery Units), Mohave ground squirrel, burrowing owl, and streams (Mojave River Watershed and Colorado River Basin only)
Mojave River Watershed Mitigation Bank	2022	Active – credits available	**Corps, RWQCB, CDFW**	436	Riverine (streambed), palustrine (scrub-shrub wetland and emergent wetland), and lacustrine (unconsolidated bottom)
Petersen Ranch Mitigation Bank	2016	Active – credits available	**CDFW, Corps, EPA, RWQCB**	496	Alluvial floodplain, ephemeral stream, wetland riparian, non-wetland riparian, freshwater marsh, open water, seasonal wetland, chaparral, Great Basin scrub, valley and foothill grassland, Swainson's hawk

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Credit Types
Sand Creek Conservation Bank	2007	Active – credits available	**FWS**	498	California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp (sold out)
West Mojave Conservation Bank (includes Inyo-Coso Preserve)	2017	Active – credits available	**Corps, CDFW**	914	Desert tortoise, Mohave ground squirrel, intermittent stream/riparian

[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 4-1. Conservation and Mitigation Bank Service Areas – Part 1

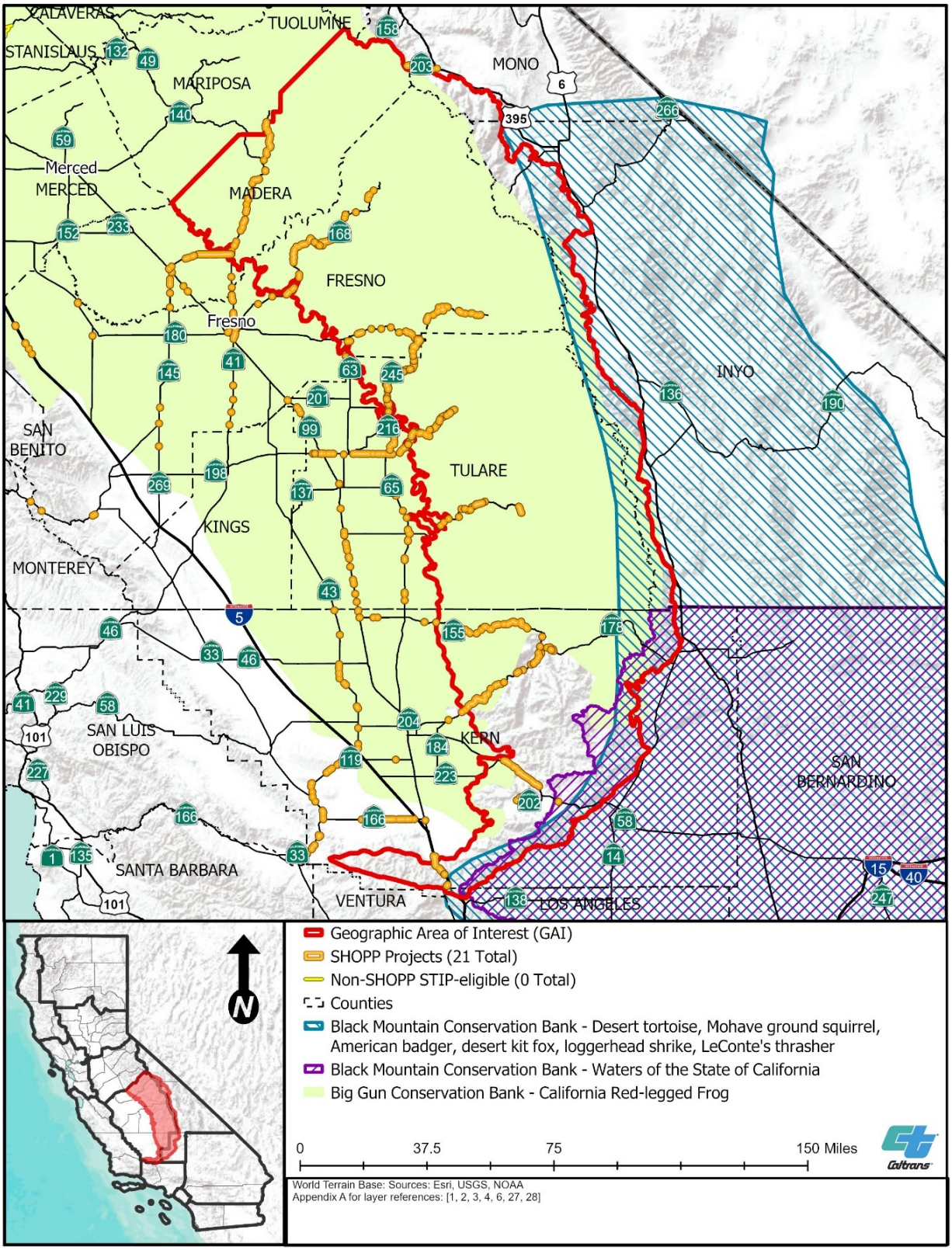


Figure 4-2. Conservation and Mitigation Bank Service Areas – Part 2

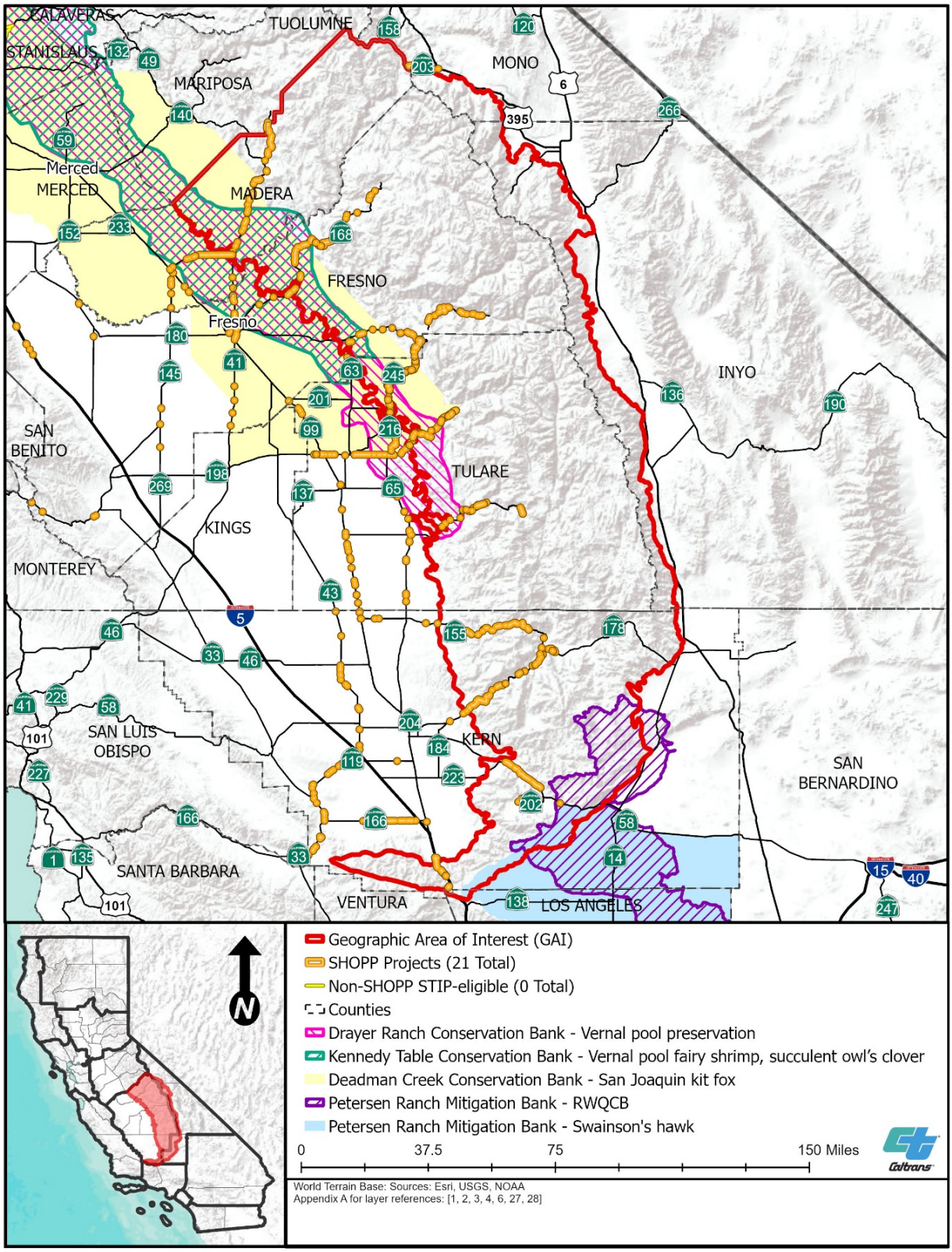


Figure 4-3. Conservation and Mitigation Bank Service Areas – Part 3

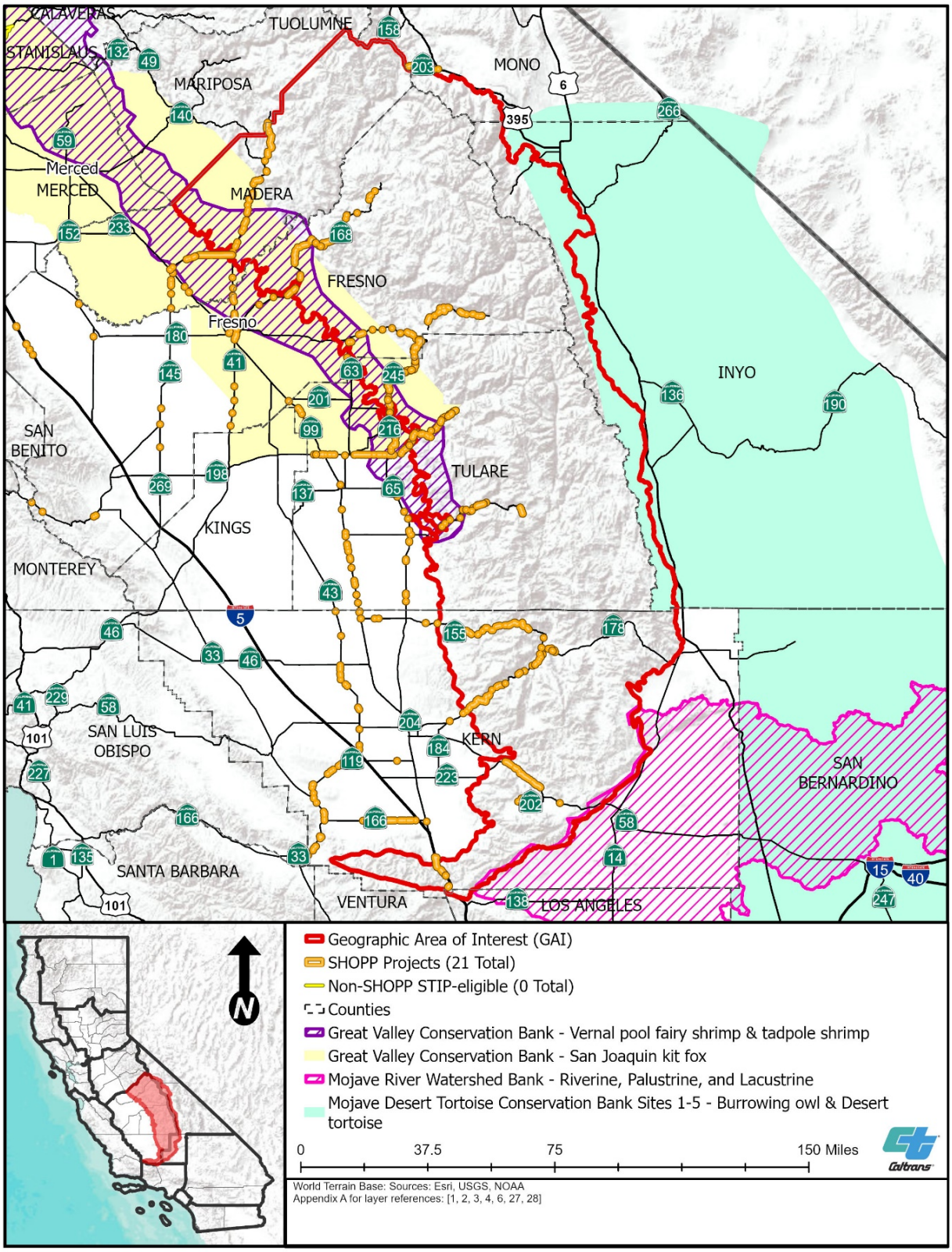
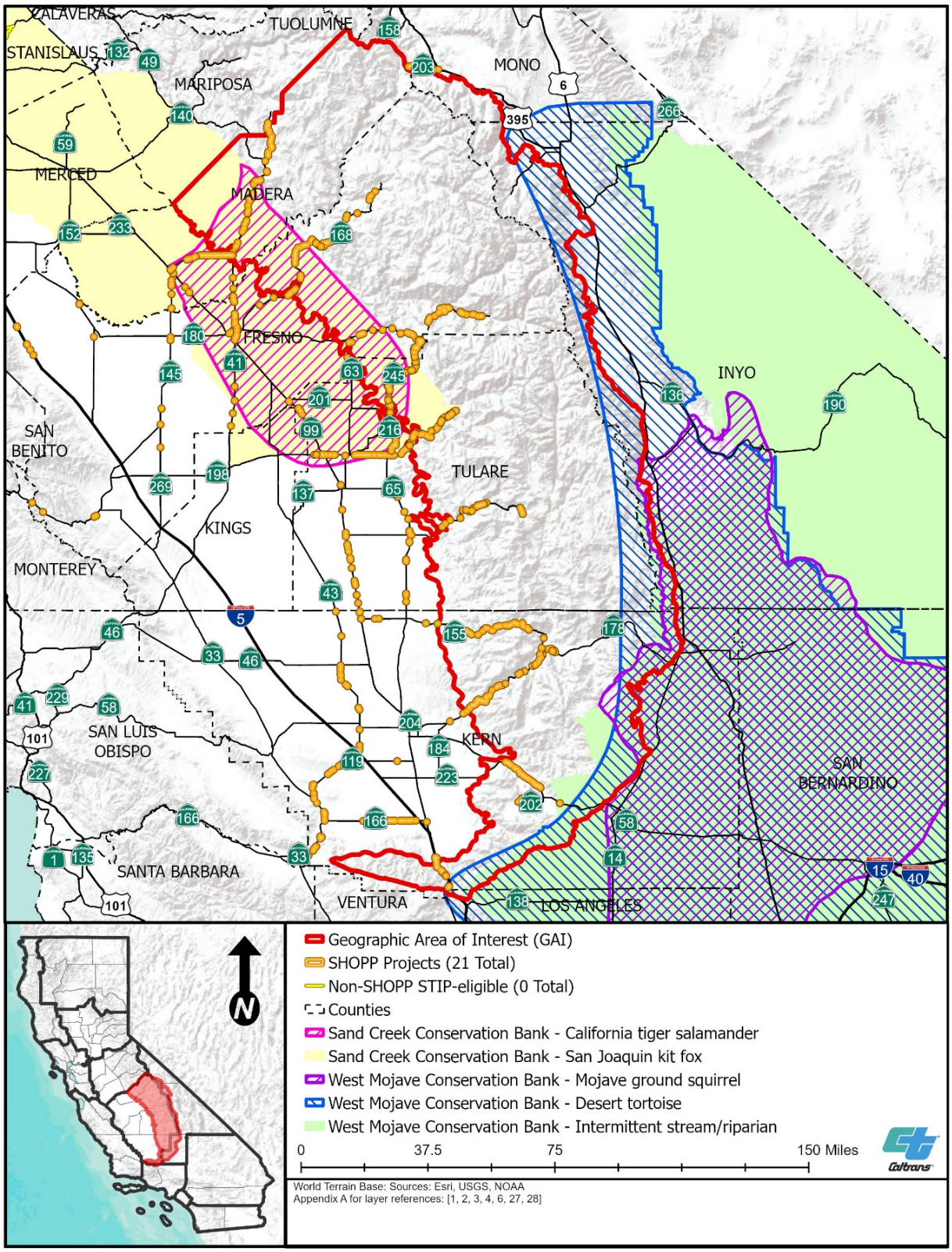


Figure 4-4. Conservation and Mitigation Bank Service Areas – Part 4



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 natural resource 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 permittee-responsible 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." Often, the mitigation occurs after the permitted impacts. However, when the instrument allows for pre-transfer credit purchases, credits can be purchased prior to permitted impacts.

One active in-lieu fee program has a service area that overlaps the GAI: the National Fish and Wildlife Foundation ("NFWF") Sacramento District California ILF Program (Table 4-2, Figures 4-5 and 4-6). This in-lieu fee program has six separate service areas for different resources in different regions and watersheds under its jurisdiction that overlap the GAI, as shown on Figures 4-5 and 4-6.

Table 4-2. Overview of In-lieu Fee Programs in the GAI[a]

Name	Year Approved	Signatories[b]	Location	Credit Types
NFWF Sacramento District California ILF Program	2014	**Corps, EPA, NMFS, RWQCB,** NFWF	Multiple service areas within the Corps Sacramento District boundary (entire)	▪ San Joaquin River Watershed Aquatic Resources ▪ King River Watershed Aquatic Resources ▪ Kaweah/Tule Rivers Watershed Aquatic Resources ▪ Kern River Watershed Aquatic Resources ▪ Southern Sierra Foothills Vernal Pools ▪ All Other Vernal Pool Areas

[a] Up-to-date information on approved in-lieu fee programs, including available credits, can be found at: https://ribits.ops.usace.army.mil/ords/f?p=107:47:13453394859366::NO

[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 4-5. In-lieu Fee Programs in the GAI – Part 1

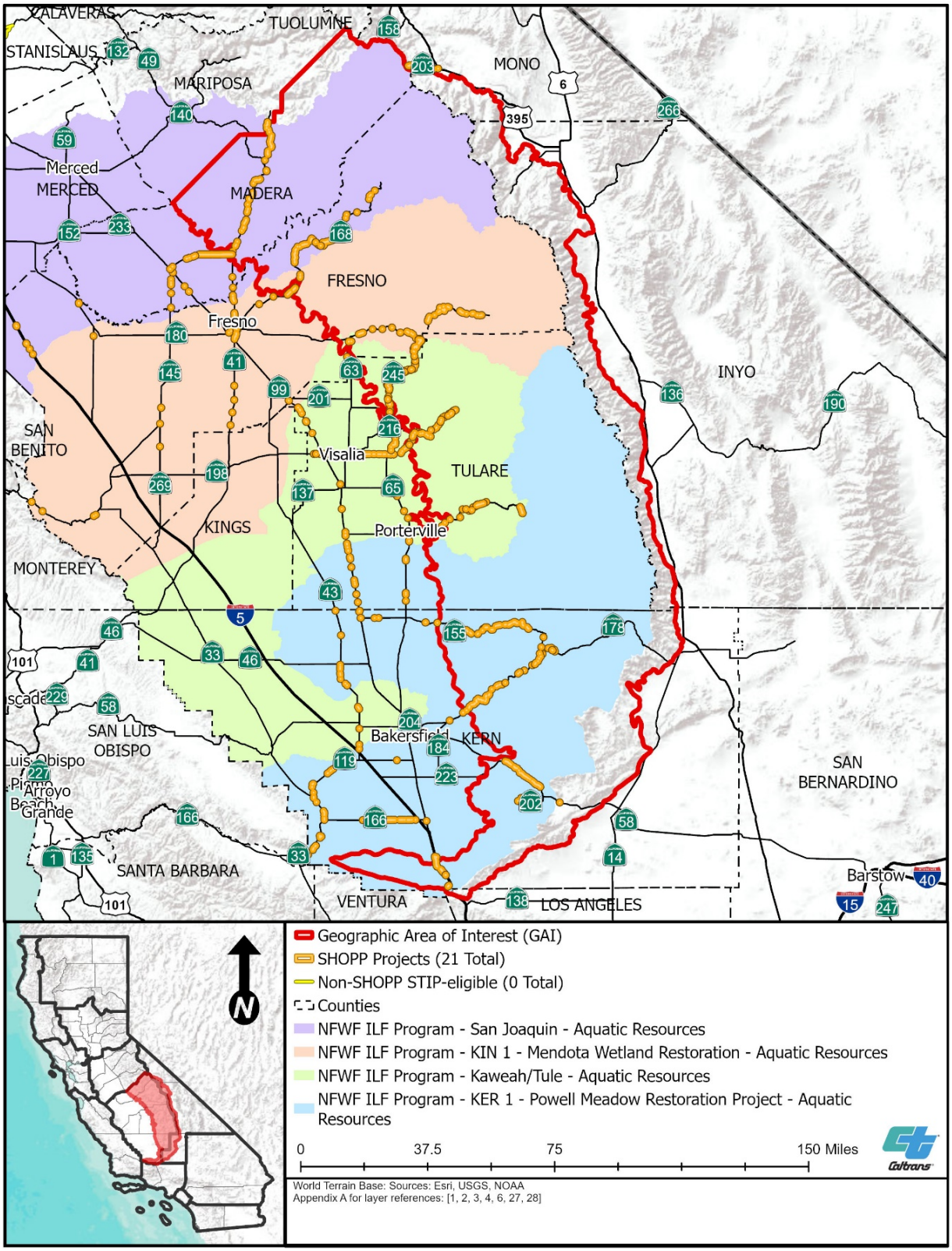
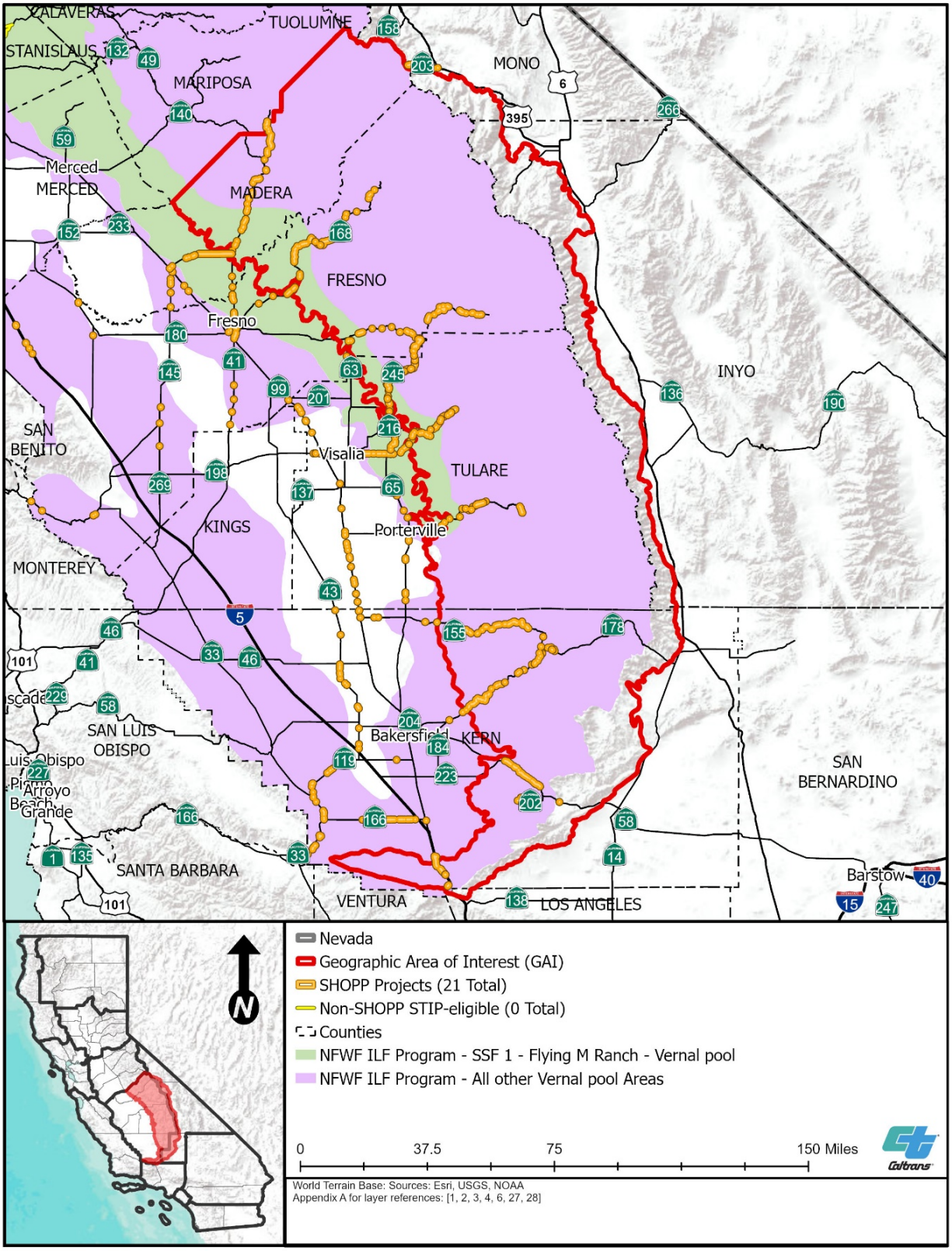


Figure 4-6. In-lieu Fee Programs in the GAI – Part 2



4.5 RCISs and MCAs

Assembly Bill 2087 established CDFW's RCIS Program in 2016 (FGC Chapter 9, § 1850 et seq.), which created 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 developed when and where CDFW approves an RCIS and, with respect to the SHS, creates credits that may be used as compensatory mitigation to offset impacts identified under CESA and the Lake and Streambed Alteration Program. It is important to note that 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 do not result in the issuance of incidental take permits for covered activities.

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 2021b).

4.5.1. Regional Conservation Investment Strategies

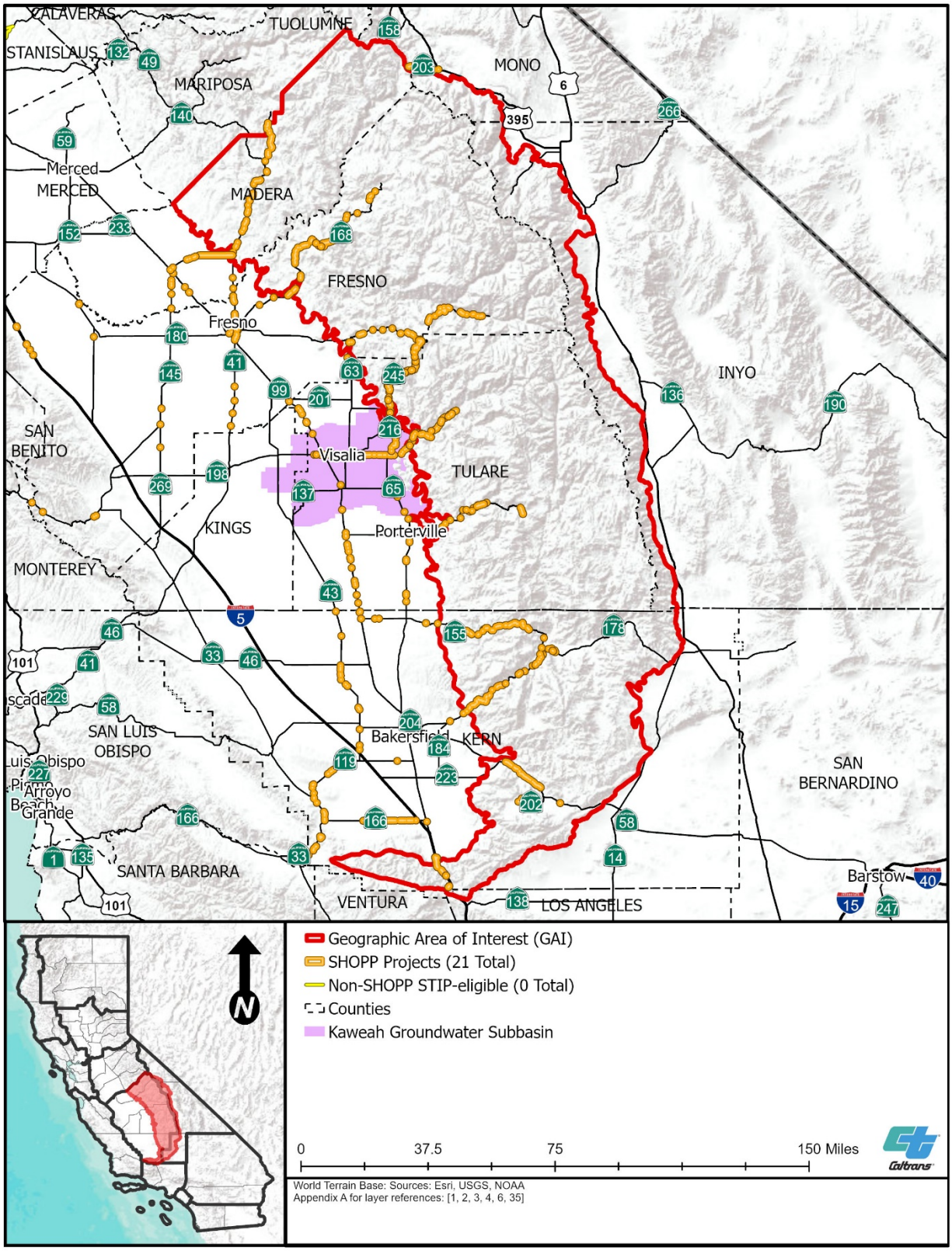
Caltrans identified one RCIS with a service area that overlaps part of the GAI (Figure 4-7):

- Kaweah Groundwater Subbasin RCIS

Kaweah Groundwater Subbasin RCIS

The Kaweah Groundwater Subbasin RCIS was finalized in August 2022 (ICF 2022) and approved in October 2022. It covers approximately 475,935 acres, generally aligning to the boundaries of the Kaweah hydrological subbasin in Tulare and Kings Counties, only slightly overlapping the western portion of the GAI in the area near Woodlake in Tulare County. The East Kaweah Groundwater Sustainability Agency is the proponent of the RCIS. The RCIS analyzes 15 focal species, including 12 wildlife species and 3 plant species whose conservation needs may be addressed through the RCIS. Of the species of mitigation need identified in this RAMNA, three are also focal species in the RCIS, including striped adobe-lily, California tiger salamander, and San Joaquin kit fox. Conservation goals and objectives of the RCIS include facilitating wildlife movement through installation of wildlife undercrossings and enhancing riparian corridors, with species-specific goals focused largely on protecting land that is not currently protected and enhancing habitat values of land that is currently protected.

Figure 4-7. RCIS Areas in the GAI



Specific objectives in the RCIS related to the species of mitigation need include the protection of five extant California tiger salamander occurrences, the protection of 2,250 acres of habitat for San Joaquin kit fox, the protection of one existing occurrence of striped adobe-lily, and the establishment of two new populations in suitable habitat. The RCIS identifies Caltrans, the Tulare County Transportation Authority, and the Kings County Roads and Bridges Division as the major transportation agencies in the RCIS area. Caltrans is noted as the state agency sponsor of the Kaweah Groundwater Subbasin RCIS, and was also an active participant in the RCIS steering committee (ICF 2022).

4.5.2. Mitigation Credit Agreements

As discussed previously, MCAs are developed when and where an RCIS is approved by CDFW and, with respect to the SHS, create credits that may be used as compensatory mitigation to offset impacts identified under CESA and the Lake and Streambed Alteration Program. An MCA has numerous required elements, many of which parallel the requirements of a mitigation bank. These required elements can be found in the California FGC § 1856. At this time, practical instructions and guidance for establishing MCAs are being developed by CDFW,[3] and no MCAs or MCA credits are available. However, if an MCA is developed and approved by CDFW that includes a service area that overlaps the GAI, they may create mitigation credits through the agreement that could be applied to Caltrans transportation projects.

4.6 Wildlife Crossing and Aquatic Corridor Enhancements

Both mitigation banks and the RCIS and MCA process may provide a mechanism to generate compensatory mitigation credits by improving permeability of the SHS through wildlife crossings and aquatic corridor enhancements. For example, through a bank instrument or an MCA developed under an RCIS, CDFW would be authorized to recognize CESA and Lake and Streambed Alteration credits established through wildlife crossing and aquatic corridor construction made separate from and distinct from a specific transportation project. Connectivity information for the GAI is summarized in Section 2.9.

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

5. MODELED ESTIMATED IMPACTS

In this chapter, Caltrans documents the potential compensatory mitigation needs in the GAI for fiscal years 2021/22 to 2030/31. Needs were based on estimated potential compensatory mitigation requirements of Caltrans' anticipated SHOPP transportation projects and regional and local STIP-eligible transportation projects, as appropriate. Because the assessment is intended to inform advance mitigation project scoping, the impact estimates used to forecast compensatory mitigation needs do not distinguish between permanent or temporary impacts. Actual transportation project impacts, and natural resource regulatory agency compensatory mitigation conditions on transportation projects, will be determined in the future through each transportation project's environmental studies and permits.

In this chapter, Caltrans:

- Describes its approach to, and major assumptions when, estimating transportation-related compensatory mitigation needs in the GAI; and
- Provides its estimate of impacts for the 10-year planning period for species of mitigation need, special-status species potentially co-occurring with the species of mitigation need, aquatic resources, and riparian habitat.

Because Caltrans District 6 chose to focus the analysis on terrestrial resources (Section 1.5), the results presented below are organized by the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections within District 6, which is also the GAI.

5.1 Approach

Transportation projects eligible to use advance mitigation credits funded by the AMA may only be SHOPP or STIP transportation projects (SHC § 800.7; Caltrans 2019a). Hence, the compensatory mitigation needs for wildlife and aquatic resources in the GAI are based on Caltrans' anticipated SHOPP transportation project impacts and Caltrans, regional, and local STIP-eligible transportation project impacts. 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 Caltrans District 6, MPO, RTPA, and other transportation agency coordination.

All estimates assume permanent losses, although it is likely that, in many cases, some of the effects of a transportation project may be avoided, may be temporary, or may not result in a full loss.

5.1.1. SHOPP Needs Assessment: SAMNA Model Results

SHOPP impacts were forecast through the SAMNA. The SAMNA consists of an intersection of assumed transportation project footprints with natural resource layers developed for 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 2018a).

To identify the list of SHOPP projects planned for the GAI, Caltrans consulted the SHOPP Ten-Year Book for fiscal years 2021/22 to 2030/31 (Caltrans 2021a). 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. The SHOPP Ten-Year Book includes 21 SHOPP transportation projects in the GAI that are currently in the planning and conceptual phases (Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*). The general locations of all 21 planned transportation projects are shown on most of the maps in this document.

SAMNA estimates are not precise and are not intended to be used for transportation project permitting; however, they are suitable for informing advance mitigation project scopes. 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 2019a, 2021b). The SAMNA model, its foundation, and assumptions are described in the *Statewide Advance Mitigation Needs Assessment Report* (Caltrans 2023), and some of its uncertainties are highlighted in Appendix D, *Complete SAMNA Species Results*. All results are provided in acres. Some species and resources are not forecast to be affected.

Specific to this assessment, forecast impacts on species of mitigation need can be found in Section 5.2 and forecast impacts on aquatic resources can be found in Section 5.3. The SAMNA results for all habitats with at least one special-status species forecast to be affected are provided in Appendix D, *Complete SAMNA Species Results*.

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. 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 need 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 in 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 Caltrans Districts and their regional and local transportation partners (see Table 1-3 of this document for the consultation summary). However, no planned STIP-eligible transportation projects were identified within the GAI for fiscal years 2021/22 to 2030/31.

Non-SHOPP STIP-eligible Potential Impacts

Because no planned STIP-eligible transportation projects were identified in the GAI for fiscal years 2021/22 to 2030/31, no STIP-eligible related impacts or mitigation needs are anticipated.

5.2 Estimated Wildlife Impacts

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

Below, estimated impacts are presented for the ecoregion sections that overlap the GAI for species of mitigation need identified by Caltrans District 6, as well as for species that may co-occur in their habitats. The complete results of the SAMNA—inclusive of the 21 transportation projects planned in the GAI and listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*, that may affect special-status plant and wildlife species—are provided in Appendix D, *Complete SAMNA Species Results*.

The 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. Based on a search of the species-attributed vegetation layer, 121 special-status terrestrial species and three threatened or endangered fish species have the potential to occur in the GAI (Section 2.7, Section 2.15.2, Appendix D; Caltrans 2021b). Using the methods described in Section 5.1.1, the SAMNA analysis determined that 21 SHOPP transportation projects could potentially affect 20 habitat types, which could support up to 100 special-status species (Table 5-1).

[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 and a transportation project has been approved to be advertised to bid for construction.

Table 5-1. Summary of Estimated SHOPP Impacts on Special-status Species Habitat in the GAI

Ecoregion Section	Number of Caltrans SHOPP Projects[a]	Number of Habitats	Number of Special-status Species[b, c]	Estimated Total Habitat Impact (acres)
Sierra Nevada	12	17	72	20.9
Sierra Nevada Foothills	17	15	92	33.9
Total[d]	**21**	**20**	**100**	**54.8**

[a] Transportation projects are listed in Appendix B.
[b] 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.
[c] Included in the SAMNA. See SAMNA Report (Caltrans 2023).
[d] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one ecoregion section. Some special-status species occur in more than one ecoregion section.

Caltrans identified species of mitigation need from the suite of special-status species anticipated to inhabit the GAI. Species of mitigation need are species for whom a high probability of compensatory 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, striped adobe-lily, and Springville clarkia. Although the estimated special-status plant and wildlife impacts provided are focused on the compensatory mitigation needs identified by Caltrans District 6, consideration was also given to the other species that the SAMNA model indicates may use the same habitat as the species of mitigation need.

5.2.1. California Tiger Salamander

Using the methods described in Section 5.1.1, impacts on California tiger salamander and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 9.9 acres of California tiger salamander habitat may be affected by 7 Caltrans SHOPP projects planned within the Sierra Nevada Foothills ecoregion section (Caltrans 2023). Results are summarized in Table 5-2.

5.2.2. San Joaquin Kit Fox

Using the methods described in Section 5.1.1, impacts on San Joaquin kit fox and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 9.2 acres of San Joaquin kit fox habitat may be affected by 12 Caltrans SHOPP projects within the Sierra Nevada Foothills ecoregion section (Caltrans 2023). Results are summarized in Table 5-2.

Table 5-2. Summary of Estimated SHOPP Impacts on Terrestrial Species of Mitigation Need in the GAI

Ecoregion Section	California Tiger Salamander: Number of Caltrans SHOPP Projects[a]	California Tiger Salamander: Estimated Habitat Impact (acres)[b]	San Joaquin Kit Fox: Number of Caltrans SHOPP Projects[a]	San Joaquin Kit Fox: Estimated Habitat Impact (acres)[b]	Striped Adobe-lily: Number of Caltrans SHOPP Projects[a]	Striped Adobe-lily: Estimated Habitat Impact (acres)[b]	Springville Clarkia: Number of Caltrans SHOPP Projects[a]	Springville Clarkia: Estimated Habitat Impact (acres)[b]	Total
Sierra Nevada	0	0.0	0	0.0	3	3.6	0	0.0	**3.6**
Sierra Nevada Foothills	7	9.9	12	9.2	12	13.6	12	14.2	**19.2**
Total[b]	**7**	**9.9**	**12**	**9.2**	**12**	**17.2**	**12**	**14.2**	**22.8**

[a] Transportation projects are listed in Appendix B.
[b] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one ecoregion section.

5.2.3. Striped Adobe-lily

Using the methods described in Section 5.1.1, impacts on striped adobe-lily and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 3.6 acres of striped adobe-lily habitat may be affected by 3 Caltrans SHOPP projects within the Sierra Nevada ecoregion section and 13.6 acres of striped adobe-lily habitat may be affected by 12 Caltrans SHOPP projects within the Sierra Nevada Foothills ecoregion section (Caltrans 2023). Results are summarized in Table 5-2.

5.2.4. Springville Clarkia

Using the methods described in Section 5.1.1, impacts on Springville clarkia and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 14.2 acres of Springville clarkia habitat may be affected by 12 Caltrans SHOPP projects within the Sierra Nevada Foothills ecoregion section (Caltrans 2023). Results are summarized in Table 5-2.

5.2.5. Other Special-status Species

The above-listed species of mitigation need co-occur with other protected plant, amphibian, bird, and mammal species in two habitats in the Sierra Nevada Ecoregion Section and in eight habitats in the Sierra Nevada Foothills Ecoregion Sections.

Using the methods described in Section 5.1.1, the SAMNA forecasts impacts on:

- an additional 53 special-status terrestrial species that potentially use the same habitats as striped adobe-lily, the species of mitigation need in the Sierra Nevada Ecoregion Section (Table 5-3); and
- an additional 85 special-status terrestrial species that potentially use the same habitats as at least one of the species of mitigation need in the Sierra Nevada Foothills Ecoregion Section (Table 5-4).

Table 5-3. Estimated SHOPP Impacts on Species of Mitigation Need and Co-occurring Species Habitat: Sierra Nevada Ecoregion Section (acres)

Common Name	Species Name	Status	Annual Grassland	Montane Hardwood
Not applicable	Not applicable	**Total**	**6.79**	**2.31**
Species of Mitigation Need	See below	See below	See below	See below
striped adobe-lily	*Fritillaria striata*	ST	3.42	0.13
Plants	See below	See below	See below	See below
Chinese Camp brodiaea	*Brodiaea pallida*	FT, SE	0.00	0.13
Congdon's lewisia	*Lewisia congdonii*	SR	0.08	2.18
Hartweg's golden sunburst	*Pseudobahia bahiifolia*	FE, SE	0.00	0.13
Kaweah brodiaea	*Brodiaea insignis*	SE	3.42	0.13
Mariposa pussypaws	*Calyptridium pulchellum*	FT	0.00	1.16

Common Name	Species Name	Status	Annual Grassland	Montane Hardwood
Tree-anemone	*Carpenteria californica*	FT	0.00	0.25
Yosemite onion	*Allium yosemitense*	SR	0.00	1.16
Amphibians	See below	See below	See below	See below
California red-legged frog	*Rana draytonii*	FT, SSC	0.08	2.05
Yellow-blotched salamander	*Ensatina eschscholtzii croceator*	FS	0.00	0.12
Foothill yellow-legged frog	*Rana boylii*	FS, SE, SSC	6.79	2.25
Southern mountain yellow-legged frog	*Rana muscosa*	FE, SE	0.00	0.21
Tehachapi slender salamander	*Batrochoseps stebbinsi*	FS, ST	0.00	0.12
Reptiles	See below	See below	See below	See below
Blainville's horned lizard	*Phrynosoma blainvillii*	FS, SSC	6.64	0.00
Common sagebrush lizard	*Sceloporus graciosus*	FS	0.00	2.31
Desert night lizard	*Xantusia vigilis*	FS, SSC	6.64	0.00
Birds	See below	See below	See below	See below
Bald eagle	*Haliaeetus leucocephalus*	FS, SE, SFP	6.79	2.31
Black swift	*Cypseloides niger*	SSC	0.07	0.38
Burrowing owl	*Athene cunicularia*	FS, SSC	6.46	0.00
California condor	*Gymnogyps californianus*	FE, FS, SE, SFP	6.70	0.26
California spotted owl	*Strix occidentalis occidentalis*	FS, SSC	0.00	2.07
Golden eagle	*Aquila chrysaetos*	FS, SFP	3.59	0.00
Loggerhead shrike	*Lanius ludovicianus*	SSC	6.79	2.29
Long-eared owl	*Asio otus*	SSC	6.79	2.31
Mount Pinos sooty grouse	*Dendragapus obscurus howardi*	SSC	3.66	0.74
Northern goshawk	*Accipiter gentilis*	FS, SSC	0.00	2.25
Northern harrier	*Circus cyaneus*	SSC	6.64	0.06
Olive-sided flycatcher	*Contopus cooperi*	SSC	0.00	2.31
Oregon vesper sparrow	*Pooecetes gramineus affinis*	SSC	3.59	0.00
Peregrine falcon	*Falco peregrinus*	SFP	6.79	2.31
Purple martin	*Progne subis*	SSC	6.79	2.31
Red-winged blackbird	*Agelaius phoeniceus*	SSC	6.79	0.00

Common Name	Species Name	Status	Annual Grassland	Montane Hardwood
Short-eared owl	*Asio flammeus*	SSC	3.59	0.00
Swainson's hawk	*Buteo swainsoni*	FS, ST	3.59	0.03
Tricolored blackbird	*Agelaius tricolor*	FS, ST, SSC	3.59	0.00
Vaux's swift	*Chaetura vauxi*	SSC	0.00	2.31
White-tailed kite	*Elanus leucurus*	FS, SFP	3.59	0.00
Yellow warbler	*Setophaga petechia*	SSC	0.00	2.29
Mammals	See below	See below	See below	See below
American badger	*Taxidea taxus*	SSC	6.79	2.31
Big-eared woodrat	*Neotoma macrotis*	FS, SSC	0.00	2.29
Fisher	*Pekania pennanti*	FS, FS, ST, SSC	0.00	1.10
Fringed myotis	*Myotis thysanodes*	FS	6.03	1.10
Long-eared myotis	*Myotis evotis*	FS	0.00	0.66
Mountain beaver	*Aplodontia rufa*	SSC	0.00	0.59
Pallid bat	*Antrozous pallidus*	FS, SSC	6.79	2.31
Ringtail	*Bassariscus astutus*	SFP	6.79	2.31
San Joaquin pocket mouse	*Pergnathus inornatus*	FS	6.64	0.00
Small-footed myotis	*Myotis ciliolabrum*	FS	6.72	1.69
Southern grasshopper mouse	*Onychomys torridus*	SSC	6.68	0.00
Spotted bat	*Euderma maculatum*	FS, SSC	6.79	0.00
Townsend's big-eared bat	*Corynorhinus townsendii*	FS, SSC	6.79	2.31
Western mastiff bat	*Eumops perotis*	FS, SSC	6.79	2.07
Western red bat	*Lasiurus blossevillii*	SSC	4.00	1.97
Yuma myotis	*Myotis yumanensis*	FS	6.79	2.31

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

Table 5-4. Estimated SHOPP Impacts on Species of Mitigation Need and Co-occurring Species Habitat: Sierra Nevada Foothills Ecoregion Section (acres)

Common Name	Species Name	Status	Annual Grassland	Barren	Blue Oak Woodland	Blue Oak-Foothill Pine	Mixed Chaparral	Montane Hardwood	Valley Foothill Riparian	Valley Oak Woodland
Not applicable	Not applicable	**Total**	**16.52**	**5.86**	**5.48**	**0.41**	**0.67**	**0.80**	**0.56**	**2.64**
Species of Mitigation Need	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
California tiger salamander	*Ambystoma californiense*	FT, ST	7.41	0.00	1.96	0.09	0.00	0.00	0.06	0.42
San Joaquin kit fox	*Vulpes macrotis mutica*	FE, ST	8.39	0.72	0.05	0.00	0.00	0.00	0.00	0.00
striped adobe-lily	*Fritillaria striata*	ST	13.12	0.00	0.00	0.00	0.00	0.53	0.00	0.00
Springville clarkia	*Clarkia springvillensis*	FT, SE	13.12	0.00	0.00	0.00	0.52	0.53	0.00	0.00
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	8.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	SE	10.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
California jewelflower	*Caulanthus californicus*	FE, SE	9.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Camp brodiaea	*Brodiaea pallida*	FT, SE	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Congdon's lewisia	*Lewisia congdonii*	SR	4.54	0.00	0.00	0.00	0.09	0.27	0.00	0.00
Greene's tuctoria	*Tuctoria greenei*	FE, SR	8.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hairy Orcutt grass	*Orcuttia pilosa*	FE, SE	8.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Common Name	Species Name	Status	Annual Grassland	Barren	Blue Oak Woodland	Blue Oak-Foothill Pine	Mixed Chaparral	Montane Hardwood	Valley Foothill Riparian	Valley Oak Woodland
Hartweg's golden sunburst	*Pseudobahia bahiifolia*	FE, SE	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hoover's spurge	*Euphorbia hooveri*	FT	8.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kaweah brodiaea	*Brodiaea insignis*	SE	13.12	0.00	0.00	0.00	0.00	0.53	0.00	0.00
Keck''s checkerbloom	*Sidalcea keckii*	FE	14.96	0.00	0.00	0.00	0.00	0.53	0.00	0.00
Kern mallow	*Eremalche parryi* ssp. *kernensis*	FE	8.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mojave tarplant	*Deinandra mohavensis*	SE	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00
Red Hills vervain	*Verbena californica*	FT, ST	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Joaquin adobe sunburst	*Pseudobahia peirsonii*	FT, SE	15.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Joaquin Valley Orcutt grass	*Orcuttia inaequalis*	FT, SE	10.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Joaquin woollythreads	*Monolopia congdonii*	FE	8.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Southern mountain buckwheat	*Eriogonum kennedyi* var. *austromontanum*	FT	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00
Succulent owl's-clover	*Castilleja campestris* var. *succulenta*	FT, SE	15.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tree-anemone	*Carpenteria californica*	FT	0.00	0.00	0.00	0.00	0.52	0.53	0.00	0.00

Common Name	Species Name	Status	Annual Grassland	Barren	Blue Oak Woodland	Blue Oak-Foothill Pine	Mixed Chaparral	Montane Hardwood	Valley Foothill Riparian	Valley Oak Woodland
Invertebrates	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT	6.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vernal pool tadpole shrimp	*Lepidurus packardi*	FE	6.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
California red-legged frog	*Rana draytonii*	FT, SSC	10.10	0.00	2.98	0.09	0.14	0.47	0.32	2.09
Yellow-blotched salamander	*Ensatina eschscholtzii croceator*	FS	0.00	0.00	0.74	0.32	0.60	0.12	0.38	0.32
Foothill yellow-legged frog	*Rana boylii*	FS, SE, SSC	15.03	0.00	5.48	0.41	0.60	0.80	0.29	2.59
Kern Canyon slender salamander	*Batrachoseps simatus*	FS, ST	0.00	0.00	0.05	0.23	0.31	0.00	0.01	0.08
Relictual slender salamander	*Batrachoseps relictus*	FS, SSC	0.48	0.00	0.05	0.10	0.02	0.00	0.01	0.08
Tehachapi slender salamander	*Batrachoseps stebbinsi*	FS, ST	0.00	0.00	0.15	0.00	0.00	0.00	0.26	0.09
Western spadefoot	*Spea hammondii*	FS, SSC	10.69	0.00	3.85	0.09	0.00	0.00	0.00	0.80

Common Name	Species Name	Status	Annual Grassland	Barren	Blue Oak Woodland	Blue Oak-Foothill Pine	Mixed Chaparral	Montane Hardwood	Valley Foothill Riparian	Valley Oak Woodland
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	16.52	0.00	5.48	0.41	0.67	0.00	0.56	2.64
Blunt-nosed leopard lizard	*Gambelia sila*	FE, SE, SFP	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
California legless lizard	*Anniella pulchra*	FS, SSC	0.00	0.00	2.50	0.32	0.60	0.00	0.50	0.75
Coachwhip	*Coluber flagellum*	SSC	6.04	0.00	0.20	0.23	0.51	0.00	0.28	0.16
Desert night lizard	*Xantusia vigilis*	FS, SSC	6.15	0.00	0.74	0.32	0.00	0.00	0.00	0.32
Two-striped gartersnake	*Thamnophis hammondii*	FS, SSC	1.49	0.00	0.00	0.00	0.07	0.00	0.26	0.06
Western patch-nosed snake	*Salvadora hexalepis*	SSC	3.13	0.41	0.15	0.00	0.21	0.00	0.26	0.09
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	0.00	1.99	0.00	0.00	0.00	0.00	0.00	0.00
Bald eagle	*Haliaeetus leucocephalus*	FS, SE, SFP	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Black swift	*Cypseloides niger*	SSC	1.44	0.37	1.12	0.00	0.00	0.21	0.12	0.29
Burrowing owl	*Athene cunicularia*	FS, SSC	16.52	5.86	5.48	0.41	0.67	0.00	0.56	2.64
California condor	*Gymnogyps californianus*	FE, FS, SE, SFP	7.91	4.17	2.50	0.32	0.60	0.33	0.00	0.61
California spotted owl	*Strix occidentalis occidentalis*	FS, SSC	0.00	0.00	0.00	0.25	0.00	0.80	0.31	0.00

Common Name	Species Name	Status	Annual Grassland	Barren	Blue Oak Woodland	Blue Oak-Foothill Pine	Mixed Chaparral	Montane Hardwood	Valley Foothill Riparian	Valley Oak Woodland
Golden eagle	*Aquila chrysaetos*	FS, SFP	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Grasshopper sparrow	*Ammodramus savannarum*	SSC	15.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kern red-winged blackbird	*Agelaius phoeniceus aciculatus*	SSC	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loggerhead shrike	*Lanius ludovicianus*	SSC	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Long-eared owl	*Asio otus*	SSC	16.52	0.00	5.48	0.41	0.67	0.80	0.56	2.64
Mount Pinos sooty grouse	*Dendragapus obscurus howardi*	SSC	1.59	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Northern goshawk	*Accipiter gentilis*	FS, SSC	0.00	0.00	0.11	0.05	0.16	0.13	0.00	1.01
Northern harrier	*Circus cyaneus*	SSC	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Olive-sided flycatcher	*Contopus cooperi*	SSC	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00
Oregon vesper sparrow	*Pooecetes gramineus affinis*	SSC	16.52	0.00	5.48	0.41	0.67	0.00	0.00	2.64
Peregrine falcon	*Falco peregrinus*	SFP	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Purple martin	*Progne subis*	SSC	1.59	0.00	0.07	0.00	0.00	0.03	0.00	0.17
Short-eared owl	*Asio flammeus*	SSC	16.52	0.00	5.48	0.41	0.67	0.00	0.56	2.64
Swainson's hawk	*Buteo swainsoni*	FS, ST	11.40	3.72	0.95	0.32	0.53	0.12	0.12	0.26
Tricolored blackbird	*Agelaius tricolor*	FS, ST, SSC	16.52	0.00	0.00	0.00	0.00	0.00	0.56	0.00
Vaux's swift	*Chaetura vauxi*	SSC	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00
White-tailed kite	*Elanus leucurus*	FS, SFP	16.52	5.86	5.48	0.41	0.67	0.00	0.56	2.64

Common Name	Species Name	Status	Annual Grassland	Barren	Blue Oak Woodland	Blue Oak-Foothill Pine	Mixed Chaparral	Montane Hardwood	Valley Foothill Riparian	Valley Oak Woodland
Yellow-breasted chat	*Icteria virens*	SSC	0.00	0.00	5.48	0.41	0.67	0.80	0.56	2.64
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00
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	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Big-eared woodrat	*Neotoma macrotis*	FS, SSC	0.00	0.00	5.48	0.41	0.67	0.80	0.56	2.64
Fresno kangaroo rat	*Dipodomys nitratoides*	FE, SE	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fringed myotis	*Myotis thysanodes*	FS	16.52	5.86	5.43	0.41	0.67	0.80	0.56	2.64
Giant kangaroo rat	*Dipodomys ingens*	FE, SE	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long-eared myotis	*Myotis evotis*	FS	0.00	3.32	0.15	0.15	0.58	0.03	0.26	0.10
Marten	*Martes caurina*	FS	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00
Mountain beaver	*Aplodontia rufa*	SSC	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
Pallid bat	*Antrozous pallidus*	FS, SSC	16.51	0.00	5.47	0.36	0.58	0.00	0.56	2.60
Red fox	*Vulpes vulpes*	FE, FS, ST	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Ringtail	*Bassariscus astutus*	SFP	2.68	0.72	0.00	0.00	0.02	0.00	0.00	0.00
San Joaquin pocket mouse	*Perognathus inornatus*	FS	12.59	3.78	1.12	0.00	0.51	0.00	0.00	0.34
Small-footed myotis	*Myotis ciliolabrum*	FS	15.78	5.46	4.58	0.41	0.67	0.56	0.45	2.36
Southern grasshopper mouse	*Onychomys torridus*	SSC	15.92	0.00	0.00	0.00	0.67	0.00	0.51	0.00

Common Name	Species Name	Status	Annual Grassland	Barren	Blue Oak Woodland	Blue Oak-Foothill Pine	Mixed Chaparral	Montane Hardwood	Valley Foothill Riparian	Valley Oak Woodland
Spotted bat	*Euderma maculatum*	FS, SSC	16.24	0.00	5.48	0.41	0.00	0.00	0.29	2.59
Townsend's big-eared bat	*Corynorhinus townsendii*	FS, SSC	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Western mastiff bat	*Eumops perotis*	FS, SSC	16.52	5.86	5.48	0.41	0.67	0.80	0.56	2.64
Western red bat	*Lasiurus blossevillii*	SSC	16.20	0.00	5.48	0.39	0.46	0.80	0.56	2.64
White-eared pocket mouse	*Perognathus alticolus*	FS, SSC	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00
Wolverine	*Gulo gulo*	FS, ST, SFP	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00
Yuma myotis	*Myotis yumanensis*	FS	16.52	0.00	5.48	0.41	0.67	0.80	0.56	2.64

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

5.3 Estimated Aquatic Resources Impacts

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

Below, estimated aquatic resource impacts are presented for the HUC-8 sub-basins that make up the GAI. Aquatic resources impacts are categorized as potential impacts on threatened and endangered fish, wetlands, and non-wetland waters. Riparian habitat is also discussed. Refer to Appendix G, *Aquatic Resource Locations*, for maps depicting the location and extent of wetlands and non-wetland waters in the GAI. Riparian habitat is a land cover type mapped in Appendix C, *Land Cover Types.*

5.3.1. Estimated Impacts on Threatened and Endangered Fish Habitat

Using the methods described in Section 5.1.1, impacts on fish habitat were estimated for the 21 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, 2 are forecast to affect 0.7 acre of threatened and endangered fish habitat (Table 5-5; Caltrans 2023). Specifically, 2 transportation projects are anticipated to affect 0.4 acre of Lahontan cutthroat trout habitat in the Upper King Sub-basin and 2 transportation projects are anticipated to affect 0.3 acre of Lahontan cutthroat trout and Paiute cutthroat trout habitat in the Upper San Joaquin Sub-basin.

Table 5-5. Summary of Estimated SHOPP Project Impacts on Threatened and Endangered Fish Habitat in the GAI (acres)[a, b]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Lahontan Cutthroat Trout	Paiute Cutthroat Trout	Total[c]
Upper King	18030010	2	0.4	0.0	**0.4**
Upper San Joaquin	18040006	2	0.3	0.3	**0.3**
Total	Not applicable	**2**	**0.7**	**0.3**	**0.7**

[a] Threatened and endangered fish species habitat impacts are forecast by the SAMNA Reporting Tool.
[b] Stream/river habitat impacts are provided. Stream/river habitat impacts are assumed to be representative of fish habitat impacts.
[c] For sub-basins with more than one species, co-occurrence of impacts is assumed. Acreage for the total impact across all habitat types is provided.

5.3.2. Estimated Impacts on Wetlands

Using the methods described in Section 5.1.1, impacts on wetlands were estimated for the 21 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, 6 would result in impacts on 0.2 acre of wetland habitat in the GAI, including <0.1 acre of freshwater emergent wetland, 0.2 acre of freshwater forested/shrub wetland, and <0.1 acre of freshwater pond (Table 5-6; Caltrans 2023).

Table 5-6. Summary of Estimated SHOPP Impacts on Wetlands in the GAI (acres)[a]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Freshwater Emergent Wetland	Freshwater Forested/ Shrub Wetland	Freshwater Pond	Total[b]
Middle Kern-Upper Tehachapi-Grapevine	18030003	3	0.0	0.1	0.0	**0.1**
Middle San Joaquin-Lower Chowchilla	18040001	1	<0.1	0.0	0.0	**<0.1**
Upper Dry	18030009	1	0.0	0.0	<0.1	**<0.1**
Upper Kaweah	18030007	1	0.0	<0.1	0.0	**<0.1**
Upper San Joaquin	18040006	1	0.0	<0.1	0.0	**<0.1**
Total[b, c]	Not applicable	**6**	**<0.1**	**0.2**	**<0.1**	**0.2**

[a] The SAMNA forecasts impacts on wetlands for 5 of the 21 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect wetlands.

Note the SAMNA's wetland layers provide output that appears similar to its terrestrial output, in that the results are provided in terms of wetland habitat. Wetland forecasts based on the SAMNA's wetland layer, however, are considered more certain than wetland habitat forecasts based on the SAMNA's terrestrial habitat layers. Therefore, the wetland estimates below are based solely on the SAMNA's wetland data layer (Caltrans 2023).

5.3.3. Estimated Impacts on Non-wetland Waters

Using the methods described in Section 5.1.1, impacts on non-wetland waters were estimated for the 21 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, 13 would result in impacts on 4.1 acres of non-wetland waters in the GAI, including 0.1 acre of reservoir and 4.0 acres of stream/river habitat (Table 5-7; Caltrans 2023).

Table 5-7. Summary of Estimated SHOPP Project Impacts on Non-wetland Waters in the GAI (acres)[a]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Reservoir	Stream/ River	Total[b]
Fresno River	18040007	1	0.0	0.2	**0.2**
Middle Kern-Upper Tehachapi-Grapevine	18030003	5	0.0	1.5	**1.5**
Middle San Joaquin-Lower Chowchilla	18040001	2	0.0	0.2	**0.2**
South Fork Kern	18030002	1	0.0	<0.1	**<0.1**
Tulare Lake Bed	18030012	2	0.0	0.2	**0.2**
Upper Deer-Upper White	18030005	1	0.0	<0.1	**<0.1**
Upper Dry	18030009	1	0.0	0.2	**0.2**
Upper Kaweah	18030007	3	0.1	0.4	**0.6**
Upper King	18030010	2	0.0	0.4	**0.4**
Upper Poso	18030004	2	0.0	0.1	**0.1**
Upper San Joaquin	18040006	2	0.0	0.8	**0.8**
Total[b, c]	Not applicable	**13**	**0.1**	**4.0**	**4.1**

[a] The SAMNA forecasts impacts for 11 of the 21 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect non-wetland waters.

5.3.4. Estimated Impacts on Vernal Pools

The SAMNA does not directly estimate vernal pool impacts, but vernal pool impacts can be estimated by proxy using the SAMNA vernal pool crustacean habitat impact forecast from the SAMNA's terrestrial layer. Critical habitat in the GAI for two vernal pool invertebrate species, vernal pool fairy shrimp and vernal pool tadpole shrimp, is shown on Figure 2-7, and available vernal pool location information is shown in Figure 2-15. Of the 21 SHOPP transportation projects evaluated, 8 would result in impacts on 6.8 acres of vernal pool fairy shrimp habitat and 8 would result in impacts on 6.3 acres of vernal pool tadpole shrimp habitat in the GAI (Table 5-8; Caltrans 2023).

Table 5-8. Summary of Estimated SHOPP Project Impacts on Vernal Pool Habitat in the GAI (acres)[a, b]

Sub-basin (HUC-8)[c]	Sub-basin Number	Number of Transportation Projects	Vernal Pool Fairy Shrimp	Vernal Pool Tadpole Shrimp	Total[d]
Middle San Joaquin-Lower Chowchilla	18040001	3	1.3	1.4	**1.4**
Tulare Lake Bed	18030012	1	3.6	3.6	**3.6**
Upper Dry	18030009	1	0.1	<0.1	**0.1**
Upper Kaweah	18030007	3	1.3	1.3	**1.3**
Upper Tule	18030006	2	0.4	0.0	**0.4**
Total[d, e]	Not applicable	**8**	**6.8**	**6.3**	**6.9**

[a] As described in Chapter 2, the SAMNA maps vernal pool habitat based on California Natural Diversity Database occurrences of vernal pool invertebrate species and a 4-mile buffer.
[b] See Appendix D for forecast impacts on all special-status species, including vernal pool plant special-status species.
[c] The SAMNA forecasts impacts on only 5 of the 21 HUC-8s in the GAI.
[d] Totals may be different on account of rounding.
[e] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect non-wetland waters.

5.3.5. Estimated Impacts on Riparian Habitat

The SAMNA does not directly estimate riparian impacts through its aquatic resource layers, but riparian impacts can be estimated by proxy using the SAMNA montane riparian and valley foothill riparian forecasts from the SAMNA's terrestrial layer. Adapting the methods described in Section 5.1.1, impacts on riparian habitat were estimated for the 21 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period.* Of the 21 SHOPP transportation projects evaluated, the SAMNA estimated that 0.6 acre of riparian habitat may be affected by 7 Caltrans SHOPP transportation projects in the GAI, all of which is valley foothill riparian habitat (Table 5-9; Caltrans 2023).

Table 5-9. Summary of Estimated SHOPP Project Impacts on Riparian Habitat in GAI (acres)[a]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Valley Foothill Riparian	Total (acres)[b, c]
Middle Kern-Upper Tehachapi-Grapevine	18030003	2	0.3	**0.3**
Upper Kaweah	18030007	3	0.1	**0.1**
Upper Poso	18030004	1	0.1	**0.1**
Upper Tule	18030006	2	<0.1	**<0.1**
Total[c, d]	Not applicable	**7**	**0.6**	**0.6**

[a] The SAMNA forecasts impacts for 4 of the 21 HUCs in the GAI.
[b] The sum of montane riparian and valley foothill riparian habitat impacts is provided.
[c] Totals may be different on account of rounding.
[d] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect riparian habitat.

6. BENEFITING TRANSPORTATION PROJECT CONSIDERATIONS

Benefiting transportation projects have delivery schedules that would likely benefit from advance mitigation credits. Potentially benefiting transportation projects are identified in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*, for advance mitigation planning to guide advance mitigation project scoping. Actual benefiting transportation projects will be determined in the future. Caltrans and relevant natural resource regulatory agencies will 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.

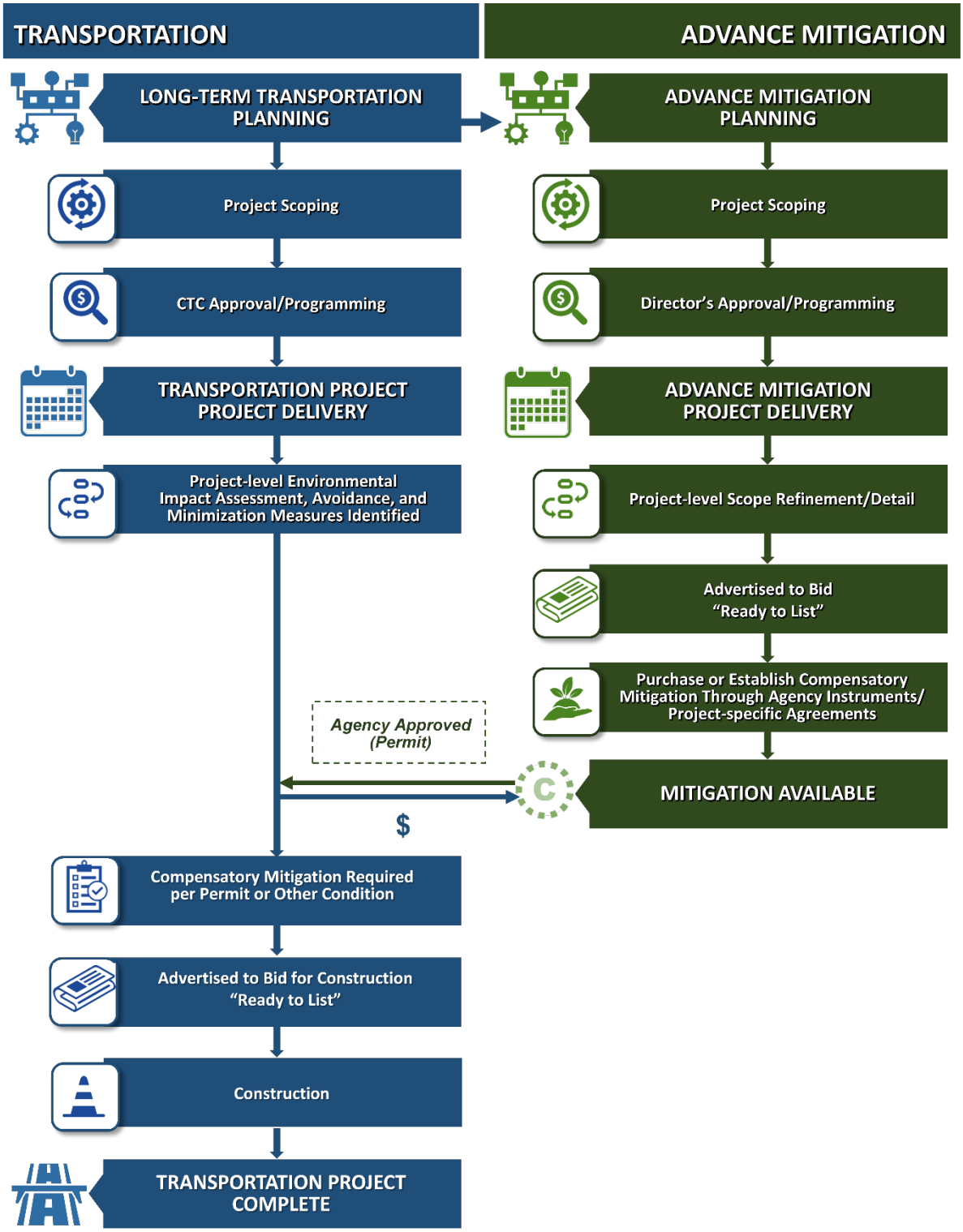
In this chapter, Caltrans summarizes the scheduling considerations and constraints of potential benefiting transportation projects in order to inform advance mitigation project schedules. A time frame for the forecast advance mitigation needs is provided and analyzed. The potentially benefiting transportation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

6.1 Why Timing is Important

Broadly speaking, an advance mitigation project is an SHC § 800.6(a)-authorized activity that consists of (1) purchasing compensatory mitigation that has been previously approved by the natural resource regulatory agencies through a conservation bank, 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 (see Table 1-1). Elaborated upon in Chapter 9, *Assessment of Authorized Activities*, the time it takes to deliver each authorized activity varies; however, purchasing compensatory mitigation credits would likely take less time than establishing compensatory mitigation credits.

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 project scoping, the Caltrans District's nomination 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).

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



The date when a Caltrans potential transportation project is expected to be Ready to List[1] is an appropriate estimate for identifying when a Caltrans advance mitigation project will need to deliver compensatory mitigation to a potential benefiting transportation project.

6.2 Patterns of Estimated Potential Impacts

Given that the planning horizon for this assessment covers the 2021/22 through 2030/31 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, and hence the AMP cannot feasibly supply compensatory mitigation credits on the required schedule;
- would need compensatory mitigation delivered in a nearer time frame, which may favor seeking already existing credits as an AMP advance mitigation project scope; or
- would need compensatory mitigation farther out in time and, if so, whether there is time to establish new compensatory mitigation.

Initial estimated impact patterns are based on the SHOPP transportation project information provided in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period.*

- As shown in Table 6-1 and on 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 in the Sierra Nevada Ecoregion Section are limited to fiscal years 2024/25, 2025/26, 2027/28, and 2028/29, with impacts only on Springville clarkia and striped adobe-lily.
- As shown in Table 6-2 and on Figure 6-3, 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 in the Sierra Nevada Foothills Ecoregion Section are concentrated in fiscal years 2023/24 and 2024/25 with additional need spread throughout the 10-year planning horizon, with the greatest impact acreage for Springville clarkia.
- As shown in Tables 6-3 through 6-15 and on Figures 6-4 through 6-16, when the SHOPP transportation projects identified previously have their aquatic resource impacts examined relative to their expected advertising date, the compensatory mitigation needs for 14 of the 22 HUC-8 sub-basins are spread throughout the 10-year planning horizon, as described below:

[1] 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 and a transportation project has been approved to be advertised to bid for construction.

- Compensatory mitigation needs in the Fresno River Sub-basin are limited to non-wetland waters in fiscal year 2028/29.
- Compensatory mitigation needs in the Middle Kern-Upper Tehachapi-Grapevine Sub-basin are focused on wetlands, non-wetland waters, and riparian habitat in fiscal year 2024/25, with minimal impacts to non-wetland waters in fiscal years 2021/22, 2029/30 and 2030/31; and to wetlands and riparian habitat in fiscal years 2021/22 and 2030/31.
- Compensatory mitigation needs in the Middle San Joaquin-Lower Chowchilla Sub-basin are focused on vernal pool habitat in fiscal years 2023/24, 2024/25, and 2028/29, with lesser impacts to non-wetland waters in fiscal years 2024/25 and 2028/29; and minimal impacts to wetlands in fiscal year 2023/24.
- Compensatory mitigation needs in the South Fork Kern Sub-basin are limited to non-wetland waters in fiscal year 2021/22.
- Compensatory mitigation needs in the Tulare Lake Bed Sub-basin are focused on vernal pool habitat in fiscal year 2023/24, with minimal impacts to non-wetland waters in fiscal years 2023/24 and 2025/26.
- Compensatory mitigation needs in the Upper Deer-Upper White Sub-basin are limited to non-wetland waters in fiscal year 2030/31.
- Compensatory mitigation needs in the Upper Dry Sub-basin are limited to wetlands and non-wetland waters in fiscal year 2024/25 and vernal pool habitat in fiscal year 2025/26.
- Compensatory mitigation needs in the Upper Kaweah Sub-basin are concentrated around non-wetland waters and vernal pools in fiscal years 2024/25 and 2028/29, with lesser non-wetland waters impacts in fiscal year 2025/26; lesser impacts to riparian habitat in fiscal years 2022/23, 2024/25, and 2028/29; and minimal impacts to wetlands in fiscal years 2024/25.
- Compensatory mitigation needs in the Upper Kern Sub-basin are limited to non-wetland waters in fiscal year 2030/31.
- Compensatory mitigation needs in the Upper King Sub-basin are limited to fish habitat and non-wetland waters in fiscal years 2024/25 and 2025/26.
- Compensatory mitigation needs in the Upper Poso Sub-basin are limited to non-wetland waters and riparian habitat in fiscal year 2028/29 and non-wetland waters in fiscal year 2030/31.
- Compensatory mitigation needs in the Upper San Joaquin Sub-basin are focused on fish habitat and non-wetland waters in fiscal years 2024/25 and 2025/26, with minimal impacts to wetlands in fiscal year 2024/25.
- Compensatory mitigation needs in the Upper Tule Sub-basin are focused on vernal pool habitat in fiscal years 2022/23 and 2028/29, with minimal impacts to riparian habitat in fiscal years 2027/28 and 2028/29.

Spatially, these transportation projects are distributed throughout the GAI (Figure 6-17).

Table 6-1. Sierra Nevada Ecoregion Section: Estimated Impacts on Species of Mitigation Need within the GAI, by Transportation Project Delivery Year

Expected Adver-tisement Year	California Tiger Salamander: Number of Transportation Projects	California Tiger Salamander: Estimated Potential Impacts (acres)	San Joaquin Kit Fox: Number of Transportation Projects	San Joaquin Kit Fox: Estimated Potential Impacts (acres)	Springville Clarkia: Number of Transportation Projects	Springville Clarkia: Estimated Potential Impacts (acres)	Striped Adobe-lily: Number of Transportation Projects	Striped Adobe-lily: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	0	0.0	1	3.4	1	3.4
2025/26	0	0.0	0	0.0	1	0.1	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	1	0.1	1	0.1
2028/29	0	0.0	0	0.0	1	0.1	1	0.1
2029/30	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**0**	**0.0**	**4**	**3.7**	**3**	**3.6**

[a] Total may be different on account of rounding.

Figure 6-2. Sierra Nevada Ecoregion Section: Estimated Impacts on Species of Mitigation Need within the GAI, by Transportation Project Delivery Year

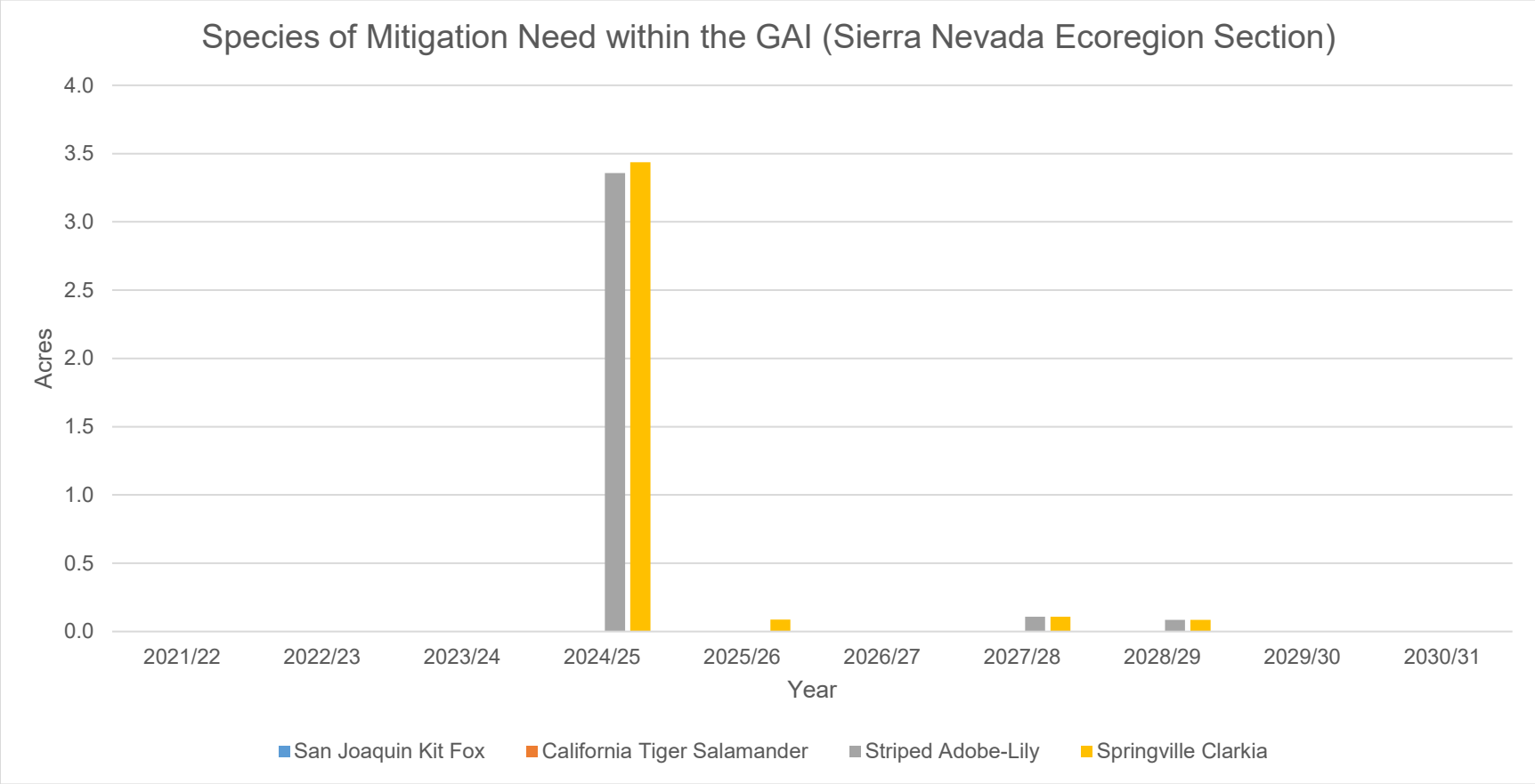


Table 6-2. Sierra Nevada Foothills Ecoregion Section: Estimated Impacts on Species of Mitigation Need within the GAI, by Transportation Project Delivery Year

Expected Adver-tisement Year	California Tiger Salamander: Number of Transportation Projects	California Tiger Salamander: Estimated Potential Impacts (acres)	San Joaquin Kit Fox: Number of Transportation Projects	San Joaquin Kit Fox: Estimated Potential Impacts (acres)	Springville Clarkia: Number of Transportation Projects	Springville Clarkia: Estimated Potential Impacts (acres)	Striped Adobe-lily: Number of Transportation Projects	Striped Adobe-lily: Estimated Potential Impacts (acres)
2021/22	0	0.0	1	1.2	1	1.1	1	0.9
2022/23	0	0.0	1	0.4	1	1.3	1	1.3
2023/24	2	4.2	2	4.2	1	3.6	1	3.6
2024/25	2	2.9	4	2.4	3	4.7	3	4.5
2025/26	1	0.2	1	<0.1	1	0.1	1	0.1
2026/27	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	1	<0.1	1	<0.1
2028/29	2	2.6	2	0.7	2	1.8	2	1.8
2029/30	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	1	0.2	2	1.4	2	1.4
Total[a]	**7**	**9.9**	**12**	**9.2**	**12**	**14.2**	**12**	**13.6**

[a] Total may be different on account of rounding.

Figure 6-3. Sierra Nevada Foothills Ecoregion Section: Estimated Impacts on Species of Mitigation Need within the GAI, by Transportation Project Delivery Year

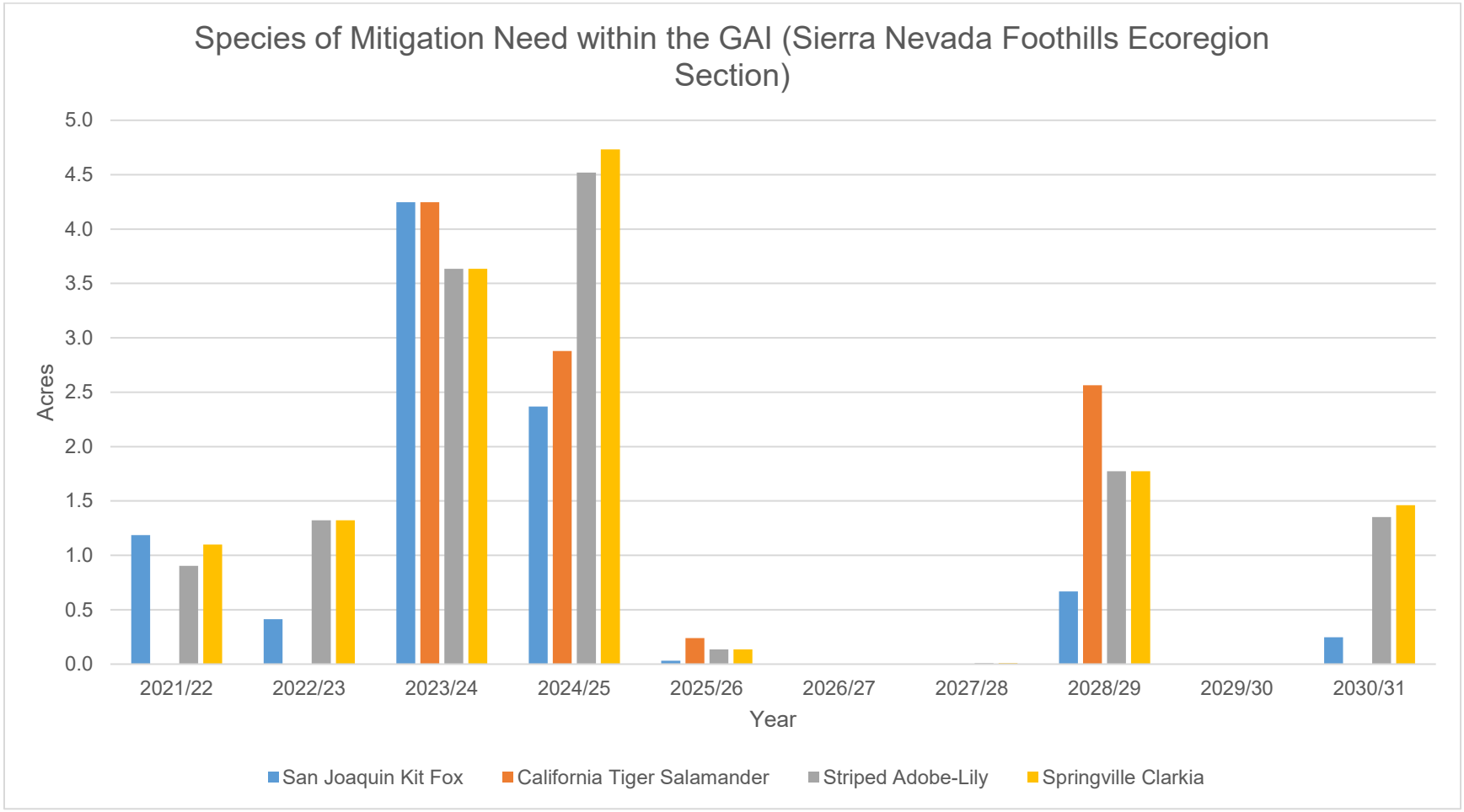


Table 6-3. Fresno River Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	1	0.2	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**0**	**0.0**	**1**	**0.2**	**0**	**0.0**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-4. Fresno River Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

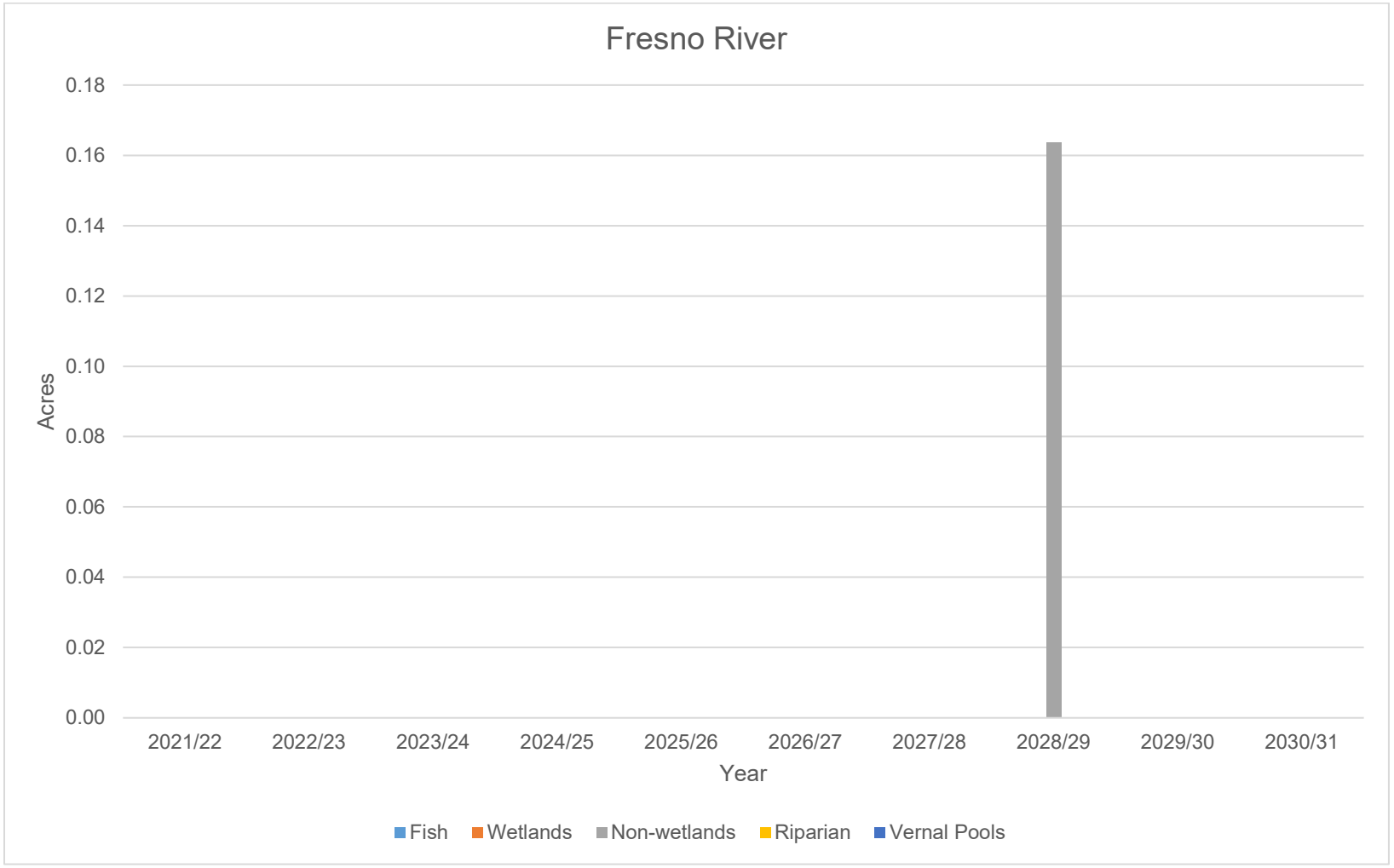


Table 6-4. Middle Kern-Upper Tehachapi-Grapevine Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	1	<0.1	1	0.1	1	<0.1	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	1	<0.1	1	1.2	1	0.3	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0
2030/31	0	0.0	1	0.1	1	0.1	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**3**	**0.1**	**4**	**1.5**	**2**	**0.3**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-5. Middle Kern-Upper Tehachapi-Grapevine Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

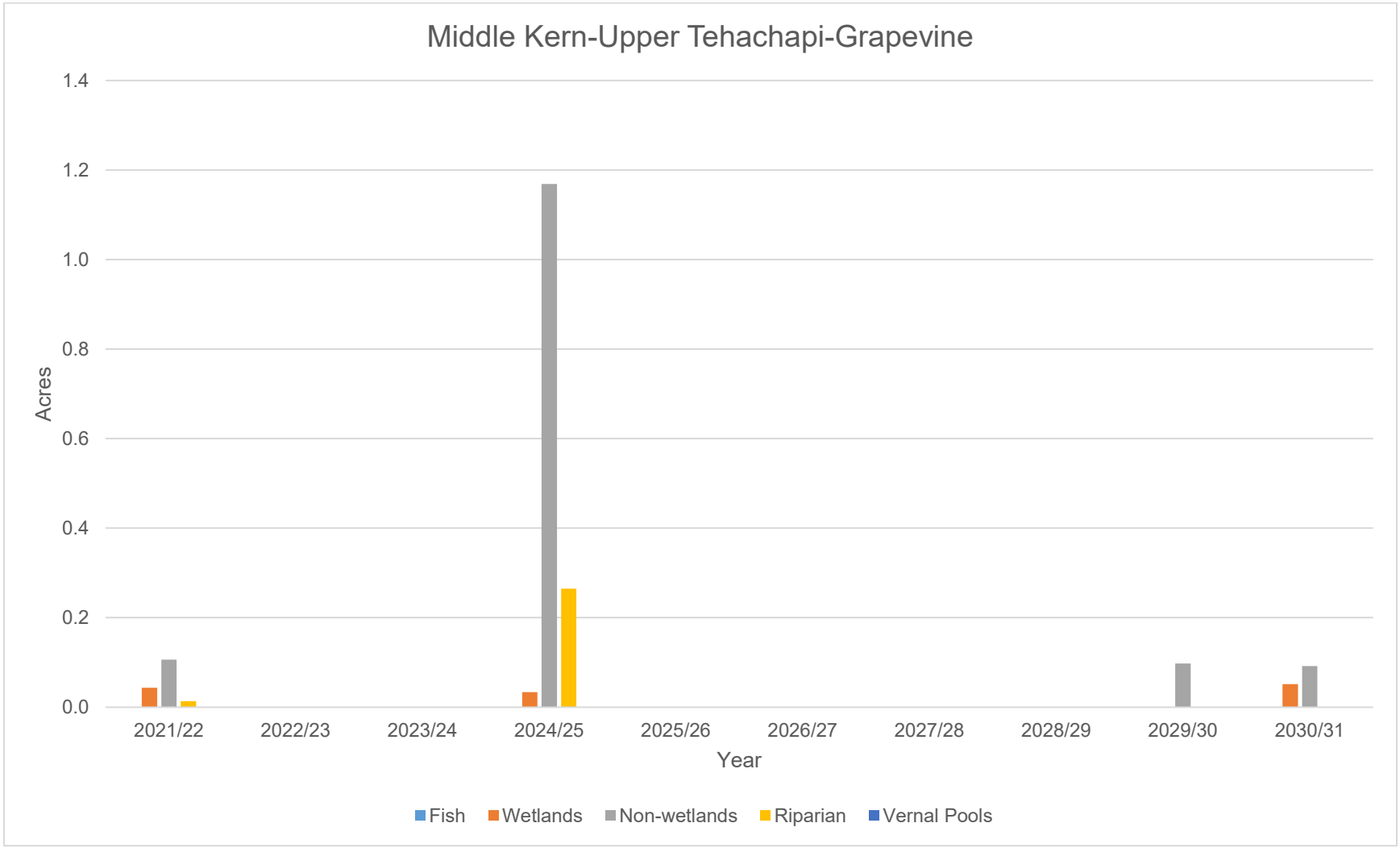


Table 6-5. Middle San Joaquin-Lower Chowchilla Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	1	<0.1	0	0.0	0	0.0	1	0.6
2024/25	0	0.0	0	0.0	1	<0.1	0	0.0	1	0.5
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	1	0.2	0	0.0	1	0.3
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**1**	**<0.1**	**2**	**0.2**	**0**	**0.0**	**3**	**1.4**

[a] Total may be different on account of rounding.

Figure 6-6. Middle San Joaquin-Lower Chowchilla Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

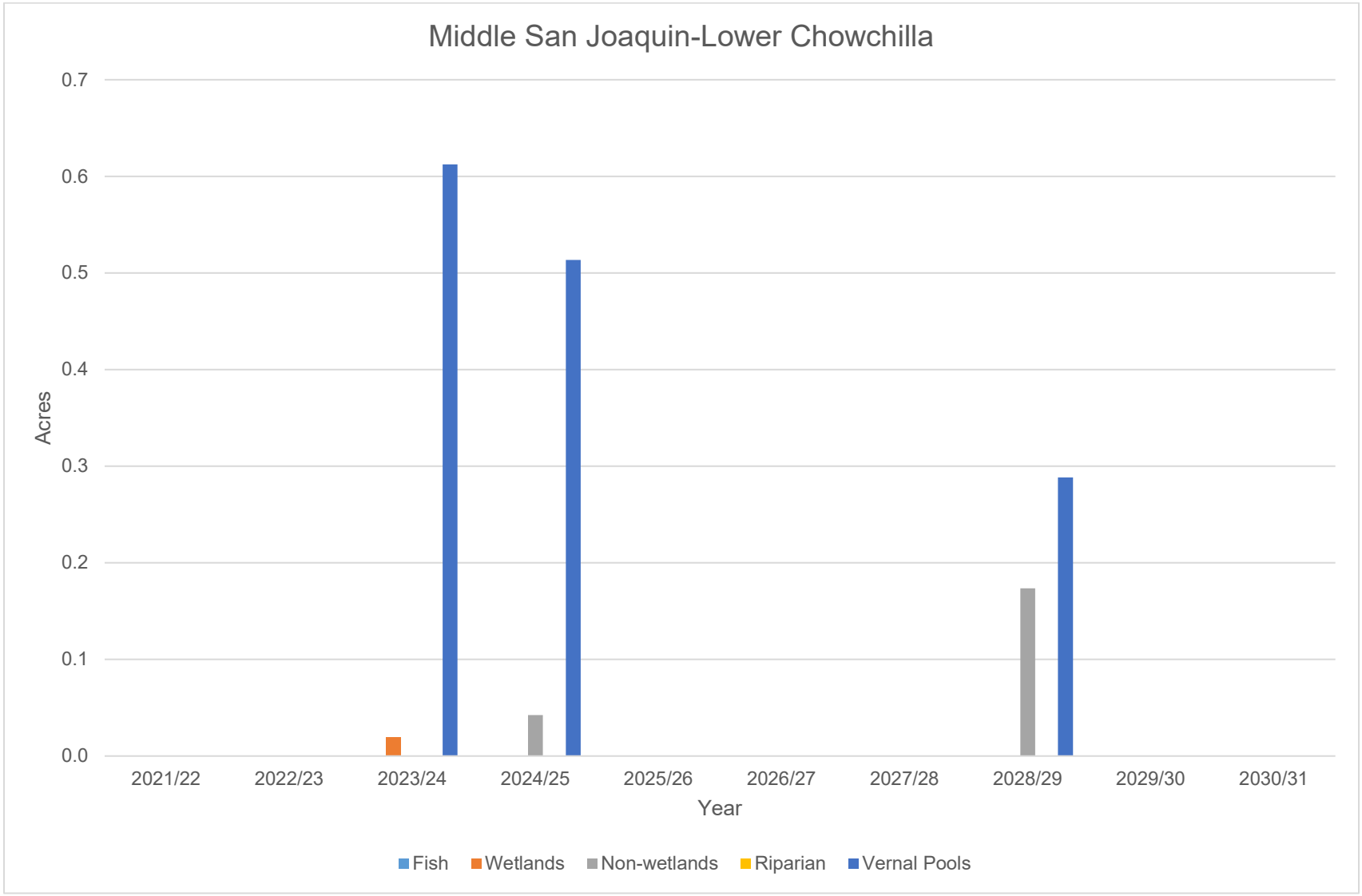


Table 6-6. South Fork Kern Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	1	0.2	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**0**	**0.0**	**1**	**0.2**	**0**	**0.0**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-7. South Fork Kern Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

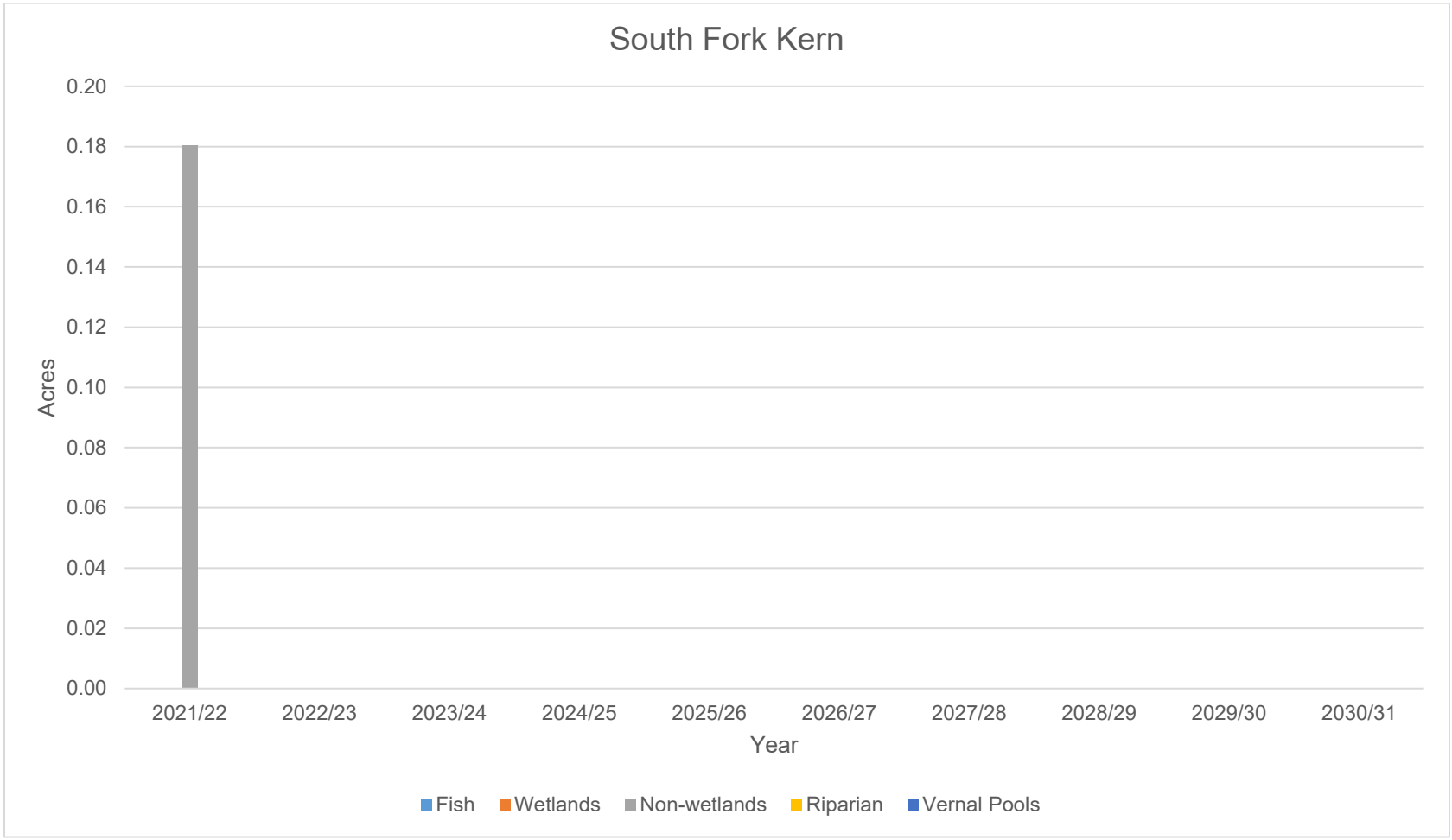


Table 6-7. Tulare Lake Bed Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	1	0.1	1	3.6	0	0.0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	1	0.2	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**0**	**0.0**	**2**	**0.2**	**1**	**3.6**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-8. Tulare Lake Bed Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

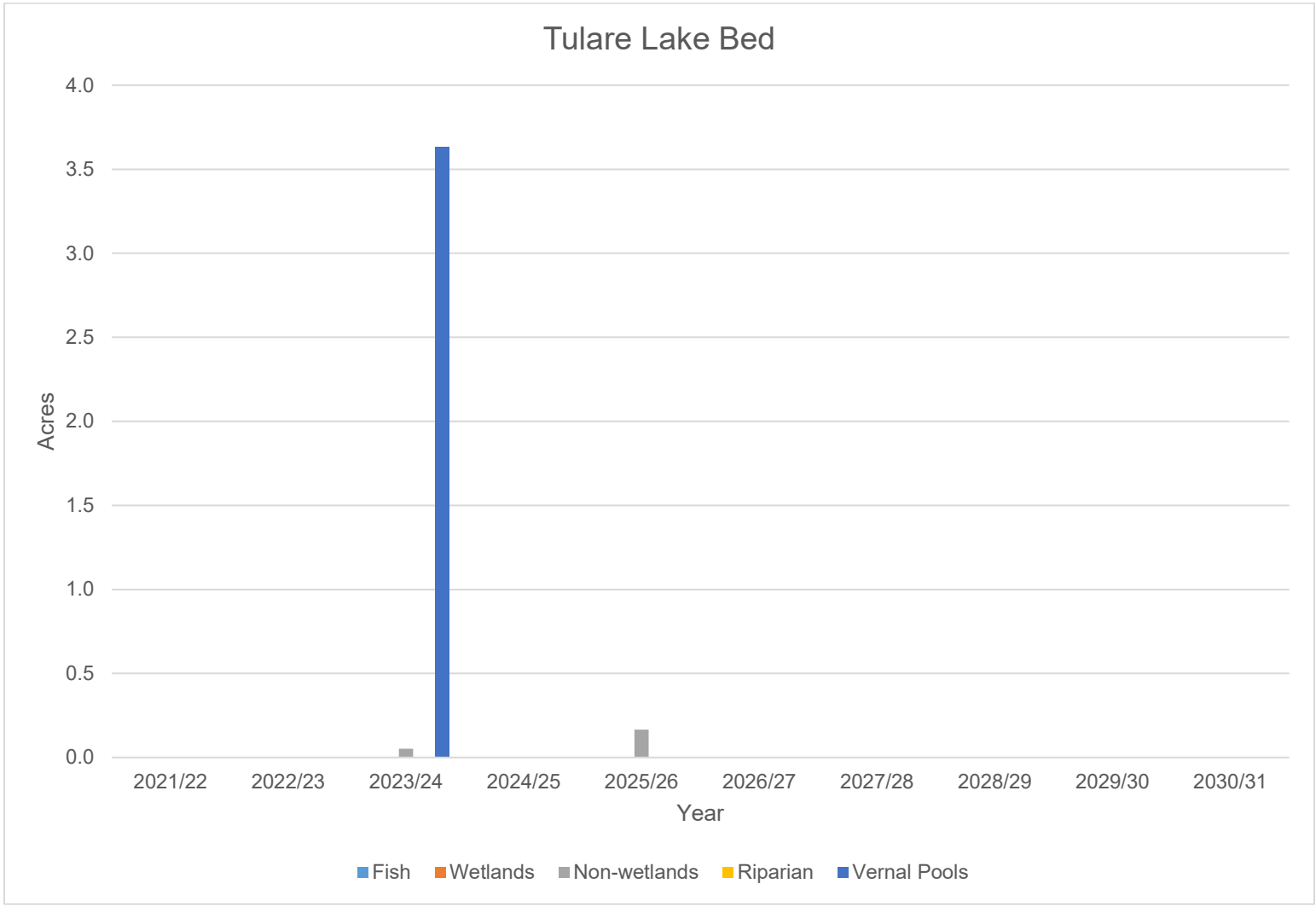


Table 6-8. Upper Deer-Upper White Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	1	<0.1	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**0**	**0.0**	**1**	**<0.1**	**0**	**0.0**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-9. Upper Deer-Upper White Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

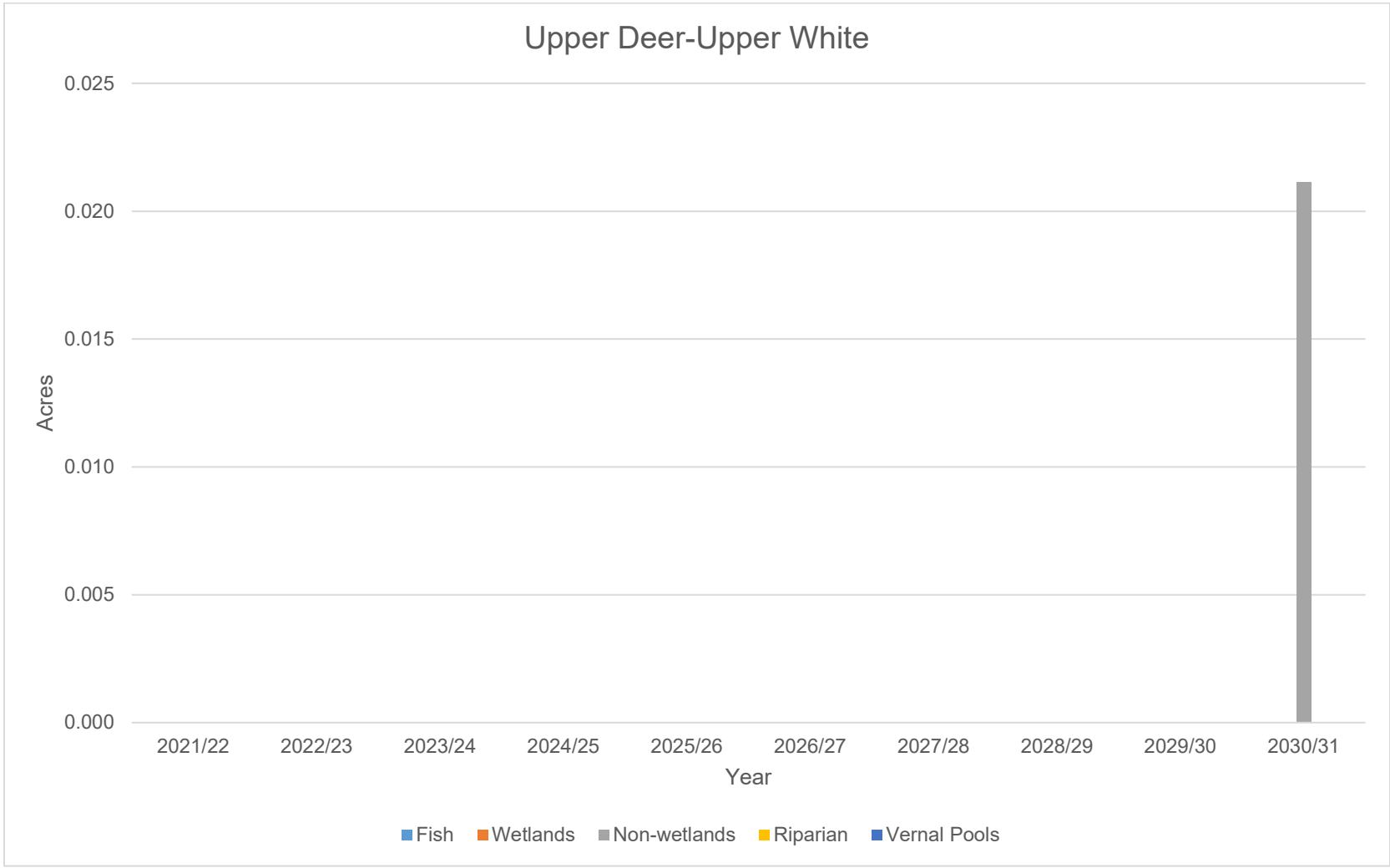


Table 6-9. Upper Dry Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	1	<0.1	1	0.2	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**1**	**<0.1**	**1**	**0.2**	**0**	**0.0**	**1**	**0.1**

[a] Total may be different on account of rounding.

Figure 6-10. Upper Dry Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

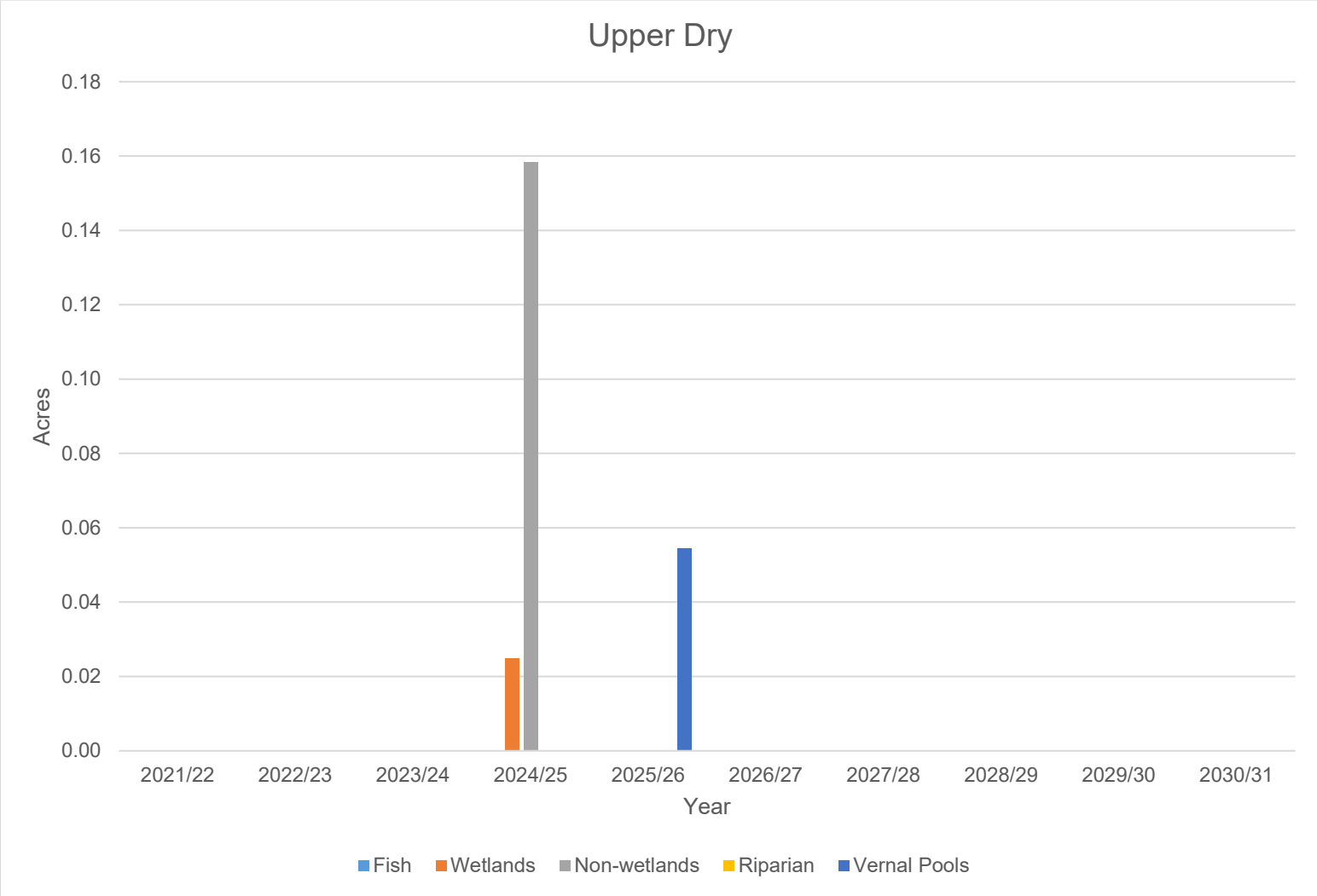


Table 6-10. Upper Kaweah Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	1	<0.1	1	<0.1
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	1	<0.1	1	0.2	1	<0.1	1	1.0
2025/26	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	1	0.3	1	0.1	1	0.4
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**1**	**<0.1**	**3**	**0.6**	**3**	**0.1**	**3**	**1.3**

[a] Total may be different on account of rounding.

Figure 6-11. Upper Kaweah Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

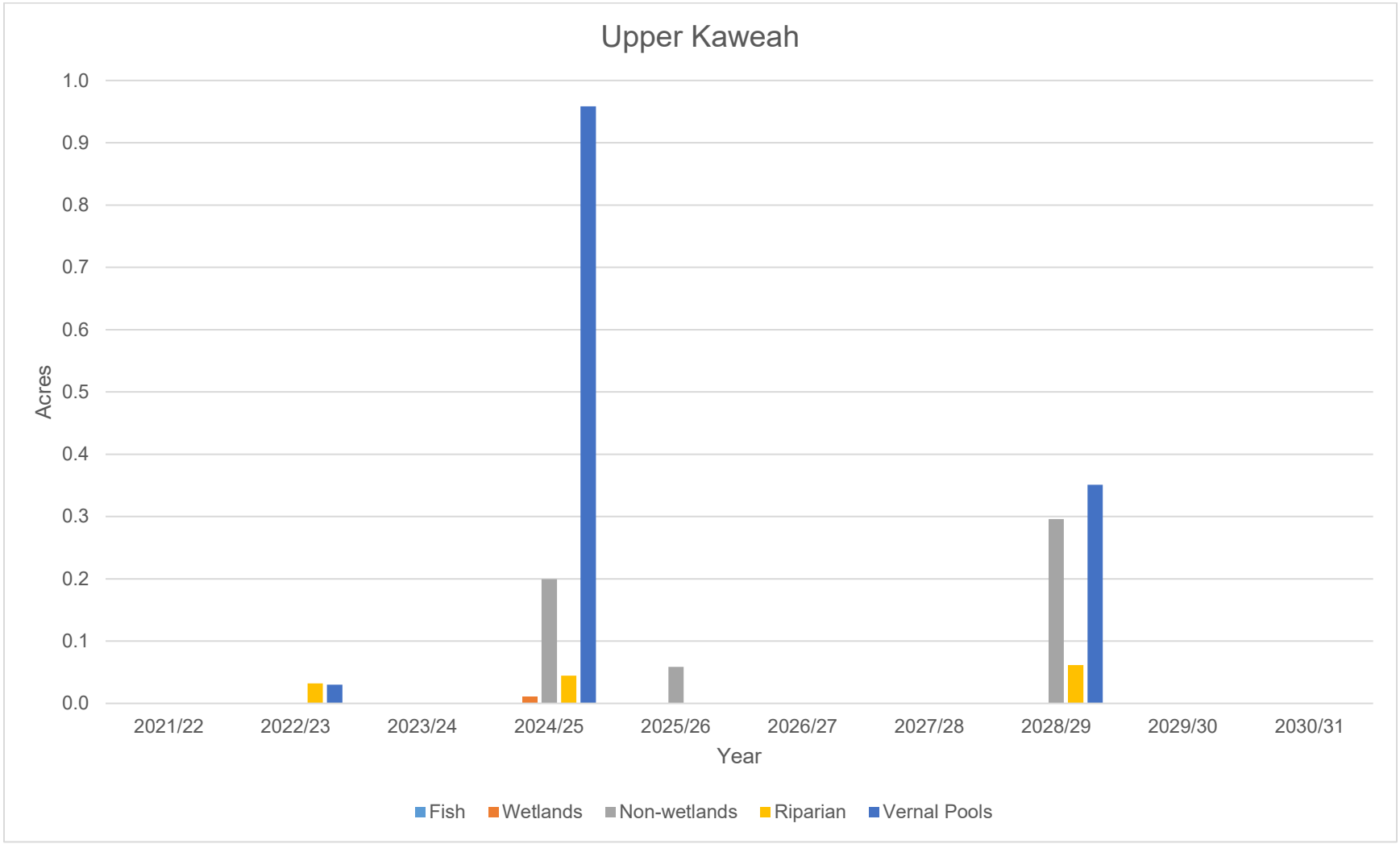


Table 6-11. Upper Kern Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	1	<0.1	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**0**	**0.0**	**1**	**<0.1**	**0**	**0.0**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-12. Upper Kern Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

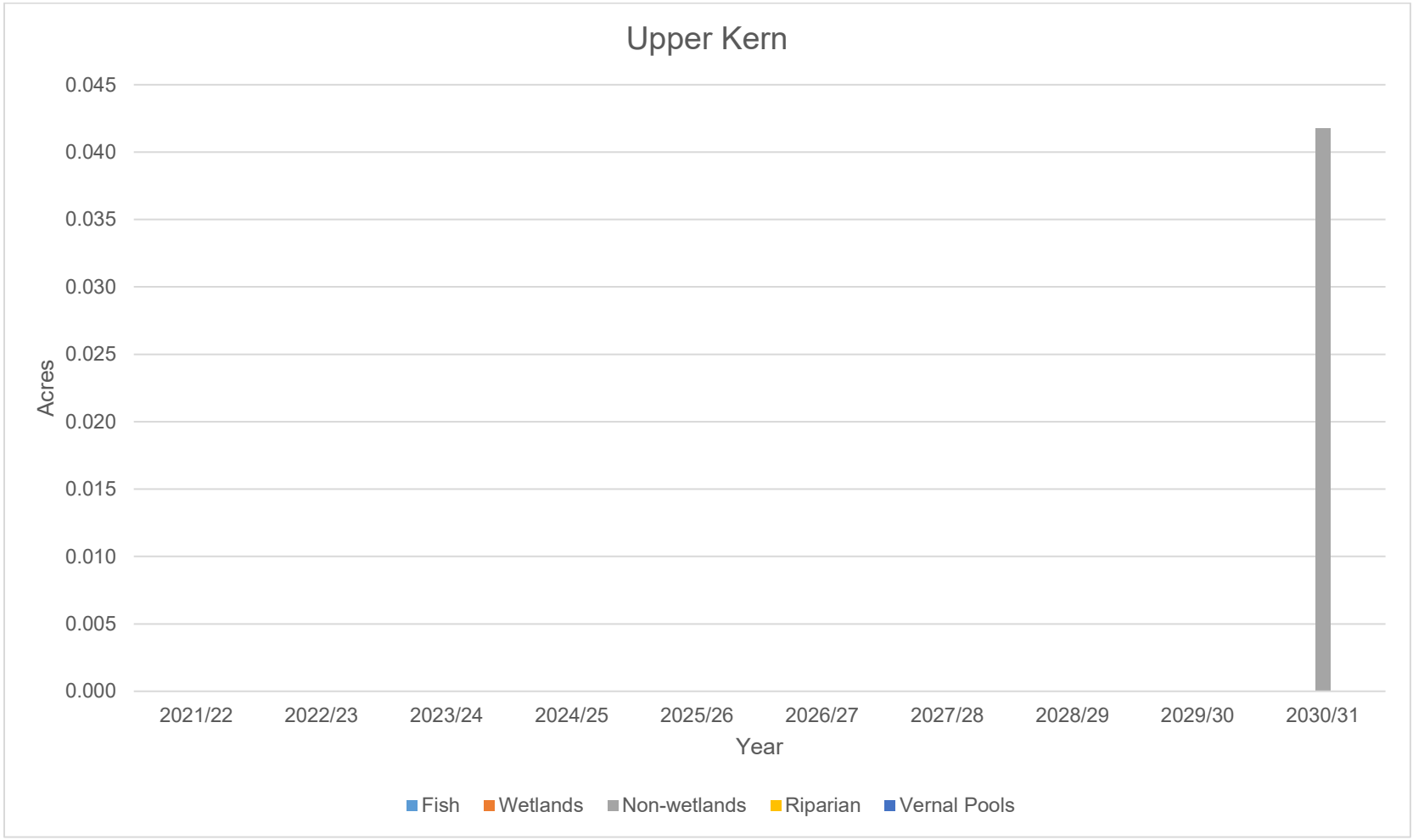


Table 6-12. Upper King Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	1	0.2	0	0.0	1	0.2	0	0.0	0	0.0
2025/26	1	0.2	0	0.0	1	0.2	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	**2**	**0.4**	**0**	**0.0**	**2**	**0.4**	**0**	**0.0**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-13. Upper King Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

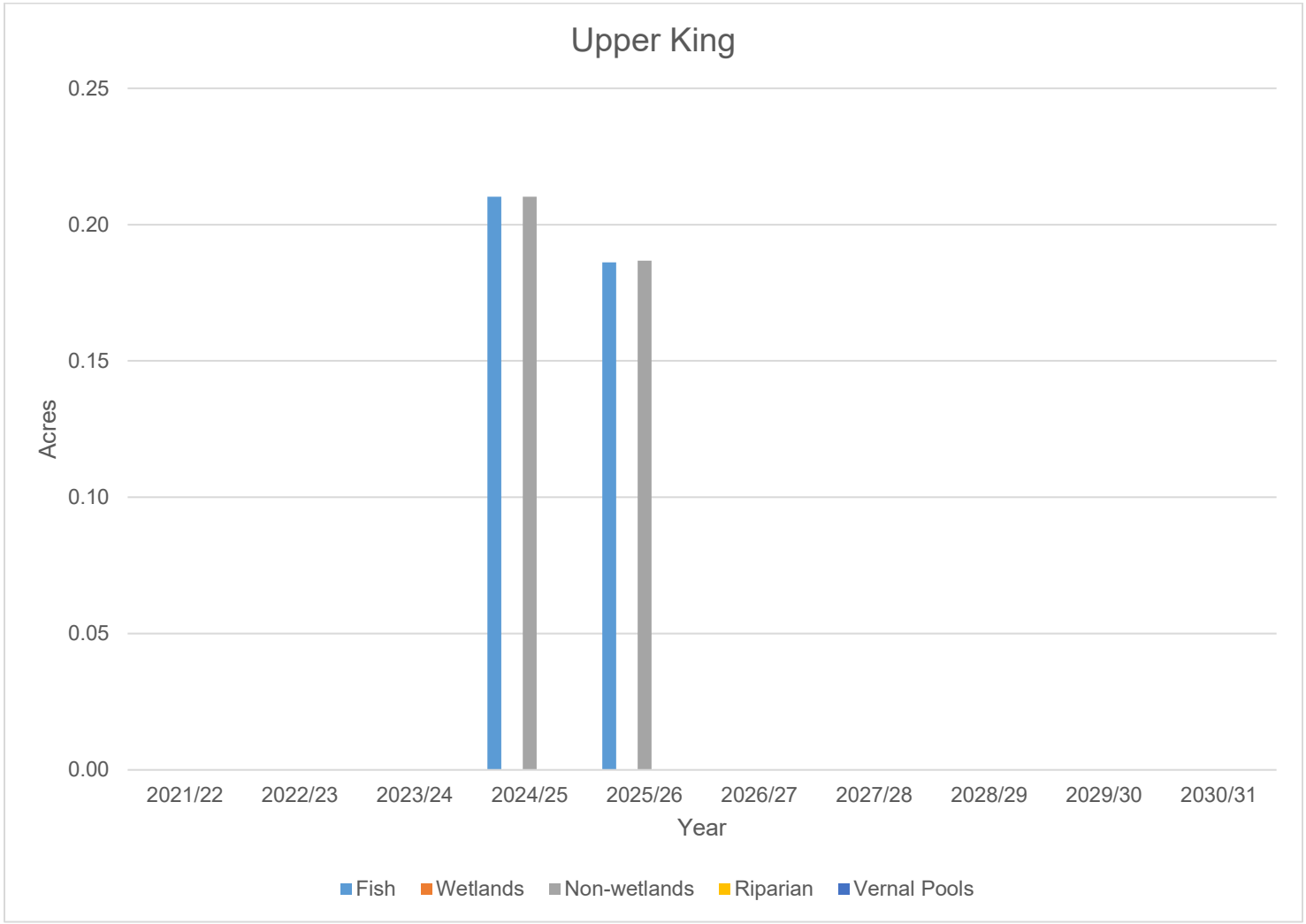


Table 6-13. Upper Poso Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	1	0.1	1	0.1	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	1	0.1	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**0**	**0.0**	**2**	**0.1**	**1**	**0.1**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-14. Upper Poso Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

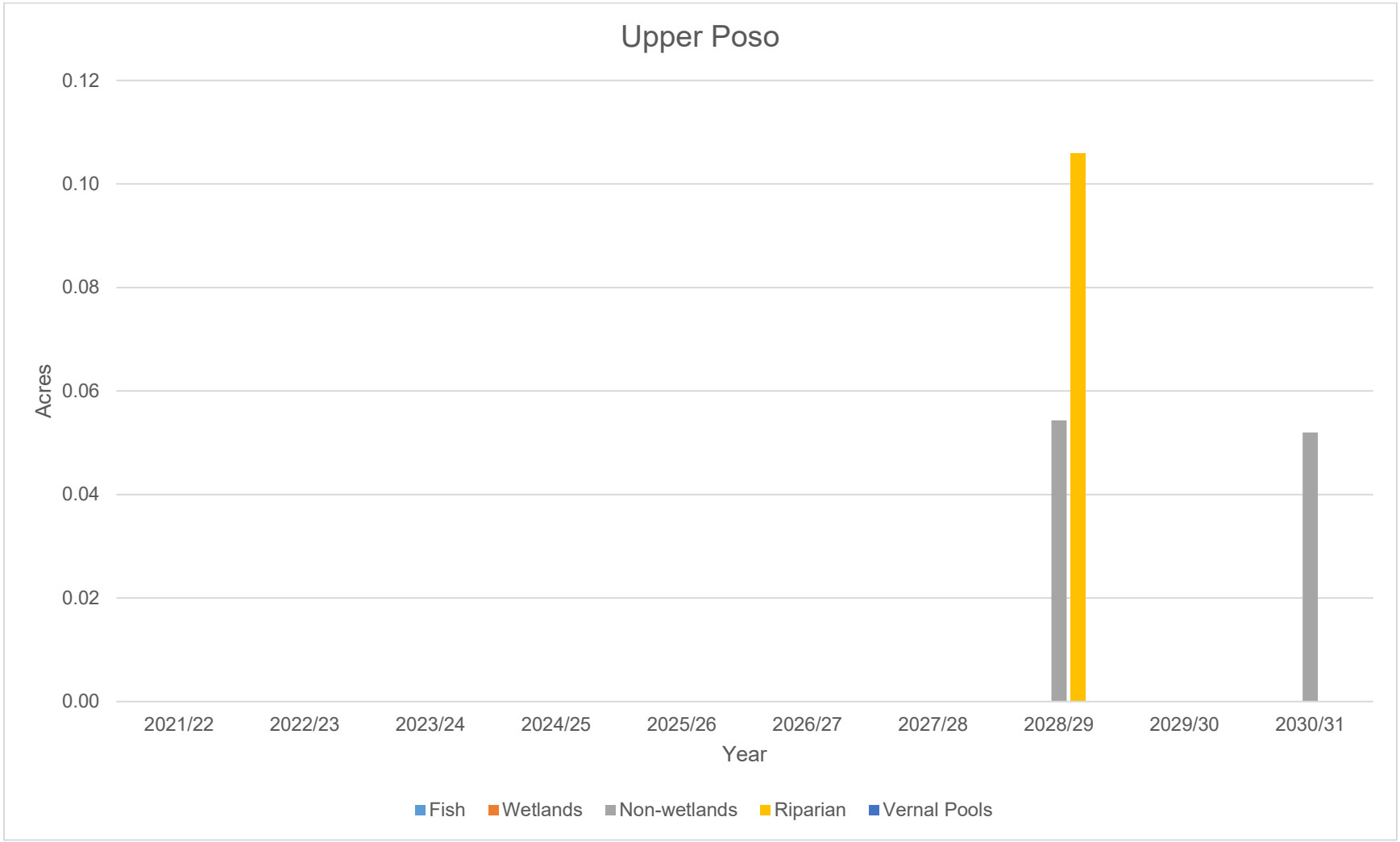


Table 6-14. Upper San Joaquin Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	1	0.5	1	<0.1	1	0.5	0	0.0	0	0.0
2025/26	1	0.3	0	0.0	1	0.3	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**2**	**0.8**	**1**	**<0.1**	**2**	**0.8**	**0**	**0.0**	**0**	**0.0**

[a] Total may be different on account of rounding.

Figure 6-15. Upper San Joaquin Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

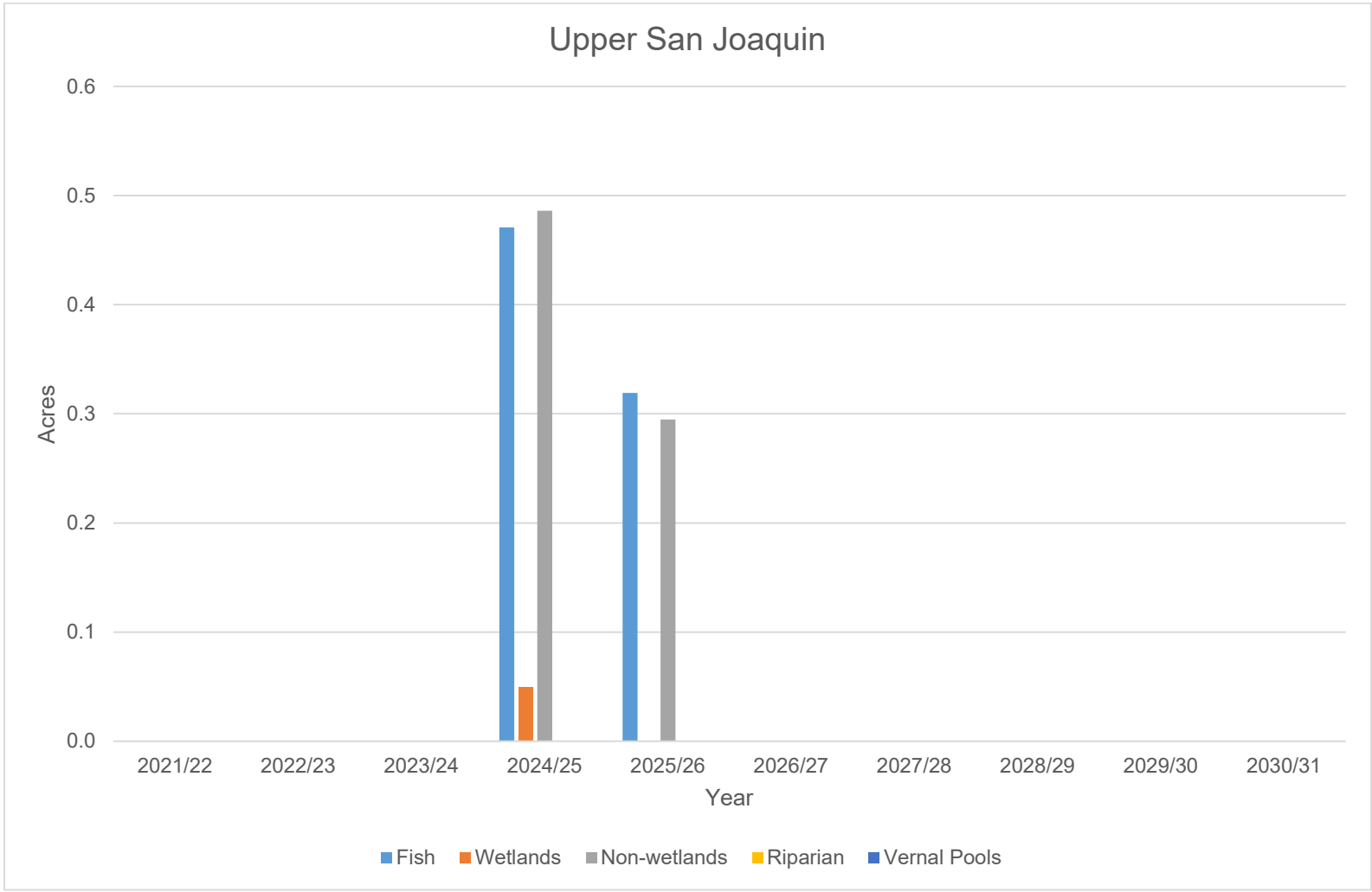
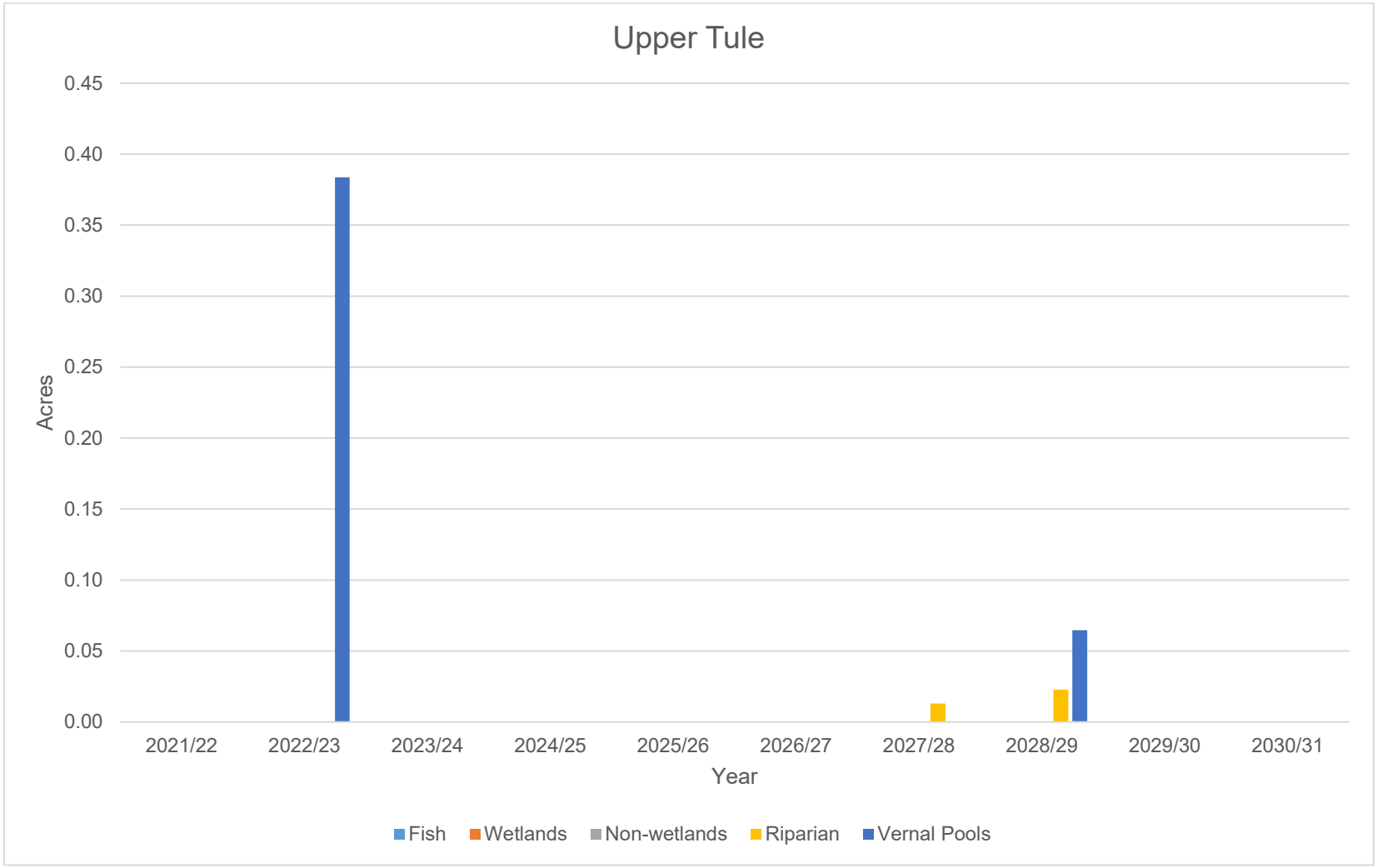


Table 6-15. Upper Tule Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Adver-tisement Year	Fish: Number of Transportation Projects	Fish: Estimated Potential Impacts (acres)	Wetland: Number of Transportation Projects	Wetland: Estimated Potential Impacts (acres)	Non-wetland waters: Number of Transportation Projects	Non-wetland waters: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	1	<0.1	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	1	<0.1	1	0.1
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**2**	**<0.1**	**2**	**0.4**

[a] Total may be different on account of rounding.

Figure 6-16. Upper Tule Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year



6.3 Acceleration Priorities

Caltrans asset management investment strategies are the policies for resource allocation that will deliver the best asset performance given available funds and the goals and objectives of state and local agencies. In other words, they are policies that will meet the district's needs and performance targets while financially balancing the district's accounts. To this end, through transportation planning, the District periodically prioritizes its transportation projects undertaken to maintain the SHS through the SHOPP, updating its transportation project sequence prioritization (Caltrans 2022). This prioritization is expressed in each update of the SHS Management Plan (Caltrans 2019b).

Impact forecasts presented here are based on the transportation project sequencing provided in the 2021/22–2030/31 (Quarter 1) SHOPP Ten-Year Book (Figure 6-17). Since it was published, however, the transportation project delivery schedules may have changed or have been discontinued. Prior to proposing advance mitigation projects, District 6 will consult the most recent SHS Management Plan to obtain an up-to-date estimate of the timing of transportation projects that may need credits established or purchased through the AMA.

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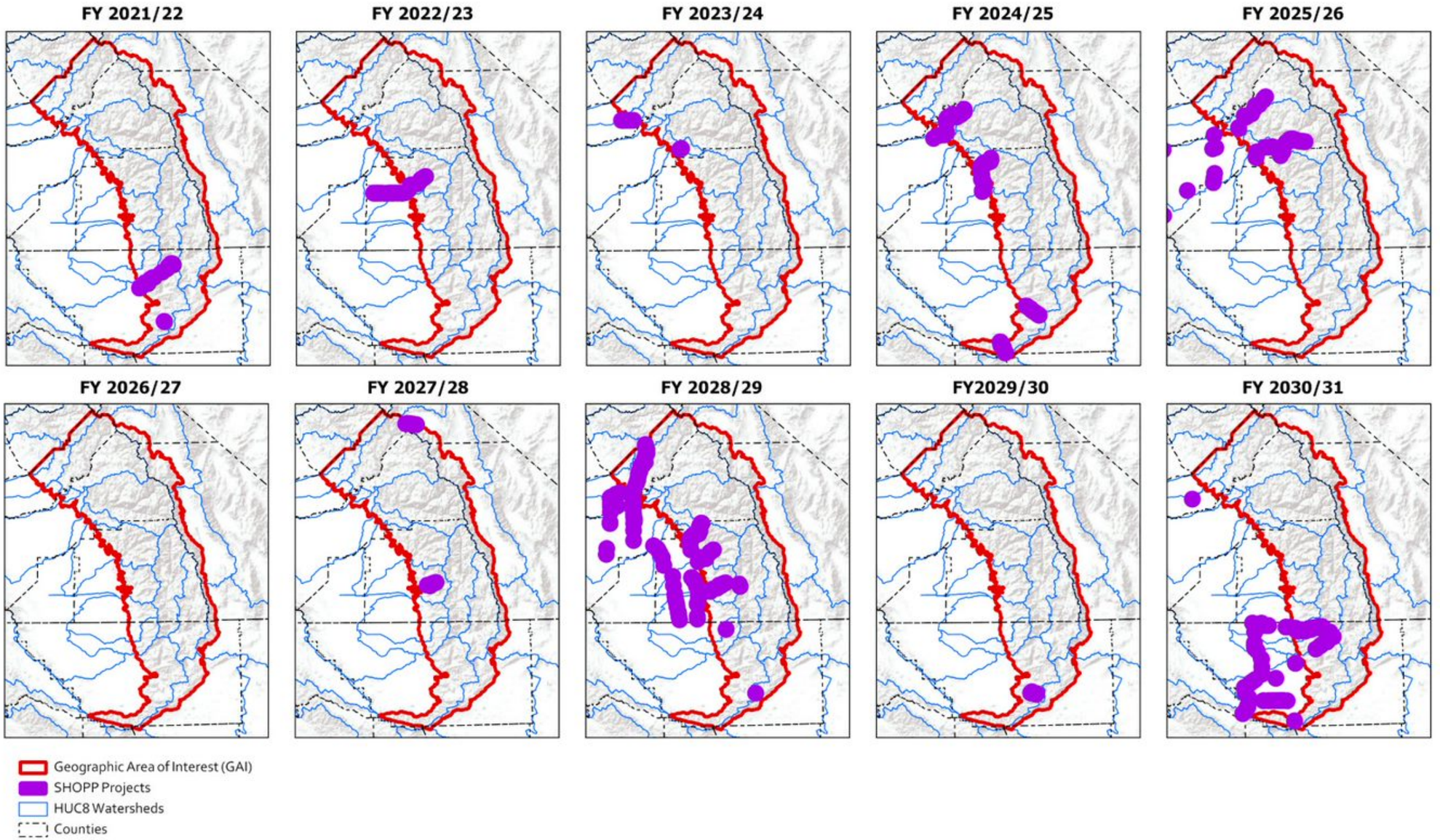
Figure 6-17. Location of SHOPP Estimated Impacts, by Transportation Project Delivery Year



Sources: Esri, USGS, NOAA, USGS

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7. WILDLIFE RESOURCES CONSERVATION GOALS AND OBJECTIVES

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

Caltrans seeks to align its advance mitigation projects with natural resource regulatory agencies' goals and objectives, thus contributing to an improved environmental outcome within the GAI. With this in mind, this chapter presents Caltrans' understanding of natural resource regulatory agencies' regional conservation goals and objectives and how they could be applied to advance mitigation projects undertaken in the GAI to offset forecast impacts on natural resources from SHOPP and STIP-eligible transportation projects.

The goals and objectives assembled for this chapter are intended to guide Caltrans' advance mitigation project scoping decisions toward those choices that provide the greatest environmental benefit available through the advance mitigation planning and delivery processes. Such projects undertaken by Caltrans should contribute to natural 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.

[1] Pursuant to SHC § 800.9, to the maximum extent practicable, the information required for an RCIS is presented in this RAMNA. 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).

To determine the natural resource conservation goals and objectives applicable to the GAI, Caltrans:

- First, in Section 7.2, identifies the natural resource regulatory agencies with the authority to condition transportation projects with natural resource-related compensatory mitigation in the GAI.
- Then, in Section 7.3, summarizes the life history information for the two plant and two wildlife species of mitigation need chosen to focus the assessment, as identified in Section 1.5.
- Next, in Sections 7.4, 7.5, and 7.6, for the species of mitigation need, identifies:
  - Federal and state binding and non-binding regional conservation and land management plans
  - Current and projected pressures and stressors for which there is a potential transportation nexus
  - Opportunities to enhance the conservation benefits through advance mitigation projects
  - Opportunities to benefit other special-status and native plant and wildlife species through advance mitigation
- Last, analyzes the aforementioned information 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 result of this analysis is a framework of conservation goals and objectives for use in advance mitigation project scoping (Section 7.7).

7.2 Natural Resource Regulatory Agencies with Natural Resources Oversight

Table 7-1 lists the natural resource regulatory agencies with the authority to condition transportation projects delivered in the GAI with natural resource-related compensatory mitigation. The aquatic resources used by wildlife, such as streams, wetlands, and non-wetland waters, are regulated by other natural resource regulatory agencies. This RAMNA identifies goals and objectives for aquatic resources, including threatened and endangered fish species, separately in Chapter 8, *Aquatic Resources Conservation Goals and Objectives*.

Table 7-1. Natural Resource Regulatory Agencies with the Authority to Approve Natural Resource Compensatory Mitigation Credits (or Values)

Agency[a]	Summary
CDFW	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 has jurisdiction over a broad range of fish and wildlife resources. FWS authorities related to these resources are codified under multiple statutes, including, but not limited to, the ESA. Most statutes give FWS an advisory role in mitigation. However, if a non-federal entity applies for an incidental take permit for a listed animal species, ESA Section 10(a)(2)(b) requires that the impact of any incidental take be minimized and mitigated to the maximum extent practicable. ESA Section 7(a)(1) also requires all federal agencies to use their authorities to conserve listed species. Many federal agencies have developed programs to include mitigation as part of the Section 7(a)(2) consultation on their proposed actions to partially fulfill this Congressional mandate. In May 2023, FWS issued a Mitigation Policy that builds upon the guidance in the 1981 Mitigation Policy for recommendations and requirements on mitigating adverse impacts of land and water developments on fish and wildlife, and an ESA Compensatory Mitigation Policy that adopts mitigation principles established in the FWS Mitigation Policy, establishes compensatory mitigation standards, and provides guidance for the application of compensatory mitigation through implementation of the ESA. Conservation banking can assist federal and non-federal participants in the Section 7 and Section 10 process. In May 2003, FWS issued comprehensive federal guidelines designed to promote conservation banks as a tool for mitigating adverse impacts on species; the guidelines foster national consistency by standardizing establishment and operational criteria. Many activities conducted under Section 7 and Section 10 of the ESA result in adverse effects on listed species, including habitat loss or modification. One way to offset these types of impacts is to include in the project design a plan that involves the restoration and/or protection of similar habitat on site and/or off site. Purchasing credits in conservation banks is one method of protecting habitat on site or off site.

Agency[a]	Summary
NMFS	NMFS has jurisdiction over marine species listed as threatened or endangered under the ESA. Federal agencies must consult with NMFS to ensure that their actions do not jeopardize the continued existence of ESA listed species or result in the destruction or adverse modification of designated critical habitat. NMFS also manages and conserves wildlife and fisheries resources in the marine and estuarine environment under the Magnuson-Stevens Fishery Conservation and Management Act. Federal agencies must consult with NMFS on any action that might adversely affect EFH. NMFS will advise federal agencies to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH. Magnuson-Stevens Fishery Conservation and Management Act EFH consultation can be done in tandem with ESA consultation. NMFS protects marine mammals under the Marine Mammal Protection Act, with the exception of sea otters, walruses, manatees, and polar bears, which are managed by FWS. With some exceptions, the Marine Mammal Protection Act prohibits the take of marine mammals, including harassment, hunting, capturing, collecting, or killing, in U.S. waters and by U.S. citizens on the high seas.

[a] In addition to the agencies listed above, the RWQCBs may exert jurisdiction over species to the extent that wildlife habitat, rare, threatened, or endangered species, warm freshwater habitat, cold freshwater habitat, or spawning, reproduction, and/or early development 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, *Environmental Setting*. 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 terrestrial species of mitigation need identified for the GAI are Springville clarkia, striped adobe-lily, California tiger salamander, and San Joaquin kit fox. Each species is briefly described below.

7.3.1. Springville Clarkia

Springville clarkia is a federally threatened and state endangered plant species. This species has a very narrow range, occurring entirely within the Tule River watershed of Tulare County in the southern Sierra Nevada foothills between the communities of Three Rivers in the north and White River in the south (Calflora 2023). It grows mostly within chaparral and blue oak (*Quercus douglasii*) woodland communities on the slope of road banks, on small decomposing granitic domes, and in sunny openings between elevations of 1,080 and 4,000 feet above mean sea level (FWS 2022).

Springville clarkia is an annual herb in the evening primrose family (Onagraceae). Individuals of this species can grow to be roughly 3 feet tall and their lavender-pink flowers with deep purple basal spots bloom between May and July. Seed germination occurs in late November and early December. Their seeds can remain dormant for 2 years or more, forming a soil seed bank that helps maintain genetic diversity. Springville clarkia is thought to bloom earlier than the sympatric elegant clarkia (*Clarkia unguiculata*), although there is some overlap in their blooming periods, which results in the potential for hybridization (FWS 2022). Elegant clarkia is also endemic to California but is far more

widespread in the state than Springville clarkia and is not considered a special-status species (Calflora 2023).

7.3.2. Striped Adobe-lily

Striped adobe-lily is a state threatened plant species. Like Springville clarkia, this species also has a very narrow range, occurring only from near the town of Porterville in Tulare County and then south along the southern Sierra Nevada foothills to the Tejon Hills just north of the Tehachapi Mountains. It grows mostly within foothill grassland and cismontane woodland communities with heavy clay adobe soils between elevations of 440 and 4,790 feet above mean sea level (Calflora 2023).

Striped adobe-lily is a perennial herb (bulb) in the lily family (Liliaceae). Individuals of this species are deep-rooted, seated 8 to 14 inches underground, and grow roughly 9 to 15 inches tall. Their white to pink (sometimes burgundy) red-striped flowers bloom between February and April. Historically, the largest populations of striped adobe-lily grew on more level ground at the base of the foothills where the deepest clay soils provided ample soil moisture. Over the past century, conversion to orchards has rendered the species extirpated from much of these historic locations, leaving the remnant populations to grow in what was likely formerly considered marginal habitat (Stebbins 1989).

7.3.3. California Tiger Salamander

California tiger salamander is a federally and state threatened amphibian. There are three DPS of California tiger salamander: the Central California DPS, Santa Barbara County DPS, and Sonoma County DPS (FWS 2005a). The Central California DPS is the only one that occurs in the GAI. 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. Most of the historical Central Valley populations of this California endemic species have been extirpated. Typical habitat associations include grassland, oak savanna, and edges of mixed woodland and lower-elevation coniferous forest. 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 2017b).

California tiger salamanders require both suitable upland (terrestrial) habitat for refuge and aquatic habitat for breeding and larval development. They spend most of their lives underground, relying on a network of burrows created by small mammal species such as Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Otospermophilus beecheyi*), and moles (*Scapanus* spp.). 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. Optimal breeding ponds are ephemeral, forming in winter and drying in summer, and free of predatory nonnative fish and bullfrogs.

7.3.4. 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. San Joaquin kit fox is typically found in areas with open, level, sandy ground. Historically, it 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. This primarily nocturnal species uses subsurface dens extending 6 or more feet below ground for shelter and reproduction (FWS 2020).

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. These conservation and land management plans are presented in Table 7-2.

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

Document	Reference	Areas of Important Habitat
Special-status Species and Sensitive Habitat Documents	See below	See below
*5-Year Review Springville Clarkia (*Clarkia springvillensis*)*	FWS 2022	Shows the distribution of Springville clarkia and identifies threats to the species.
Population Status and Management Analysis of Clarkia springvillensis*,* Fritillaria striata*, and* Pseudobahia peirsonii *in the San Joaquin Valley California*	Stebbins 1991	Describes the status of Springville clarkia and striped adobe lily at the time the document was written. The document also summarizes protection measures for each occurrence that was known at the time.
Striped Adobe Lily Species Management Plan	Stebbins 1989	Summarizes known information about the species at the time it was written and presents multiple goals centered on topics of research for the species with the intention of improving management practices.
California Tiger Salamander Central California DPS Designation of Critical Habitat	FWS 2005a	Identifies critical habitat for the Central California DPS California tiger salamander.
California Tiger Salamander Central California DPS 5-Year Review	FWS 2014	Identifies protected lands that have known occurrences of California tiger salamander.
*Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)*	FWS 2017b	Identifies California tiger salamander Recovery Units and their respective Management Units. The GAI falls within the Central Valley and Southern San Joaquin Valley Recovery Units.
*Recovery Plan of Upland Species of the San Joaquin Valley: San Joaquin Kit Fox (*Vulpes macrotis mutica*)*	FWS 1998	Recovery plan for 11 listed species and 23 candidate species in the San Joaquin Valley, which includes San Joaquin kit fox. Site-specific recovery criteria are itemized in Table 5 of the recovery plan.
Five-Year Status Review for San Joaquin Kit Fox (Vulpes macrotis mutica)	FWS 2010	Identifies core, linkage, and satellite areas for San Joaquin kit fox within their distribution and identifies threats to the subspecies.

Document	Reference	Areas of Important Habitat
Conservation and Land Management Documents	See below	See below
California Essential Habitat Connectivity Project (CEHC)	Spencer et al. 2010	Identifies Natural Landscape Blocks and Essential Connectivity Areas in a set of defined ecoregions. The GAI falls entirely within the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections. Notes that most Essential Connectivity Areas in the GAI connect between high-elevation parks and wilderness areas, through multiuse USFS and private lands, to Natural Landscape Blocks at lower elevations. Map shows a lack of north-to-south connectivity along large expanses of the western slope of the Sierra Nevada, so there is opportunity to improve connectivity for a wide array of species in this area.
California Wildlife Movement Barriers: 2020 Priority Wildlife Movement Barrier Locations by Region	CDFW 2020a	Within the GAI, identifies four highway segments (Tehachapi Grade along SR 58, the Grapevine portion of Interstate 5, and Canebrake along SR 178 in Kern County, as well as the Kings Canyon Foothills portion of SR 180 in Fresno County) as wildlife passage priorities for kit fox (Grapevine only), mule deer, mountain lion, black bear, and American badger.
Hopper Mountain, Bitter Creek, and Blue Ridge National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Assessment	FWS 2013	FWS' management plan covering three national wildlife refuges, of which the Bitter Creek and Blue Ridge National Wildlife Refuges occur in the GAI. San Joaquin kit fox is known to occur at Bitter Creek National Wildlife Refuge. Goals pertaining to the Bitter Creek National Wildlife Refuge relevant to this RAMNA include: ▪ Enhance 9,000 acres of grassland habitat for special-status species in the San Joaquin Valley. ▪ Restore and enhance riparian habitat by modifying water control structures to restore natural flows. ▪ Remove invasive saltcedar and selectively replant with native riparian species.
Lost Lake Park Master Plan	Fresno County Public Works and Planning Department 2011	Fresno County's plan for the management of Lost Lake Park. Included in the plan is a goal to restore the San Joaquin River floodplain, seasonal wetlands, and riparian vegetation along riparian corridors within the park. California tiger salamander is known to occur in the park.
Millerton Lake State Recreation Area Resource Management Plan	California State Parks 2010	Management plan for Millerton State Recreation Area on the border of Fresno and Madera Counties. California tiger salamander is known to occur at Millerton Lake State Recreation Area.

Document	Reference	Areas of Important Habitat
California State Wildlife Action Plan (SWAP)	CDFW 2015a	The GAI overlaps one of the SWAP's defined geographic provinces: ▪ Central Valley and Sierra Nevada Province: o In the Central Valley and Sierra Nevada Province, only one species of mitigation need (California tiger salamander) is considered a Species of Greatest Conservation Need. ▪ The SWAP defines a broad target of increasing the acreage of specific vegetation types and habitats available to focal species by 5 percent over their 2015 levels by 2025.
Wildlife Connectivity Across the Northern Sierra Nevada Foothills	CDFW 2015b	▪ Builds on the statewide CEHC work, as recommended in the CEHC project report. ▪ Project objectives were to take a fine-scale look at connectivity within the Northern Sierra Nevada Foothills and between there and adjacent lands in the Central Valley and Sierra Nevada, using species-specific data to model connections between blocks of protected lands. ▪ The study area overlaps only the northernmost portion of the GAI in Madera County.
City and County General Plans	See below	See below
Kern County General Plan	Kern County 2009	General plan for Kern County. Includes land use designations of resource reserve and resource management.
Porterville General Plan	City of Porterville 2007	General plan for Porterville. San Joaquin kit fox, striped adobe-lily, and Springville clarkia are known to occur in the planning area. Identifies goals for the enhancement of wetlands, vernal pools, and the Tule River. Contains land use designation for open space and conservation.

The 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 that approve mitigation.

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 its habitat. According to the SWAP (CDFW 2015a), 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 2015a). The *5-Year Review Springville Clarkia (*Clarkia springvillensis*)* (FWS 2022), *Striped Adobe Lily Species Management Plan* (Stebbins 1989), *California Tiger Salamander Central California DPS 5-year Review* (FWS 2014), and *Five-Year Status Review for San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 2010) refer to these 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 2010, 2014, 2022). 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 whether the species of mitigation need could benefit from in-kind compensatory 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 the species of mitigation need. Additionally, roads and urbanization have resulted in habitat fragmentation and a decrease in connectivity between habitats that support wildlife species of mitigation need populations, as well as increased mortality of wildlife species from vehicle strikes.

Road maintenance activities, road improvements, and competition from nonnative plants are currently listed as the primary threats to Springville clarkia (FWS 2022). Over the twentieth century, agricultural land conversion led to the extirpation of many populations of striped adobe-lily, with remaining populations subject to various degrees of livestock grazing (Stebbins 1991). Given their affinity for clay soils, which are notoriously unstable during the wet season, emergency slope stabilization activities are another potential threat to striped adobe-lily (Stebbins 1989).

Roads and highways hinder the movement of California tiger salamanders and San Joaquin kit foxes and are considered permanent physical barriers leading to increased habitat fragmentation and isolation of populations (FWS 2010, 2014). Roads that are poorly constructed or inadequately maintained near aquatic habitats may lead to increased erosion, sedimentation, and petrochemical runoff, negatively affecting populations of California tiger salamander (FWS 2017b). Artificial light pollution from urban and roadway illumination can affect wildlife by causing spatial disorientation, disruption in circadian rhythms, and alteration to natural foraging, breeding, and migration activity, which can negatively affect populations (Bliss-Ketchum et al. 2016).

Culverts under roads may provide some connectivity for various species but, if not constructed properly, they can impede dispersal and trap some species such as California tiger salamander. In some instances, culverts may result in deep scoured pools that can support predatory fish and frogs or provide habitat where premature drying is a threat. In addition, corrugated metal culverts have uneven surfaces that may prevent easy passage for smaller wildlife or may have varying temperatures from the surrounding air temperature that may be harmful to wildlife (Caltrans 2021g). Loss and modification of habitat as a result of agricultural conversion, infrastructure construction, oil extraction and mining activities, solar development, and urban development represent the largest threats to San Joaquin kit fox (FWS 2010).

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 may result in a reduction of biodiversity, degradation of habitat, alteration of native genetic diversity, shifting of habitat types, and further threats to already endangered or threatened natural resources.

Competition from nonnative plants is a primary threat to Springville clarkia. The Springville Clarkia Ecological Reserve, managed by CDFW, excludes livestock grazing, road maintenance activities, and road improvements for the benefit of Springville clarkia. However, the nonnative Italian thistle (*Carduus pycnocephalus*) is competing with Springville clarkia at the reserve and is not currently managed because of a lack of funding (FWS 2022). Nonnative herbs, such as oats (*Avena* spp.), mustard (*Brassica* and *Sisymbrium* spp.), brome (*Bromus* spp.), and wild radish (*Raphanus* spp.) are known to compete with striped adobe-lily for light and nutrients, especially at degraded sites (Stebbins 1989). Invasive grasses can be a major problem for California tiger salamander. 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 California tiger salamander (FWS 2017b).

Introduced fish and bullfrogs are known to predate California tiger salamanders (FWS 2017b). The invasive barred tiger salamander is known to hybridize with California tiger salamander, producing offspring that are more likely to survive than either parent species. These hybrids have been shown to negatively affect populations of the native

California tiger salamander (Ryan et al. 2009). Changes to vegetative structure attributable to the introduction of nonnative plant species is listed as a potential threat to San Joaquin kit fox habitat (FWS 2010).

7.5.3. Disease and Predation

Disease is considered a threat to California tiger salamander, which is affected by various forms of ranavirus and a chytrid fungus that can lead to mortality and has the potential to affect populations (FWS 2017b). Canine distemper and canine parvovirus have been detected in San Joaquin kit fox populations, but serological studies through the late twentieth century found no evidence that these or other diseases were an important mortality factor for the species (FWS 2010). However, starting in 2013, an outbreak of sarcoptic mange in the Bakersfield population has led to a significant decline in San Joaquin kit fox numbers (FWS 2020).

Predation is considered a major threat to California tiger salamanders, which are susceptible to predation from invasive species including bullfrogs, crayfish, and nonnative fish (FWS 2017b). Predation is considered a significant threat to San Joaquin kit fox, which are extensively preyed upon by coyote, bobcat, and, to a lesser extent, red fox (*Vulpes vulpes*), American badger (*Taxidea taxus*), and golden eagle (*Aquila chrysaetos*).

7.5.4. Climate Change, Drought, and Wildfire

Section 2.4 provides a brief overview of the GAI's climate and available planning-level predictions for climate change in the region. In the next 30 years, the climate is expected to change. Predicted climate change effects 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 drought, wildfires, and landslides (Caltrans 2018b).

Terrestrial connectivity in the GAI, including large remaining blocks of intact habitat or natural landscape, is shown on 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 of the wildlife species toward more suitable habitat as the climate changes, and by providing protection for the ecological processes that support key habitats for all four species. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a) is presented on Figure 2-5. Climate resilience is low along the base of the Sierra Nevada Range, with much of the area having a rank of only 1 or 2. It is in these low-elevation locations that impacts from climate change are expected to be the most severe in the GAI.

Many of those who manage land for Springville clarkia cite climate change and drought as significant threats to the species. For example, a known colony of Springville clarkia along Balch Park Road near the type locality was noted during informal surveys in 2021 to only have two plants present where there are typically hundreds. Another known colony in a nearby location had no plants present for 3 consecutive years, while at other known locations some plants were observed blooming earlier than their typical bloom period,

with flowers desiccating before fruiting. Observers have hypothesized that climate change may have the potential to disrupt seed production in this way (FWS 2022).

Climate change is expected to bring with it an increased risk of wildfires (Caltrans 2018b), which could be detrimental to all the species of mitigation need. Following fires, native vegetation is often outcompeted by nonnative annual grasses, which can dominate the system and permanently alter the habitat, rendering it less appropriate for Springville clarkia and striped adobe-lily. Fire can have beneficial effects on rare plants, such as controlling the growth of over-mature woody and perennial species such as chamise (*Adenostoma fasciculatum*) that are known to compete with Springville clarkia, especially in chaparral habitat. However, high-intensity, long-duration, and spring to early-summer fires may deplete the soil seed bank, create hydrophobic soil layers, and result in unfavorable microhabitat conditions for Springville clarkia (FWS 2022).

California tiger salamander may be affected by climate change through a decrease in hydroperiods necessary 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 in 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 salamanders under higher temperatures (FWS 2017b). 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).

Increased variability in rainfall as a result of climate change has the potential to affect San Joaquin kit fox populations. High amounts of precipitation in habitats now dominated by nonnative, annual grasses lead to dense, tall growth that is unsuitable for both San Joaquin kit fox and its primary prey, kangaroo rats (*Dipodomys* spp.). Conversely, persistent dry conditions lead to low primary productivity that cannot support kangaroo rats and results in a corresponding decline in kit fox populations (Nogeire-McRae et al. 2019).

7.5.5. Contaminants

Pesticides, herbicides, mineral fertilizers, industrial chemicals, and airborne pollutants are known to have negative effects on amphibians. Amphibians are especially susceptible to contaminants in their environment because of their highly permeable skin. Exposure to pesticides has been shown to increase the susceptibility of salamanders in the genus *Ambystoma* to parasitic or bacterial infections (FWS 2014).

While not directly related to contaminants, the application of rodenticides and other rodent control methods pose a threat to California tiger salamander by removing rodents from the landscape and preventing new burrow construction, thus reducing upland habitat for California tiger salamander (FWS 2017b). This would have a negative effect on San Joaquin kit fox as well by reducing their prey base. San Joaquin kit foxes exposed to anticoagulant rodenticides through their prey experience adverse effects on an individual

basis, although to this point long-term effects of this on their populations need further study (Nogeire-McRae et al. 2019).

7.6 Multi-species Benefits

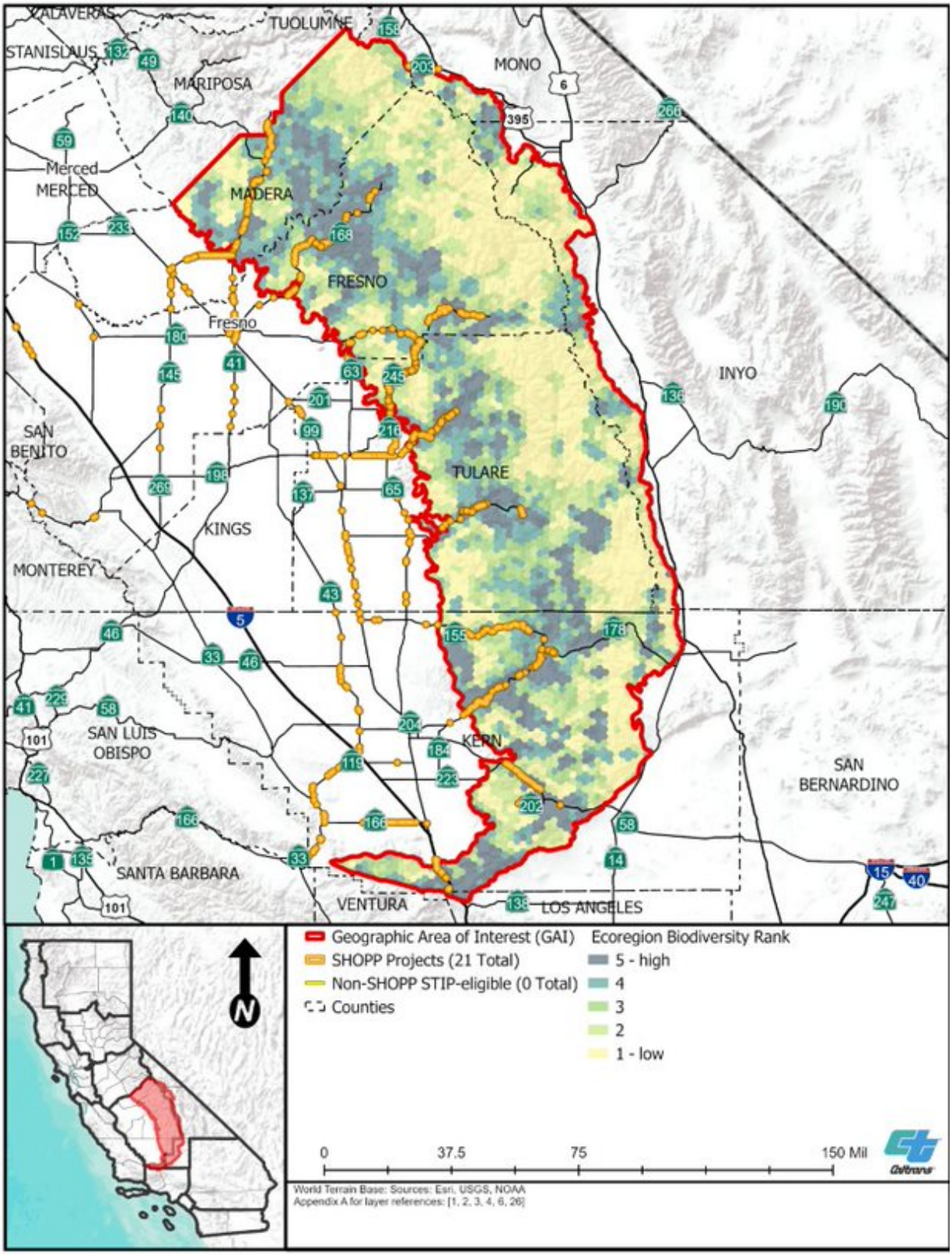
While the species of mitigation need identified for this GAI are Springville clarkia, striped adobe-lily, California tiger salamander, and San Joaquin kit fox, several other special-status species share habitat with these species and could potentially be affected by Caltrans transportation projects that will need compensatory mitigation to satisfy natural resource regulatory agency conditions on a transportation project. This includes species such as:

- Hartweg's golden sunburst (*Pseudobahia bahiifolia*)
- Hairy Orcutt grass (*Orcuttia pilosa*)
- Hoover's spurge (*Euphorbia hooveri*)
- Kaweah brodiaea (*Brodiaea insignis*)
- Keck's checker-mallow
- San Joaquin adobe sunburst
- Foothill yellow-legged frog (*Rana boylii*)
- Tehachapi slender salamander
- Yosemite toad
- Swainson's hawk (*Buteo swainsoni*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- Vernal pool tadpole shrimp (*Lepidurus packardi*)

Advance mitigation planning provides Caltrans an opportunity to prioritize multi-species and multi-resource benefits through acquisition, protection, restoration, and/or enhancement of habitat that provides the most multi-species benefits within the GAI. Figure 7-1 illustrates the regional terrestrial biodiversity in the GAI, according to CDFW's ACE GIS dataset. According to these data, high to moderate terrestrial biodiversity is present along much of the SHS with SHOPP and STIP-eligible projects, while other portions of the SHS within the GAI with SHOPP and STIP-eligible projects show low biodiversity. Habitats are mapped in Appendix C, *Land Cover Types*, and the other special-status species that may occur in these habitats are provided in Appendix D, *Complete SAMNA Species Results*.

The installation of artificial bat roosts, culvert ramps, undercrossings, and deer jumpouts to facilitate safe movement across highways would also benefit numerous terrestrial wildlife species (Caltrans 2021g). 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 habitats with species of mitigation need in order to inform advance mitigation scoping and thereby improve the conservation benefits of mitigation in the GAI.

Figure 7-1. Terrestrial Biodiversity in the GAI



7.7 Advance Mitigation Conservation Goals and Objectives

The conservation goals and objectives compiled in Table 7-3 were 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 and is meant to further guide Caltrans District 6 toward scoping advance mitigation projects to achieve the desired result specified by the goal. Project-specific objectives will be developed for advance mitigation projects in the future, during their project delivery phase in accordance with an instrument, MCA, or other project-specific agreement (Figure 1-2). Project-specific advance mitigation project objectives will be specific, measurable, achievable, relevant, and time-bound.

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 and project 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. They are not presented in order of importance.

[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 habitat for species of mitigation need within the GAI to support ecosystem functions that are essential to recovery of the species.	See below	See below	See below
Objective WILD-1.1: Acquire, protect, restore, and/or enhance habitat of sufficient quantity to offset estimated impacts on species of mitigation need within the GAI in advance of transportation project impacts.	**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, including consolidating compensatory mitigation. **Sub-Objective WILD-1.1.2:** Prioritize key areas, such as designated critical habitat, movement corridors, and buffer zones. **Sub-Objective WILD-1.1.3:** Prioritize acquisition and/or protection of large blocks of suitable, occupied habitat for the species of mitigation need; lands adjacent to occupied habitat; and/or land that expands or buffers existing occupied protected habitats. **Sub-Objective WILD-1.1.4:** Prioritize land acquisition and/or protection that supports key populations.[c] **Sub-Objective WILD-1.1.5:** Prioritize acquisition, protection, and/or enhancement of SWAP (CDFW 2015a) conservation targets: western upland grasslands, shadscale-saltbush scrub, chaparral, California grassland and flowerfields, California foothill and valley forests and woodlands, and American southwest riparian forest and woodland (Figure 7-2) that coincide with the species of mitigation need range, as well as other locally or regionally important habitat types. **Sub-Objective WILD-1.1.6:** Create, enhance, or restore breeding habitat in protected areas where it is limited.[c]	▪ Springville clarkia ▪ striped adobe-lily ▪ California tiger salamander ▪ San Joaquin kit fox	▪ *CEHC* (Spencer et al. 2010) ▪ *SWAP* (CDFW 2015a) and companion plans ▪ *California Wildlife Movement Barriers* (CDFW 2020a) ▪ *Wildlife Connectivity across the Northern Sierra Nevada Foothills* (CDFW 2015b) ▪ *Hopper Mountain, Bitter Creek, and Blue Ridge NWR Final Comprehensive Conservation Plan* (FWS 2013) ▪ *Lost Lake Park Master Plan* (Fresno County 2011) ▪ *Millerton Lake State Recreation Area Resource Management Plan* (California State Parks 2010) ▪ *Kern County General Plan* (Kern County 2009) ▪ *Porterville General Plan* (City of Porterville 2007) ▪ *5-Year Review Springville Clarkia* (FWS 2022) ▪ *Striped Adobe Lily Species Management Plan* (Stebbins 1989) ▪ *California Tiger Salamander Central California DPS Designation of Critical Habitat* (FWS 2005a) ▪ *California Tiger Salamander Central California DPS 5-Year Review* (FWS 2014) ▪ *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)* (FWS 2017b) ▪ *Recovery Plan of Upland Species of the San Joaquin Valley: San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 1998) ▪ *Five-Year Status Review for San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 2010)

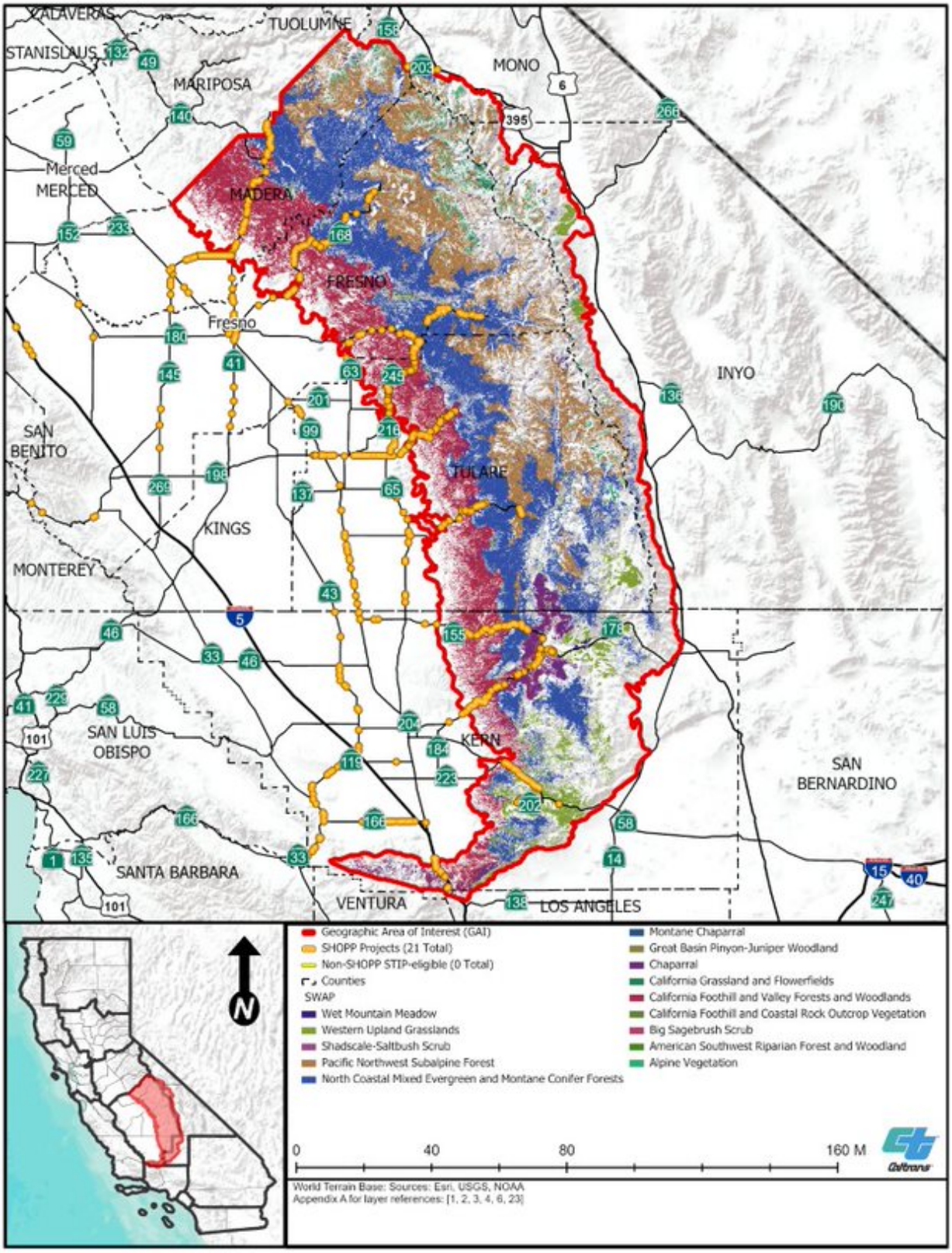
Objective	Sub-Objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-2: Preserve, enhance, and increase connectivity between blocks of habitat supporting species of mitigation need to allow for dispersal that will maintain resilience and variability of populations.	See below	See below	See below
Objective WILD- 2.1: Acquire, protect, restore, and/or enhance movement corridors within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-2.1.1:** Identify movement corridors for the wildlife species of mitigation need in the GAI and acquire, protect, restore, and/or enhance corridors such that the greatest functional lift for the wildlife 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.[c] **Sub-Objective WILD-2.1.3:** Identify areas that will enhance connectivity between existing protected breeding locations and create new breeding habitat for the wildlife species of mitigation need.[c]	▪ California tiger salamander ▪ San Joaquin kit fox	▪ *CEHC* (Spencer et al. 2010) ▪ *SWAP* (CDFW 2015a) and companion plans ▪ *California Wildlife Movement Barriers* (CDFW 2020a) ▪ *Wildlife Connectivity across the Northern Sierra Nevada Foothills* (CDFW 2015b) ▪ *California Tiger Salamander Central California DPS 5-Year Review* (FWS 2014) ▪ *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)* (FWS 2017b) ▪ *Recovery Plan of Upland Species of the San Joaquin Valley: San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 1998) ▪ *Five-Year Status Review for San Joaquin Kit Fox (Vulpes macrotis mutica)* (FWS 2010)
Goal WILD-3: Support resiliency of the landscape to climate change.	See below	See below	See below
Objective WILD-3.1: Acquire, protect, restore, and/or enhance habitat that supports resilience to climate change within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-3.1.1:** Identify, acquire, protect, restore, and/or enhance habitat critical to climate resilience for the species of mitigation need in the GAI (Figure 2-5). **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 and that would provide functional lift for the species of mitigation need.	▪ Springville clarkia ▪ striped adobe-lily ▪ California tiger salamander ▪ San Joaquin kit fox	▪ *CEHC* (Spencer et al. 2010) ▪ *SWAP* (CDFW 2015a) and companion plans ▪ *California Wildlife Movement Barriers* (CDFW 2020a) ▪ *Wildlife Connectivity across the Northern Sierra Nevada Foothills* (CDFW 2015b) ▪ *5-Year Review Springville Clarkia* (FWS 2022) ▪ *California Tiger Salamander Central California DPS Designation of Critical Habitat* (FWS 2005a) ▪ *California Tiger Salamander Central California DPS 5-Year Review* (FWS 2014) ▪ *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)* (FWS 2017b) ▪ *Recovery Plan of Upland Species of the San Joaquin Valley: San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 1998) ▪ *Five-Year Status Review for San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 2010)

Objective	Sub-Objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-4: Decrease mortality and competition, and protect population health for 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 within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-4.1.1:** Reduce 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 reduction 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 areas, such as critical habitat, movement corridors, and buffer zones.	▪ Springville clarkia ▪ striped adobe-lily ▪ California tiger salamander ▪ San Joaquin kit fox	▪ *CEHC* (Spencer et al. 2010) ▪ *SWAP* (CDFW 2015a) and companion plans ▪ *Hopper Mountain, Bitter Creek, and Blue Ridge NWR Final Comprehensive Conservation Plan* (FWS 2013) ▪ *Millerton Lake State Recreation Area Resource Management Plan* (California State Parks 2010) ▪ *5-Year Review Springville Clarkia* (FWS 2022) ▪ *Striped Adobe Lily Species Management Plan* (Stebbins 1989) ▪ *California Tiger Salamander Central California DPS Designation of Critical Habitat* (FWS 2005a) ▪ *California Tiger Salamander Central California DPS 5-Year Review* (FWS 2014) ▪ *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)* (FWS 2017b) ▪ *Recovery Plan of Upland Species of the San Joaquin Valley: San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 1998) ▪ *Five-Year Status Review for San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 2010)
Objective WILD-4.2: Reduce impacts from nonnative predators within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-4.2.1:** Identify and implement measures to reduce predation, such as designing ponds that dry up on an annual basis to discourage bullfrogs from establishing.	▪ California tiger salamander	▪ *CEHC* (Spencer et al. 2010) ▪ *SWAP* (CDFW 2015a) and companion plans ▪ *Lost Lake Park Master Plan* (Fresno County 2011) ▪ *Millerton Lake State Recreation Area Resource Management Plan* (California State Parks 2010) ▪ *California Tiger Salamander Central California DPS Designation of Critical Habitat* (FWS 2005a) ▪ *California Tiger Salamander Central California DPS 5-Year Review* (FWS 2014) ▪ *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)* (FWS 2017b)
Objective WILD-4.3: Reduce road-associated mortality within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-4.3.1:** Identify locations to develop safe SHS wildlife crossing areas in the GAI and direct the species of mitigation need to such crossing areas.	▪ California tiger salamander ▪ San Joaquin kit fox	▪ *CEHC* (Spencer et al. 2010) ▪ *SWAP* (CDFW 2015a) and companion plans ▪ *California Wildlife Movement Barriers* (CDFW 2020a) ▪ *Wildlife Connectivity across the Northern Sierra Nevada Foothills* (CDFW 2015b) ▪ *California Tiger Salamander Central California DPS Designation of Critical Habitat* (FWS 2005a) ▪ *California Tiger Salamander Central California DPS 5-Year Review* (FWS 2014) ▪ *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)* (FWS 2017b) ▪ *Recovery Plan of Upland Species of the San Joaquin Valley: San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 1998) ▪ *Five-Year Status Review for San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 2010) ▪ *Measures to Reduce Road Impacts on Amphibians and Reptiles in California: Best Management Practices and Technical Guidance* (Caltrans 2021g)

Objective	Sub-Objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-5: Prioritize multi-species and multi-resource benefits.	See below	See below	See below
Objective WILD-5.1: Acquire, protect, restore, and/or enhance habitat that provides multi-species benefits within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-5.1.1:** Prioritize mitigation to provide benefits to special-status species that may co-occur with the species of mitigation need in key areas and that will provide functional lift to other special-status species within the GAI. **Sub-Objective WILD-5.1.2:** Identify SHS right-of-way areas where enhancement efforts may benefit pollinators, as well as the species of mitigation need.	▪ Springville clarkia ▪ striped adobe-lily ▪ California tiger salamander ▪ San Joaquin kit fox	▪ *CEHC* (Spencer et al. 2010) ▪ *SWAP* (CDFW 2015a) and companion plans ▪ *Hopper Mountain, Bitter Creek, and Blue Ridge NWR Final Comprehensive Conservation Plan* (FWS 2013) ▪ *Lost Lake Park Master Plan* (Fresno County 2011) ▪ *Millerton Lake State Recreation Area Resource Management Plan* (California State Parks 2010) ▪ *Kern County General Plan* (Kern County 2009) ▪ *Porterville General Plan* (City of Porterville 2007) ▪ *5-Year Review Springville Clarkia* (FWS 2022) ▪ *Striped Adobe Lily Species Management Plan* (Stebbins 1989) ▪ *California Tiger Salamander Central California DPS Designation of Critical Habitat* (FWS 2005a) ▪ *California Tiger Salamander Central California DPS 5-Year Review* (FWS 2014) ▪ *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*)* (FWS 2017b) ▪ *Recovery Plan of Upland Species of the San Joaquin Valley: San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 1998) ▪ *Five-Year Status Review for San Joaquin Kit Fox (*Vulpes macrotis mutica*)* (FWS 2010)

[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] As identified in recovery plans and other pertinent documents (see Table 7-2).

Figure 7-2. SWAP Conservation Target Habitats



7.8 Summary

Caltrans anticipates that future SHOPP and STIP-eligible transportation projects may be conditioned by CDFW, FWS, and NMFS 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, drought, and wildfire; and
- Contaminants.

Hence, Caltrans will seek to align advance mitigation project 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 compensatory mitigation credit establishment that would successfully offset future transportation project impacts on plant and wildlife resources by creating functional lift or conservation benefit and by mitigating the pressures and stressors on plant and 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, and/or enhancement of land. 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. By increasing connectivity for the wildlife species of mitigation need, Caltrans anticipates that co-occurring wildlife species will realize these same benefits. These goals and objectives were selected to address habitat loss, fragmentation, and degradation and to address impacts from climate change, drought, and wildfire. Further, Caltrans anticipates that actions completed through restoration, enhancement, and/or preservation may also provide opportunities to address invasive species, predation, and road-associated mortality.

Goal WILD-3 seeks to support landscape resiliency for species of mitigation need habitat in the GAI. The primary objectives are to reduce the effects of climate change on these species by increasing the protection and functionality of land that is identified as crucial for climate resiliency, including corridors that allow the wildlife 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 address habitat loss, fragmentation, and degradation as well as 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 competitors, and protecting the wildlife species of mitigation need from road-associated mortality. These objectives address issues related to habitat loss, fragmentation, and degradation, as well as threats from invasive species and predation.

Goal WILD-5 seeks to guide advance mitigation scoping to prioritize multi-species and multi-resource benefits to maximize ecological benefits to the GAI. Advance mitigation provides the opportunity to maximize Caltrans' benefit to conservation in the GAI, including to species other than the species of mitigation need and other land management objectives. 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 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 that will provide a functional lift for the species of mitigation need and maximize conservation benefits from mitigation within the GAI.

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8. AQUATIC RESOURCES CONSERVATION GOALS AND OBJECTIVES

Caltrans' primary objective for aquatic resources is to avoid and minimize all impacts on fish, wetlands, non-wetland waters, vernal pools, and riparian habitat from Caltrans transportation projects in the GAI. However, when avoidance and minimization are insufficient or infeasible, compensatory mitigation may be used to offset impacts. Credits or values established through SHC § 800.6(a)-authorized advance mitigation projects offer the unique opportunity to consolidate needed compensatory mitigation. This consolidation helps to provide strategically placed and environmentally sound compensatory mitigation options, including enhanced, restored, or created habitat, and an improved environmental outcome that may not be available through the usual transportation project-by-project approach to compensatory mitigation.

Caltrans seeks to align its advance mitigation projects with natural resource regulatory agencies' conservation goals and objectives and, therefore, contribute to an improved environmental outcome in the GAI. With this in mind, this chapter presents Caltrans' understanding of natural resource regulatory agencies' regional conservation goals and objectives that could be applied to advance mitigation projects undertaken in the GAI to offset forecast impacts from SHOPP and STIP-eligible transportation projects.

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, vernal pool, and/or riparian habitat 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

[1] Pursuant to SHC § 800.9, to the maximum extent practicable, the information required for an RCIS is presented in this RAMNA. 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).

regulatory requirements and conservation science. To determine the aquatic resource conservation goals and objectives applicable to the GAI, Caltrans:

- First, in Section 8.2, identifies natural resource regulatory agencies with the authority to condition transportation projects with aquatic resource-related and riparian habitat compensatory mitigation in the GAI.
- Then, in Section 8.3, summarizes information for the wetland, non-wetland waters, and fish species addressed by the assessment.
- Next, in Sections 8.4, 8.5, and 8.6, for aquatic resources identifies:
  - Federal and state policies and binding and non-binding regional conservation and land management plans
  - Current and projected pressures and stressors, including climate change, for which there is a transportation nexus
  - Opportunities to enhance the conservation benefits through advance mitigation projects
  - Opportunities to provide co-benefits, where possible, to water quality, groundwater recharge, and species that require aquatic habitats
- Last, Caltrans analyzed the aforementioned information in relation to the transportation-related activities that could potentially affect aquatic resources and riparian habitats, and the potential range of compensatory mitigation that could satisfy a transportation project condition associated with the activities.

The result of this analysis is a framework of conservation goals and objectives for use in advance mitigation project scoping (Section 8.7).

8.2 Natural Resource Regulatory Agencies with Aquatic Resources Oversight

Table 8-1 lists the natural resource regulatory agencies with the authority to condition transportation projects delivered in the GAI with aquatic resource-related compensatory mitigation. 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. This RAMNA identifies goals and objectives for terrestrial species separately in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*.

Table 8-1. Natural Resource Regulatory Agencies with the Authority to Approve Aquatic Resource Compensatory Mitigation Credits (or Values)

Agency	Summary
CDFW	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. Under CESA, CDFW also has authority to issue incidental take permits for state listed fish species. Additionally, CDFW's Environmental Review and Permitting, Conservation and Mitigation Banking, NCCP, and RCIS programs implement sections of the FGC and 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.
Corps	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 the Corps' civil works projects are proposed to be used or altered by another entity, CWA Section 408 permission (33 USC 408 or Section 14 of the Rivers and Harbors Act of 1899, as amended) must be obtained in addition to the CWA Section 404 authorization. Per the 2008 mitigation rule, in general it is the preference of the Corps to use the following order of priority for mitigation: mitigation bank, in-lieu fee program, permittee responsible mitigation under the watershed approach, on-site permittee responsible mitigation, and off-site permittee responsible mitigation, but the preference may change based on what is environmentally preferable.
EPA	EPA has authority under the CWA (33 USC § 11251–1357) to restore and maintain the chemical, physical, and biological integrity of the nation's waters. EPA and Corps jointly implement the CWA Section 404 program, which regulates discharge of dredge or fill material into WOTUS. Federal authorizations also need to be reviewed for compliance with CWA Section 401. EPA has been delegated the responsibility of implementing CWA Section 401 for projects on tribal land, unless EPA has delegated 401 authority to a recognized tribe.

Agency	Summary
FWS	FWS has jurisdiction over a broad range of fish and wildlife resources. FWS does not, however, have jurisdiction over anadromous fish. FWS authorities related to these resources are codified under multiple statutes, including, but not limited to, the ESA. Most statutes give FWS an advisory role in mitigation. However, if a non-federal entity applies for an incidental take permit for a listed animal species, Section 10(a)(2)(b) of the ESA requires that the impact of any incidental take be minimized and mitigated to the maximum extent practicable. Section 7(a)(1) of the ESA also requires all federal agencies to use their authorities to conserve listed species. Many federal agencies have developed programs to include mitigation as part of the Section 7(a)(2) consultation on their proposed actions to partially fulfill this Congressional mandate. In May 2023, FWS issued a Mitigation Policy that builds upon the guidance in the 1981 Mitigation Policy for recommendations and requirements on mitigating adverse impacts of land and water developments on fish and wildlife, and an ESA Compensatory Mitigation Policy that adopts mitigation principles established in the FWS Mitigation Policy, establishes compensatory mitigation standards, and provides guidance for the application of compensatory mitigation through implementation of the ESA. Conservation banking can assist federal and non-federal participants in the Section 7 and Section 10 process. In May 2003, FWS issued comprehensive federal guidelines designed to promote conservation banks as a tool for mitigating adverse impacts on species; the guidelines foster national consistency by standardizing establishment and operational criteria. Many activities conducted under Section 7 and Section 10 of the ESA result in adverse effects on listed species, including habitat loss or modification. One way to offset these types of impacts is to include in the project design a plan that involves the restoration and/or protection of similar habitat on site and/or off site. Purchasing credits in conservation banks is one method of protecting habitat on site or off site.
Water Boards	The Porter-Cologne Act governs water quality regulation in California and gives the Water Boards 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 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 Water Boards have been delegated the responsibility of implementing CWA Section 401, which regulates the discharge of pollutants into WOTUS. The Water Boards may determine that compensatory mitigation is necessary to offset unavoidable impacts on aquatic resources. Compensatory mitigation can be achieved through the purchase of credits, as outlined in the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB, adopted 2019). Projects that occur in one region are regulated by that regional board, whereas projects that cross regions are regulated by SWRCB.

8.3 Aquatic Resources

An overview of aquatic resources was provided in Chapter 2, *Environmental Setting,* and is summarized below. The GAI overlaps, in part or in whole, with the HUC-8 boundaries listed in Table 8-2.

Additionally, the GAI has a tiny amount of overlap with the following HUC-8 boundaries: Cuyama, Mono Lake, Santa Clara, and Upper Tuolumne.

8.3.1. Wetlands and Non-wetland Waters

In the GAI, the Kaweah, Kern, Kings, and Tule Rivers are the major stream systems in the Tulare Lake Basin portion of the GAI (Central Valley RWQCB 2018). The Merced River is the major stream system in the San Joaquin River Basin portion of the GAI (Central Valley RWQCB 2019). The Basin Plan for the Lahontan Region does not identify any major stream systems that occur in the GAI (Lahontan RWQCB 2019). Additionally, there are hundreds of named and unnamed tributaries, the majority of which flow into the San Joaquin River or Owens River. Flow into these systems originates from rainfall and occasionally from snow melting in the Sierra Nevada.

Aquatic habitat types with the potential to occur in the GAI are mapped in Appendix G, *Aquatic Resource Locations*. Based on the SAMNA Reporting Tool's wetlands and waters layer, the GAI has a total of 209,652 acres of aquatic habitat, consisting of 21 wetland and non-wetland waters habitats listed in Table 2-5 (Caltrans 2021d, 2021e). Eleven beneficial uses that support the preservation and enhancement of wildlife habitat and aquatic resources in the GAI also align with the AMP's objective to contribute to an improved environmental outcome through transportation project mitigation and are relevant to this RAMNA (Table 2-4).

Vernal Pools

Vernal pool habitat was discussed in Section 2.15.3. Because no detailed vernal pool GIS layer is currently available, vernal pool habitat information was excerpted from and is consistent with the SAMNA's vernal pool layer (Figure 2-15).

8.3.2. Riparian Habitat

Riparian habitat is discussed in Section 2.16. Because no detailed riparian GIS layer is currently available, riparian habitat information was excerpted from the SAMNA's vegetation layer. The riparian habitats identified in the GAI are desert riparian, montane riparian, and valley foothill riparian (Table 2-2).

8.3.3. Special-status Fish Species of Mitigation Need

Special-status fish species are identified in Section 2.15.2 and their SAMNA results are provided in Section 5.3.1. Based on SAMNA results and historical mitigation needs, no fish species were identified as species of mitigation need for this RAMNA; that is, based on this RAMNA, fish species benefits will not be an advance mitigation project's primary objective (Section 1.5.3). Nevertheless, it is expected that a fish species could co-benefit from some advance mitigation projects.

8.4 Regional Conservation Efforts

Caltrans' understanding of natural resource regulatory agency conservation goals and objectives is that they are generally designed to protect aquatic resources. Several conservation and land management plans listed in Table 3-1, relevant to the aquatic resources, identify key habitats, specific designated waters, or areas for aquatic resource enhancement and restoration. Others identify key qualities, such as water quality, that are essential for aquatic resource enhancement and restoration. Still others name specific National Hydrologic Dataset features, presented in Table 8-2, for aquatic resource enhancement and restoration. Additionally, the documents include strategies for aquatic resource protection and measures to address specific known, ongoing threats to aquatic resources. These conservation and land management plans are presented in Table 8-3.

Table 8-2. Named Aquatic Features in the GAI with Documented Aquatic Resource Goals and Objectives, by HUC-8

Crowley Lake HUC-8 18090102	Fresno River HUC-8 18040007	Middle San Joaquin-Lower Chowchilla HUC-8 18040001	Owens Lake HUC-8 18090103	South Fork Kern HUC-8 18030002
▪ Mack Meadow ▪ McGee Creek	▪ Fresno River	▪ Chowchilla River ▪ Cottonwood Creek[a]	▪ Goondale Creek ▪ Horton Creek ▪ Independence Creek ▪ Sawmill Creek ▪ Symmes Creek ▪ Taboose Creek	▪ Fish Creek HUC-12
Upper Kaweah HUC-8 18030007	**Upper Kern HUC-8 18030001**	**Upper King HUC-8 18030010**	**Upper Merced HUC-8 18040008**	**Upper San Joaquin HUC-8 18040006**
▪ Kaweah River	▪ Bull Run Creek ▪ North Fork Kern River ▪ Osa Creek ▪ South Creek HUC-12 ▪ Upper Kern River	▪ Chiquito Creek ▪ Kings River ▪ Mill Flat Creek HUC-12 ▪ Upper Big Creek HUC-12	▪ Merced River	▪ Big Sandy Creek ▪ Fine Gold Creek ▪ Millerton Lake ▪ North Fork San Joaquin River

[a] Although many Cottonwood Creeks occur in the GAI, the Millerton Lake State Recreation Area Resource Management Plan is referring to the one in the Middle San Joaquin-Lower Chowchilla HUC-8.

Table 8-3. 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* 19593	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. 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	SWRCB 2021	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 (Appendix F in this document), 28 water bodies are listed as impaired in the GAI. Of the 28, none have 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 and Corps 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	SWRCB 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 Central Valley Region	Central Valley RWQCB 2019	Identifies water quality objectives and beneficial uses for the Central Valley region.
Water Quality Control Plan for the Lahontan Region	Lahontan RWQCB 2019	Identifies water quality objectives and beneficial uses for the South Lahontan region.
Water Quality Control Plan for the Tulare Lake Basin	Central Valley RWQCB 2018	Identifies water quality objectives and beneficial uses for the Tulare Lake Basin.
Conservation and Land Management Documents	See below	See below
Bishop Resource Management Plan Record of Decision	BLM 1993	Includes a goal to restore Goondale, Horton, Independence, Sawmill, Symmes, and Taboose Creeks.
Central Valley Flood Protection Plan 2022 Update	California Department of Water Resources 2022	Includes goals to conduct habitat restoration in areas of levee setback and areas purchased from farmers in flood zones.
Devils Postpile National Monument General Management Plan and Environmental Assessment	NPS 2014	Includes a general goal to enhance and restore aquatic habitats in the plan area.
Ecological Restoration Implementation Plan	USFS 2013	Includes goals for the Inyo National Forest to stabilize and reduce erosion and sedimentation in streams and improve water quality. Includes a goal for the Sequoia National Forest to restore meadows and streams at Mack Meadow.
General Management Plan and Comprehensive River Management Plan for Sequoia and Kings Canyon National Parks	NPS 2006	Includes a general goal to enhance and restore riverbank and wetland habitats in the plan area.

Document	Reference	Information Identified
Hopper Mountain, Bitter Creek, and Blue Ridge National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Assessment	FWS 2013	Of the National Wildlife Refuges covered in this plan, the Bitter Creek National Wildlife Refuge occurs in the GAI and has the goals listed below pertinent to this RAMNA. Includes general goals to enhance and restore riparian habitat and a specific goal to remove salt cedar from the refuge.
Kern Integrated Regional Water Management Plan	Kern County 2019	Includes a goal to restore 460 acres of riparian habitat.
Land Management Plan for the Inyo National Forest	USFS 2019	Includes a goal to restore 400 acres of riparian areas by 2034.
Land Management Plan: Part 2 Los Padres National Forest Strategy	USFS 2005	Includes a goal to enhance 22 miles of aquatic habitat.
Land Management Plan for the Sequoia National Forest Pre-objection Version	USFS 2022a	Includes the following specific goals to be implemented within 15 years of plan approval: ▪ Restore watershed conditions in 1 of the following priority HUC-12s: Mill Flat Creek – 180300100703, Fish Creek – 180300020203, and South Creek – 180300010504, all of which are in the GAI. ▪ Restore watershed conditions in 2 conservation HUC-12s that can occur in the Middle Kern-Upper Tehachapi-Grapevine, South Fork Kern, and/or Upper Kern HUC-8s, all of which are in the GAI. ▪ Restore at least 400 acres of riparian areas, prioritizing areas with the highest fire and/or flooding risk. ▪ Enhance at least 5 meadows that are part of an aquatic system. ▪ Enhance or restore habitat components of aquatic species of at least 5 stream miles.

Document	Reference	Information Identified
Land Management Plan for the Sierra National Forest Pre-objection Version	USFS 2022b	Includes the following specific goals to be implemented within 15 years of plan approval: ▪ Restore watershed conditions in 1 priority HUC-12, of which only Upper Big Creek – 180300100801 occurs in the GAI. ▪ Restore watershed conditions in 2 conservation HUC-12s of the following: – HUC-12s in the Upper San Joaquin HUC-8: Deer Creek, Fleming Creek-North Fork Kings River, Helms Creek, Lower Dinkey Creek, Middle Dinkey Creek, Patterson Creek-North Fork Kings River, Post Corral Creek-North Fork Kings River, Rancheria Creek-North Fork Kings River, Upper Dinkey Creek, and Wishon Reservoir-North Fork Kings River – HUC-12s in the Upper King HUC-8: Jackass Creek, Lower Chiquito Creek, Lower Granite Creek, Mammoth Pool Reservoir-San Joaquin River, North Fork San Joaquin River, Upper Chiquito Creek, and Upper Granite Creek ▪ Enhance at least 5 meadows that are part of an aquatic system. ▪ Enhance or restore habitat components of aquatic species of at least 5 stream miles.
Lost Lake Park Master Plan	Fresno County 2011	Includes a goal to restore the portion of the San Joaquin River adjacent to the park. Although this park is approximately 0.75 mile outside of the GAI, it is immediately downstream of the GAI along the San Joaquin River and any restoration in this area, and around Millerton Lake, would indirectly benefit the park.
Madera Integrated Regional Water Management Plan	Regional Water Management Group of Madera County 2019	Includes general goals to improve water quality; reduce flood risk, erosion, and sedimentation; and conduct aquatic habitat restoration. This document also includes a specific goal to remove giant reed from the plan area.
Millerton Lake State Recreation Area Resource Management Plan	California State Parks 2010	Includes goals for restoration of riparian areas and their buffer zones in Big Sandy Creek, Cottonwood Creek, and Fine Gold Creek to improve fish spawning habitat.
Mono County General Plan	Mono County 2021	Includes a general goal to restore riparian woodlands, wetlands, and riparian habitat. Also includes a goal to restore the area around Crowley Lake, which, although outside the GAI, does contain a portion of McGee Creek, which is in the GAI.

Document	Reference	Information Identified
Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon	FWS 2005b	Regions in the GAI covered by the plan are the San Joaquin Valley region, which does not contain core areas in the GAI, as well as the Southern Sierra Foothills region containing the, Fresno, Kaweah, Kings, Lake Success, Madera, Table Mountain, and Tulare core areas. Listed species for recovery that use aquatic habitat in these core areas include conservancy fairy shrimp, vernal pool fairy shrimp, Hoover's spurge (*Euphorbia hooveri*), Colusa grass (*Neostapfia colusana*), Green's tuctoria (*Tuctoria greenei*), San Joaquin Orcutt grass (*Orcuttia inaequalis*), hairy Orcutt grass, and succulent owl's-clover (*Castilleja campestris* ssp. *succulenta*). Midvalley fairy shrimp, western spadefoot toad, California fairy shrimp (*Linderiella occidentalis*), Boggs Lake hedge-hyssop (*Gratiola heterosepala*), and spiny sepaled button-celery (*Eryngium spinosepalum*) are also expected to benefit from this plan.
Southern Sierra Integrated Regional Water Management Plan	Southern Sierra Regional Water Management Group 2018	Includes a goal to restore aquatic habitat on the Dry Meadow segment of Bull Run Creek and the Osa Meadow segment of Osa Creek; both are tributaries of the North Fork Kern River.
SWAP	CDFW 2015a	Identifies wet mountain meadow and California foothill and valley forests and woodlands (which can have riparian constituents) as conservation targets. Also included are 5 species of fish as targets for population increase and habitat improvement in the Upper Kern River.
Tehachapi General Plan	City of Tehachapi 2015	Includes goals for the enhancement of creeks and riparian corridors in the city.

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 2015a), 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[2] or indirectly from negative impacts of pressures (e.g., habitat fragmentation)" (CDFW 2015a). The Corps defines human stressors as human-caused sources of disturbance in an ecosystem, such as roads, urban areas, and agricultural lands (Corps 2015).

The documents in Table 8-3 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 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, the expansion of roads and urbanization have resulted in habitat fragmentation and a decrease in connectivity between habitats that support different life stages and have contributed to nonpoint source pollution from chemicals and toxins. Roads have also affected local hydrological conditions by changing sheet flow and altering water movement in drainages (CDFW 2015a, 2016a). In the GAI, the majority of urbanization and development has happened around SR 168, SR 178, and SR 245 (Figure 2-6).

8.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread nonnative, invasive species. When nonnative, invasive species enter an ecosystem, they can disrupt the natural balance, resulting in lower biodiversity, degradation of habitats, alteration of native genetic diversity, shifting of wetland type, disruption of aquatic and terrestrial connectivity, and further threats to already endangered or threatened natural resources. Invasive plant species that affect vernal pool systems in the GAI include Mediterranean barley and annual beard grass, which negatively affect native aquatic species (CDFW 2015a). Invasive plant species that affect riparian systems in the GAI include tree-of-heaven, giant reed, saltcedar, perennial

[2] Direct effects occur at the time of construction and indirect effects are reasonably certain to occur, but later in time.

pepperweed, eucalyptus, black locust (*Robinia pseudoacacia*), and Himalayan blackberry (Cal-IPC 2022).

Invasive animal species that can damage aquatic ecosystems in the GAI include historic stocked populations of rainbow trout, brook trout, and brown trout in aquatic systems that did not contain them. These species prey on native species and disrupt the food web of aquatic ecosystems and can also interbreed with native trout species, altering genetics. The Sierra Nevada foothills aquatic systems have been especially harmed by nonnative sunfish, which threatens native minnow and amphibian populations (CDFW 2015a).

8.5.3. Altered Hydrology, Geomorphology, and Water Quality

Water quality and hydrology can be directly altered by physical barriers, such as dams, roads, and canals, which can have effects both upstream and downstream by truncating connectivity, altering sediment transport processes, and altering flow. For example, road prisms alter overland water flow and channelize it into culverts, pipes, or bridges. Stable geomorphology is critical to maintaining healthy streams so that degradation and aggradation do not destroy habitats in the stream and riparian and wetland habitats downstream. The loss of wetlands can result in increased flooding and decreased water quality in downstream tributaries. Water diversions, in-channel construction, riparian vegetation reduction, agriculture, alteration of streambed and banks, components of timber management, and point and nonpoint source pollution have affected the aquatic ecosystem by altering historical flooding regimes, erosion, and deposition of sediments that maintain floodplains (CDFW 2015a, 2016b). Vernal pool and seasonal wetland hydrology may be altered by changes to surface and subsurface flow, depending on topography, precipitation, and soil types (FWS 2005b).

8.5.4. Climate Change and Drought

Section 2.4 provided a brief overview of the GAI's climate and available planning-level predictions for climate change for the region. In the next 30 years, the climate is expected to change. Expected changes include quicker melting times for the Sierra Nevada snowpack, causing increased flooding, increases in the volatility of precipitation events, and an increased risk of wildfire (Caltrans 2018b). Expected habitat changes include a shift from forest and woodland habitats to those dominated by shrubs and herbs as well as a drying of wet meadow ecosystems (Dettinger et al. 2018).

8.5.5. Wildfire Risk

Vegetation can be altered by large-scale wildfire effects by altering microclimatic regimes, increasing runoff and river discharge, and enhancing erosion and sediment inputs, transport, and deposition. Fires can also affect the physical characteristics of riparian and wetland ecosystems by transitioning vegetation from aquatic and riparian areas to uplands (Bixby et al. 2015). Fire in riparian zones can reduce canopy cover, resulting in increased water temperatures (CDFW 2015a). Increased wildfire occurrence is likely to create additional erosion and reduce large woody debris in riverine habitats already under increased pressures from extreme drought and floods (Ice et al. 2004).

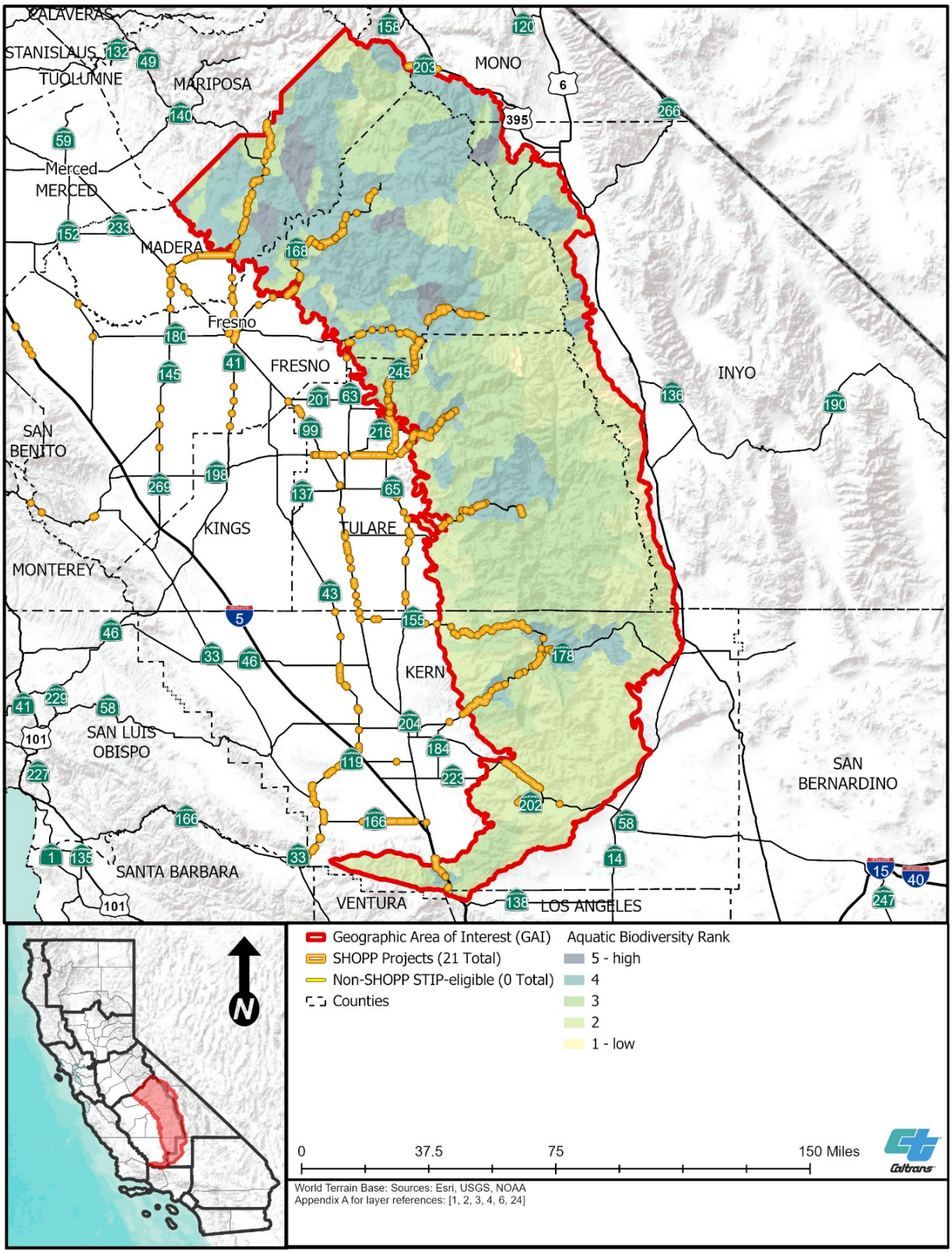
8.6 Multi-resource Benefits

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, aquatic and terrestrial connectivity, special-status species, wetlands, and non-wetland resources.

- Figure 8-1 illustrates the regional aquatic biodiversity in the GAI, as provided by CDFW's ACE GIS dataset. According to these data, moderate aquatic biodiversity dominates the GAI, with higher aquatic biodiversity in the northern portion of the GAI. These areas are located along the SHS with planned SHOPP projects.
- 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, increasing the amount, complexity, and connectivity of riparian habitat will provide additional shaded riverine aquatic habitat in the GAI that can benefit fish species such as Pacific lamprey (*Entosphenus tridentatus*) and speckled dace (*Rhinichthys osculus*) as well as other species that use aquatic habitat, such as California floater mussel (*Anodonta californiensis*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*) western spadefoot toad (*Spea hammondii*), hairy Orcutt grass (*Orcuttia pilosa*), and watershield (*Brasenia schreberi*).
- Enhancing and/or restoring the aquatic resources of the GAI is expected to support or contribute to beneficial uses of wetland and non-wetland waters of the GAI. For example, enhancement and/or restoration of wetlands adjacent to wildlife habitat would likely improve wildlife habitat water quality. Further, enhancement and/or restoration of wetlands adjacent to GAI waters could sequester contaminants on waters 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 waters, and impaired waters during advance mitigation project scoping—thereby improving the conservation benefits of mitigation in the GAI.

Figure 8-1. Aquatic Biodiversity of the GAI



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 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, protect and restore hydrologic processes such as channel stability, 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 here 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, EPA, SWRCB, 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 resources 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 topographic watershed-based system, depending on the size and location of a transportation or other project (Corps 2015). The Water Boards 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 (SWRCB 2019). The goals, objectives, and sub-objectives presented in Table 8-4 reflect Caltrans' intention to develop advance mitigation project scopes for in-kind mitigation.

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

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Goal AR-1: No net loss of area, functions, values, and condition of wetland and non-wetland water resources.	See below	See below
Objective AR-1.1: Improve quality and function of wetland and non-wetland water resources.	**Sub-Objective AR-1.1.1:** Enhance and/or rehabilitate wetland and non-wetland water resources such that the greatest functional lift to the aquatic resource is provided, including by consolidating compensatory mitigation consistent with Executive Order W59-93. **Sub-Objective AR-1.1.2:** Enhance and/or rehabilitate key wetland and non-wetland water habitats that are identified in the SWAP, FWS recovery plans, and other land management plans identified in Table 8-3. **Sub-Objective AR-1.1.3:** Enhance and/or rehabilitate riparian vegetation in the GAI, particularly in the Kern River and the North Fork San Joaquin River; as well as Chiquito Creek, Goondale Creek, and Sawmill Creek; and other named and unnamed tributaries into the San Joaquin River and Owens River, many of which are listed in Table 8-2. **Sub-Objective AR-1.1.4:** Enhance and/or restore wetland and non-wetland water resource functions, such as connectivity, abundance of native plants, and water quality, that define habitat value for aquatic organisms and increase basin-wide value of resources.	▪ *2008 Final Compensatory Mitigation Rule* (73 *Federal Register* 19593) ▪ All documents found under the *Conservation and Land Management Documents* section of Table 8-3. ▪ *National Wetlands Mitigation Action Plan* (EPA and Corps 2002) ▪ *Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division* (Corps 2015) ▪ *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material in Waters of the State* (SWRCB 2019)
Objective AR-1.2: Avoid a net loss of aquatic resource acreage by establishing aquatic resources.	**Sub-Objective AR-1.2.1:** Establish and/or reestablish wetland and non-wetland waters, particularly in key wetland and non-wetland water habitats that are identified in the SWAP and other land management plans identified in Table 8-3. **Sub-Objective AR-1.2.2:** Establish and/or reestablish riparian vegetation in the HUC-8s included in Table 8-2, particularly the Chowchilla, Fresno, Kaweah, Kern, Merced, and North Fork San Joaquin Rivers; as well as Chiquito, Goondale, and Sawmill Creeks; and other named and unnamed tributaries into the San Joaquin River and Owens River, many of which are listed in Table 8-2.	Same references as listed with Objective AR-1.1.

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Goal AR-2: Restore and maintain the chemical, physical, and biological integrity of wetlands and non-wetland waters.	See below	See below
Objective AR-2.1: Restore and/or enhance water quality.	**Sub-Objective AR-2.1.1:** In coordination with the RWQCB, restore and/or enhance wetland and non-wetland waters with RWQCB biology-related beneficial use designations such as cold freshwater habitat, freshwater replenishment, groundwater recharge, migration of aquatic organisms, rare, threatened, or endangered species, spawning, reproduction, and/or early development, warm freshwater habitat, and wildlife habitat. **Sub-Objective AR-2.1.2:** In coordination with natural resource regulatory agencies, address aggradation, erosion, nutrients, contaminants, sedimentation, and temperatures in the Crowley Lake, Owens Lake, Upper Kern, Upper King, and Upper San Joaquin HUC-8s. **Sub-Objective AR-2.1.3:** In coordination with the RWQCB, implement restoration and enhancement actions that address water quality for aquatic resources, for example, at Bull Run Creek, Mack Meadow, McGee Creek, and Osa Creek as well as riparian marshes. **Sub-Objective AR-2.1.4**: Restore or create riparian floodplain habitat, adjacent wetlands, and adjacent non-wetland aquatic features to enhance water quality in tributaries and downstream systems. **Sub-Objective AR-2.1.5:** Rehabilitate and/or enhance small streams and sections of larger streams by removing nonnative plant species that degrade stream water quality, such as Mediterranean barley, annual beard grass, tree-of-heaven, giant reed, saltcedar, perennial pepperweed, eucalyptus, black locust, and Himalayan blackberry. **Sub-Objective AR-2.1.6:** Improve stream temperatures by increasing shaded riverine aquatic habitat in the Kern and North Fork San Joaquin Rivers as well as Big Sandy Creek, Cottonwood Creek, and Fine Gold Creek for fish and other aquatic life.	▪ *303(d) List of Impaired Water Bodies* (SWRCB 2021) ▪ *Central Valley Flood Protection Plan 2022 Update* (California Department of Water Resources 2022) ▪ *Ecological Restoration Implementation Plan* (USFS 2013) ▪ *Hopper Mountain, Bitter Creek, and Blue Ridge National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Assessment* (FWS 2013) ▪ *Madera Integrated Regional Water Management Plan* (Regional Water Management Group of Madera County 2019) ▪ *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (FWS 2005b) ▪ *Southern Sierra Integrated Regional Water Management Plan* (Southern Sierra Regional Water Management Group 2018) ▪ *SWAP* (CDFW 2015a) ▪ *Water Quality Control Plan for the Central Valley Region* (Central Valley RWQCB 2019) ▪ *Water Quality Control Plan for the Lahontan Region* (Lahontan RWQCB 2019) ▪ *Water Quality Control Plan for the Tulare Lake Region* (Central Valley RWQCB 2018)
Objective AR-2.2: Improve surface water hydrology.	**Sub-Objective AR-2.2.1:** Restore and/or enhance natural hydrologic regimes, natural sediment transport, and geomorphic processes. **Sub-Objective AR-2.2.2:** Reconnect severed aquatic systems and improve connectivity in aquatic and riparian systems, with particular focus on reconnecting higher watershed areas with lower watershed areas, such as reconnecting tributaries to the Kern, San Joaquin, and Owens Rivers. **Sub-Objective AR-2.2.3:** Reestablish hydrologic regimes or drainage patterns for better function of depressional wetlands, freshwater emergent wetlands, freshwater forested/shrub wetlands, freshwater ponds, lakes, and riverine systems.	Same references as listed with Objective AR-2.1.
Objective AR-2.3: Improve water storage and groundwater recharge.	**Sub-Objective AR-2.3.1:** Promote restoration of stream and riparian areas' natural functions to provide water storage and release. **Sub-Objective AR-2.3.2:** Reduce excessive nonnative vegetation along stream/riparian corridors to lower vegetative transpiration rates to sustainable levels and increase water storage in soils and streams. **Sub-Objective AR-2.3.3:** Create or restore wetlands to streams to enhance groundwater-surface water dynamics in tributaries.	Same references as listed with Objective AR-2.1.

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Goal AR-3: Support resiliency of aquatic resources to climate change.	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 and southern portions of the GAI, and at depressional wetlands and freshwater wetlands to reduce climate change effects on aquatic resources. **Sub-Objective AR-3.1.2:** Prioritize enhancement and/or restoration that will increase resilience to climate change such as aquatic features with hydrologic connection to the Kern, San Joaquin, and Owens Rivers, as well as Chiquito, Goondale, and Sawmill Creeks, such that the potential for aquatic resource migration increases by the enhancement and/or restoration of ecotones that transition from aquatic to upland habitats. **Sub-Objective AR-3.1.3:** Prioritize riparian areas of the Crowley Lake, Owens Lake, Upper Kern, Upper King, and Upper San Joaquin HUC-8s for enhancement and/or restoration to improve freshwater quantity and quality, floodplain connectivity, and instream cover continuity. **Sub-Objective AR-3.1.4:** Enhance, rehabilitate, establish and/or reestablish aquatic habitats by using native species such as box elder (*Acer negundo*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), willows (*Salix* spp.), cattails (*Typha* spp.), rushes (*Juncus* spp.), and bulrushes (*Schoenoplectus* spp.) to reduce the effects of climate change. **Sub-Objective AR-3.1.5:** Reduce adverse instream flooding effects by restoring affected headwater and tributary hydrological functions for Bull Run Creek, Chiquito Creek, Osa Creek, and North Fork Kern River. **Sub-Objective AR-3.1.6:** Prioritize habitat establishment and reestablishment in areas that can also reduce risk in floodprone systems, particularly in areas along Bull Run Creek, Chiquito Creek, Osa Creek, and North Fork Kern River.	▪ *Bishop Resource Management Plan Record of Decision* (BLM 1993) ▪ *Central Valley Flood Protection Plan 2022 Update* (California Department of Water Resources 2022) ▪ *Devils Postpile National Monument General Management Plan and Environmental Assessment* (NPS 2014) ▪ *General Management Plan and Comprehensive River Management Plan for Sequoia and Kings Canyon National Parks* (NPS 2006) ▪ *Hopper Mountain, Bitter Creek, and Blue Ridge National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Assessment* (FWS 2013) ▪ *Kern Integrated Regional Water Management Plan* (Kern County 2019) ▪ *Land Management Plan for the Inyo National Forest* (USFS 2019) ▪ *Land Management Plan for the Sequoia National Forest Pre-objection Version* (USFS 2022a) ▪ *Land Management Plan for the Sierra National Forest Pre-objection Version* (USFS 2022b) ▪ *Mono County General Plan* (Mono County 2021) ▪ *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (FWS 2005b) ▪ *SWAP* (CDFW 2015a) ▪ *Tehachapi General Plan* (City of Tehachapi 2015)
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 that occur in large contiguous areas in aquatic habitats, such as annual beard grass, tree-of-heaven, giant reed, saltcedar, perennial pepperweed, rainbow trout, and brook trout that may be exacerbated by climate change such that the greatest functional lift is provided. **Sub-Objective AR-3.2.3:** Enhance, rehabilitate, establish and/or reestablish small (that is, low order) tributaries/streams that discharge into larger rivers such as the Kern River, San Joaquin River, and Owens River.	Same references as listed with Objective AR-3.1.

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Goal AR-4: Provide multi-resource benefits.	See below	See below
Objective AR-4.1: Maximize mitigation opportunities for multiple environmental benefits.	**Sub-Objective AR-4.1.1:** Enhance, rehabilitate, establish, and/or reestablish 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 habitats for other aquatic species such as vernal pool crustaceans and plants, fish species included in Section 2.15.2, and species included in Appendix D of this document that could benefit from aquatic habitat enhancement and/or restoration. **Sub-Objective AR-4.1.3:** Address additional RWQCB beneficial use designations, such as recreation (for example, bird watching) through enhancement, rehabilitation, establishment, and/or reestablishment actions.	▪ *Land Management Plan for the Sequoia National Forest Pre-objection Version* (USFS 2022a) ▪ *Land Management Plan for the Sierra National Forest Pre-objection Version* (USFS 2022b) ▪ *Millerton Lake State Recreation Area Resource Management Plan* (California State Parks 2010) ▪ *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (FWS 2005b) ▪ *SWAP* (CDFW 2015a) ▪ *Water Quality Control Plan for the Central Valley Region* (Central Valley RWQCB 2019) ▪ *Water Quality Control Plan for the Lahontan Region* (Lahontan RWQCB 2019) ▪ *Water Quality Control Plan for the Tulare Lake Region* (Central Valley RWQCB 2018)

8.8 Summary

Caltrans anticipates that future SHOPP transportation projects may be conditioned by the Corps, the Water Boards, and/or CDFW to address the pressures and stressors that threaten aquatic resources in the GAI. These pressures and stressors include:

- Habitat loss, fragmentation, and degradation;
- Invasive species;
- Altered hydrology, geomorphology, and water quality;
- Climate change and drought; and
- Wildfire risk.

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 33 CFR § 332.3, consolidating compensatory mitigation is generally 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 area, functions, values, and the condition of wetland and non-wetland water resources in the GAI. The primary objectives associated with this goal are to improve existing wetland and non-wetland water resources and create new ones. The sub-objectives were selected to address the following pressures and stressors: altered hydrology, geomorphology, and water quality; habitat loss, fragmentation, and degradation; invasive species; and wildfire risk.

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, improve surface water hydrology, and improve water storage and groundwater recharge. The sub-objectives were selected to address the following pressures and stressors: altered hydrology, geomorphology, 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: climate change and drought; invasive species; and wildfire risk.

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-objective of Goal AR-4 describes 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 in-kind transportation projects' effects on aquatic resources.

Each of the goals and objectives have sub-objectives intended to further guide advance mitigation project scoping toward resource and regulatory agencies' regional conservation goals and objectives. These sub-objectives will prompt Caltrans to incorporate multiple benefits into advance mitigation project 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 in 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 on 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 and 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, advance mitigation project scopes will address transportation project delivery acceleration and environmental objectives:

- To meet the AMP's objective of accelerating transportation project delivery, 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.
- To meet the environmental objectives through transportation project mitigation, an advance mitigation project scope will be consistent with natural resource regulatory agency goals and objectives expressed in an approved regulatory instrument or interagency agreement and/or aligned with conservation goals and objectives identified in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*, or Chapter 8, *Aquatic Resources Conservation Goals and Objectives*.

Summaries of transportation-related advance mitigation project scope requirements and conservation-related advance mitigation project scope goals and objectives are provided in Tables 9-1 and 9-2, respectively.

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

Advance mitigation project scopes must:
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 natural resource regulatory 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 Advance Mitigation Project Scope 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 natural resource regulatory 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 transportation projects to natural resources is shown on figures throughout this document and listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Estimated transportation project mitigation needs within the GAI for fiscal years 2021/22 to 2030/31 are presented in Chapter 5, *Modeled Estimated Impacts*, and the timing of the needs is analyzed in Chapter 6, *Benefiting Transportation Project Considerations*. For the time interval under consideration, fiscal years 2021/22 to 2030/31, Caltrans District 6 intends to prioritize purchasing or developing mitigation credits or values that address Road Repair and Accountability Act of 2017 (also known as Senate Bill 1) priorities that are planned for the middle of the planning period. Given the expected timing of mitigation need, at this time (July of fiscal year 2023/24) mitigation that can be purchased or established by fiscal year 2025/26 (within the next 2 years) could potentially address approximately:

- 3.7 acres of Springville clarkia habitat and 3.6 acres of striped adobe-lily habitat impacts in the Sierra Nevada Ecoregion Section, potentially contributing to the acceleration of 4 and 3 transportation projects, respectively
- 9.9 acres of California tiger salamander habitat, 9.2 acres of San Joaquin kit fox habitat, 14.2 acres of Springville clarkia habitat, and 13.6 acres of striped adobe-lily habitat impacts in the Sierra Nevada Foothills Ecoregion Section, potentially contributing to the acceleration of 7, 12, 12, and 12 transportation projects, respectively
- 0.2 acre of non-wetland waters impacts in the Fresno River Sub-basin, potentially contributing to the acceleration of 1 transportation project

- 0.1 acre of wetland, 1.5 acres of non-wetland waters, and 0.3 acre of riparian habitat impacts in the Middle Kern-Upper Tehachapi-Grapevine Sub-basin, potentially contributing to the acceleration of 3, 4, and 2 transportation projects, respectively
- <0.1 acre of wetland, 0.2 acre of non-wetland waters, and 1.4 acres of vernal pool habitat impacts in the Middle San Joaquin-Lower Chowchilla Sub-basin, potentially contributing to the acceleration of 1, 2, and 3 transportation projects, respectively
- 0.2 acre of non-wetland waters impacts in the South Fork Kern Sub-basin, potentially contributing to the acceleration of 1 transportation project
- 0.2 acre of non-wetland waters and 3.6 acres of riparian habitat impacts in the Tulare Lake Bed Sub-basin, potentially contributing to the acceleration of 2 and 1 transportation projects, respectively
- <0.1 acre of non-wetland waters impacts in the Upper Deer-Upper White Sub-basin, potentially contributing to the acceleration of 1 transportation project
- <0.1 acre of wetland, 0.2 acre of non-wetland waters, 0.1 acre of vernal pool habitat impacts in the Upper Dry Sub-basin, potentially contributing to the acceleration of 1, 1, and 1 transportation projects, respectively
- <0.1 acre of wetland, 0.6 acre of non-wetland waters, 1.3 acres of vernal pool habitat, and 0.1 acre of riparian habitat impacts in the Upper Kaweah Sub-basin, potentially contributing to the acceleration of 1, 3, 3, and 3 transportation projects, respectively
- <0.1 acre of non-wetland waters impacts in the Upper Kern Sub-basin, potentially contributing to the acceleration of 1 transportation project
- 0.4 acre of non-wetland waters and 0.4 acre of threatened and endangered fish habitat impacts in the Upper King Sub-basin, potentially contributing to the acceleration of 2 and 2 transportation projects, respectively
- 0.1 acre of non-wetland waters and 0.1 acre of riparian habitat impacts in the Upper Poso Sub-basin, potentially contributing to the acceleration of 2 and 1 transportation projects, respectively
- <0.1 acre of wetland, 0.8 acre of non-wetland waters, and 0.8 acre of threatened and endangered fish habitat impacts in the Upper San Joaquin Sub-basin, potentially contributing to the acceleration of 2, 1, and 2 transportation projects, respectively
- 0.4 acre of vernal pool habitat and <0.1 acre of riparian habitat impacts in the Upper Tule Sub-basin, potentially contributing to the acceleration of 2 and 2 transportation projects, respectively

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

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, a brief description of each of the

11 SHC § 800.6(a)-authorized advance mitigation project types is provided, 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 have potential but may not be feasible to implement on a schedule to contribute to accelerated transportation project delivery. Further, the activity authorized by SHC § 800.6(a)(4) is only feasible if § 800.6(a)(1)–(3) options are not feasible. Results of the feasibility analysis are summarized in the subsections below and in Table 9-4 (wildlife resources) and Table 9-5 (aquatic resources) later in 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
Caltrans funds the implementation of conservation actions and habitat enhancement actions[c,d] to generate mitigation credits pursuant to an MCA[b] 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[e] 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

Advance Mitigation Project Type	Authorization	Section
When the other mitigation options (above) are not practicable, Caltrans may perform mitigation in accordance with a programmatic mitigation plan[f] 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] The Water Boards do not typically approve establishment of or accept preservation credits.
[f] 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

NCCPs and HCPs are discussed in Section 4.2. NCCPs and HCPs are species-focused and are aligned with and plan for natural resource protection. NCCPs and HCPs provide for incidental take under CESA and ESA, respectively. CDFW is the signatory agency to NCCPs. FWS is the signatory agency to HCPs. Caltrans identified no transportation-related HCP/NCCPs with plan areas that overlap the GAI.

Feasibility. This authorized activity is not feasible. At this time (July of fiscal year 2023/24), there are no HCPs or NCCPs that Caltrans can contribute or pay fees to in the GAI.

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. In the GAI, CDFW is a signatory to three active conservation banks, none of which offer credits for the species of mitigation need (Table 4-1). FWS is a signatory to seven active conservation banks, including three that offer California tiger salamander and San Joaquin kit fox credits (Table 4-3). CDFW and FWS are cosignatories to one of the conservation banks.

Conservation bank service areas are shown on Figures 4-1 through 4-4, and the anticipated transportation project impact forecast on species of mitigation need is presented by year on Figures 6-2 and 6-3. When placed side-by-side, it is possible to see that multiple transportation projects may need species of mitigation need credits and which bank's service areas might have them available by 2023/24, when the credits might contribute to transportation project acceleration.

Feasibility. When bank instruments include pre-transfer credit purchases, this authorized activity may be feasible. Caltrans District 6 may be able to address some of its California tiger salamander and San Joaquin kit fox mitigation need through pre-transfer credits purchased from conservation banks in the GAI. 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 Caltrans 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 CDFW approval, be applied to meet future CDFW permit conditions on transportation projects. Since the California tiger salamander is a dually listed species, it is probable that compensatory mitigation will be incorporated into future consultations under Section 7 or permits under Section 10 of the ESA in coordination with the FWS. For existing banks, a BEI amendment would be required to formalize a process for bulk pre-transfer credit purchases, and additional time for amending the bank instrument should be addressed in the schedule; the additional time it would take to amend an instrument may make this pathway infeasible. In 2021, the Interagency Project Delivery Team finalized new bank templates that incorporate pre-transfer purchase terms satisfactory to the Project Delivery Team; however, terms may not be satisfactory for bankers and Caltrans. Districts should explore with banker sponsors whether additional Caltrans-specific terms would also need to be negotiated with bank sponsors. 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 non-wetland waters-focused, and each bank's alignment with natural resource protection is documented through its BEI. Two mitigation banks occur in the GAI, both of which provide wetland and/or non-wetland water credits. The Corps is a signatory on both mitigation banks in the GAI (Table 4-1).

Feasibility. When bank instruments include pre-transfer credit purchases, this authorized activity may be feasible. 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. For existing banks, a BEI amendment would be required to formalize a process for bulk pre-transfer credit purchases, and additional time for amending the bank instrument should be addressed in the schedule; the additional time it would take to amend an instrument may make this pathway infeasible. In 2021, the Interagency Project Delivery Team finalized new bank templates that incorporate pre-transfer purchase terms satisfactory to the Project Delivery Team; however, terms may not be satisfactory for bankers and Caltrans. Districts should explore with banker sponsors whether additional Caltrans-specific terms would also need to be negotiated with bank sponsors. 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 were discussed in Section 4.4.[1] In-lieu fee mitigation occurs when a permittee provides funds to an in-lieu fee sponsor instead of either completing project-

[1] Up-to-date information on approved in-lieu fee programs, including available credits, can be found at: https://ribits.ops.usace.army.mil/ords/f?p=107:47:13453394859366::NO

specific mitigation or purchasing credits from a conservation or mitigation bank 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, Rivers and Harbors Act, ESA, Porter-Cologne Water Quality Control Act, and other applicable laws. Once enough money is received by an in-lieu fee program, it implements wetland, stream, or threatened or endangered species habitat restoration, creation, enhancement, or preservation activities in a watershed or other defined area.[2] The in-lieu fee program's alignment with natural resource protection is documented through its enabling instrument and will be incorporated into future biological opinions on transportation projects.

There is one active in-lieu fee program with a service area that overlaps the GAI (Figures 4-5 and 4-6). The NFWF Sacramento District California ILF Program instrument includes pre-transfer credit purchases.

Feasibility. This authorized activity is feasible. 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. Pre-permit credits purchased from the NFWF Sacramento District California in-lieu fee program through an advance mitigation project might, with natural resource agency approval, be incorporated into future conditions on transportation projects.

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 (July of fiscal year 2023/24), instructions and guidance for establishing MCAs are currently under finalization by CDFW.[3] However, an approved RCIS is a pre-condition for MCA creation and there are no active or pending RCISs with service areas that overlap the GAI.

Feasibility. At this time (July of fiscal year 2023/24), this authorized activity is not feasible because 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[4] and FWS.[5] Conservation banks are species-focused, and each bank's alignment with natural resource protection will be documented through its BEI. CDFW, FWS, and NMFS are potential signatories, and there also may be circumstances where the Corps, SWRCB, and/or RWQCBs would participate.

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[2] https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/banking_faq.pdf
[3] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[4] https://wildlife.ca.gov/Conservation/Planning/Banking/Templates
[5] https://www.fws.gov/endangered/esa-library/pdf/Conservation_Banking_Guidance.pdf

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 3*, Relevant Plans, Policies, and Regulations*
- 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, *Wildlife Resources Conservation Goals and Objectives*, Caltrans analyzed and synthesized the relevant and applicable information listed in Chapter 3, *Relevant Plans, Policies, and Regulations*, to develop its understanding of natural resource regulatory agency goals and objectives for the GAI. In brief, it is Caltrans' understanding that a conservation bank that addresses the following goals would be consistent with CDFW and FWS goals:

- Conserve and expand habitat for species of mitigation need within the GAI to support ecosystem functions that are essential to recovery of the species (WILD-1).
- Preserve, enhance, and increase connectivity between blocks of habitat supporting species of mitigation need to allow for dispersal that will maintain resilience and variability of populations (WILD-2). [6]
- Support resiliency of the landscape to climate change (WILD-3).
- Decrease mortality and competition, and protect population health for species of mitigation need (WILD-4).
- Prioritize multi-species and multi-resource benefits (WILD-5).

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

Feasibility. This authorized activity may be feasible. 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

[6] In 2021, CDFW was authorized to approve compensatory mitigation credits for wildlife connectivity actions taken under the conservation and mitigation banking program or the regional conservation investment strategy program (FGC § 1955 et. seq.). Soon thereafter, CDFW began developing a crediting methodology that is expected to be published in 2023.

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. New BEI templates are under development and may need to be finalized before third-party bank sponsors would contract or subcontract with Caltrans; the additional time required for the templates to be finalized and go through the public notice process may make this pathway infeasible.

9.3.7. Mitigation Bank Establishment

Instructions and guidance for establishing mitigation banks are available from the Corps[7] and CDFW.[8] At a minimum, mitigation bank establishment project scopes will refer to and rely on GAI information provided in:

- Chapter 2, *Environmental Setting*
- Chapter 3, *Relevant Plans, Policies, and Regulations*
- Chapter 7, *Wildlife Resources Conservation Goals and Objectives*
- Chapter 8, *Aquatic Resources Conservation Goals and Objectives*
- Appendix E, *Hydrologic Units*
- Appendix G, *Aquatic Resource Locations*

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

Mitigation banks are wetland- and non-wetland waters-focused, and each bank's alignment with natural resource protection is documented through its BEI. In addition, there may be an understanding of special-status species and wildlife goals, if a joint mitigation and conservation bank that would have both aquatic resource and species credits were proposed. The Corps, RWQCB, FWS, CDFW, and NMFS are potential signatories. In some circumstances, CDFW's participation in a bank could be documented through an MCA.

An understanding of Corps, RWQCB, FWS, CDFW, and NMFS 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, *Aquatic Resources Conservation Goals and Objectives*, Caltrans analyzed and synthesized the relevant and applicable information listed in Chapter 3, *Relevant Plans, Policies, and Regulations*, to develop its understanding of natural resource regulatory agency goals and objectives for the GAI. In brief, it is Caltrans' understanding that a mitigation bank that addresses the following goals would be consistent with natural resource regulatory agency goals:

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

- Ensure no net loss of area, functions, values, and condition of WOTUS and waters of the state to ensure no overall net loss and long-term net gain in the quantity, quality, and permanence of wetland 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[9] (AR-1).
- Restore and maintain the chemical, physical, and biological integrity of wetlands and non-wetland waters (AR-2).
- Support resiliency of aquatic resources to climate change (AR-3).
- Provide multi-resource benefits (AR-4).

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. This authorized activity may be feasible. 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. New BEI templates are under development and may need to be finalized before third-party bank sponsors would contract or subcontract with Caltrans; the additional time required for the templates to be finalized and go through the public notice process may make this pathway infeasible.

9.3.8. In-lieu Fee Program Establishment

Each in-lieu fee program's alignment with natural resource protection is documented in its enabling instrument. Instructions and guidance for establishing in-lieu fee programs are available from the federal agencies.[10] With respect to wildlife, like the Corps, FWS also follows federal guidance for establishing an in-lieu fee program; however, a supportive legislative, regulatory, and administrative pathway for CDFW to develop an in-lieu fee program has not been developed.

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 3*, Relevant Plans, Policies, and Regulations*
- Chapter 7, *Wildlife Resources Conservation Goals and Objectives*

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

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

To support future transportation project permits, Caltrans would seek CWA credit establishment under the Corps' jurisdiction (WOTUS) and RWQCB jurisdiction (waters of the state). The Corps, EPA, SWRCB, and/or RWQCBs are potential signatories to the in-lieu fee program enabling instrument. Caltrans may also seek to establish credits that could be applied as compensatory mitigation to offset impacts as part of future ESA biological assessments/opinions in coordination with FWS and NMFS.

Feasibility. This authorized activity may be feasible. As pointed out above, instructions and guidance for establishing an in-lieu fee program for CWA credits 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 2 to 6 years. 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 implementation tasks.

9.3.9. MCA Credit or Value Establishment

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. In accordance with the *Regional Conservation Investment Strategies Program Guidelines*, MCAs are species- and species habitat-focused and can include credits under CESA and/or for riparian habitat or bed, bank, and channel habitat within streams, rivers, and lakes to meet mitigation needs under a Lake and Streambed Alteration Agreement. An MCA's alignment with natural resource protection will be documented through the foundational RCIS and the MCA itself (CDFW 2021b). RCIS development is also an SHC § 800.6(a)-authorized advance mitigation project deliverable.

Caltrans envisions that credits or values created through an MCA and funded through the AMA could be established under three scenarios:

- 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. 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, in which a third party is the MCA sponsor. The MCA sponsor, CDFW, and 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.

To support future transportation project permits, an MCA or, if needed, an RCIS in concert with an MCA, funded through the AMA, could potentially establish CESA and/or Lake and Streambed Alteration Program credits[11] 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 natural resource regulatory 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. At this time (July of fiscal year 2023/24), instructions and guidance for establishing MCAs are being finalized by CDFW[12] and the RCIS Program is conducting pilot efforts to inform the development of MCAs and associated agreements. Consequently, at this time, timelines and specifics related to the MCAs are uncertain and scoping and delivering an advance mitigation project within the AMP's timeline needs is unlikely. Caltrans will stay involved to understand how CDFW's pilots are going, but given the nature of the AMP's revolving account, Caltrans has determined that it cannot commit AMA funds to a pilot effort.

Nevertheless, in the future, Caltrans anticipates that when a CDFW-approved RCIS is in place[13] and after the Caltrans Director's approval for funding, delivering an advance mitigation project to establish an MCA and its credits or values would take 4 to 9 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[14] 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 natural resource regulatory agencies with overlapping jurisdictions and/or conducting parallel evaluations[15] with the other agencies into the scope and schedule; the additional time required to align with non-CDFW natural resource regulatory agencies may make this pathway infeasible.

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[11] Caltrans is the Lead Agency under CEQA; CDFW's permitting authority does not include conditioning transportation projects under CEQA (Section 7).
[12] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[13] 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.
[14] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[15] Parallel evaluations are undertaken when, for the same environmental enhancement/action, two or more agencies must employ different mechanisms to approve the credits.

Wildlife Crossing and Aquatic Corridor Enhancements

As described in Section 4.6 and discussed previously, the bank instrument mechanism provides the natural resource regulatory agencies with a compensatory mitigation mechanism to approve credits for wildlife crossing and aquatic corridor enhancements and the RCIS and MCA framework provides CDFW with an additional compensatory mitigation mechanism to approve credits for wildlife crossing and aquatic corridor enhancements. In other words, through a bank instrument or an MCA developed under an RCIS, one or more natural resource regulatory agencies would be authorized to recognize credits established through wildlife crossing and aquatic corridor enhancement made separate from and distinct from specific transportation projects. An instrument or MCA for connectivity would be consistent with Caltrans' understanding of natural resource regulatory agency goals and objectives that support resiliency of aquatic resources to climate change (AR-3), provide multi-resource benefits (AR-4 and WILD-5), conserve and expand existing habitat for species of mitigation need in the GAI (WILD-1), and preserve, enhance, 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 funded through the AMA to establish credits. In addition to the uncertainty listed above related to implementation and associated agreements, connectivity enhancements have additional uncertainty related to mitigation crediting framework and outputs (temporary versus permanent), cost feasibility, engineering, and delivery timelines. Caltrans will reassess wildlife crossing and aquatic corridor enhancements related to feasibility with respect to the AMA expenditures and mitigation needs covered in this RAMNA once CDFW has published its connectivity crediting guidelines.

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[16] 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 (July of fiscal year 2023/24), this authorized activity is not feasible. A supportive regulatory and administrative pathway for a natural resource regulatory agency 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

[16] SWRCB and RWQCBs do not typically approve establishment of or accept preservation credits.

uncertain. Consequently, at this time, scoping and delivering an advance mitigation project within the AMP's timeline needs through this authorized activity is unlikely. Given the nature of the AMP's revolving account, the AMP has determined that Caltrans cannot commit AMA funds to a pilot effort.

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.*

This authorized activity would 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, 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 (July of fiscal year 2023/24), a few of the authorized activities listed in Table 9-3 may be feasible (Tables 9-4 and 9-5). This suggests that addressing a 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 2021/22 through 2030/31 (Chapter 5, *Modeled Estimated Impacts*) and evaluated its needs in light of when transportation projects might need the mitigation (Chapter 6, *Benefiting Transportation Project Considerations*, and Section 9.2). 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 (Sections 9.3.1 to 9.3.5) or establish additional mitigation (Section 9.3.6 through 9.3.11).

Based on its evaluation, Caltrans found that, at this time (July of fiscal year 2023/24), a few authorized activities are feasible and, under several scenarios, advance mitigation project scopes could cover multiple resources and address overlapping natural resource regulatory agency jurisdictions (see Section 9.2). For example, California tiger salamander and WOTUS could be addressed within the same credit purchase or through establishing a single credit establishment project. Under some conditions, establishing new mitigation credits through existing mechanisms may also be possible.

Table 9-4. Wildlife Resources Credit Options and Feasibility, July 2023

Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Pay NCCP and/or HCP fees[b]	Yes	No, zero HCP/NCCPs in the GAI	No	1 to 3 years
Purchase conservation bank credits	Yes, may require instrument amendment	Yes, 3 FWS-approved banks in GAI with California tiger salamander and San Joaquin kit fox credits	No	1 to 3 years
Purchase in-lieu fee credits	Yes	Yes, one Corps in-lieu fee program in the GAI, but none for FWS or CDFW	Yes, with SWRCB, RWQCBs, and NMFS	1 to 3 years
Purchase MCA credits	No	Not available	Not available	Not available
Establish conservation bank	Yes	Yes, with CDFW, FWS, and NMFS	Yes, with CDFW, FWS, NMFS	2 to 6 years
Establish in-lieu fee program	Yes	Yes, with FWS and NMFS	Yes, with FWS and NMFS Potential to align with Corps in-lieu fee program	2 to 6 years
Establish MCA credits or values[c]	No; zero approved RCISs; MCA guidelines in progress	Maybe—MCA guidelines in progress	Maybe, CDFW, SWRCB, RWQCBs, FWS, and NMFS Potential for parallel evaluations	Unknown
Establish RCIS and MCA[c]	No; zero approved RCISs; MCA guidelines in progress	Maybe—RCIS guidelines available; MCA guidelines in progress	Maybe, CDFW, SWRCB, RWQCBs, FWS, and NMFS Potential for parallel evaluations	Unknown

Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Establish mitigation that meets an RCIS objective	No	Not available	Not available	Not available
Establish mitigation in accordance with a programmatic mitigation plan	No	Not available	Not available	Not available

[a] Caltrans contracting processes and agency interactions are incorporated into this time estimate.
[b] Payment of NCCP/HCP fees may have some overlap with in-lieu fee program credits and meet multiple mitigation needs.
[c] Either Caltrans or a third party would be the signatory with CDFW.

Table 9-5. Aquatic Resources Credit Options and Feasibility, July 2023

Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Purchase mitigation bank credits	Yes, may require instrument amendment	Yes, two Corps banks	Yes, RWQCB, Corps, EPA, and CDFW	1 to 3 years
Purchase in-lieu fee credits	Yes, may require instrument amendment	Yes, one in-lieu fee program in the GAI; instrument has been amended	Yes, Corps, RWQCB, EPA, and NMFS	1 to 3 years
Purchase MCA credits	No	Not available	Not available	Not available
Establish mitigation bank	Yes	Yes, Corps, EPA, CDFW, FWS, and NMFS	Yes, RWQCB, Corps, EPA, CDFW, FWS, and NMFS	2 to 6 years
Establish in-lieu fee program	Yes	Yes, for Corps, EPA, FWS, and NMFS	Maybe, Corps, FWS, NMFS, EPA, and RWQCB	2 to 6 years
Establish MCA credits or values[b]	No; zero approved RCISs; MCA guidelines in progress	Maybe—MCA guidelines in progress	Maybe, RWQCB and NMFS Potential for parallel evaluation(s)	Unknown
Establish RCIS and MCA[b]	No; zero approved RCISs; MCA guidelines in progress	Maybe—RCIS guidelines available; MCA guidelines in progress	Maybe, RWQCB, and NMFS Potential for parallel evaluation(s)	Unknown
Establish mitigation that meets an RCIS objective	No	Not available	Not available	Not available
Establish mitigation in accordance with a programmatic mitigation plan	No	Not available	Not available	Not available

[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.

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, as determined by a natural resource regulatory agency, 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 as well as 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 and in 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.

Caltrans 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 on Figure 1-2; Caltrans 2021b). Advance mitigation project delivery includes stakeholder engagement, project alternative analysis, 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.

- When required by the advance mitigation project type, 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, and 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 be consistent with appropriate conservation goals and objectives identified in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*, and Chapter 8, *Aquatic Resources Conservation Goals and Objectives*.
- When appropriate for the advance mitigation project type, it may be necessary to identify the steps required to meet the goal of satisfying overlapping jurisdictional mitigation requirements.
- Instruments and advance-mitigation project-specific interagency agreements 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-8 sub-basins 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.

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